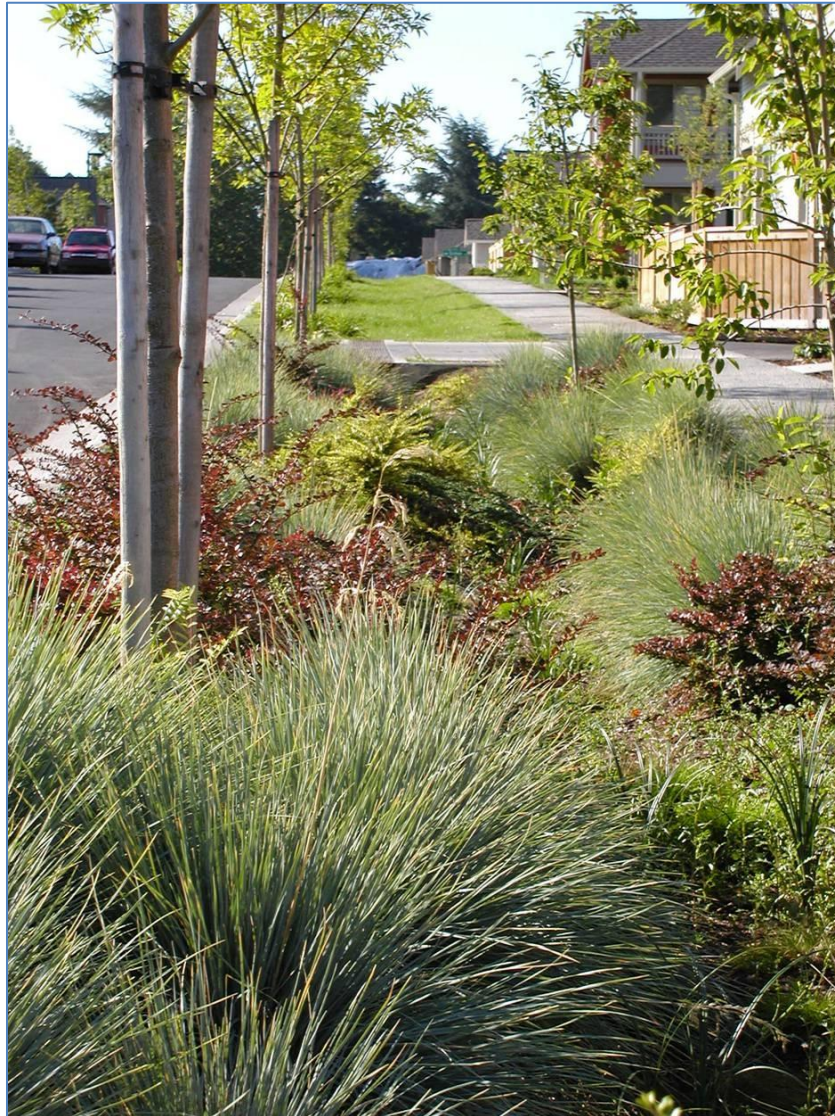




**ATTACHMENT A
CITY OF SEATTLE**

**2011 NPDES PHASE I MUNICIPAL STORMWATER PERMIT
STORMWATER MANAGEMENT PROGRAM**



March 2011



CITY OF SEATTLE
2011 NPDES STORM WATER MANAGEMENT PROGRAM

On the Cover: High Point Natural Drainage System. Designed in partnership with Seattle Housing Authority, this natural drainage system treats about ten percent of the watershed feeding Longfellow Creek. This large scale project serves as a model for other large-scale developments both locally and across the country.



CITY OF SEATTLE
2011 NPDES STORM WATER MANAGEMENT PROGRAM

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**CITY OF SEATTLE NPDES STORMWATER MANAGEMENT
PROGRAM**

**Submitted to the Washington Department of Ecology in compliance with the
2007 Phase I Municipal Stormwater National Pollutant Discharge Elimination
System and State Discharge General Permit for discharges from Large and
Medium Municipal Separate Storm Sewer Systems**

WAR04-4503

**City of Seattle
Seattle Public Utilities
Seattle, Washington**

Date: March 31, 2011

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I. INTRODUCTION



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I.1 Introduction

This document comprises the fourth-year compilation of the Stormwater Management Program (SWMP) for the City of Seattle (City) under the 2007 National Pollution Discharge Elimination System (NPDES) Phase I Municipal Stormwater Permit (Permit) (Ecology 2010a). This SWMP applies to the municipal separate storm sewers owned or operated by the City within the geographical boundaries established by the Permit. Existing City programs relevant to the SWMP are outlined with minimum performance requirements, principal responsibilities, information links and summaries of current status and upcoming work. This fourth-year compilation of the SWMP is Attachment A to the Annual Report Form, which addresses the activities that the Permit requires to be completed in the fourth year of the Permit (January 1, 2010 to December 31, 2010). This SWMP will be reviewed and updated annually according to the Permit requirement. This version of the SWMP has been updated to incorporate modifications to, or additional sets of actions, that have been implemented to comply with the required components listed in S5 of the permit.

Permit Condition S5 outlines the ten components of the SWMP that have required programs and activities, which include reporting and minimum performance measures. Section II of this document is organized to follow these Permit requirements in a parallel structure and describes the set of actions that the City is or will be implementing to comply with S5 of the permit. Many of these components involve existing programs conducted by the City's various departments and organizational structure. This SWMP compiles this information in a single document that will not only meet Permit requirements but will also aid the City's implementation of its NPDES stormwater management program. The acronyms and terms used in this document are defined in Section V.

There are six City departments primarily responsible for implementing the SWMP components and associated activities and projects. Seattle Public Utilities (SPU) has the designated lead role for managing stormwater, conducting water quality programs, and managing drainage-related capital projects. Other departments with major Permit-related responsibilities include the Department of Planning and Development (DPD), Seattle Parks and Recreation (Parks), Seattle Department of Finance and Administrative Services (FAS) (formerly known as the Seattle Department of Fleets and Facilities), Seattle City Light (SCL), and Seattle Department of Transportation (SDOT). These departments and SPU have been implementing many of the Permit-required programs for many years and in some cases well before the first NPDES municipal separate storm sewer system (MS4) permit was issued in 1995.

I.1.1 Background

The NPDES program is a key element of the Federal Clean Water Act¹ aimed at controlling and reducing waterborne pollutants discharged from point sources such as wastewater and stormwater. The Washington State Department of Ecology (Ecology) has jurisdiction for implementing the federal NPDES program in the State of Washington. In implementing this program, Ecology issues NPDES permits to cover individual facilities or groups of multiple entities with common activities under a general NPDES permit. These

¹ Note: The "Clean Water Act" as a term refers to the body of law that includes: Federal Water Pollution Control Act (1972), Clean Water Act (1977), and the Water Quality Act (1987), as may be amended from time to time.



permits must meet federal minimum requirements. For regulated municipal stormwater discharges, the NPDES program requires permits for large, medium and small MS4s as defined in federal regulations. The Phase I regulations of the MS4 program went into effect in 1990 and apply to MS4s in municipalities with populations of more than 100,000 (medium and large MS4s).

The first Phase I MS4 permit was issued by Ecology in July 1995 to the cities of Seattle and Tacoma and counties of Clark, King, Pierce and Snohomish. The MS4s owned or operated by the Washington State Department of Transportation (WSDOT) located in these cities and counties were also regulated under the 1995 permits. To meet the requirements of the 1995 Permit, the City prepared and managed stormwater under a SWMP that was approved by Ecology in 1997. The City provided updates on stormwater management activities to Ecology in annual reports that were submitted from 1996 to 2005. The new format for SWMPs and Annual Reports pursuant to the 2007 Permit replaces the City's 1997 SWMP.

On January 17, 2007, Ecology re-issued the Phase I MS4 permit. The Permit became effective on February 16, 2007, was modified on June 17, 2009 and September 1, 2010 and bears an expiration date five years later, February 15, 2012. (The Phase II MS4 permit was issued concurrently and applies to approximately 90 small cities and counties in Western Washington and approximately 30 cities and counties in Eastern Washington). The 2007 Phase I MS4 permit has 20 pages of text outlining the requirements for developing the SWMP and its ten components and associated programs, along with minimum performance measures and reporting requirements. The Phase I and II permit were appealed in 2007 by various interests, and the Washington State Pollution Control Hearings Board issued a series of rulings, which Ecology has incorporated by permit modification dated June 17, 2009. A second permit modification was issued on September 1, 2010 to incorporate Ecology's equivalency determination of Clark County's Flow Control Mitigation program and minor changes to equivalency documents for King County and the City of Seattle's Code (Appendix 10). The 2010 permit modification as to the Clark County program was on appeal during 2010.

I.1.2 City of Seattle Drainage

Drainage infrastructure in the City's system was developed with the primary purpose of conveying stormwater runoff in order to protect people and property. Prior to 1890, Seattle relied on an assortment of sewers and cesspools that, at best, drained into surrounding lakes and salt water. Faced with recurring threats of waterborne diseases including typhoid and cholera, Seattle's first centralized combined sewage system was planned in 1891. This plan sought to remove as much city sewage as possible into the salt water of Elliott Bay and the Puget Sound with more limited drainage into the fresh water of Lake Washington. Although originally untreated, the City undertook a succession of steps starting in the late 1910's to remove solids, begin primary sewage treatment, and eventually separate storm water from raw sewage. Metropolitan King County took over the City's wastewater treatment responsibilities in the 1960's, but Seattle continues to manage its network of municipal combined and separated storm sewers.

The City's current drainage infrastructure includes three different types (Figure I.1.1): the separate storm sewer system (in purple), the partially separated system (in green), and the combined sewer system (in yellow) each serving approximately one third of the geographical area of Seattle.

In the separate system, storm drainage is directed to a separate storm drain system, while wastewater goes to a sanitary sewer and on to the wastewater treatment plant before discharge. While parts of the City's separated drainage system are formal and piped, some parts of the separate stormwater runoff are managed primarily through an informal system of ditches and culverts, most of which drain to creeks or larger receiving waters. The area north of NE 85th Street, which the City annexed in 1954, is an example of an area still served primarily by ditch and culvert drainage systems.

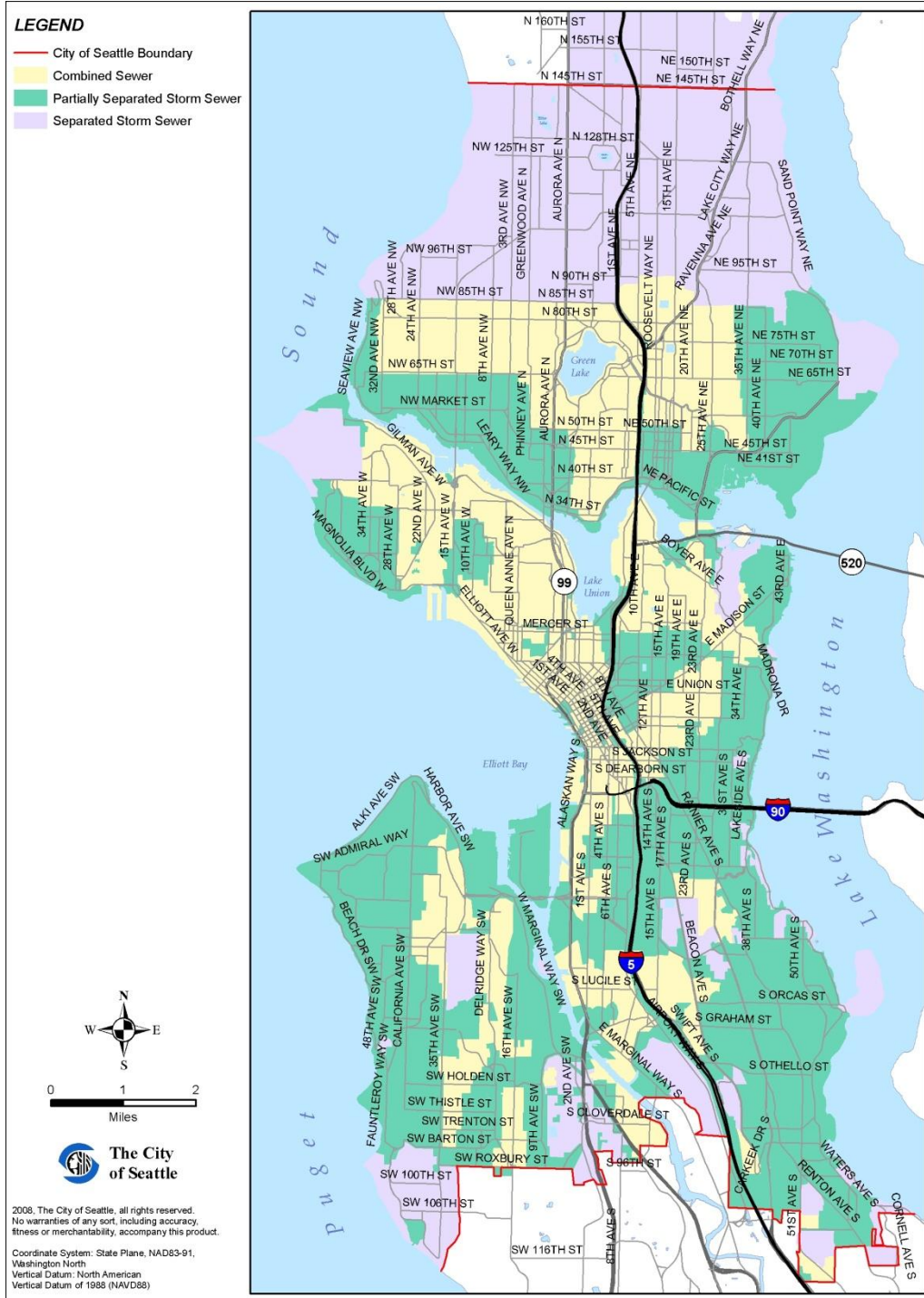
In partially separated sewer areas of the City, all drainage once flowed in the combined system. During the 1960's, storm drain separation projects were built that diverted street runoff in pipes to the separate storm



drainage system and receiving waters. Rooftop and other private property drainage continue to be directed to wastewater treatment plants.

The combined sewer system is a formal piped system that continues to carry both sanitary wastewater and stormwater runoff from some parts of the City to one of the area's wastewater treatment plants. Combined sewers are outside the NPDES municipal stormwater permit structure.

Figure I.1-1. Map of City Drainage Systems



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II. NPDES STORMWATER MANAGEMENT PROGRAM



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II.1 Legal Authority-S5.C.1

II.1.1 Requirements

The Permit (Section S5.C.1) requires the SWMP to demonstrate certain legal authorities for controlling stormwater discharges to the City's MS4. Section S5.C.1 of the Permit outlines these areas, but does not require specific products, submittals, reports or a schedule for completing required activities because this requirement has been in effect since the 1995 NPDES permit. Many of these legal authorities are expressed in the requirements of the other SWMP components, some of which have Permit-required products and completion schedules, including the authorities needed for controlling stormwater related to:

- Industrial activity
- Illicit discharges, spills and dumping
- Inter-jurisdictional agreements
- Development and redevelopment
- Construction inspections

II.1.2 Program description

Legal authority enabling the City to control discharges to and from the MS4 is primarily established by Seattle Municipal Code (SMC), Stormwater Code (SMC 22.800 – 22.808) effective on November 30, 2009, including revisions, achieving equivalency with the Department of Ecology's 2005 Stormwater Management Manual for Western Washington. The Directors of SPU and DPD share responsibility for issuance of notices of violation, stop work orders, and corrective actions for violation of the Stormwater Code. The Stormwater Code is designed to control, through regulation and ordinance, the contribution of pollutants to the MS4. It prohibits illicit discharges, spills and illegal dumping, and authorizes inspections, surveillance and monitoring to determine compliance and meet the ongoing Permit requirements.

The Side Sewer Code (SMC 21.16) regulates side sewers and, for example, prohibits discharge of certain materials; requires maintenance of detention facilities; provides a right of entry for inspection; requires repair of inoperative or inadequate sewers, drains, or natural watercourses; and regulates the construction, alteration, repair, and connection of side sewers and service drains. The Side Sewer Code was amended in 2010, signed by Mayor on December 20, 2010 and effective on January 5, 2011.

The City's Regulations for Environmentally Critical Areas (Ch. 25.09 SMC) also provide protections and standards relevant to municipal stormwater.

II.1.3 Responsible City Departments

The City Attorney's Office provides legal advice to the City about implementation of legal authority for SMC and Directors' Rules, further discussed in II.1.4, related to the management of stormwater.

II.1.4 Completed Activities

In September of 2009 Mayor Greg Nickels signed into law three new ordinances relating to stormwater and grading. Among other changes, the revised Stormwater Code requires the use of green stormwater infrastructure to the maximum extent feasible (MEF). Green stormwater infrastructure is defined as a drainage control facility that uses infiltration, evapotranspiration, or stormwater reuse. Examples of green stormwater infrastructure include permeable pavement, bioretention facilities and green roofs. Changes to the Code were effective on November 30, 2009, achieving equivalency to Appendix 1 of the permit, Minimum Technical Requirements for New Development and Redevelopment as required in S5.C.5 of the permit.

The purpose of this revised Stormwater Code and its associated Directors' Rules are to protect life, property, public health, and the environment from the adverse impacts of urban stormwater runoff. These adverse impacts can include flooding, pollution, landslides, and erosion. The revisions were drafted to the Stormwater Code and Directors' Rules in order to account for advances in urban stormwater runoff management practices since the Stormwater Code was last comprehensively updated in 2000 and to reflect the requirements of the 2007 Permit.

Table II.1.1. Components of the Stormwater Code and Directors' Rules

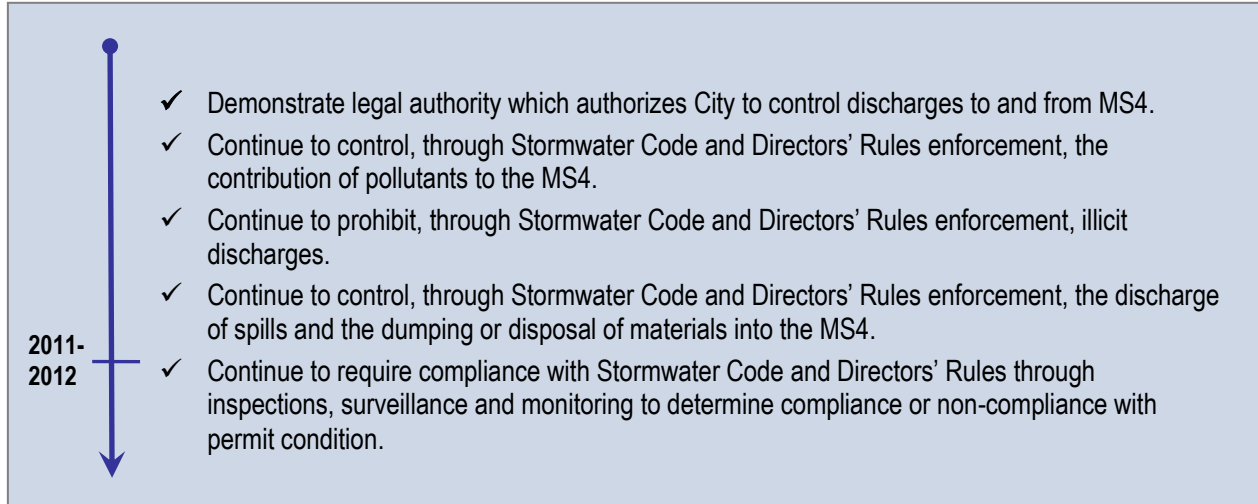
Seattle Municipal Code	Effective Date	Directors' Rules		Effective Date	Title
		DPD	SPU		
22.800 – 22.808	11/30/09			12/1/09	
		15-2009	2009-003		Vol. I– Source Control Technical Requirements Manual
		16-2009	2009-004		Vol. II – Construction Stormwater Controls Technical Requirements Manual
		17-2009	2009-005		Vol. III – Stormwater Flow Control and Water Quality Treatment Technical Requirements Manual
		18-2009	2009-006		Vol. IV – Stormwater Code Enforcement Manual

II.1.5 Current and Planned Activities

Ecology has determined that the revised draft Stormwater Code and Directors' Rules dated March 16, 2009, are equivalent to Appendix 1 of the permit, Minimum Technical Requirements for New Development and Redevelopment. The determination of equivalency by Ecology indicates that the revised Stormwater Code is appropriate for implementation of the minimum requirements in Appendix 1, and will protect water quality, reduce the discharge of pollutants to the maximum extent practicable, and satisfy the state requirement under chapter 90.48 RCW to apply all known, available, and reasonable methods of prevention, control and treatment (AKART).

Figure II.1-1 describes the progress made in implementation of permit requirements and the planned next steps for meeting permit requirements.

Figure II.1-1. Timeline Showing Progress and Next Steps



Legend: ✓ Implemented □ Planned

For More Information

- ❖ City of Seattle Attorney web site: <http://www.seattle.gov/law/>
- ❖ Stormwater Code: <http://www.seattle.gov/dpd/Codes/StormwaterCode/Codes/default.asp>
- ❖ City Clerk web site for SMC and other information: <http://www.seattle.gov/leg/clerk/clerk.htm>
- ❖ Seattle Public Utilities Green Stormwater Infrastructure information: http://www.seattle.gov/util/About_SPU/Drainage_&_Sewer_System/GreenStormwaterInfrastructure/
- ❖ For general questions about this SWMP or more information about this section, email swmp@seattle.gov or visit http://www.seattle.gov/util/About_SPU/Drainage_&_Sewer_System/Plans/StormwaterManagementProgram/StormwaterManagementPlan/



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II.2 Mapping-S5.C.2

II.2.1 Requirements

The Permit (Section S5.C.2) requires the City to:

- Map all known municipal separate storm sewer outfalls, receiving waters, and structural stormwater treatment and flow control Best Management Practices (BMPs) owned, operated or maintained by the City.
- Initiate a program to map connection points between municipal separate storm sewers owned or operated by the City and other municipalities or other public entities.
- Map the following attributes for all storm sewer outfalls with a 24-inch nominal diameter or larger or equivalent cross-section for non-pipe systems: land use, tributary conveyance (indicating type, material, and size where known), and associated drainage area.
- Initiate a program to develop and maintain a map of all connections to the municipal separate storm sewer authorized or allowed by the City after the Permit's effective date.
- Map existing, known connections over 8 inches to the municipal separate storm sewers tributary to all storm sewer outfalls with a 24-inch nominal diameter or larger or equivalent cross-section for non-pipe systems.
- Map geographic areas served by the City's MS4 that do not discharge stormwater to surface water.
- Make available to Ecology, Co-Permittees and Secondary Permittees maps depicting the Permit-required information, upon request.

II.2.2 Ongoing Mapping Program

The City's mapping program provides the ongoing means to document and maintain the City-owned or operated municipal separate storm drainage system including connections, outfalls, drainage infrastructure, drainage areas, land uses, receiving waters, treatment and flow control BMPs and other elements. The City's drainage systems are described in Section I.1.2.

The history of Seattle's Geographic Information System (GIS) spans 19 years, evolving from a small installation in the former Seattle Engineering Department to GIS capabilities that are now firmly integrated in the daily business functions of at least six City departments.

The City's GIS was originally built primarily to improve the way the City manages and operates its utility infrastructure. The City's GIS system has matured and can now support complex business functions in most of the City's departments. For example, GIS data and capabilities are used today at the City to inform decision makers and planners, help deliver services to the public, dispatch Police and Fire personnel, and manage City real property. The City's GIS system and data are and will continue to be an important tool for stormwater management.



II.2.3 Responsible City Departments

GIS support for stormwater management is provided by SPU's GIS Section of the Information Technology Division (GIS Section). The GIS Section will continue to develop and maintain a map of all connections to the MS4 and is responsible for updating the drainage-related GIS layers with information obtained from City-led capital improvement projects and side sewer as-built drawings. Side sewer drawings are obtained from documentation supporting development permit applications submitted to DPD. All work that is conducted under permits issued by DPD is mapped by the Permittee by hand or other methods and is reviewed and approved by the DPD inspector. These side sewer site plans are scanned by DPD, and then sent to the GIS Section. The side sewer infrastructure plans are then digitized by the SPU GIS Section and placed into the working GIS directory for use by GIS users within the City.

II.2.4 Current and Planned Mapping Activities

II.2.4.1 Mapping of known storm sewer outfalls, receiving waters and structural stormwater treatment and flow control BMPs.

The City has a project in place to map all known municipal separate storm sewer outfalls and structural stormwater treatment and flow control BMPs owned, operated or maintained by the City. This mapping continues as new outfalls are found and new BMPs are constructed that fit this description. As developed, these data are being incorporated into existing data sets and are being made available for use by GIS users within the City. For example, the illicit discharge, detection and elimination (IDDE) program can utilize the outfall data when planning the screening program for compliance with the permit requirements in S5.C.8.

II.2.4.2 Develop a program to map connection points between the City's MS4 and those owned and operated by other municipalities or other public entities

The City has a project in place to map connection points between the City's MS4 and those owned and operated by other municipalities or other public entities. Any new connections of this type must be permitted and will follow the methods outlined in III.2.4.3 below. The SPU GIS team is conducting research to determine if there are existing unknown connections between the City's MS4 and others. After discovery, the City will work with the other municipalities or other public entities to share data and update the City's GIS data set.

II.2.4.3 Map Attributes for all storm sewer outfalls with a 24 inch or larger diameter

The permit requires the City to map attributes of the MS4 that have 24-inch or greater nominal diameter, or equivalent cross-sectional area for non-pipe systems. City's GIS System contains data and attributes for the mapped MS4 on the conveyance type, pipe material and diameter of the pipe. Most of the City's MS4 outfall drainage basins have been delineated to identify which portions of the City are served by the system. Information on the land use is mapped and contained in the land use data set, which is part of the parcel data maintained by King County and available to City employees and the public in the City's GIS data set.

II.2.4.4 Map all known connections greater than 8 inches to storm sewer outfalls greater than 24 inches and map connections after Permit effective date

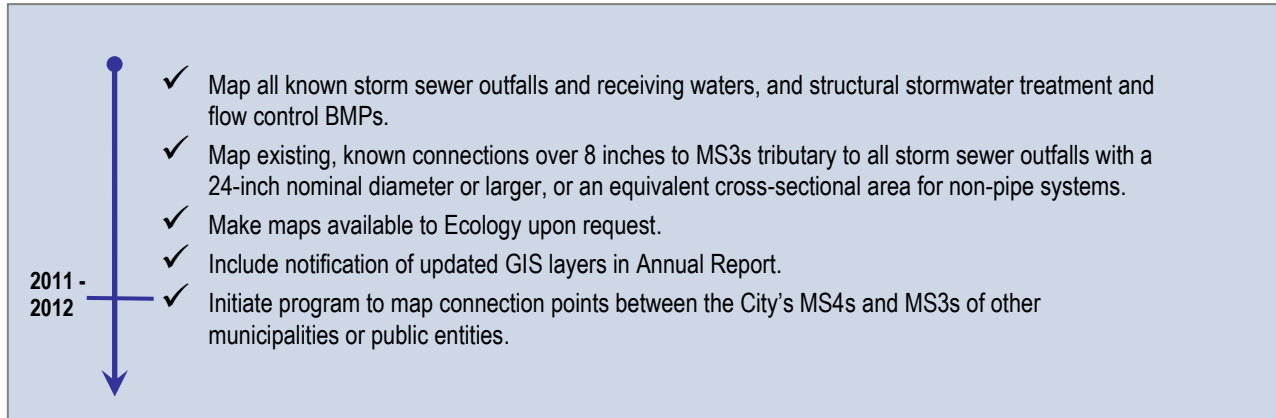
Existing, known connections greater than 8 inches to storm sewer outfalls greater than 24 inches are currently mapped in SPU's GIS system. The City also has a program to map all connections to the City MS3 authorized or allowed by the City after the effective date of the permit. DPD issues a side sewer permit for connections to the City's MS4 before work begins on a side sewer, including new installations, alterations, repairs, capping, relocations, removals, and conditional and temporary dewatering work. Applicants are



required to submit a site plan during the planning stage and, later, an as-built plan which is reviewed by the site inspector. A permit cannot be finalized without as-built approval. Approved as-built for side sewers are then circulated from DPD staff to SPU GIS staff for processing into to SPU's GIS system.

Figure II.2-1 describes the progress made in implementation of permit requirements and the planned next steps for meeting permit requirements.

Figure II.2-1. Timeline Showing Progress and Next Steps



Current Activities

Legend: ✓ Implemented □ Planned

For More Information

- ❖ The Public may request map information in person at the Map Counter in the Public Resource Center, Seattle Municipal Tower 20th floor, or by phone at 206.684.0965 or via email at gismap@seattle.gov.
- ❖ The public can view standard GIS maps and find out more information at the web site: http://www2.seattle.gov/GIS_Map/default.asp.
- ❖ For general questions about this SWMP or more information about this section, email swmp@seattle.gov or visit http://www.seattle.gov/util/About_SPU/Drainage_&_Sewer_System/Plans/Stormwater_ManagementProgram/StormwaterManagementPlan/

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II.3 Coordination-S5.C.3

II.3.1 Requirements

The Permit (Section S5.C.3) requires internal coordination of municipal stormwater activities among City departments and external coordination between the City and outside agencies. Minimum performance measures include:

- Developing and implementing a written internal coordination agreement or Executive Directive to facilitate compliance with the terms of the Permit.
- Establishing coordination mechanisms between physically interconnected municipal separate storm sewers (MS3s) of the City and any other Permittee covered by a municipal stormwater permit.
- Coordinating stormwater management activities for shared water bodies among other MS4 Permittees and Secondary Permittees to avoid conflicting plans, policies and regulations.
- Documenting the coordination efforts.

II.3.2 Coordination Program

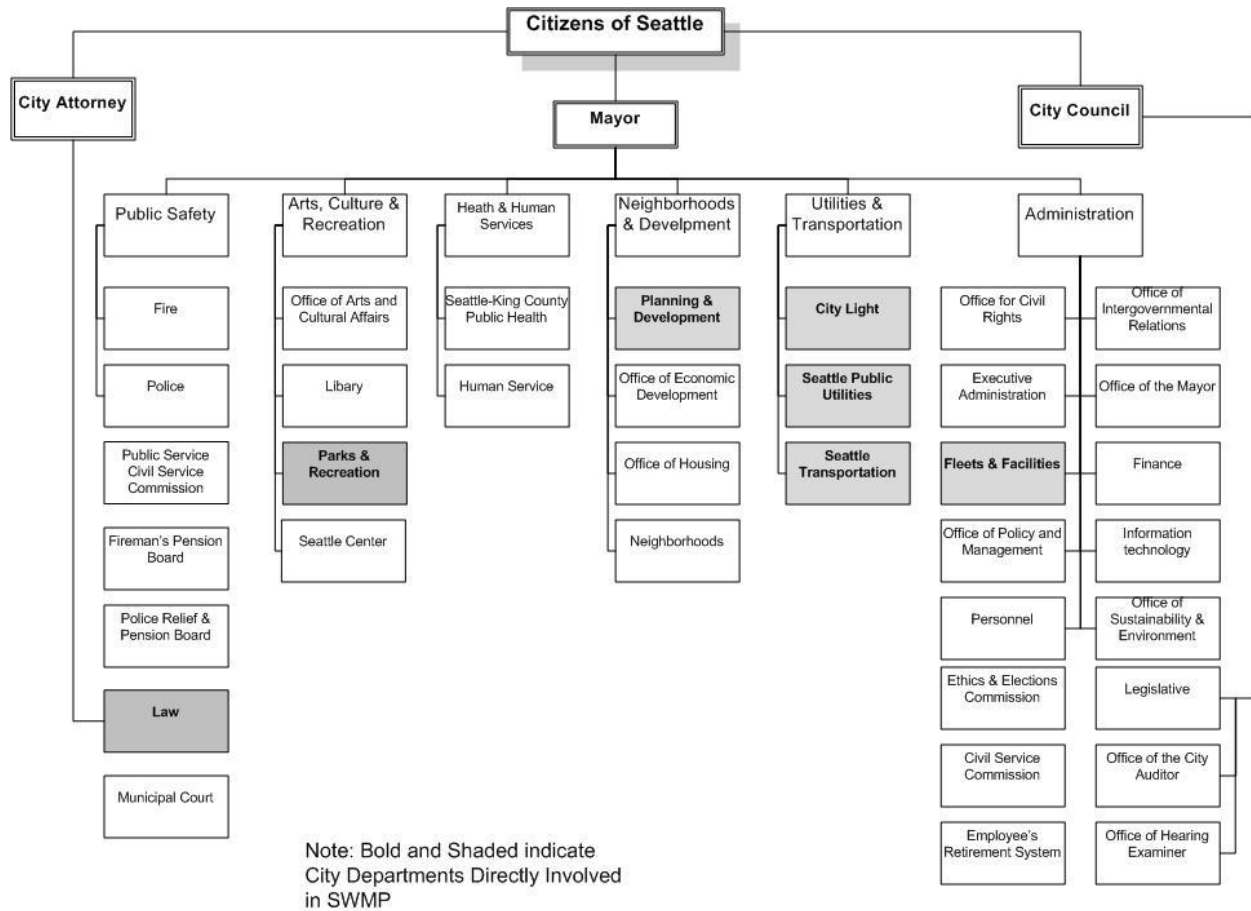
SPU is the lead department for coordinating Permit and municipal stormwater related activities among City departments, as designated by a mayoral Executive Order dated January 29, 2008 (Appendix 1). External coordination mechanisms and coordinating municipal stormwater activities were required by February 16, 2009. SPU has established external coordination mechanisms with King County, University of Washington and Seattle Public Schools (see Section III.3.4.3) and is coordinating with other Permittees and Secondary Permittees for shared waterbodies.

II.3.3 Responsible City Departments

SPU is the lead City department for implementing Permit coordination requirements in the SWMP. Among the many City departments serving the residents of Seattle, there are six departments (highlighted on Figure II.3.1) primarily responsible for implementation of programs and projects for stormwater management within the City's MS4. These are SPU, DPD, Parks, FAS, SCL, and SDOT.



Figure II.3-1. City Organizational Chart



II.3.3.1 Seattle Public Utilities

SPU is the City-designated lead department for managing municipal stormwater, including meeting Phase I Permit requirements, conducting water quality programs, and managing drainage-related capital projects. SPU conducts inspections, maintenance and repair of stormwater facilities in the right-of-way.

II.3.3.2 Department of Planning and Development

DPD is the City department responsible for developing, administering, and enforcing development standards. DPD issues development permits as required under the Stormwater Code and other ordinances and inspects sites prior to and during construction. SPU and DPD share complaint response and enforcement (i.e., inspection and response) responsibilities. Both SPU and DPD have authority to issue notices of violation and initiate enforcement for drainage related issues. DPD manages customer complaints and inquiries related to current construction activities. SPU manages customer complaints and inquiries unrelated to development permits. Seattle Parks and Recreation

Parks is responsible for several hundred parks and park facilities and plays a key role in environmental stewardship. Parks trains its staff in comprehensive BMPs for various maintenance activities, works in partnership with SPU on creek improvement projects, and is involved in programs designed to reduce pesticide use, remove invasive plants, and replant native species on property managed by Parks.

II.3.3.3 Seattle Department Finance and Administrative Services

FAS, formerly the Fleets and Facilities Department, manages most of the City's non-utility real estate portfolio, oversees the design, construction and occupancy of City facilities, maintains City buildings, and purchases, maintains and repairs the City's fleet of vehicles. FAS trains its staff in BMPs related to its business activities and works to reduce impacts on stormwater. FAS is responsible for implementation of the Stormwater Code at facilities under its management.

II.3.3.4 Seattle City Light

Created by the citizens of Seattle in 1902, SCL provides customers with electricity and related services. SCL is dedicated to managing all of its activities in an environmentally responsible manner. SCL trains its staff in BMPs related to its business activities and works to reduce adverse impacts on stormwater. SCL is responsible for implementation of the Stormwater Code at facilities under its management.

II.3.3.5 Seattle Department of Transportation

SDOT is responsible for the City's streets, bridges, sidewalks, bike paths, street trees, and traffic operations. SDOT performs such roadway maintenance activities as street sweeping and snow and ice control. The Capital Projects Division of SDOT oversees all aspects of Transportation Capital Improvement Programs (CIPs) and coordinates development and implementation of large-scale City projects. SPU works with SDOT during implementation of projects to design stormwater facilities in the right-of-way. At project completion, SPU takes over operation and maintenance of all stormwater facilities in the right-of-way.

II.3.4 Current and Planned Coordination Activities

II.3.4.1 Internal Coordination

SPU leads inter-departmental meetings to coordinate the City's stormwater management and Permit reporting efforts. These meetings are typically held quarterly, and have enabled the different departments to better coordinate stormwater-related policies, programs and projects.

II.3.4.1.1 Executive Directive

The Permit requires SPU to "establish, in writing...intra-governmental (internal) coordination agreement(s) or Executive Directive(s) to facilitate compliance with the terms of the permit." Executive Order # 01-08 (Appendix 1) (City of Seattle, 2008) was issued on January 29, 2008, by the Mayor of Seattle to meet this Permit requirement. The Executive Order prescribes the following responsibilities and orders all departments to coordinate all stormwater-related policies, programs, and projects:

- Each department director will be responsible for meeting the Permit requirements that apply to his or her respective department.
- SPU will serve as the lead department for overseeing City compliance with the Permit.
- SPU will provide each department with information, technical support, and a forum for inter-departmental coordination.
- All City departments must provide SPU with all necessary reporting elements and supporting material necessary to comply with the reporting requirements and associated deadlines of the Permit.

SPU will continue to coordinate with the various departments to facilitate the stormwater management program for the City. Coordination between Secondary Permittees with physically interconnected MS3s



The Port of Seattle, University of Washington, and Seattle Public Schools are currently the entities in Seattle that have submitted notice of intent for coverage as a secondary Permittee under the 2007 NPDES Phase I Municipal Stormwater Permit. The City communicates with these entities about the control of pollutants, coordination of stormwater management activities for shared waterbodies and provides technical assistance when requested. The City communicates with other Phase I and Phase II municipalities where there are interconnected MS3s, shared waterbodies, or both as needed to address issues or coordinate activities.

II.3.4.2 External Coordination

SPU represents the City at the Regional Permit Coordinators' Group, which meets to coordinate and discuss implementation of the Permit and coordination of stormwater management activities for shared waterbodies. In addition, the group discusses stormwater related issues; shares permit implementation information and identify solutions and potential future issues.

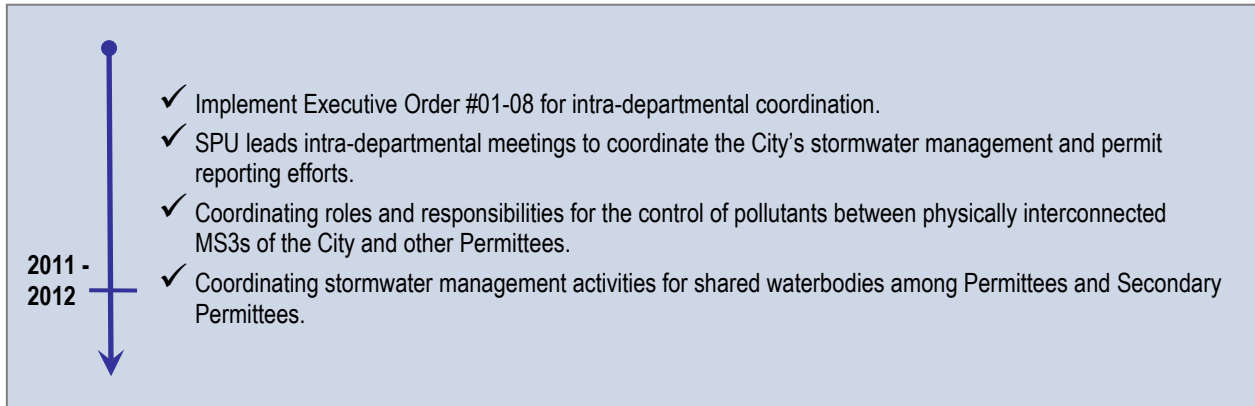
II.3.4.3 King County as Co-Permittee

King County is listed as Co-Permittee with the City in S1.C of the Permit for discharges from outfalls that King County owns or operates within the City of Seattle. King County's activities as a Co-Permittee are further explained in S6.F which states: "King County, as a Co-Permittee with the City of Seattle for the discharges from outfalls King County owns or operates in the City, shall participate in the City of Seattle's Stormwater Management Program in accordance with the Joint Stormwater Management Program element of the Memorandum of Agreement between the City and County dated September 25, 1995. The apportionment of responsibilities for stormwater management within the City shall be governed solely by the MOA or its amendment, provided the City's stormwater management program, including King County participation, shall fully comply with Section S5 of this permit. Any amendments to the MOA shall be approved by Ecology before becoming effective."

There have been no amendments to the MOA between the City and King County. The City and King County have and will continue to meet and coordinate on King County's participation in SWMP activities in the Lander and Densmore basins per the MOA. The City has and will continue to implement the stormwater management activities detailed in this SWMP in the Lander and Densmore basins.



Figure II.3-2. Timeline Showing Progress and Next Steps



Legend: ✓ Implemented □ Planned

For More Information

- ❖ City of Seattle: <http://www.seattle.gov/>
- ❖ Seattle Public Utilities: <http://www.seattle.gov/util/services/>
- ❖ Department of Planning and Development: <http://www.seattle.gov/dpd/>
- ❖ Seattle Parks and Recreation: <http://www.seattle.gov/parks/>
- ❖ Finance and Administrative Services: <http://www.seattle.gov/fleetsfacilities/>
- ❖ Seattle City Light: <http://www.seattle.gov/light/>
- ❖ Seattle Department of Transportation: <http://www.seattle.gov/transportation/>
- ❖ For general questions about this SWMP or more information about this section, email swmp@seattle.gov or visit http://www.seattle.gov/util/About_SPU/Drainage_&_Sewer_System/Plans/Stormwater_ManagementProgram/StormwaterManagementPlan/



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II.4 Public Participation During SWMP Development – S5.C.4

II.4.1 Requirements

The Permit (Section S5.C.4) requires the City to provide ongoing opportunities for public involvement in the SWMP and input on implementation priorities. The minimum performance measures include:

- Developing and implementing a public participation process for considering input on development, implementation and update of the SWMP.
- Making the SWMP, required SWMP documentation, and all Permit-required submittals available to the public on the City’s web site or via electronic submittals for posting on Ecology’s web site.

II.4.2 Public Participation Program

Starting in February 2007 and continuing into the future, the City will provide a variety of opportunities for public involvement in the stormwater management program. Public comments on budget, Stormwater Codes and this SWMP also help to refine ongoing development of stormwater management activities.

II.4.3 Responsible City Departments

SPU is the lead City department responsible for implementing the public involvement and participation program for the SWMP and Permit-related activities. The City Council provides opportunities for public participation in public hearings.

II.4.4 Current and Planned Public Participation Activities

The public has several means of participating in the SWMP development process and associated activities. As described below, these opportunities have been in place since early 2007.

II.4.4.1 City Budget Process

The City budget process provides opportunities for public input on how monies are allocated for implementation of NPDES-related stormwater management. Adoption of the City Budget - one of the most important products of the work of City Council - always requires public hearings to be scheduled on two or more days. All meetings are held in Council Chambers unless otherwise noted. The public is encouraged to attend Council meetings, hear the debate, and offer public comment on issues. The City Council meeting schedule and methods for providing comments are listed on the City Council’s web site: (<http://www.seattle.gov/council/default.htm>).

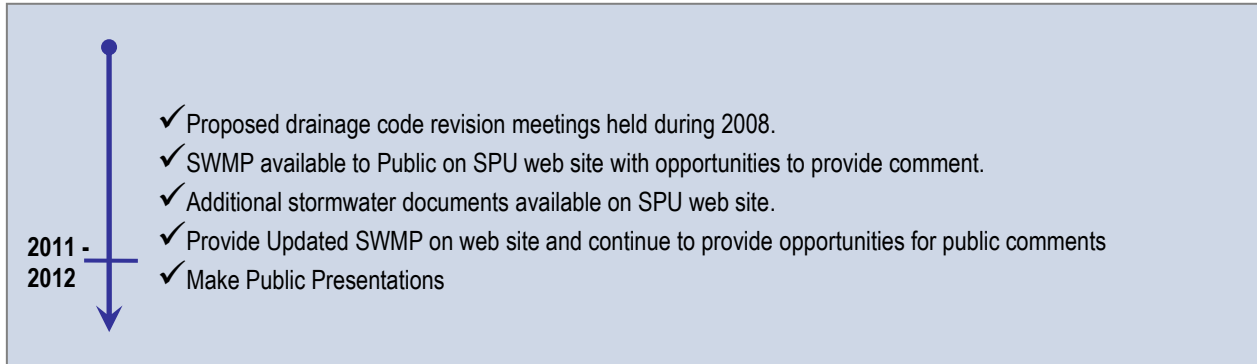
II.4.4.2 Public Participation during SWMP Development

SPU facilitates several citizen advisory groups that provide an on-going opportunity for citizens to participate in planning and development of policies and programs and to advise SPU and other pertinent City entities of its findings and recommendations. SPU will continue to engage citizen advisory groups to provide a diversity of viewpoints on implementation of stormwater management activities.



To provide for additional public input beyond that provided by the stakeholder groups, SPU has created a stormwater management web site to host an electronic version of the SWMP and other related stormwater management information and documents (see link in the “For More Information” box below). In addition, the web site provides contact information (swmp@seattle.gov) for citizens to provide comments and ask questions.

Figure II.4-1. Timeline Showing Progress and Next Steps



Legend: ✓ Implemented □ Planned

For More Information

- ❖ City Council : <http://www.seattle.gov/council/councilcontact.htm> , or via email at: budget@seattle.gov , or call Council reception at (206) 684-8888
- ❖ Stormwater Code information on DPD web site: [http://www.seattle.gov/dpd/Planning/Stormwater Grading and Drainage Code Revisions](http://www.seattle.gov/dpd/Planning/Stormwater_Grading_and_Drainage_Code_Revisions)
- ❖ For general questions about this SWMP or more information about this section, email swmp@seattle.gov or visit: [http://www.seattle.gov/util/About_SPU/Drainage & Sewer System/Plans/Stormwater ManagementProgram/StormwaterManagementPlan/](http://www.seattle.gov/util/About_SPU/Drainage_&_Sewer_System/Plans/Stormwater_ManagementProgram/StormwaterManagementPlan/)



II.5 Controlling Runoff from New Development, Redevelopment and Construction Sites -S5.C.5

II.5.1 Requirements

The Permit (Section S5.C.5) requires the City to develop, implement, and enforce a program to prevent and control the impacts of stormwater runoff from new development, redevelopment and construction site activities. The minimum performance measures include the following main areas with more detailed requirements included in the Permit text:

- Adopt enforceable regulations (codes, standards, or both) to meet or exceed the minimum technical requirements (thresholds) in Appendix 1 of the Permit, or equivalent as determined by Ecology.
- Implement a plan review process and a BMP selection and design process that meets maximum extent practicable (MEP) and all known, available and reasonable methods of prevention, control and treatment (AKART) conditions.
- Allow non-structural preventive actions and source reduction approaches such as Low Impact Development (LID) techniques.
- Adopt a local program that meets the requirements above (enforceable requirements, technical standards, and manual(s)). The program must be reviewed and approved by Ecology.
- Establish legal authority to inspect private stormwater facilities and enforce maintenance standards for all new development and redevelopment approved by the local program.
- A process of permits, plan review, inspections, enforcement capability and record keeping to meet permit conditions during and post construction for public and private new development and redevelopment.
- Make Ecology's Notice of Intent (NOI) documents for construction and industrial activities available to project proponents. Enforce local ordinances for these sites covered by other Ecology permits.
- Provide training to staff whose primary job duties are implementing the program to control runoff from new development, redevelopment and construction sites, and document the training. Training to include revisions to the Stormwater Code, and resulting new standards, processes and procedures.

II.5.2 Development Standards Program

SMC Chapters 22.800 through 22.808 contains the City's Stormwater Code, which is the City's primary means of implementing stormwater standards required by the Permit. The Stormwater Code is listed in Appendix 10 of the permit as an equivalent program for runoff controls for new and redevelopment and Construction Sites as it was adopted with accompanying Grading Code and Directors' Rules below. The purpose of the Stormwater Code is to protect, to the greatest extent practicable, life, property, and the environment from loss, injury, and damage by pollution, erosion, flooding, landslides, and other adverse impacts from urban stormwater runoff. Seattle's Stormwater Code includes the following requirements: (1) to practice stormwater pollution prevention during construction; (2) to reduce the introduction of pollutants into stormwater runoff as close to the source as possible; and (3) to install flow control, stormwater treatment facilities, or both depending on the size and nature of a project. The Stormwater Code is implemented through the four Directors' Rules, promulgated jointly by the Director of SPU and the Director of DPD. These Directors' Rules provide specifications, guidelines, and additional information needed for meeting the requirements of the Stormwater Code. The four Directors' Rules currently in place are:

- Vol. I - Source Control Technical Requirements Manual: DPD Director's Rule 15-2009/SPU Director's Rule 2009-003



- Vol. II – Construction Stormwater Control Technical Requirements Manual: DPD Director’s Rule 16-2009/SPU Director’s Rule 2009-004
- Vol. III – Stormwater Flow Control and Water Quality Treatment Technical Requirements Manual: DPD Director’s Rule 17-2009/SPU Director’s Rule 2009-005
- Vol. IV – Stormwater Code Enforcement Manual: DPD Director’s Rule 18-2009/SPU Director’s Rule 2009-06

The City’s Side Sewer Code (Ch. 21.16 SMC), Grading Code (Ch. 22.170 SMC), Land Use Code (Ch. 23 SMC), Street and Sidewalk Use (Ch. 15 SMC) and Regulations for Environmentally Critical Areas (Ch. 25.09 SMC) also provide protections and standards relevant to municipal stormwater.

II.5.3 Responsible City Departments

The DPD is the City department primarily responsible for developing, administering, and enforcing development standards. SDOT issues Street Use permits to parties conducting ground disturbing activities in the City right-of-way. DPD and SDOT issue development permits as required under the Stormwater Code and other ordinances and inspects sites prior to and during construction. SPU, DPD and SDOT conduct complaint response and enforcement (inspection and response) activities. Both SPU and DPD have authority to issue notices of violation and initiate enforcement for drainage related issues. DPD manages customer complaints and inquiries related to current construction activities. SPU manages customer complaints and inquiries unrelated to development permits. SDOT manages customer complaints and inquiries related to projects in the right-of-way. All complaints and inquiries related to existing public owned or operated stormwater facilities are directed to SPU Customer Service.

II.5.4 Current and Planned Activities

The following sections outline completed or planned activities needed to meet the key Permit requirements.

II.5.4.1 Stormwater Code

The City has completed its project to revise the Stormwater Code and associated Directors’ Rules. The project was directed by SPU and was conducted in close collaboration with DPD and other internal and external stakeholders. Ecology determined that the Stormwater Code is equivalent to the minimum requirements in Appendix 1, and will protect water quality, reduce the discharge of pollutants to the maximum extent practicable, and satisfy the state requirement under chapter 90.48 RCW to apply all known, available, and reasonable methods of prevention, control and treatment (AKART).

The multi-year project involved a cross-departmental effort involving SPU, DPD, SDOT, Parks, FAS, Seattle City Attorney’s Office, and other City departments. Beginning in late 2006, a series of briefings and public meetings were conducted to provide information to, and obtain feedback from, developers, builders, contractors, designers, engineers, consultants, public agencies, and representatives of environmental advocacy groups. The Stormwater Code (SMC 22.800-22.808) was adopted by the City Council on September 28, 2009 and signed by the Mayor on September 30, 2009, with an effective date of November 30, 2009.

II.5.4.2 Authority to Inspect Private Facilities

Legal authority for inspection of private facilities for new development and redevelopment is established by SMC 22.807.090.B, which states:

“The Director of SPU may establish inspection programs to evaluate and, when required, enforce compliance with the requirements of this subtitle and accomplishment of its purposes. Inspection programs may be established on any reasonable basis, including but not limited to: routine inspections; random inspections; inspections based upon complaints or other notice of possible violations; inspection of drainage basins or areas identified as higher than typical sources of sediment or other contaminants or pollutants; inspections of businesses or industries of a type associated with higher than usual discharges of contaminants or pollutants or with discharges of a type which are



more likely than the typical discharge to cause violations of state or federal water or sediment quality standards or the City's NPDES stormwater permit; and joint inspections with other agencies inspecting under environmental or safety laws. Inspections may include, but are not limited to: reviewing maintenance and repair records; sampling discharges, surface water, groundwater, and material or water in drainage control facilities; and evaluating the condition of drainage control facilities and other best management practices.”

Entry onto properties is subject to the requirements and limitations of local, state and federal laws.

II.5.4.3 Permitting Program

DPD is the City department primarily responsible for issuance of permits for new development and redevelopment for parcel based projects. DPD's routine permitting procedures are outlined below:

II.5.4.3.1 DPD Permit Application Process

- Step 1. The permitting process begins with an optional but recommended step of applicant coaching. In this step, a DPD land use planner, or permit leader, meets with the potential applicant to identify unique or particular issues of the proposed project. Coaching helps to determine what is allowed on a piece of property, what development standards apply, what types of permits the project will require, and what the permit process will entail. If the project is a multifamily or commercial building and there are special circumstances or issues unresolved during coaching, the proponent will request a pre-submittal conference for project review.
- Step 2. The next step for an applicant is to research and prepare a preliminary site plan. The site plan describes where the structure(s) and BMPs will be located, the amount of new impervious surfaces that will result, the general topography of the site, and the existing level of street and alley improvements in the rights-of-way abutting the site.

For those projects that involve ground disturbance, DPD requires two separate on-site steps in the permitting process. First, a Pre-Application Site Visit (PASV) is performed by a DPD site inspector prior to permit intake. The PASV identifies existing site conditions, including steep slopes, sensitive areas, and erosion control issues that can be anticipated with the project due to site conditions. A PASV report is generated for the applicant and plan reviewer's use. Second, after a permit is issued for projects with ground disturbance, but prior to any ground disturbance, the applicant is required to schedule a first ground disturbance (FGD) inspection with a DPD Site Inspector. The FGD inspection requirement is codified in the Seattle Building Code (SMC 22.100 – 22.204). The purpose of the FGD inspection is for the applicant and inspector to identify potential erosion control issues that may be encountered during construction and map out BMPs that are acceptable to prevent sediment from leaving the site.

- Step 3. Prior to permit issuance on projects that have ground disturbance and a high likelihood of erosion control issues due to steep slopes, the applicant nominates a geotechnical special inspector. The geotechnical special inspector is charged with determining that adequate temporary and permanent erosion control measures are in place throughout the construction of the project.
- Step 4. The applicant submits plans to DPD and the plans are reviewed for compliance.
- Step 5. The applicant submits an application to the DPD Applicant Services Center on the 20th Floor of the Seattle Municipal Tower, which will issue a building permit as appropriate.

II.5.4.3.2 SDOT Street Use Permitting Process

Any private development that triggers permanent improvements in the City's public right of way requires a Street Improvement Permit issued by the Street Use Division of SDOT in addition to the permits required by



DPD. Examples of these kinds of improvements are street drainage facilities, curbs and sidewalks, trees and street or alley paving.

SDOT Street Use section issues street use permits for private and public activities in the City's public right of way under SMC Title 15. SDOT tracks permits, inspections and enforcement actions of permitted projects. Each permit type requires a specific number of inspections during the construction process. Most permit types require an initial and final inspection to determine compliance with the permit. The construction and source control BMPs listed in the Stormwater Code (SMC 22.800-22.808) apply and failure to implement these BMPs constitutes a violation of the street use permit.

SDOT's Street Use & Urban Forestry Division inspects and approves permanent erosion controls, including tree and plant installations within the right of way, prior to the DPD issuance of the certificate of occupancy.

II.5.4.3.3 Inspections of Permitted Parcel Based Projects

After all required Pre-Application Site Visits (PASVs) are completed and a building permit is issued, a DPD inspector checks to make sure that work is done according to code. Customers with permits are responsible for arranging inspections.

There are five types of site inspections that can occur after a permit is issued.

1. FGD inspection - DPD inspectors conduct a site visit prior to ground disturbance to determine erosion potential and review and tailor temporary erosion and sediment control (TESC) measures to the site.
2. Pre-construction inspection – This inspection is conducted with DPD geotechnical and environmental scientists to establish a clear understanding of the project, DPD requirements, and point of contact for the permitted project. The TESC inspection is also conducted at this time.
3. Side sewer inspection - This is a key inspection to prevent cross-connections between side sewers and storm drains that have been partially or completely separated
4. Special inspection - This type of inspection is both applied to structural work and for geotechnical for special grading, excavation and filling involved with ground disturbance.
5. Final inspection - After successful completion of all inspections, the permittee is granted approval to occupy or certificate of occupancy.

II.5.4.3.4 Enforcement

DPD's Code Compliance staff enforces the Stormwater Code and Directors' Rules that govern construction, land use, and environmental protection. Enforcement can take the form of notices, fines and legal action.

SDOT Street Use Inspectors use written warnings, citations, and stop work orders, or revoke the permit if compliance is not achieved. This process is documented in SMC Title 15.

II.5.4.4 Ecology Notice of Intent

DPD has made and will continue to make available copies of the "Notice of Intent for Construction Activity" (Ecology, 2010b), "Notice of Intent for Industrial Activity" (Ecology, 2009), or both to City permit applicants in the Applicant Services Center.

II.5.4.5 Training

DPD and SDOT have revised the temporary erosion and sediment control (TESC) training that is provided to City staff and the public involved in ground disturbing activities to reflect the changes in the 2009 Stormwater Code. This new training, called stormwater construction controls (SWCC), is offered to City staff and the public on a regular basis or as needed. DPD conducts on the job and classroom training for all staff whose primary job duties relate to implementing the City's program to Control Stormwater Runoff from New Development, Redevelopment, and Construction Sites, which helps confirm that those individuals are properly trained. Training topics include permitting, plan review, construction site inspections, and enforcement procedures.



SDOT conducts training for all Street Use Inspectors on the required BMPs, inspection procedures and enforcement for Street Use Permits. The City has and will continue to provide training to City staff on the revised Stormwater Code and its associated Directors' Rules. These trainings are:

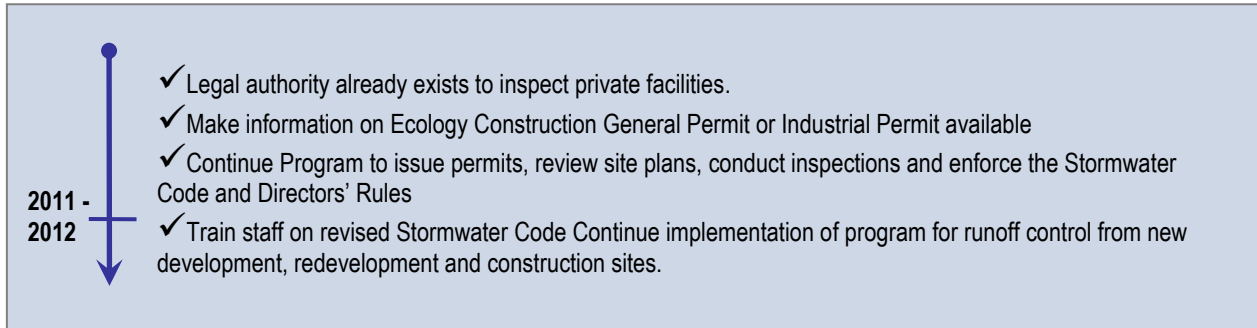
1. Modeling - Description of minimum requirements, with focus on specifics for each type of drainage basin; combined sewer, non-listed creek, listed creeks and wetlands. Submittal requirements and design aids to include the TIR (technical information report), Hydro-stats (the post-processor), pre-sized tables and spreadsheets.
2. Green Stormwater Infrastructure for Projects in the Right of Way - Green Stormwater Infrastructure for Right of Way projects requirements under the revised Stormwater Code. This training provides an overview of GSI, a description of MEF, and a review of the calculator and reviewers checklist.
3. Green Stormwater Infrastructure for Projects for Parcel - Green Stormwater Infrastructure for Right of Way projects requirements under the revised Stormwater Code. This training provides an overview of GSI, a description of MEF, and a review of the calculator and reviewers checklist.
4. Overview of Standard Plans for Construction Management – description of the required elements for standard plans with a focus on review of required elements.
5. Stormwater Construction Training - This training module introduces the new Construction Stormwater Control plans for large and small projects, discussing the code requirement changes from the old code. The training describes what the plan looks like, introduce the usual BMPs, shows what those BMPs look like and discuss what an inspector, designer, planner or reviewer needs to review on the plans during project development and during on-site reviews.

City staff who routinely conduct ground disturbing activities as part of their duties were trained during a City-wide training session during spring 2008. The training consisted of classroom and field exercises that are designed to provide instruction on the requirements of the Stormwater Code and Directors' Rules, with a focus on BMPs for construction projects. Follow-up training on this subject is being developed so that existing employees can refresh their knowledge and new employees can be properly trained.



Current
Activities

Figure II.5-1. Timeline Showing Progress and Next Steps



Legend: ✓ Implemented □ Planned

For More Information

- ❖ The Stormwater Code and Directors' Rules are available on the DPD web site at:
<http://www.seattle.gov/dpd/Codes/StormwaterCode/Codes/default.asp>
- ❖ Information on the permitting process for new and redevelopment is available on the DPD web site at:
<http://www.seattle.gov/dpd/permits/>
- ❖ Information on Green Stormwater Infrastructure from SPU is available at:
http://www.seattle.gov/util/About_SPU/Drainage_&_Sewer_System/GreenStormwaterInfrastructure/StormwaterCodeCompliance/index.htm
- ❖ Information from SDOT on Street Use Permits is available at:
http://www.seattle.gov/transportation/stuse_permits.htm
- ❖ Information from SDOT on the Seattle Right-of-Way Improvements Manual is available at:
<http://www.seattle.gov/transportation/rowmanual/>
- ❖ For general questions about this SWMP or more information about this section, email swmp@seattle.gov or visit http://www.seattle.gov/util/About_SPU/Drainage_&_Sewer_System/Plans/StormwaterManagementProgram/StormwaterManagementPlan/



II.6 Structural SW Controls-S5C.6

II.6.1 Requirements

The Permit (Section S5.C.6) requires the City to:

- Develop a Structural Stormwater Control Program (SSCP) that is designed to control stormwater impacts that are not adequately controlled by other required actions of the SWMP. The SSCP may also include a program designed to implement small scale projects that are not planned in advance.
- Describe the SSCP in the SWMP document, including goals, planning process, budgets, and public involvement, the prioritization process, procedures and criteria used to select the projects.
- Provide a list of planned SSCP projects to be implemented during the term of the Permit; update the list annually.
- For each planned project, provide information on estimated pollution reduction, expected outcomes, environmental benefits, and planned or completed monitoring or evaluation.
- Include updated information on the SSCP in each annual report.

II.6.2 Structural Stormwater Control Program

The key elements of the City's SSCP are described below under Current and Planned Activities. The SSCP includes water quality and flow control projects.

II.6.3 Responsible City Departments

SPU is the lead City department for development and implementation of the SSCP.

II.6.4 Current and Planned Activities

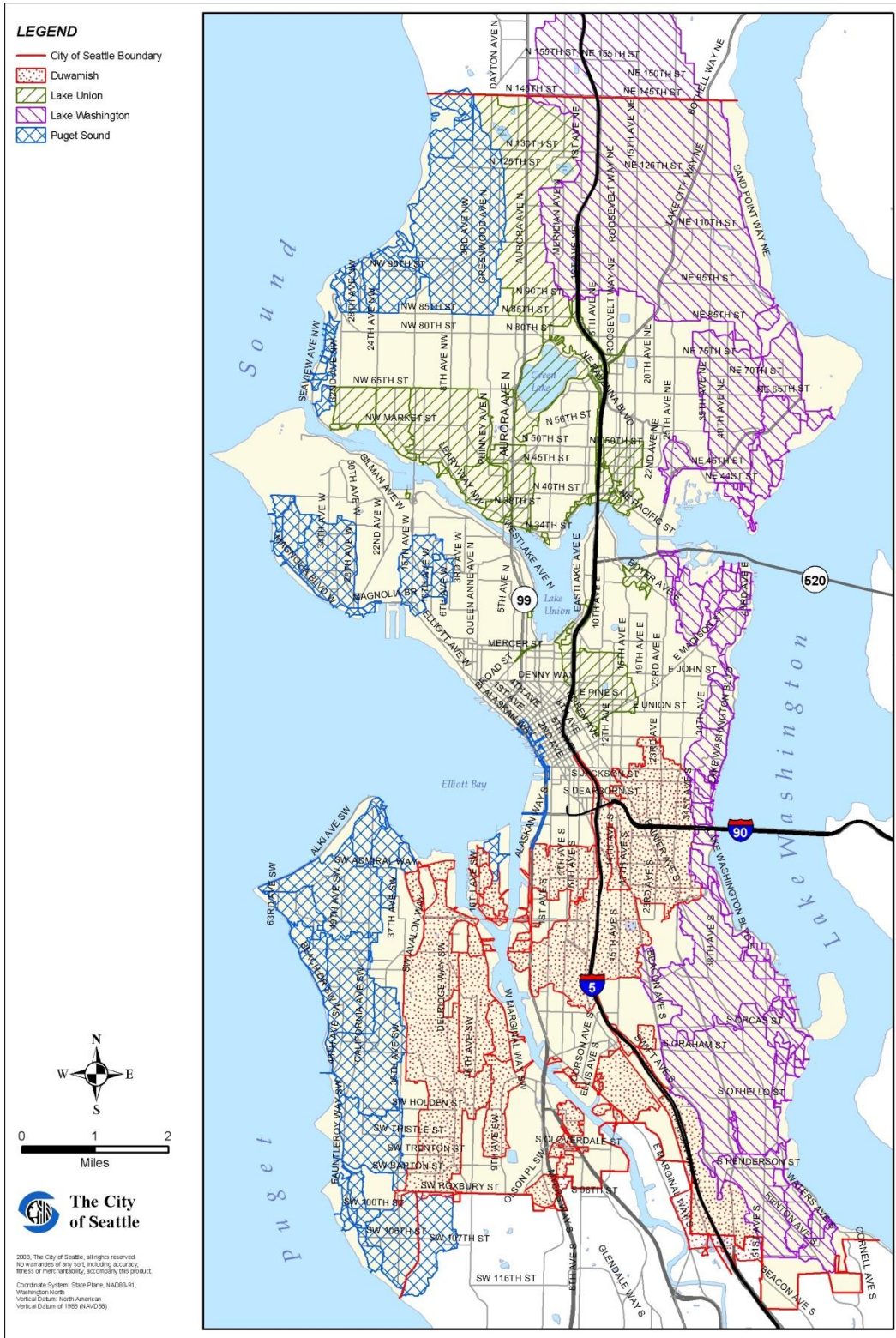
The following sections outline the goals of the City's SSCP, which is to implement projects that protect, and/or improve the beneficial uses of certain receiving water bodies, reflect asset management principles and are not otherwise required actions in the SWMP.

II.6.4.1 Planning Process and Considerations

A comprehensive planning process is in place to support the SSCP. The geographic scale of the program is the area served by the City's MS4 and the MS4-related receiving water bodies. This area is evaluated based on the watersheds of the four major receiving water bodies; Puget Sound, Lake Washington, Duwamish River, and the Ship Canal/Lake Union (Figure II.6-1). Regulations and issues considered during the SSCP development process included: 303 (d) listed and other impaired water bodies, TMDLs, Stormwater Code requirements, Superfund and MTCA sites, as well as opportunity, feasibility, and available funding.



Figure II.6-1. Major Receiving Water Bodies



The SSCP program develops and prioritizes projects by using asset management principles. The type of treatment facilities evaluated for a project is based on project goals, site conditions, and consideration of AKART and MEP principles as they apply in a fully developed urban area. Projects are prioritized by SPU staff based on an assessment of receiving water body conditions, anticipated benefits of the project, regulatory compliance needs, opportunity, and application of asset management principles that have been adopted by SPU under the guidance of the Asset Management Committee (AMC). Projects must pass through several AMC evaluation screens and funding allocation phases before they are formally approved by SPU management for implementation. Asset management is the process by which projects are evaluated for their whole-life cycle cost benefit including social, economic, and environmental factors (the triple bottom line). This rigorous process assures that the City's SSCP needs are being addressed with the most effective use of ratepayer dollars by the time a project breaks ground. Additionally, project implementation is dependent upon City Council budget approval.

The public involvement process related to SSCP development includes (as appropriate): Seattle City Council budget process, public review of the Comprehensive Drainage Plan (Seattle, 2005), involvement of the CDWAC, State Environmental Policy Act (SEPA) review, and Joint Aquatic Resources Permit Application (JARPA) review.

II.6.4.2 Structural Project List

SSCP projects are summarized in Table II.6-1. The projects are grouped by status. SSCP projects currently in construction have a high probability of being constructed on the anticipated schedule. For those projects currently in preliminary engineering (PE) or design, there is greater uncertainty associated with technical issues, schedule, available funding, and other unforeseen items that may result in changes to the project.

For projects that are primarily intended to provide stormwater treatment, the estimated pollutant load reduction (total suspended solids [TSS] kg/year) is shown in Table II.6-1. The concentration of TSS is used to represent estimated pollutant load because it is the target pollutant for "basic" stormwater treatment (Ecology, 2005) and is often related to other particle-bound pollutants such as total metals, total phosphorus, and certain organic chemicals. For projects that are primarily intended to provide flow control, the expected outcome of the project is shown in Table II.6-1. For all projects, other expected environmental benefits are shown in Table II.6-1. Anticipated monitoring or evaluation and anticipated construction dates are shown in Table II.6-1. The estimated annual capital budget (2011 – 2012) for each project is presented in Table II.6-2. A brief summary of each project included in the SSCP is provided below.



Table II.6-1. Structural Stormwater Control Projects – Summary

	Stormwater Treatment	Flow Control	Other Expected Environmental Benefits	Planned Monitoring or Evaluation?	Anticipated Construction
Project	Estimated median TSS Reduction (kg/year)	Expected Outcome			
Construction/Close out Phase					
Norfolk Water Quality Project	9,000 – 35,000		<ul style="list-style-type: none"> Stormwater treatment of other pollutants 		2011
PE or Design Phase					
Midvale & 107 th Drainage Project	6,000 – 22,000		<ul style="list-style-type: none"> Flood control project enhanced to provide water quality benefits Stormwater treatment of other pollutants 		2011
Capitol Hill Water Quality Project	8,000 – 43,000		<ul style="list-style-type: none"> Increased green space 	To be determined	2011 - 2017
Venema NDS Project	1,000 – 6,000	<ul style="list-style-type: none"> Volume reduction: 60.6 ac-ft/yr (82% decrease) 2-year peak flow reduction: from 9.6 cfs (current) to 5.1 cfs 	<ul style="list-style-type: none"> Stormwater treatment of other pollutants Increased green space 	Flow and Water Quality	2011-2013
South Park Water Quality Project	12,000 – 50,000		<ul style="list-style-type: none"> Stormwater treatment of other pollutants 		2011 -2014
Street Sweeping for Water Quality Program	50,000-75000		<ul style="list-style-type: none"> Prevents other pollutants(in addition to TSS) from entering MS4 Improved air quality 		2011 - ongoing

Table II.6-2. Structural Stormwater Control Projects – Estimated Budget Projections

Project	2011	2012
Construction/Close-out Phase		
Norfolk Water Quality Project	\$2,730,000	\$20,000
PE or Design Phase		
Midvale & 107 th Drainage Project	\$1,000,000 ¹	
Capitol Hill Water Quality Project	\$802,000	\$2,225,500
Venema NDS Project	\$1,066,000	\$3,411,000
South Park Water Quality Project	\$1,554,000	\$6,590,000
Implementation Phase		
Street Sweeping for Water Quality Program	\$1,024,000	\$1,875,000

1. Estimated budget for the stormwater quality treatment portion of the project.
2. Total project cost for the year. The portion of the project related to riparian restoration is not included.

Norfolk Water Quality Project

The Norfolk Water Quality Project will be a regional stormwater wet pond that will treat stormwater draining to the Duwamish Waterway from a 216-acre industrial basin. The Norfolk Water Quality Project is scheduled for construction in 2011. The Norfolk Water Quality Project is a component of the Norfolk-MLK Way Stormwater Improvement Project which also included conveyance improvements at the site.

Midvale & 107th Drainage Project

The Midvale & 107th Drainage Project will be a combined detention and wet pool facility located in north Seattle. The primary objective of the project is to reduce surface flooding in the area. Dead storage was added to the design of the facility to provide stormwater quality treatment for a 1,100-acre urban residential and commercial basin which drains to the Lake Washington Ship Canal and Lake Union. The project is scheduled for construction in 2011.

http://www.seattle.gov/util/About_SPU/Drainage_&_Sewer_System/Projects/MidvaleStormwaterProject/SEPASatus/index.htm

Capitol Hill Water Quality Project

The Capitol Hill Water Quality Project (aka Swale on Yale) will be an innovative, regional-scale stormwater facility consisting of four blocks of biofiltration swales with an infiltration and underdrain component that will treat stormwater draining to Lake Union from a 626-acre high density commercial and residential basin (Figures II.6-2 and II.6-3). SPU is teaming with private development during the redevelopment of this highly urbanized area to incorporate a regional stormwater treatment facility while increasing green space in the right



of way. This is a multi-phase project with the first phase of the project scheduled to begin construction in 2011.

http://www.seattle.gov/util/About_SPU/Drainage_&Sewer_System/Projects/CapitolHillWaterQuality/index.htm

Figure II.6-2. Artist depiction of Capitol Hill Water Quality Project

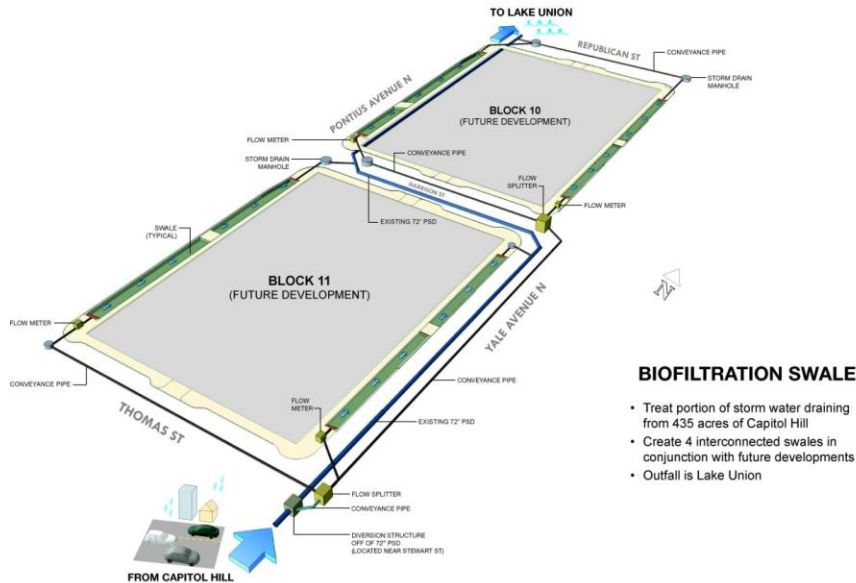


Figure II.6-3. Artist depiction of Street View of Capitol Hill Water Quality Project



Venema Natural Drainage System

The Venema Natural Drainage System (NDS) Project is located in the Piper’s Creek Watershed in northwest Seattle. The Venema NDS Project will provide flow control and water quality treatment for a significant portion of the 85-acre basin draining to Venema Creek (a tributary to Piper’s Creek which drains to Puget Sound). The Venema NDS system will consist of a hybrid of “SEASstreet” type and “Cascade type” swales

along one side of 8.5 blocks in a residential neighborhood. This project provides a unique opportunity to evaluate the effectiveness of an NDS project in improving flow and habitat in an urban creek. Pre-project flow and stormwater quality monitoring is being conducted. This project is currently in Design and scheduled to begin construction in late 2011 or 2012.

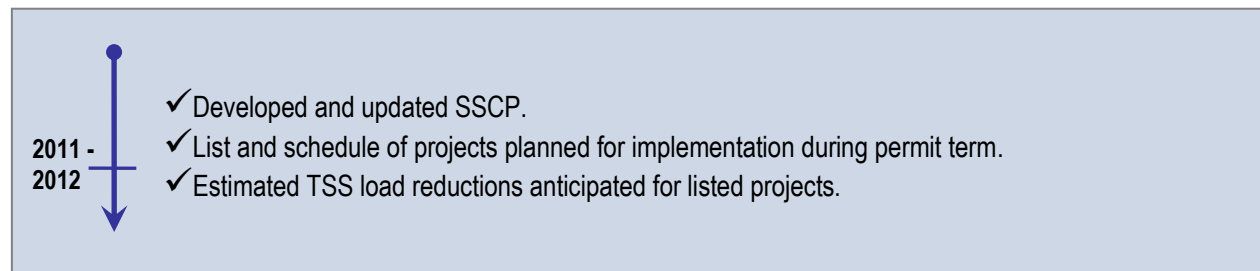
South Park Water Quality Project

The South Park Water Quality Project will be a regional water quality treatment facility located at the downstream end of the existing 7th Avenue South drainage basin (220 acres) which drains to the Duwamish Waterway. Stormwater will be conveyed to the water quality facility by a new pump station which draws from just upstream of the drainage basin's existing outfall to the Duwamish Waterway. The South Park Water Quality Facility will provide water quality treatment using Stormfilters® zeolite/perlite/granular activated carbon (ZPG) filter media cartridges in an above grade concrete structure measuring approximately 50-feet wide by 100-feet long by 12-feet high. Treated stormwater will mix with untreated flow from the high flow bypass and will gravity flow back to the existing outfall. The South Park Water Quality Project is currently scheduled to begin construction in 2011. The South Park Water Quality Project is associated with other conveyance improvements in the 7th Avenue South basin, including the construction of the new pump station.

Street Sweeping for Water Quality Program

In 2011, Seattle is launching its city-wide Street Sweeping for Water Quality (SS4WQ) Program to remove pollutants from Seattle's roadways prior to entering the MS4. The SS4WQ Program utilizes high efficiency street sweepers and is focused on curbed arterial and industrial roadways that drain to the MS4. Based on program effectiveness studies including the *Seattle Street Sweeping Pilot Study* ([http://www.seattle.gov/util/Services/Drainage & Sewer/Keep Water Safe & Clean/Street Sweep Project/QuestionsAnswers/](http://www.seattle.gov/util/Services/Drainage%20&%20Sewer/Keep%20Water%20Safe%20&%20Clean/Street%20Sweep%20Project/QuestionsAnswers/)) and additional life-cycle cost analysis, high-efficiency street sweeping has been found to be a cost-effective means to remove pollutants in Seattle's highly urbanized, road dense environment compared to conventional structural stormwater controls.

Figure II.6-3. Timeline Showing Progress and Next Steps



Legend: ✓ Implemented □ Planned

For More Information

- ❖ For general questions about this SWMP or more information about this section, email swmp@seattle.gov or visit [http://www.seattle.gov/util/About SPU/Drainage & Sewer System/Plans/Stormwater ManagementProgram/StormwaterManagementPlan/](http://www.seattle.gov/util/About_SPU/Drainage%20&%20Sewer%20System/Plans/Stormwater%20ManagementProgram/StormwaterManagementPlan/)

Current Activities

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II.7 Source Control Program for Existing Development-S5C.7

II.7.1 Requirements

The Permit (Section S5.C.7) requires the City to continue implementing an ongoing program to reduce pollutants in runoff from areas that drain to the municipal separate storm sewers owned or operated by the City. The minimum performance measures include these areas with more detailed requirements included in the Permit text:

- Adopt and begin enforcement of an ordinance, or other enforceable documents, requiring the application of source control BMPs for pollutant generating sources associated with existing land uses and activities as detailed in Appendix 8 of the Permit.
- Establish a program to identify land uses/businesses, based on Appendix 8 of the Permit, which are potentially pollution generating, update the inventory or list, and include a complaint-based response to identify other pollution generating sources such as mobile or home-based businesses.
- Implement an audit/inspection program for the identified land uses/businesses and provide information about activities that may generate pollutants and the source control requirements applicable to those activities. The program shall inspect 20% of the identified land uses/businesses annually to determine BMP effectiveness and compliance with source control requirements. Inspect all sites identified by legitimate complaints.
- Implement a progressive enforcement policy to require sites to come into compliance with stormwater requirements within a reasonable time period.
- All staff whose primary job duties are implementing the source control program are trained to conduct these activities. Training shall cover legal authority, source control BMPs and their proper application, inspection protocols, and enforcement procedures. Follow-up training and documentation are required.

II.7.2 Source Control Program

Source control is regulated by the Stormwater Code and associated Directors' Rules. The Stormwater Code regulates activities that have the potential to impact the quality and quantity of stormwater runoff and define the operational and structural BMPs required for those activities.

Ecology determined that the revised draft Stormwater Code and Directors' Rules dated March 16, 2009, are equivalent to Appendix 1 of the permit, Minimum Technical Requirements for New Development and Redevelopment. The determination of equivalency by Ecology indicates that the revised Stormwater Code is appropriate for implementation of the minimum requirements in Appendix 1, and will protect water quality, reduce the discharge of pollutants to the maximum extent practicable, and satisfy the state requirement under chapter 90.48 RCW to apply all known, available, and reasonable methods of prevention, control and



treatment (AKART). The revised Stormwater Code and Directors' Rules became effective on November 30, 2009.

In addition to the activities outlined above, the City conducts education and outreach activities to the public on issues related to stormwater; specifically how individuals can adopt new behaviors or change existing behaviors to reduce their impacts on water quality. Examples of education and outreach activities related to source control include the publicly-listed Water Quality Hotline (206-684-7587) and the Resource Venture, a contracted consultant of SPU, that provides free site visits, spill kits and education to Seattle businesses to assist them with development of a spill prevention plan and proper clean up and disposal of spills.

Documentation on the City's proposed Source Control Program was submitted to Ecology on February 15, 2008 as required by S5.C.7.b.i.

II.7.3 Responsible City Departments

SPU is the lead department for development and implementation of the City's Source Control Program.

II.7.4 Current and Planned Activities

The following sections outline completed or planned activities needed to meet the key Permit requirements.

II.7.4.1 Business Inspection Program

The Source Control and Monitoring (SCM) Team within SPU has been conducting and will continue to conduct business audit/inspections within areas of the City served by the MS4. SCM works with businesses and residents to reduce the risk of pollutants reaching surface waters. SCM conducts audits/inspections of businesses to provide education and technical assistance to property managers and business owners about the requirement of the Stormwater Code and Directors' Rules and enforce source control requirements. A progressive enforcement process is in place to address non-compliance and egregious violations.

Education and technical assistance provided by SCM is delivered in person during site visits, inspections, or complaint investigations and also through outreach materials, such as BMP sheets. Enforcement is used when the education and technical assistance elements have failed to gain compliance voluntarily. The Resource Venture, a free resource conservation program for Seattle businesses that is currently being implemented by Cascadia Consulting under contract with SPU, provides outreach and education to the business community regarding stormwater pollution prevention. The Resource Venture also facilitates the Spill Kit Incentive Program (SKIP), which provides free spill kits and spill plans to Seattle businesses.

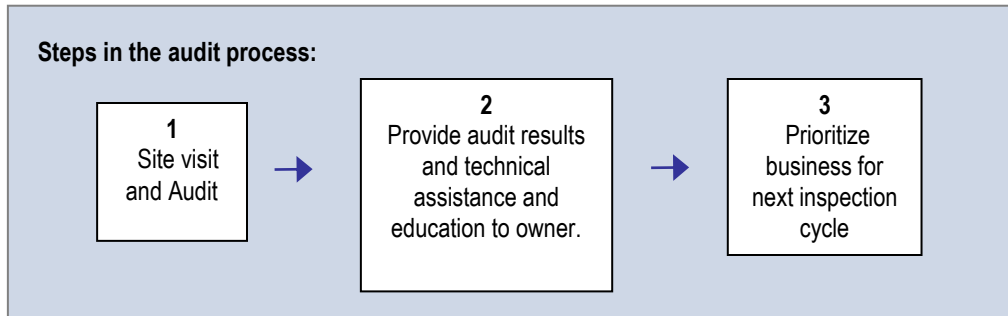
To meet the 2007 Permit requirements as defined in S5.C.7.b.ii and iii, SPU has established a program to identify sites which are potentially pollution generating and implementation of an audit/inspection program for identified sites that drain to the City's MS3. SPU has compared a list of licensed businesses in Seattle against the SIC categories of land uses and businesses in Appendix 8 of the permit. The list of businesses to be audited/inspected was established as of August 2008 and was refined in February 2010 to reflect advances in GIS mapping capabilities. It is anticipated that the number of businesses on the list will change over time due to businesses economic shifts and discovery of businesses with pollution-generating activities that did not properly designate their standard industrial classification (SIC).

SPU uses a suite of inspection types to conduct inspections of business that drain to the City's MS4 areas. The suite of inspection types was developed to address the complexity in achieving permit compliance and utilizing resources to achieve maximum water quality benefit. The first is an "audit" inspection, whereby businesses are visited by an SPU Inspector, informed of their source control requirements and relevant Code changes and informed of the results of the audit on site. As a result of the visit and the activities that are determined to be occurring onsite, the business is ranked as High, Medium or Low priority based on its



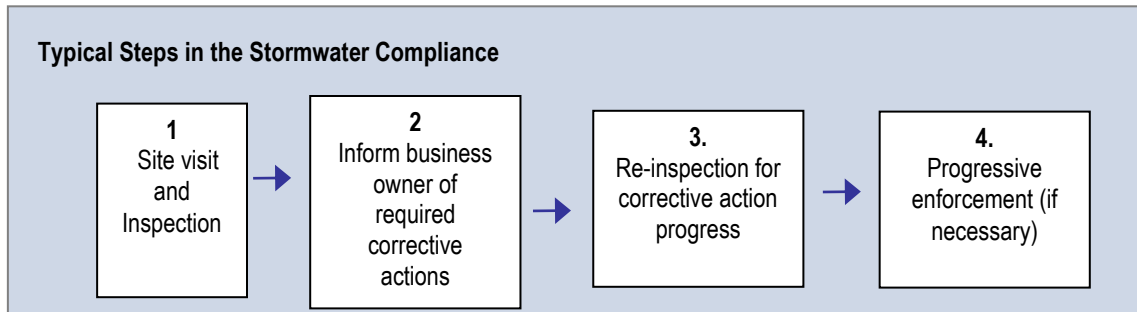
potential to pollute. The ranking established during the “audit” inspection will be used to develop a prioritization scheme and an inspection schedule that will seek to minimize the overall pollution risk from The City’s pollution-generating businesses and help allocate available resources where they will be of most benefit to achieve water quality goals. Businesses who are involved in a complaint reported to SCM, or a spill, or an IDDE event and businesses in the Superfund areas will continue to be inspected using the “stormwater compliance inspection” and Superfund business inspections described below.

Figure II.7-1. Audit Process



The second inspection type is a “stormwater compliance inspection,” whereby businesses will be visited by an SPU Inspector and informed of the corrective actions necessary for their site to come into compliance with the City’s Stormwater Code. Inspectors will then follow up with the business after the compliance deadline to require that the necessary corrective actions have been implemented and will proceed with progressive enforcement if necessary. The “stormwater compliance inspection” will be used for water quality complaint response at businesses or if an egregious violation is found during an “audit” inspection.

Figure II.7-2. Stormwater Compliance Inspection Process



The third approach to business inspections is directed at businesses that discharge to areas where the City is currently engaged in a comprehensive process for sediment cleanup of the Lower Duwamish Waterway and the East Waterway in partnership with Ecology and the U.S. Environmental Protection Agency (EPA). Business inspections within the Superfund Cleanup areas focus on stormwater pollution prevention, as well as hazardous waste management and industrial waste management and follow the same process as the stormwater compliance inspection. If hazardous waste or industrial compliance issues are not resolved at the re-inspection, they are referred to other agencies for follow up.

Mobile and home-based businesses that drain to the City’s MS3 are included in this program in one of two ways. First, mobile and home-based businesses that are registered with the City as a business and have a SIC code are included in the business inspection program. The second way that these business types are included is if a call is made to the City’s Water Quality Hotline (206-684-7587). Inspectors will respond to these calls and treat the mobile and home-based business in the same manner as other businesses. Additionally, a multi-

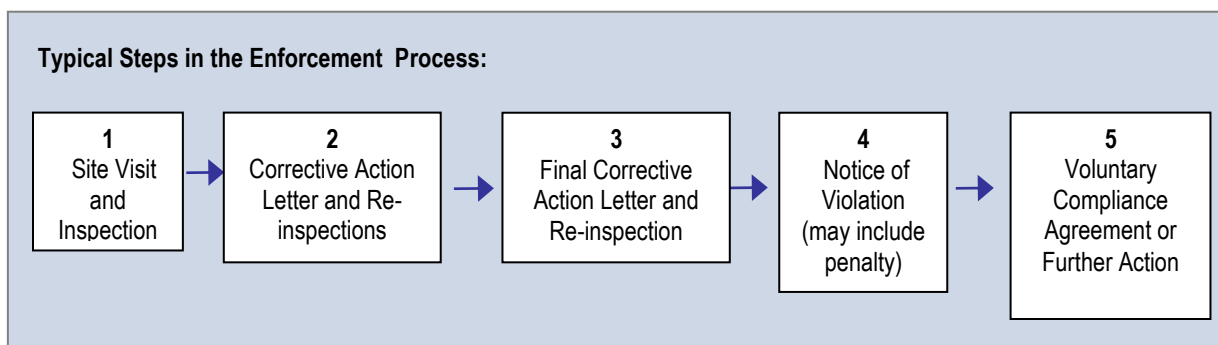
jurisdictional project is underway to address mobile businesses on a regional basis, which is where outreach is most effective for this business sector, as they cross jurisdictional boundaries.

II.7.4.2 Progressive Enforcement Program

SCM uses a progressive enforcement program to achieve source control implementation at inspected businesses. The following describes the typical steps in enforcement, though cases vary. SCM Inspectors start by issuing a corrective action letter that requires source control for the activities observed to be occurring on site. Businesses are given 30 days to comply with source control requirements, at which time a re-inspection is conducted to ensure implementation. If source controls have not been implemented, a 'Second and Final' letter is issued, which provides a shorter deadline for compliance and acts as a warning of impending enforcement. If the site remains out of compliance, a Notice of Violation is issued. A penalty may also be issued at the same time and may be suspended pending implementation of the requirements by the deadline provided in the Notice of Violation. Egregious violations and illicit discharge violation typically receive a penalty and request for payment at the issuance of the Notice of Violation.

The enforcement process is closely linked to the inspection process. Figure II.7-3 summarizes typical steps in the enforcement process.

Figure II.7-3. Enforcement Process



II.7.4.3 Enforcement Criteria and Procedure

If a serious violation occurs, or if the corrective action process does not result in compliance, a Notice of Violation (NOV) will be considered and can be issued for violations found during the business inspection process. An inspector who believes that a NOV is necessary to achieve compliance consults with the program lead to determine the merits of proceeding with enforcement and weighs it against established criteria. In some cases, cost recovery may be appropriate to pursue where the City has expended resources to terminate the polluting activity.

II.7.4.3.1 Voluntary Compliance Agreement

Either before or after a Notice of Violation is issued, a business may choose to enter into a Voluntary Compliance Agreement (VCA) with the City. Another use of the Voluntary Compliance Agreement is to formalize compliance steps in an attempt to resolve a pollution issue before issuing a NOV.

A Voluntary Compliance Agreement may be appropriate in the following situations:

- where a capital investment may be necessary to achieve compliance, or

- where the steps to achieve compliance are difficult or technically complex, or
- where obvious alternatives are not available.

SCM will work with the property owner at each of the steps in the agreement to require the business owner or property manager to meet milestones and make progress toward compliance. If the Voluntary Compliance Agreement target dates pass without compliance, further enforcement steps may be taken.

II.7.4.3.2 Records Management

The Source Control Program tracks its inspection and enforcement records through a database and file management system. The inspection database is based in Microsoft Access and tracks information for both source control inspections and drainage system maintenance inspections. The database records all site inspection information, generates corrective action letters, tracks compliance deadlines and reports inspections outcomes and other information. The database also has a QA/QC element built in to check data entry and reduce errors. In addition, all hard copy inspection records are kept in a filing system by address. In general, the file includes all previous inspection information, correspondence, maps and other relevant site information. Records are managed in accordance with the state record keeping requirements.

II.7.5 Training for Staff Involved in Source Control Program

The SCM group will use the following training methods and classes to ensure that all staff whose primary job duties are involved in implementation of the Source Control Program are knowledgeable of the current policies and procedures.

II.7.5.1 Basic Inspector Training

Each SCM staff member involved in inspections attends the EPA-sponsored Basic Inspector Training course. The course provides an overview of all aspects of inspection preparation, conduct, and follow-up. The course also introduces various federal environmental laws and regulations. The policy is that all personnel hired by SCM whose primary job duties are implementing the source control program will attend this training, either in classroom or by CD when the class is not offered in Seattle, WA.

II.7.5.2 On-the-job Training

All SCM staff that are responsible for implementing the source control program are trained in the use and application of the SCM Inspection Procedure Manual to help establish that the program is implemented in a consistent, repeatable manner and upholds technical and customer-driven principles.

II.7.5.3 Inspector Meetings

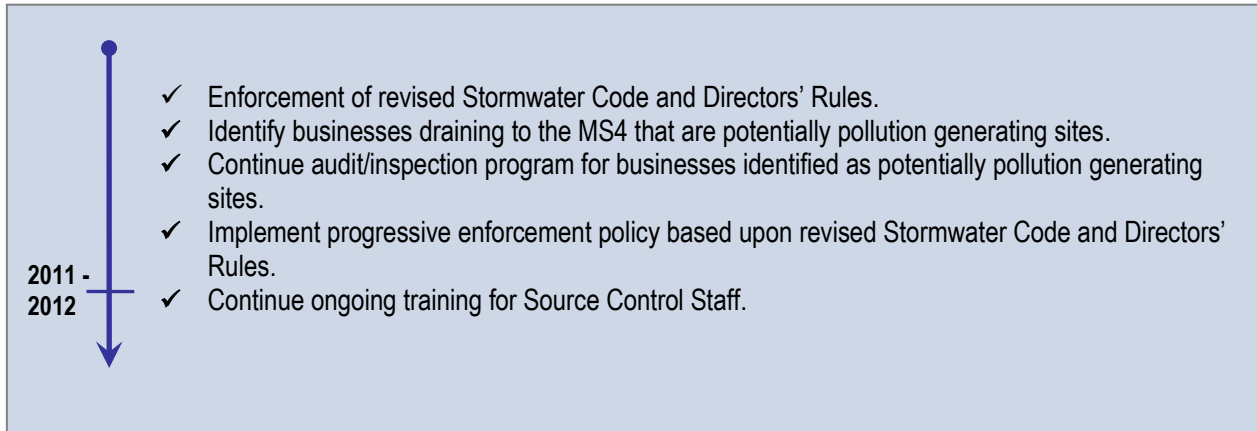
SCM staff hold meetings on a regular basis to present information and discuss issues, problems and lessons learned during field visits. Staff present and discuss investigations and assist each other with troubleshooting. Presentations on new information related to Illicit Discharge Detection and Elimination (IDDE) are included as appropriate.

II.7.5.4 Ongoing Training

As new inspection training opportunities arise, typically through Interagency Resource for Achieving Cooperation or the U.S. Environmental Protection Agency (EPA), inspectors take advantage of these opportunities. Such training topics include environmental chemistry and sampling protocol.



Figure II.7-1. Timeline Showing Progress and Next Steps



Legend: ✓ Implemented ☐ Planned

For More Information

❖ **Business Inspection Program:**

<http://www.seattle.gov/util/Services/Drainage & Sewer/PollutionControl/index.htm>

For general questions about this SWMP or more information about this section, email swmp@seattle.gov or visit

http://www.seattle.gov/util/About_SPU/Drainage & Sewer System/Plans/StormwaterManagementProgram/StormwaterManagementPlan/

Current Activities





II.8 Illicit Connections and Illicit Discharge Detection and Elimination Program-S5C.8

II.8.1 Requirements

The Permit (Section S5.C.8) requires the City to continue implementing an ongoing program to detect, remove and prevent illicit connections, illicit discharges, connections, including any spills, into the municipal separate storm sewers owned or operated by the City. The minimum performance measures include these nine main areas with more detailed requirements included in the Permit text:

- Continue implementing an ongoing IDDE program.
- Evaluate, and if necessary update, existing ordinances or other regulatory mechanisms to effectively prohibit non-stormwater illegal discharges and/or dumping into the City's MS4. Certain non-stormwater discharges are subject to meeting conditions stated in the Permit in order to be permissible, and these must be addressed in the SWMP.
- Train all municipal field staff who are responsible for identification, investigation, termination, cleanup and reporting of illicit discharges, including spills, improper disposal and illicit connections to conduct these activities.
- Train all municipal field staff, which as part of their normal duties, may come into contact with or otherwise observe an illicit connection or illicit discharge to the storm sewer system, on identification and proper procedures for reporting and responding. Provide follow-up training as needed to address changes and maintain training records.
- Publicly list a hotline or other local telephone number for public reporting of spills and other illicit discharges.
- Conduct on-going screening to detect illicit connections, including field screening and source tracing. Prioritize conveyances and outfalls for screening, and screen at least 60 percent according to Permit terms.
- Upon discovery or receiving a report of a suspected illicit connection, initiate an investigation within 21 days to determine sources and the nature of the connection, and the responsible party.
- Upon confirmation of the illicit nature of a connection, use enforcement authority in a documented effort to eliminate the illicit connection within six months.
- Contact Ecology immediately upon discovering an illicit connection that presents a severe threat to human health or the environment.
- Participate in a regional emergency response program, or develop and implement procedures to respond to spills and improper disposal into the City's MS4.
- Track and maintain records of illicit discharge detection and elimination program, including documentation of inspections, complaint/spill response and other enforcement records.



II.8.2 IDDE Program

The City continues to implement the Illicit Connection and Discharge Detection and Elimination (IDDE) Program developed under the previous Cedar/Green NPDES general permit issued by Ecology in 1995. SPU's Source Control and Monitoring group (SCM) is responsible for the development and implementation of the City's IDDE program. The IDDE program is focused on preventing and eliminating non-stormwater discharges to the City's MS3 (permissible non-stormwater discharges are described below). The IDDE program addresses the following illicit discharges:

- Illicit connections –any man-made conveyance that is connected to the City's municipal separate storm sewer without a permit, excluding roof drains and other similar type connections. An example is an industrial floor drain connected into the stormwater system instead of the separated or combined sanitary sewer system.
- Illegal dumping – discharge of solid or liquid waste into the City's MS3. Examples include washing trash or dumping used motor oil into a storm drain.
- Spills – an unintentional discharge of any size into the City's MS4. Examples include fluids released from a vehicle involved in an accident.

Reports of illicit discharges are received from a variety of sources such as the SPU Complaint Hotline, SPU Spill Response Program, as well as the SPU Business Inspection Program and SPU Stormwater Facility Inspection Program. Each program is tracked using a database which documents each event and enforcement records. Two major components of the IDDE program are the publicly-listed, 24-hour citizen complaint telephone number (Water Quality Hotline 206-684-7587) and web form for reporting water quality complaints. In addition to citizen reports, the hotline is used to capture complaints from other departments and agencies.

II.8.3 Responsible City Departments

SPU is the lead department for development and implementation of the IDDE Program.

II.8.4 Current and Planned Activities

The following sections outline completed or planned activities needed to meet the key Permit requirements.

II.8.4.1 Field Screening and Source Tracing

SCM has developed a field screening and source tracing program for compliance with S5.C.8.b.vi based upon literature review and in consultation with other jurisdictions to determine appropriate methods for detection of illicit discharges. SCM has incorporated and modified the approaches from these various programs to develop procedures that will serve the urban setting.

The SPU program uses the following field screening elements designed to identify and characterize continuous dry-weather flows and identify suspect intermittent and transitory flows: prioritize the conveyance system, perform field characterization which may include water and sediment chemical screening at conveyance system locations, and use trigger values to initiate source tracing efforts. Source tracing investigations will be started when a sample exceeds the trigger level. Follow up source tracing can include additional water or sediment sampling, visual tracing, side sewer research, dye testing, smoke testing, business inspections, stream walks, and closed circuit TV filming of piped systems. These investigations may require the participation of other City inspectors, operations and maintenance staff, and the participation of other agencies.



If and when an IDDE event is identified by field screening and source tracing, SCM will continue to use the SCM Inspection Procedure Manual to define procedures for conducting and documenting investigations, gaining rights of entry, conducting source tracing, collecting samples, pursuing enforcement measures and managing data. The manual also contains information and contacts for interagency cooperation. In addition to the inspection procedure manual, SCM currently uses decision and sampling guidance developed by the City as part of program implementation.

II.8.4.2 Permissible Non-stormwater Discharges

The Stormwater Code and Directors' Rules prohibit non-stormwater discharges (SMC 22.802.020), and allow the following non-stormwater discharges into the City's MS3 when specific conditions are met, as is allowed by the Permit. (SMC 22.802.030).

II.8.4.2.1 Potable Water Sources

Discharges from potable water sources, including flushing of potable water lines, hyperchlorinated water line flushing, fire hydrant system flushing, and pipeline hydrostatic test water must meet the following conditions to be permissible. Planned discharges shall be de-chlorinated to a concentration of 0.1 ppm or less, pH-adjusted if necessary, and volumetrically and velocity controlled to prevent resuspension of sediments in the drainage system. (SMC 22.802.030.A.1).

II.8.4.2.2 Lawn and Other Irrigation Runoff

The Stormwater Code allows discharges of runoff from lawn watering and discharges from irrigation runoff, including irrigation water from agricultural sources that is commingled with urban stormwater (SMC 22.802.030.A.8 - 9). Education and outreach on these subjects are provided to the public, landscapers, and property owners by a variety of City programs and are explained in Section III.10 of this document.

II.8.4.2.3 Swimming Pool Discharges

The Stormwater Code allows discharges from swimming pools, hot tubs, fountains, or similar aquatic recreation facilities and constructed water features, provided the discharges have been dechlorinated to a concentration of 0.1 ppm or less, pH-adjusted and reoxygenated if necessary, and volumetrically and velocity controlled to prevent resuspension of sediments in the drainage control system (SMC 22.802.030.A.13).

II.8.4.2.4 Street and Sidewalk Wash Water

The Stormwater Code allows discharges of runoff from street and sidewalk wash-water that do not use detergents or chemical additives, water used to control dust, and water from routine external building washdown that does not use detergents or chemical additives (SMC 22.802.030.A. 14-16) as long as the discharge does not cause a visual discoloration or contain a prohibited discharge. Education and outreach on these subjects are provided to the public, landscapers, and property owners by a variety of City programs and are explained in Section III.10 of this document.

II.8.4.2.5 Other Non-Stormwater Discharges

The Stormwater Code addresses discharges of runoff from other non-stormwater discharges, and discharges that are in compliance with the requirements of an approved stormwater pollution prevention plan (SWPPP) that addresses such discharges (SMC 22.802.030.A.19). In addition to discharges addressed above, the following types of other non-stormwater discharges are permissible unless the City determines that the type of discharge is causing or contributing to a Permit violation or a water quality problem:

- Discharges from washing or rinsing of potable water storage reservoirs, dechlorinated as described in the Code, addressed above



- Discharges from surface waters, including diverted stream flows
- Discharges of uncontaminated groundwater, including uncontaminated groundwater infiltration (as defined at 40 CFR 35.2005(2)), uncontaminated pumped groundwater, and rising ground waters
- Discharges from foundation drains
- Discharges of air conditioning condensation
- Discharges from springs
- Discharges of uncontaminated water from crawl space pumps
- Discharges from riparian habitats and wetlands
- Discharges from approved footing drains and other subsurface drains or, where approval is not required, installed in compliance with this subtitle and rules promulgated pursuant to this subtitle
- Discharges that are in compliance with a separate individual or general NPDES permit
- Discharges that are from emergency fire fighting activities

II.8.4.3 Training for Staff Involved in the IDDE Program

The SCM group staff members are responsible for identification, investigation, termination, cleanup and reporting of illicit discharges, including spills, improper disposal and illicit connections. SCM will use the following training methods and classes to provide that Environmental Compliance Inspectors within SCM involved in identification, investigation, termination, cleanup and reporting associated with the IDDE program are knowledgeable of the current policies and procedures.

II.8.4.3.1 Basic Inspector Training

Each SCM staff member involved in inspections attends the EPA sponsored Basic Inspector Training course. The course provides an overview of all aspects of inspection preparation, conduct, and follow-up. The course also introduces various federal environmental laws and regulations.

II.8.4.3.2 Spill Training

Spill Training for SCM staff includes attending the 40-hour Hazardous Waste Operations and Emergency Response Standard (HAZWOPER) training. Staff attends an 8 hour HAZWOPER refresher as needed.

II.8.4.3.3 On-the-job Training

All SCM staff that are responsible for implementing the source control program are trained in the use and application of the SCM Inspection Procedure Manual to help establish that the program is implemented in a consistent manner and upholds technical and customer driven principles.

II.8.4.3.4 Inspector Meetings

SCM staff hold meetings on a regular basis to present information and discuss issues, problems and lessons learned during field visits. Staff present and discuss investigations and assist each other with troubleshooting. Presentations on new information related to Illicit Discharge Detection and Elimination (IDDE) are included as appropriate.



II.8.4.3.5 Ongoing Training

As new inspection training opportunities arise, typically through Interagency Resource for Achieving Cooperation or the U.S. Environmental Protection Agency (EPA), inspectors take advantage of these opportunities. Such training topics include environmental chemistry and sampling protocol.

II.8.4.3.6 City Staff Training

All municipal field staff, which as part of their normal job duties may come into contact with or otherwise observe an illicit connection or illicit discharge to the storm sewer system, were trained during a City-wide Federal Permit Training session occurring spring 2008. The training consisted of classroom and field exercises designed to provide instruction on how to identify illicit discharges and connections and how to properly report and/or respond to them. On-going training on this subject is provided via a DVD of the City-wide Federal Permit Training so that existing employees can refresh their knowledge to added changes in procedures or techniques and so new employees can be properly trained.

II.8.4.4 Water Quality Hotline

The City provides a publicly listed Water Quality Hotline and web form (<http://www2.seattle.gov/util/forms/surfacewater/surfacewaterForm.asp>) for the public to report potential stormwater, illicit discharge and other water quality related violations. This is part of the City's procedure to prioritize complaints to respond to illicit connections and to investigate and respond to spills and improper disposal into MS3s owned or operated by the City. The phone number is listed in the



government section of the phone book and is available on the SPU web page. SPU maintains the hotline and responds to calls, which are left on a message system and set off a messaging system to alert responders. SCM also receives complaints directly from other City departments and agencies. SCM has a staff of Environmental Compliance Inspectors who respond to water quality complaints within Seattle City limits. The inspectors attempt to locate the source of the water quality problem and the responsible party, and then provide technical assistance including education on best management practices for pollution prevention and information on the Stormwater Code and Directors' Rules, and provide clean up assistance when necessary. If a spill is reported, the caller is directed by staff at the Water Quality Hotline to call the Operation Response Center (ORC) at 206-386-1800 to report the spill so that a Spill Coordinator can be dispatched immediately.

All of the complaints, regardless of the suspected cause, are responded to within three business days and in no case would SCM respond to a complaint more than 21 days after receiving the call. The person reporting the potential violation is notified of investigation results if they leave contact information.

The SCM database was revised in 2007 to allow additional data entry, enhanced tracking, and analysis of the complaints that are received. This complaint hotline will continue through 2011 and beyond.

II.8.4.5 On-going Illicit Discharge and Illicit Connection Screening

The City has designed its on-going IDDE screening and source tracing program to meet the permit requirement to screen 60% of the MS4 and to employ a systematic approach to finding illicit discharges and illicit connections using dry weather field screening and source tracing at key locations in the MS4. Field screening is designed to identify and characterize dry-weather flows and attempt to identify pollutants which may indicate illicit discharges or connections. The dry weather field screening element attempts to find illicit discharges/connections by:

1. Prioritizing drainage basins for field screening using existing data and basin characteristics to evaluate the potential for illicit discharges and illicit connections.
2. Identifying screening parameters to use as indicators of discharges



3. Performing field screening which consists of characterization and chemical screening at key locations within selected basins
4. Conducting data review to compare screening results to trigger levels
5. Source tracing where the comparison suggests that problems exist
6. Identifying and removing sources of illicit discharges and connections when found

II.8.4.5.1 Prioritization of Drainage Basins

Drainage basins are prioritized for field screening using existing data to weight the potential for illicit discharges and illicit connections. Factors considered during prioritization include: drainage basin size, previous data collection efforts, areas of the MS4 that discharge to 303(d) listed water bodies, areas of the MS4 that discharge in the vicinity of public water access, and areas where storm drain separation projects have occurred in the past. These screening factors are tabulated and weighted by drainage basin to generate a priority list for IDDE screening.

II.8.4.5.2 Parameters of Concern

The field screening consists of visual observations, field measurements, and laboratory analysis of chemical and biological parameters to characterize flowing discharges. When flow is not present, the field screening element relies on visual observations, such as damage or staining of the MS4 infrastructure as an indication of the presence of intermittent or transitory discharges. Table II.8.1 details the parameters used to identify and characterize flow types and to determine if an illicit discharge or illicit connection is suspected at each sample location. Literature has indicated that these screening parameters have been useful for identifying and characterizing residential, commercial, and industrial discharges (Brown, Caraco & Pitt, 2004).

Table II.8.1 IDDE Screening Parameters

Screening Parameter	Parameter Type	Trigger Parameter
Color	Field observation	Yes
Odor	Field observation	Yes
Floatables	Field observation	Yes
Turbidity	Field observation + field analysis	Yes
Conductivity	Field analysis	Yes
pH	Field analysis	Yes
Temperature	Field analysis	Yes
Dissolved oxygen	Field analysis	No
Estimated flow	Field analysis	No
Fluoride	Laboratory analysis – SPU Water Quality Lab	Yes
Surfactants	Field analysis	Yes
Ammonia	Field analysis	Yes
Potassium	Laboratory analysis – SPU Water Quality Lab	Yes
Fecal Coliform	Laboratory analysis - SPU Water Quality Lab	Yes

II.8.5 Field Screening

The general approach to field screening is to begin at an accessible location at or near the discharge point of a drainage basin, such as an outfall, maintenance hole, ditch, or other MS4 structure. Field screening is performed at multiple key locations in most drainage basins instead of relying on one observation at the MS4 outfall. The size of the drainage basin is used to determine the number of locations screened. In large MS4 basins, key upstream maintenance holes representing major branches of the MS4 are screened to help detect discharges that may be diluted, and therefore, masked by blended flows at downstream locations.

IDDE staff are responsible for field sampling and collection of samples for laboratory analyses. Sample collection consists of grab samples of flowing water. Field screening is conducted during the summer months during dry weather conditions.

For the purposes of the IDDE program, dry weather means a maximum of 0.04 inches of rainfall in the preceding six-hour period, with no more than 0.02 inches of rainfall in any one hour period. If runoff can be observed entering the drainage system samples cannot be collected, regardless of rainfall measured.

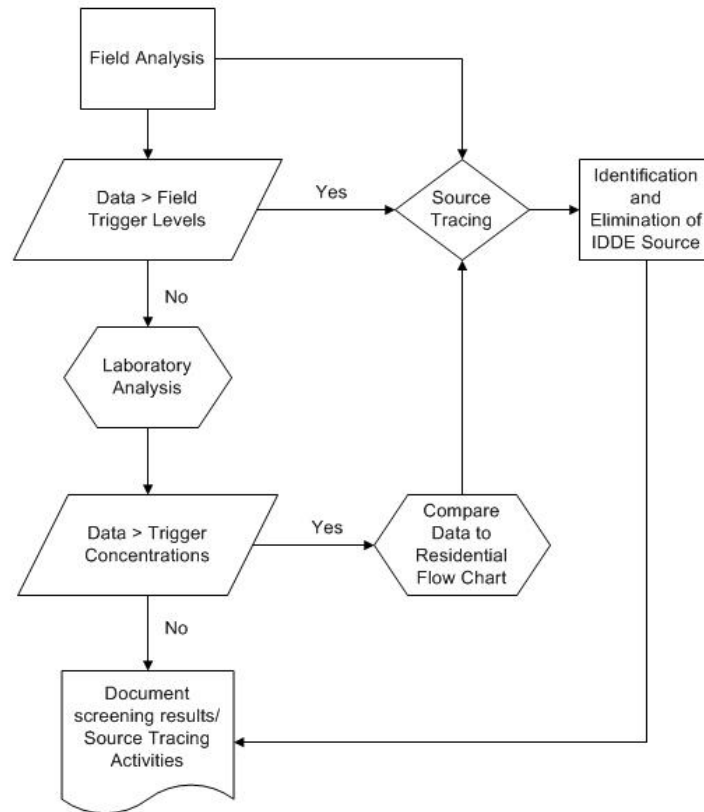
The sampling schedule must also account for tidal intrusion in areas of the City influenced by tidal flows.

The principal components of SPU's field screening element are:

- Field observations of the physical and environmental conditions at each site
- Field analyses by in-situ chemical screening
- Source tracing if illicit discharges or illicit connections are suspected based on the field observations or field analyses
- Laboratory analysis of the collected samples for the remaining chemical parameters
- Additional source tracing based on laboratory analyses



Figure II.8-1. IDDE Field Screening Flow Chart



II.8.5.1 Field Survey of Physical and Environmental Conditions

At each screening location, SCM staff will document the date, time sample taken, a City specific unique asset identifier, initials of staff taking samples, sample number (which is also written on the sample bottle), and other general information regarding screening location on a white board and photograph for electronic record keeping. Staff then gathers field observations of the physical and environmental conditions of each field screening location (estimated flow, color, odor, turbidity, and floatables). These observations are recorded using a geodatabase in ArcPad on a laptop

II.8.5.2 Chemical Screening by Field Analyses

SCM staff conduct the following field analyses if flow is present: temperature, dissolved oxygen, pH, conductivity, turbidity, surfactants, and ammonia. This information is recorded with a laptop using ArcPad and uploaded to a geodatabase via ArcGIS 9.2.

II.8.5.3 Laboratory Analysis of Collected Samples

II.8.5.3.1 SCM staff take a sample for laboratory analyses of the following, if flow is present: fluoride, potassium, and fecal coliform. Data Review: Triggers, Flow Charts, and Benchmarks

The data review process involves comparing all of the screening parameters from field observations and field analyses to the trigger levels to verify that source tracing has been initiated for all results over the trigger

levels. In some instances, source tracing may be recommended after the data review process when the screening results are not over the trigger levels but the data suggest the potential for an illicit discharge or connection.

II.8.6 Source Tracing

Source tracing in response to a field observation or analysis is initiated when one or more of the trigger levels for parameters listed in Table II.8.1 have been reached. Many of the MS4 maintenance holes in the City of Seattle have several inlets, therefore several samples may be taken at each location which can result in detection of multiple triggers. Priority for source tracing is based on the severity of the public health and safety of the screening parameters identified, such as visual indicators (color, odor, floatables), fecal coliform, ammonia, and surfactants.

Additional source tracing based upon laboratory analysis of samples follows the same process as detailed for the field analysis section, but rather than beginning immediately, tracing will generally occur within 21 days after receiving and reviewing laboratory results. If there is a suspected illicit discharge or connection that cannot be located by the IDDE screening process, business inspectors and other SPU staff are consulted to determine the type of source tracing investigation most appropriate for the types of businesses located in the basin.

Occasionally, source tracing a specific trigger, such as conductivity, does not lead to an obvious pollution source, and SCM field staff have reason to believe the trigger source is from a natural occurrence. The surrounding area will be investigated visually for any potential pollution source(s), and field and lab data will be carefully reviewed to identify that the most likely cause of the trigger is a natural source. In some cases there may be outstanding triggers as the IDDE dry field season ends. In these instances, field staff will review the field and laboratory data to assess each individual trigger in relation to public health and safety. Triggers suspected to be a potential severe threat to human health or the environment will be investigated further into the wet season following 'dry weather' conditions: maximum of 0.04 inches of rainfall in the preceding six-hour period, with no more than 0.02 inches of rainfall in any one hour period. Techniques such as closed circuit television (CCTV), smoke testing, and basic source tracing (i.e. visual observations, odor etc.) can be used if the problem presents a severe threat to human health or the environment.

II.8.6.1 Response to Illicit Connections

Illicit connections are considered a top priority complaint and are most often responded to the same business day or within 24 hours. It is a SCM policy to notify Ecology within 24 hours of a discovery of an illicit connection, regardless of the threat potential. Ecology is contacted immediately if an illicit connection presents a severe threat to human health or the environment. The contact date, time and Environmental Response Tracking System (ERTS) number assigned are recorded on the SPU Complaint Inspection form and tracked in the SCM database. SCM uses progressive enforcement tools to eliminate all illicit connections within 6 months.

II.8.6.2 Emergency Response

Spill response at the City is handled by a variety of departments dependent on the source and type of spill. This is part of the City's procedure to investigate and respond to spills, improper disposal and illegal dumping into MS3s owned or operated by the City. SPU is responsible for response to spills that have the potential to enter, or have entered the City's MS4. In cases where a City Department other than SPU responds and cleans up a spill, the Department's procedures direct them to notify SPU of all spills that enter or have the potential to enter the MS4.



The SPU Spill Response Program is staffed by a Senior Spill Coordinator and a network of on-call Spill Coordinators. Spill Coordinators work in shifts and are available 24 hrs/ 7 days week. The Spill Coordinator is responsible for responding to the spill, coordinating cleanup and filing a report form to the Senior Spill Coordinator.

Spill response calls are dispatched through the SPU ORC and are received via a publicly available phone number (206-386-1800). If a citizen calls in to report an active spill, they are directed by the Water Quality Hotline to call the ORC to report the spill. Once a spill call is received, the Dispatcher contacts the SPU on-call Spill Coordinator and advises them of the situation.

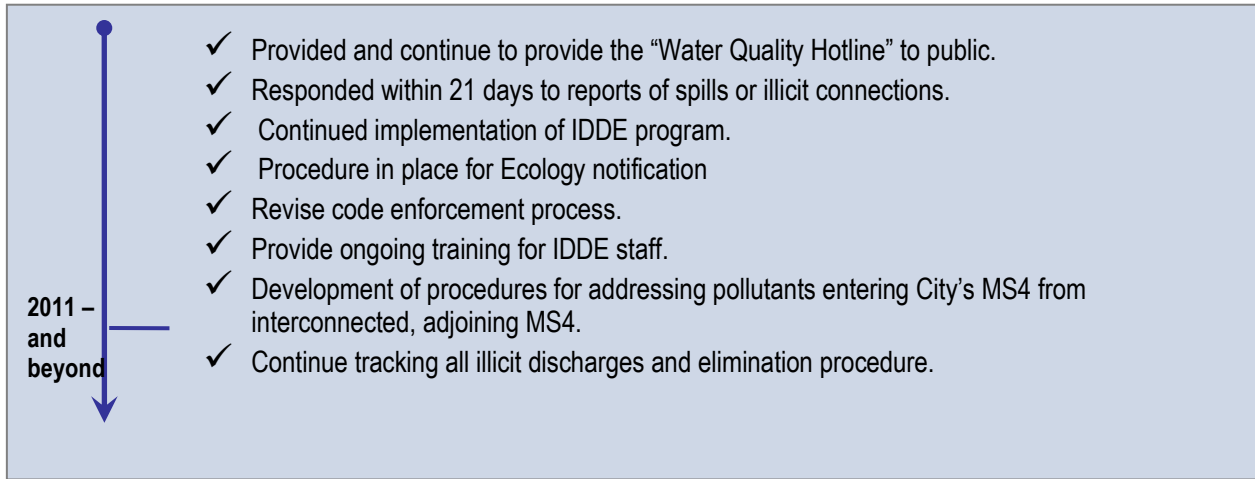
Spill Coordinators follow written procedures for investigation, clean up and reporting to appropriate agencies. Spill Response Guidelines were established by SPU in 2000, revised in 2008, and cover spill classifications, training requirements, safety procedures, documentation, disposal, interagency cooperation and regulatory notification.

II.8.6.3 Record Tracking

Enforcement actions are tracked both in the SCM database and electronically in a separate folder on the City network. All enforcement documentation, inspection reports, warning letters, notices of violations, and other enforcement records are kept on file. SPU utilizes its progressive enforcement procedures in situations where a spill has occurred.



Figure II.8-1. Timeline Showing Progress and Next Steps



Current Activities

For More Information

- ❖ Water Quality Hotline: 206-684-7587
- ❖ Report a Spill - SPU Operations Control Center: 206-386-1800
- ❖ Water Quality Hotline information and online form:
http://www.seattle.gov/util/Services/Drainage & Sewer/Keep Water Safe & Clean/COS_002180.asp
- ❖ For information on the IDDE and Spills program:
http://www.seattle.gov/util/Services/Drainage_&_Sewer/PollutionControl/
- ❖ For general questions about this SWMP or more information about this section, email swmp@seattle.gov or visit
http://www.seattle.gov/util/About_SPU/Drainage & Sewer System/Plans/StormwaterManagementProgram/StormwaterManagementPlan/

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II.9 Operation and Maintenance-S5C.9

II.9.1 Requirements

The Permit (Section S5.C.9) requires the City to develop and implement an operations and maintenance (O&M) program to reduce stormwater impacts associated with the City's municipal separate stormwater system and regulate municipal operations and maintenance activities in areas served by the City's MS3. The minimum performance measures include the following areas with more detailed requirements included in the Permit text:

- Establish maintenance standards for facilities that are as protective, or more protective, of facility function than those specified in Chapter 4 of Volume V of the 2005 Stormwater Management Manual for Western Washington (Ecology, 2005).
- Evaluate and, if necessary, update existing ordinances or other enforceable documents to require maintenance of existing permanent stormwater facilities regulated by the City. Establish an initial and ongoing inspection program for stormwater facilities and catch basins regulated by the City.
- Develop and implement an initial inspection schedule for all known, permanent stormwater treatment and flow control facilities (other than catch basins) regulated by the City to inspect each facility at least once during the term of the Permit to enforce compliance with adopted maintenance standards as needed based on the inspection.
- Develop an on-going inspection schedule to annually inspect all stormwater treatment and flow control facilities (other than catch basins) regulated by the City.
- Manage maintenance activities to inspect all new permanent stormwater treatment and flow control facilities, including catch basins, in new residential development every 6 months during the period of heaviest construction to identify maintenance needs and enforce compliance.
- Require cleaning of catch basins regulated by the City if found to be out of compliance during source control or IDDE program activities or if part of treatment or flow control system inspected under this O&M program.
- Implement an inspection process for all permanent stormwater facilities owned or operated by the City. Conduct spot checks of potentially damaged stormwater facilities after storm events. Conduct repairs or maintenance actions in compliance with maintenance standards.
- Implement a program to annually inspect all catch basins and inlets owned or operated by the City.
- Maintain records of inspections and repair activities conducted by the City.
- Establish and implement processes and procedures to reduce stormwater impacts associated with runoff from municipal operation and maintenance activities including but not limited to streets, parking lots, roads or highways owned or maintained by the City, and to reduce pollutants in discharges from all lands owned or maintained by the City.



- Train employees who have primary construction, operations or maintenance job functions that could impact stormwater quality. Track and maintain training records.
- Develop and implement SWPPPs for all heavy equipment maintenance or storage yards, and material storage facilities owned or operated by the City in areas covered by the Permit that are not covered by another Ecology-issued stormwater discharge permit.

II.9.2 O&M Program

The City's municipal stormwater permit-related O&M program is comprised of the activities outlined below.

II.9.3 Responsible City Departments

SPU is responsible for operation and maintenance of stormwater facilities owned, operated or maintained by the City and located in the right of way and for conducting inspections of private stormwater facilities to determine that those stormwater facilities meet operation and maintenance standards. Other City Departments, SDOT, FAS, Parks, and SCL are responsible for operation and maintenance of stormwater facilities and implementation of operation and maintenance policies and procedures specific to the properties they manage.

II.9.4 Current and Planned Activities

The following sections outline completed or planned activities needed to meet the key Permit requirements.

II.9.4.1 Maintenance Standards

The City has a program based on maintenance standards in place to reduce stormwater impacts associated with runoff from impervious surfaces and operation and maintenance of stormwater facilities that discharge to the City's MS3. This program follows the current Stormwater Code (2009) and the current Director's Rule DR 17-2009, SPU 2009-005, Vol. III - Stormwater Flow Control and Water Quality Treatment Technical Requirements Manual, Appendix D of Vol. III outlines inspection, maintenance, and record keeping requirements for stormwater management facilities, both public and private, in the City. In some cases, the City owns or operates facilities with site-specific maintenance requirements that require facility-specific maintenance standards. For these situations the City has developed facility specific standard operating procedures that incorporate the inspection and maintenance requirements of Appendix D as well as detailed information such as the location and access restrictions of facilities, necessary equipment, safety procedures and maintenance procedures.

II.9.4.2 Maintenance Standards for Private Stormwater Facilities Regulated by the City

The SCM group at SPU is responsible for inspecting private facilities regulated by the City, based on maintenance standards established by the City in the Stormwater Code and DR 17-2009, SPU 2009-005, Vol. III - Stormwater Flow Control and Water Quality Treatment Technical Requirements Manual. During a facility inspection, all aspects of the system are inspected (e.g., flow control devices, catch basins). When any part of that system (including catch basins) is found to be out of compliance with Stormwater Code requirements for maintenance, a corrective action letter is sent to the facility owner and the owner must certify that the work has been completed to correct the noncompliance.

SPU and other City departments have revised the public and private facility maintenance programs to reflect the new requirement of the Permit revised Stormwater Code.



There are approximately 1,800 privately-owned water quality and flow control facilities regulated by the City (hereafter in this subsection, “facilities”) that drain to the City’s MS3s, and up to 250 are added each year due to new development or redevelopment requirements. Maintenance standards for private stormwater facilities regulated by the City Stormwater Code are defined and described in Appendix D of the 2009 DR 17-2009, SPU 2009-005, Vol. III - Stormwater Flow Control and Water Quality Treatment Technical Requirements Manual. The Directors’ Rule provides a summary of the inspection and maintenance requirements. The inspection and maintenance requirements include information about what features to inspect at each facility, when and how often these private systems should be inspected, and how to identify specific defects that warrant corrective action. Corrective actions are described that should be taken to maintain system performance.

The permit requires that the City develop an ongoing inspection schedule in 2011 to annually inspect all stormwater treatment and flow control facilities (other than catch basins) regulated by the City. To comply with this requirement, SPU conducted a study during 2010 of private stormwater facility compliance to evaluate whether there would be sufficient justification to reduce the frequency of inspections of private storm water facilities from the level specified in the permit (annually starting in 2012). The study was completed, and the results support a change in the inspection frequency of private stormwater facilities.

Starting on January 1, 2012, SPU will change in the inspection frequency for all private stormwater facilities that discharge to the City of Seattle’s MS4 to once every two years. However, if SPU receives a complaint about a private stormwater facility via its Water Quality Hotline or SPU determines during a Source Control Inspection that a site’s stormwater facility is out of compliance, SPU will use progressive enforcement to bring the private stormwater facility into compliance with the City ordinances and rules.

II.9.4.3 Maintenance of Catch Basins Owned or Operated by the Permittee

SPU has continued its catch basin maintenance and inspection program that focuses on maintaining catch basins for public health, safety and property and by nature includes water quality benefits. Staff have implemented a catch basin inspection and maintenance program to meet new Permit requirements. FAS, SCL and Parks each continue to implement programs for catch basin inspection and maintenance for catch basins on City owned properties that the department manages or operates.

II.9.4.4 Inspection and Maintenance of Private Stormwater Facilities

The SCM group at SPU is responsible for inspection consistent with the Permit of private stormwater facilities that drain to the City’s MS3 to require the systems are properly maintained by responsible parties and are operating as designed. Inspectors inform the owner of the stormwater facility of the results of the inspection and the required maintenance necessary to bring the system into compliance. SCM uses the same progressive enforcement process detailed DR 18-2009, SPU 2009-006, Vol. 4: Stormwater Code Enforcement Manual. SCM has developed and is implementing an initial inspection schedule designed to inspect such each private stormwater facility once during the final three years of the Permit. Facility owners self certify that the work needed for compliance has been completed by providing a signed copy of the corrective action letter with a copy of the work detail performed.

DPD is responsible for conducting inspections of private stormwater facilities in new residential developments during the period of heaviest construction to identify maintenance needs and enforcing compliance as needed. DPD is incorporating this requirement into the inspection process described in Section II.5.4.3.2.

II.9.4.5 Inspection and Maintenance of City-Owned Stormwater Facilities

SPU has asset managers that schedule and coordinate inspection and maintenance of conventional and innovative (e.g., Green Stormwater Infrastructure (GSI)) stormwater facilities owned or operated by the City



on an annual basis and following 10-year 24-hour storm events. The Field Operations and Maintenance Division (FOM) at SPU is responsible for the actual inspection and maintenance of stormwater facilities located in the right-of-way and owned, operated or maintained SPU. Stormwater facilities owned by the City, but located outside of the right-of-way, are inspected and maintained by the City Department that manages the property unless there is an agreement between SPU and the City Department.

SPU and the other City Departments have developed and implemented an inspection program to annually inspect all permanent stormwater facilities owned or operated by the City. The program is designed to determine if maintenance is needed and implement the needed maintenance in accordance to the Directors' Rules or a facility-specific maintenance standard.

II.9.4.6 Records of Inspections, Maintenance, or Repair

II.9.4.6.1 Private Stormwater Facilities

The SCM group tracks private facility inspection and enforcement records through a Microsoft Access database and file management system. The database tracks information for both source control inspections and drainage system maintenance inspections. Records are managed in accordance with the State record keeping requirements. Enforcement actions are tracked both in the database and electronically in a separate folder on the City network. Any enforcement paperwork is kept with the file.

II.9.4.6.2 City-Owned Stormwater Facilities

SPU has asset managers that oversee inspection and maintenance of conventional and innovative (e.g., GSI) facilities owned, operated or maintained by the City. The asset managers track inspection data and facilitate maintenance as needed following the applicable maintenance standard.

Inspection and maintenance of stormwater facilities owned, operated or maintained by the City are tracked by the computer program MAXIMO at SPU. This program is used to generate work orders for facility inspections and maintenance and to record the results of these activities. The other City Departments use a variety of methods to record inspections and maintenance results.

II.9.4.7 Stormwater Practices to Reduce Impacts Associated with Parking Lots, Streets, and Roads

The City's Stormwater Code and Volume 1 and 2 of the Directors' Rules establish practices to reduce the stormwater impacts associated with parking lots, streets and roads owned or operated by the City and that drain to the City's MS3s.

In addition to the Stormwater Code, the SDOT has established and has implemented practices to reduce stormwater impacts associated with runoff from City road maintenance activities through the use of Maintenance Management System Performance Sheets that reference BMPs and elements of the Regional Road Maintenance initiative.

Parks, FAS and SCL follow the Stormwater Codes and Directors' Rules in place for management of stormwater from roads and parking lots under their departments' management outside the City rights of way. The departments follow the Stormwater Code and use appropriate BMPs when they conduct construction and maintenance activities on or near streets, parking lots and roads. City managed capital projects are inspected for Stormwater Code compliance and BMPs by the responsible department. The individual City Departments have implemented and will continue to implement a spill program and provide training on spill and source control.



II.9.4.8 Policies and Procedures to Reduce Pollutants from City-Owned or Maintained Lands

The Stormwater Code (2009) and DR 15-2009, SPU 2009-003, Vol. I - Source Control Technical Requirements Manual, presents approved methods, criteria, details, and general guidance for controlling pollutants at their source and establishes policies and procedures to reduce pollutants in discharges from lands owned or maintained by the City that drain to the City's MS3s. The Office of Sustainability and Environment (OSE) collaborates with City agencies to protect and enhance Seattle's distinctive environmental quality and livability. For example OSE has established a Pesticide Reduction Program for the City. This program has two main goals: (1) to eliminate the use of the most potentially hazardous herbicides and insecticides and (2) to achieve a 30 percent reduction in overall pesticide use by City departments.

The following policies and procedures have been established by OSE and are implemented by the City Departments.

Integrated Pest Management

Policies for addressing application of fertilizer, pesticides and herbicides are addressed under BMP 20: Landscaping and Lawn and Vegetation Management in DR 15-2009, SPU 2009-003, Vol. I - Source Control Technical Requirements Manual, which requires the development of an integrated pest management (IPM) program that, at a minimum, includes the requirements outlined in Appendix B of DR 15-2009, SPU 2009-003, Example of Integrated Pest Management Program and Plan.

Environmental Management Program Chemical Use Policy

The purpose of this policy is to establish a chemical use program to provide for consistent evaluation of hazardous materials used by City employees, to phase out products that pose human health or environmental risks, and to promote the use of non-hazardous alternatives by the City that are protective of human health and the environment (Seattle, 2008e).

Landscape and Grounds Management Policy

The purpose of this policy is to establish that City landscapes are designed, constructed, and maintained in a manner that protects and enhances our region's natural resources and public health; that City landscapes are models of environmental stewardship in the eyes of the public; that the City establishes a leadership role in developing both aesthetically pleasing and ecologically sensitive landscapes; and that there is a consistent standard of environmental stewardship observed by City departments managing landscapes and other grounds (Seattle, 2008e).

Landscape and Grounds Management Guidelines

The guidelines are intended to provide a framework for environmental responsibility in how the City plans, designs, constructs, commissions, manages, and maintains parks, rights of way, and other landscaped areas. The focus of the guidelines is on environmental stewardship of City-owned lands.

The SDOT's Street Use and Urban Forestry Division limits the use of fertilizers, pesticides and herbicides in accordance with City policies and procedures. This division also has policies and procedure in place to address erosion and sediment control, landscape maintenance, and vegetation disposal on lands owned and maintained by SDOT. Urban Forestry uses Resource-efficient Natural Landscaping: Design – Build – Maintain (Seattle, 2007a), as a BMP reference. These practices will continue during 2010 and into the future.

Parks operates under City regulations, policies and procedures including but not limited to the Stormwater Code, Parks BMPs for Landscape Horticulture and Forestry (Seattle, 2000a) and the Seattle Biological Evaluation BMPs (Seattle, 2007b). Parks has an active Integrated Pest Management program to control and



reduce pesticide use. Parks has been maintaining 14 parks without the use of any pesticides since 2001. The program is expanding to include eight more parks and about 25 more acres, for a total of 22 parks and about 50 acres.

Trash Management

Policies for addressing trash management are addressed under Citywide BMP 3: Dispose of Fluids and Wastes Properly and Citywide BMP 4: Proper Storage of Solid Wastes in DR 15-2009, SPU 2009-003, Vol. I - Source Control Technical Requirements Manual.

Building Exterior Cleaning and Maintenance

Policies for addressing Building Exterior Cleaning and Maintenance are addressed under BMP 9: Washing, Pressure Washing, and Steam Cleaning of Vehicles, Equipment and Buildings in DR 15-2009, SPU 2009-003, Vol. I - Source Control Technical Requirements Manual.

II.9.4.9 Training Program

The City has developed and implemented the “Water Rules!” Federal and State permit training, for workers who work on projects that may impact water bodies, which includes employees of the City who have primary construction, operations or maintenance job functions that could impact stormwater quality. This training, first offered in 2008, includes information on BMPs for construction and operation and maintenance projects. A DVD on this training has been developed to provide opportunities for on-going training. DPD provides training to City Staff on temporary erosion and sediment control (TESC).

SDOT Street Maintenance employees receive stormwater BMP training for their work and are provided with stormwater BMP reference manuals. Fourteen separate field manuals provide information in the field for implementation of appropriate stormwater BMPs

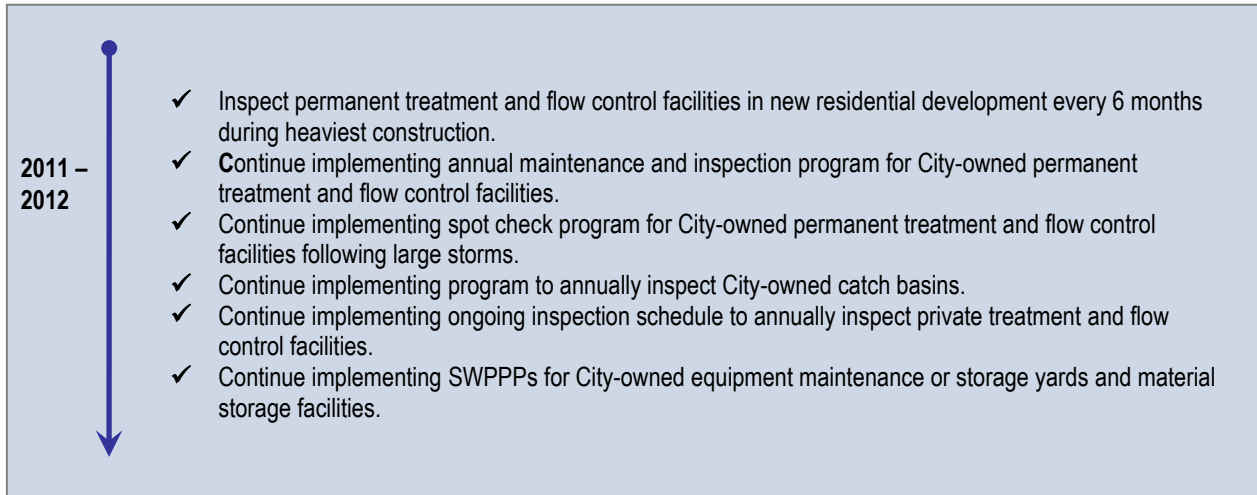
SPU, SDOT, Parks, FAS and SCL all have spill prevention training and source control training in place. These departments are evaluating their existing training and updating as needed to comply with the Permit.

II.9.4.10 Stormwater Pollution Prevention Plans

An umbrella SWPPP that includes operational BMPs that meet the Stormwater Code and Directors’ Rules has been developed and then customized for each facility to include site specific requirements and structural BMPs. The SWPPPs have been implemented and will be revised as needed.



Figure II.9-1. Timeline Showing Progress and Next Steps



Legend: ✓ Implemented □ Planned

For More Information

- ❖ **Private Stormwater Facility Inspections:**
<http://www.seattle.gov/util/Services/Drainage & Sewer/Stormwater Related Inspections/Maintenance Inspections/index.asp>
- ❖ **Office of Sustainability and Environment:** <http://www.seattle.gov/environment/>
- ❖ For general questions about this SWMP or more information about this section, email swmp@seattle.gov or visit http://www.seattle.gov/util/About_SPU/Drainage & Sewer System/Plans/StormwaterManagementProgram/StormwaterManagementPlan/

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II.10 Education and Outreach-S5C.10

II.10.1 Requirements

The Permit (Section S5.C.10) requires the City to perform the following minimum performance measures:

- Implement or participate in an education and outreach program that uses a variety of methods to target the audiences to educate them to help reduce or eliminate behaviors and practices that cause or contribute to adverse stormwater impacts.
- Have program elements designed to measure understanding and adoption of the targeted behaviors for at least one targeted audience in at least one subject area. Use this information to direct education and outreach resources most effectively and evaluate changes in adoption of targeted behaviors.
- Track and maintain records of public education and outreach activities.

II.10.2 Education and Outreach Program

The City is using a variety of educational programs (Table III.10-1) to engage the citizens of Seattle in source control and stormwater management. These programs provide educational materials, instruction or designs that citizens can use at their home, business or in the community at large. The City uses community based social marketing approaches (CBSM) to evaluate the audiences' understanding of how their actions can have negative impacts on stormwater and how they can take an active role in the improvement of stormwater quality. The evaluations are used to direct education and outreach programs most effectively and to evaluate changes in the audiences' adoption of the target behavior.

II.10.3 Education and Outreach Tracking

The June 17, 2009 permit modification changed the requirement that each of the programs in place or being developed for the Education and Outreach requirements of the permit has or will have a mechanism in place to track and maintain records of the City's public education activities to requiring the City to implement or participate in an effort to measure understanding and adoption of the targeted behaviors for at least one targeted audience in at least one subject area.

II.10.4 Responsible City Departments

SPU is the lead department for implementation of the education and outreach programs for Permit compliance. Several programs have cooperative elements in other departments.

II.10.5 Current and Planned Activities

The City has conducted and will be conducting the activities outlined in Table III.10-1 and described in the following sections for each target audience.



Table II.10-1 – Education and Outreach Activities

Audience	Target Behavior/Practice	City Education and Outreach Program	
General Public	General Impacts of Stormwater	Urban Watershed	
	Impacts of Impervious Surfaces	Schools Program	
	Source Control BMPs	Pet Waste	Doo Diligence - Pet Waste Program
		Vehicle Maintenance	Auto Maintenance Program (AMP)
		Landscaping/Buffers	RainWise
General Public and Businesses including Mobile	Chemical Storage BMPs	Spills	Spill kits
		Car Wash Soap	AMP
		Cleaning Supplies	STORM and Resource Venture
		Automotive Products	AMP and Spill Kits
		Illicit Discharges	Water Quality Hotline
Homeowners, Landscapers and Property Managers	Yard care Techniques	Green Gardening Program and Natural Soil Building	
	BMPs for Storage of Pesticides and Fertilizers	Natural Soil Building	
	BMPs for Carpet Care	Resource Venture	
	BMPs for Auto Repair and Maintenance	AMP	
	Low Impact Development	RainWise	
	Stormwater Treatment and Flow Control	RainWise	
Engineers, Contractors, Developers, Review Staff, and Land Use Planners	Technical Standards for Stormwater Site and Erosion Control Plans	Stormwater Construction Control Plans, City Wide Training Integrated Federal Permit Training (IFPT), and On-The-Job (OJT) Training,	
	Stormwater Treatment and Flow Control BMPs	Stormwater Construction Control Plans, City Wide Training Integrated Federal Permit Training (IFPT), and On-The-Job (OJT) Training,	
	Low Impact Development	Natural Landscaping Professional Development	

II.10.5.1 Audience: General Public

II.10.5.1.1 The Urban Watershed School Programs

Seattle's Restore Our Waters school programs educates the general public about the general impacts of storm water flows into surface waters and the impacts associated with impervious surfaces. This program is conducted via a partnership between SPU, Seattle Parks and Seattle Public Schools. The program is linked closely with school science curriculum and includes a field trip program to one of Seattle's urban creeks. Outcomes are measured through teacher evaluations. This program reaches a diverse geographic audience in the City and engages the public in hands-on learning.

II.10.5.1.2 Pet Waste Program

The City's pet waste program is implemented in public places city-wide and is used to educate and engage the public on the topic of source control BMPs and environmental stewardship actions and opportunities in the area of pet waste disposal. The program relies on tools, educational materials and resources to facilitate the adoption of BMPs including signage in public places and on the web, brochures, as well as pet waste dispensers at key locations throughout the city. Strong partnerships with volunteer groups, city agencies, and the private sector ensure this programs' success. The pet waste program is following community-based social marketing principles by recruiting existing community groups to be an integral part of the program.



II.10.5.1.3 Auto Maintenance Program (AMP)

The Automotive Maintenance Program (AMP) targets and educates the general public about BMPs for the source control and storage of products related to vehicle maintenance. The program relies on key partnerships with QuickLube services to provide discount coupons to the general public for auto repair and oil changes. Outreach materials such as posters and brochures are used to highlight the links between



automotive maintenance and water quality and promote curbside oil recycling and best practices for vehicle maintenance. The outreach materials are available in four additional languages and are distributed to key locations throughout the city. In addition, half-day workshops at the local community college provide low-income residents with hands-on automotive maintenance training. The 2011 AMP campaign will continue to provide low-income residents with free or low cost leak repair services through its ongoing workshops and by providing discounts at auto-based businesses. The program may expand into Seattle Public Schools. Increased marketing efforts will further program participation and messaging will expand to include car wash BMPs

II.10.5.1.4 Car Wash Program

The Car Wash Program seeks to educate the general public on the adverse water quality impacts of carwash soaps associated with car washing activities and provide environmentally safe alternatives. Outreach to fundraising groups in 2011 will continue to direct them to the Brown Bear/ Puget Sound Car Wash Association's (PSCWA) ticket-based fundraising program and to sites where car wash fundraisers can occur without negatively impacting water quality. Outreach to fundraising groups will employ new strategies and messages based on the results of an evaluation conducted in 2010. In 2011, SPU plans to increase the number of host site locations available for carwash events.

In addition, SPU will include PSCWA and Brown Bear Car Wash coupons for individual residents in two separate issues of *@ Your Service*, an SPU publication, which is included with customers SPU utility bill.

II.10.5.1.5 RainWise

The City has implemented the RainWise program to meet the requirement to educate the general public, homeowners, landscapers and property managers about low impact development techniques, including site design, pervious paving, retention and expansion of existing vegetation, and installation of rain gardens and cisterns. This program provides education and outreach on how to slow, spread, filter and infiltrate stormwater. The program will implement the following educational/technical elements to raise awareness about GSI (including stormwater treatment and flow control):

- SPU will post rain garden designs, plant lists and maintenance guidelines that can be downloaded from the internet. The RainWise program provides information and brochures on various GSI techniques on our website, www.seattle.gov/util/rainwise as well as in hardcopy.
- RainWise Tools, www.rainwise.seattle.gov an internet-based education, recruitment, tracking and marketplace outreach tool that helps educate property owners about GSI techniques they can use on their property is available to all residents. Residents in target CSO basins can receive rebates for constructing qualifying rain gardens and cisterns.
- To reach landscapers and contractors SPU will hold rain garden construction training workshops to build capacity in the landscape contractor community for implementing these types of projects.
- School and community demonstration rain gardens and cisterns will be installed at target locations throughout the city as part of RainWise.

II.10.5.2 Audience: General Public and Business

II.10.5.2.1 Resource Venture

To supplement inspections and provide outreach to small businesses, SPU funds Resource Venture, a free resource conservation program for Seattle businesses, currently being implemented by Cascadia Consulting,



under contract with SPU¹. Under this contract, Resource Venture provides supplemental site specific technical assistance to businesses, develops targeted outreach materials in multiple languages, organizes and hosts industry-specific stormwater pollution prevention workshops, and implements SPU's Spill Kit Incentive Program, which provides free spill kits and assistance in developing a spill plan. Since its inception in 2005, SPU and Resource Venture have reached over 1,000 Seattle businesses that have created spill plans and received free spill kits. The spill kit program is promoted on the web and during inspections.

Resource Venture also lends free car wash kits to the general public and organizations. The car wash kits capture car wash water and direct it to the sanitary system rather than allowing the wash water to flow into the MS4. Resources and information on use and storage of automotive chemicals, hazardous cleaning supplies, carwash soaps and other hazardous materials are provided directly to the general public and business owners to help reduce behaviors that cause or contribute to adverse stormwater impacts. Car Wash kits are advertised on an RV web site, in Camp Long and Carkeek Park seasonal program brochures, and on the Parks' web site.

II.10.5.2.2 Auto Maintenance Program (AMP)

Please see description for this program in Section II.10.5.1.3.

II.10.5.2.3 STORM

The City of Seattle participates in STORM (Stormwater Outreach for Regional Municipalities) and the Puget Sound Starts Here (PSSH) regional campaign which focuses on stormwater BMPs for cars, pets, yard care and home cleaning. The Campaign includes a website and additional media with information to education the general public about the impacts of cleaning products on stormwater and alternative products. The Campaign includes outreach and education in the City through newspapers and television as well as mechanisms to evaluate the success of the program in 2011.

II.10.5.2.4 Water Quality Hotline

The City staffs a 24-hour Water Quality Hotline to allow citizens and businesses to report illicit discharges, illegal dumping, and spills into the MS4. Violators receive education and technical assistance to help address violations voluntarily; non-compliance can potentially result in legal action. This BMP provides a mechanism for the public to take an active role in stormwater pollution prevention and help the City increase awareness of activities that have negative impacts on stormwater. The Water Quality Hotline is promoted mainly to residents. Outreach to the public includes stickers, magnets and creek-watershed newsletters. Calls are tracked and resolution information is recorded to evaluate changes in program performance.

II.10.5.3 Audience: Homeowners, Landscapers, and Property Managers

II.10.5.3.1 Green Gardening Program

The Green Gardening program targets nursery staff, landscape maintenance professionals and horticulture students to increase understanding and reduce the impacts of landscaping practices on water quality. In 2011, the program will continue to outreach to underserved populations, offering classes to English as a Second Language (ESL) landscape maintenance professionals. The program will also continue education to community college horticulture programs,

¹ The Resource Venture contract is administered by Cascadia Consulting, but also subcontracts to ECOSS (Environmental Coalition of South Seattle) and Herrera Consulting as sub-contractors of the contract. The utilization of these 3 companies is available through the Resource Venture Contract.



II.10.5.3.2 Natural Soil Building

The Natural Yard Care Neighbors program is being replaced with the Natural Soil Building program to target homeowners, landscapers and property managers with education and outreach on yard care techniques protective of water quality and BMPs for the use and storage of pesticides and fertilizers. This program is targeted at the residential gardening public to increase adoption of natural yard care practices. In 2011 the following strategies will be implemented: A new Garden Hotline, training for volunteers to teach fellow gardeners about natural yard care practices, and a new e-newsletter.

II.10.5.3.3 Resource Venture

To supplement inspections and provide outreach to small businesses, SPU funds Resource Venture, a free resource conservation program for Seattle businesses, currently being implemented by Cascadia Consulting, under contract with SPU². Under this contract, Resource Venture provides supplemental site specific technical assistance to businesses, develops targeted outreach materials in multiple languages, organizes and hosts industry-specific stormwater pollution prevention workshops. Resources and information on use and storage of chemicals, hazardous cleaning supplies and other hazardous materials are provided directly to the general public and property managers to help reduce behaviors that cause or contribute to adverse stormwater impacts.

II.10.5.3.4 Auto Maintenance

Please see description for this program in Section II.10.5.1.3.

II.10.5.3.5 RainWise

Please see description for this program in Section II.10.5.1.5.

II.10.5.3.6 Natural Landscaping Professional Development

This program is a series of well attended professional workshops focused on low impact development(LID) techniques including: sustainable site design, soil BMPs and retention of native vegetation, plant selection and maintenance options that reduce pesticide and fertilizer use, and Natural Drainage/LID strategies for on-site stormwater management, stormwater treatment and flow control. These workshops specifically target engineers, design professionals, landscape contractors (including Spanish-speakers), developers, builders, and land use planners. The program is built on extensive barriers and opportunities surveys and focus group work with these professionals and customers. Participants fill out in-class evaluations to measure their understanding, and identify (pledge) the actions they intend to take as a result of the training. The program is funded by SPU's drainage, solid waste, and water funds, as well as the Local Hazardous Waste Management Program, and integrates messages from across those programs.

II.10.5.4 Audience: Engineers, Contractors, Developers, Review Staff and Land Use Planners.

II.10.5.4.1 Temporary Erosion and Sediment Control

DPD and SDOT have revised the temporary erosion and sediment control (TESC) training that is provided to City staff and the public involved in ground disturbing activities to reflect the changes in the 2009

² The Resource Venture contract is administered by Cascadia Consulting, but also subcontracts to ECOSS (Environmental Coalition of South Seattle) and Herrera Consulting as sub-contractors of the contract. The utilization of these 3 companies is available through the Resource Venture Contract.

Stormwater Code. This new training, called stormwater construction controls (SWCC), is offered to City staff and the public on a regular basis or as needed.

II.10.5.4.2 City Wide Training

The City trained staff who are engineers, review staff and land use planners at a City wide training held in spring 2010. City Staff received training on the revised draft Stormwater Code and Directors’ Rules including technical standards for stormwater site and erosion control plans, LID techniques, and stormwater and flow control BMPs. On-going training on this subject is being developed so that existing employees can refresh their knowledge and new employees can be properly trained.

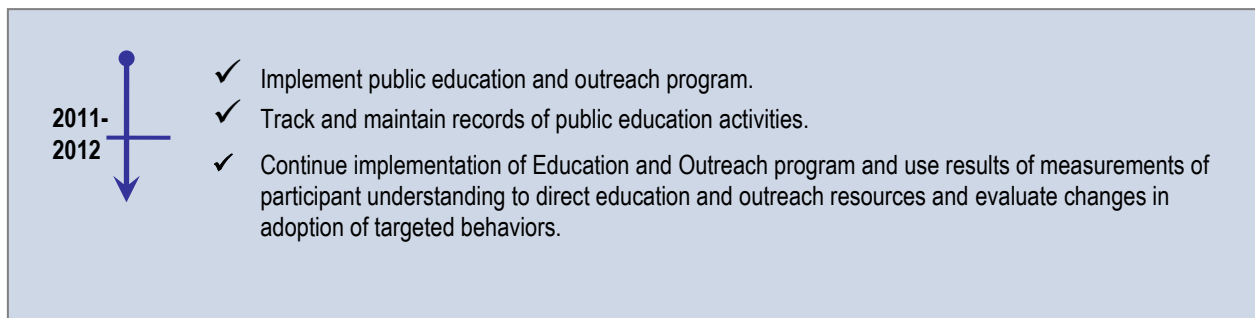
II.10.5.4.3 On the Job Training

All Departments within the City engage in on the job training to insure that staff members are current on policies, procedures, rules and requirements related to the management of stormwater. This training can take the form of classroom, informal meeting, and tailgate session. In addition, the City encourages employees to attend professional development training related to their business area.

II.10.5.4.4 Natural Landscaping Professional Development

Please see description for this program in Section II.10.5.3.6.

Figure II.10-1. Timeline Showing Progress and Next Steps



Current Activities

Legend: ✓ Implemented □ Planned

For More Information

- ❖ For more information on the Resource Venture, a free resource conservation program for Seattle businesses, visit www.resourceventure.org.
- ❖ For general questions about this SWMP or more information about this section, email swmp@seattle.gov or visit [http://www.seattle.gov/util/About_SPU/Drainage & Sewer System/Plans/Stormwater ManagementProgram/StormwaterManagementPlan/](http://www.seattle.gov/util/About_SPU/Drainage_&_Sewer_System/Plans/Stormwater_ManagementProgram/StormwaterManagementPlan/)

CITY OF SEATTLE
2008 NPDES STORM WATER MANAGEMENT PROGRAM

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III. REFERENCES



- Brown, Edward, and D. Caraco, R. Pitt. Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments. EPA Cooperative Agreement X-82907801-0. October 2004.
- Ecology, 2005. Stormwater Management Manual for Western Washington: Volume 5. Runoff Treatment BMPS. Publication # 05-10-33. Washington State Department of Ecology. February 2005.
- Ecology, 2010a. Phase I Municipal Stormwater Permit. National Pollutant Discharge Elimination System and State Waste Discharge General Permit for Discharges from Large and Medium Municipal Separate Storm Sewer Systems. State of Washington, Department of Ecology. Issued January 17, 2007, Effective February 16, 2007, Modified June 17, 2009 and September 1, 2010
- Ecology, 2010b. Washington Department of Ecology Web Site, Construction Stormwater General Permit, <http://www.ecy.wa.gov/programs/wq/stormwater/construction/>.
- Ecology, 2009. Washington Department of Ecology Web Site, Notice of Intent for Industrial Activity, <http://www.ecy.wa.gov/programs/wq/stormwater/industrial/index.html>.
- Pitt, Robert. 2001. The University of Alabama. *Methods for Detection of Inappropriate Discharges to Storm Drainage Systems: Background Literature and Summary of Findings*
- Seattle, City of. 2000a. Seattle Parks and Recreation Department Web Site, BMPs for Landscape, Horticulture and Forestry, <http://www.seattle.gov/parks/projects/bmp.htm>.
- Seattle, City of. 2005. Comprehensive Drainage Plan. Seattle Public Utilities. January 2005.
- Seattle, City of. 2006. Seattle Municipal Code, Chapter 22.100 – 22.204, Building Code Updated 2006.
- Seattle, City of. 2007a. Resource-Efficient Natural Landscaping: Design – Build – Maintain. Seattle Public Utilities. February 2007.
- Seattle, City of. 2007b. Seattle Biological Evaluation. Seattle Public Utilities. May 2007.
- Seattle, City of. 2008a. Executive Order: 01-08 NPDES Stormwater Permit. January 29, 2008.
- Seattle, City of. 2008e. Office of Sustainability and Environment web site, Pesticide Reduction, <http://www.seattle.gov/environment/pesticides.htm>.



IV. LIST OF DEFINITIONS AND ACRONYMS



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IV.1 Definitions and Acronyms

All of the definitions listed in the table below are directly from the 2007 NPDES Phase I Permit. Acronyms in the Table of Acronyms that are specific to SPU that were added beyond what was listed in the Permit are denoted with an asterisk.

Table IV.1-1. Definitions

Term	Definition
40 CFR	Title 40 of the Code of Federal Regulations, which is the codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the federal government.
AKART	All Known, Available and Reasonable methods of prevention, control and treatment. See also State Water Pollution Control Act, Chapter 90.48.010 and 90.48.520 RCW. "All Known, Available and Reasonable methods of prevention, control and treatment" refers to the State Water Pollution Control Act, Chapter 90.48.010 and 90.48.520 RCW.
Applicable TMDL	A TMDL which has been approved by EPA on or before the date permit coverage is granted.
Beneficial Uses	Uses of waters of the state, which include but are not limited to: use for domestic, stock watering, industrial, commercial, agricultural, irrigation, mining, fish and wildlife maintenance and enhancement, recreation, generation of electric power and preservation of environmental and aesthetic values, and all other uses compatible with the enjoyment of the public waters of the state.
Best Management Practices	The schedules of activities, prohibitions of practices, maintenance procedures, and structural and/or managerial practices approved by Ecology that, when used singly or in combination, prevent or reduce the release of pollutants and other adverse impacts to waters of Washington State.
Bypass	The diversion of stormwater from any portion of a stormwater treatment facility.
Clean Water Act	The federal Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Pub.L. 92-500, as amended Pub. L. 95-217, Pub. L. 95-576, Pub. L. (6-483 and Pub. L. 97-117, 33 U.S.C. 1251 et.seq.
Component or Program Component	The elements of the stormwater management program listed in Special Condition S5 Stormwater Management Program for Permittees or S6 Stormwater Management Program for Co-Permittees and Secondary Permittees.
Co-Permittee	An owner or operator of a municipal separate storm sewer that has co-applied for permit coverage with another permittee, and that is only responsible for permit conditions relating to the discharge for which it is operator. See also 40 CFR 122.26(b)(1).
Director	The Director of the Washington State Department of Ecology, or an authorized representative.
Discharge	For the purpose of this permit, unless indicated otherwise, refers to discharges from municipal separate storm sewers of the Permittees. See also 40 CFR 122.2
Ecology	The Washington State Department of Ecology
Entity	A governmental body or a public or private organization.
General Permit	Permit which covers multiple dischargers of a point source category within a designated geographical area, in lieu of individual permits being issued to each discharger.
Ground water	Water in a saturated zone or stratum beneath the surface of the land or below a surface water body.
Heavy equipment maintenance or storage yard	An area where any heavy equipment, such as mowing equipment, excavators, dump trucks, backhoes, or bulldozers are washed or maintained, or where at least five pieces of heavy equipment are stored on a long term basis.
Hyperchlorinated	Water that contains more than 10 mg/Liter chlorine.
Illicit connection	An Illicit Connection is the discharge of pollutants or non-storm water materials into a storm sewer system via a pipe or other direct connection. Sources of illicit connections may include sanitary sewer taps, wash water from laundromats or carwashes, and other similar sources



Term	Definition
Illicit discharge	Any discharge to a municipal separate storm sewer that is not composed entirely of storm water except discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from fire fighting activities.
Industrial or Construction Activity	Manufacturing, processing or raw materials storage areas at an industrial plant; or clearing, grading and/or excavation. These activities are required to have NPDES permit coverage in accordance with 40 CFR 122.26.
Integrated Pest Management	<p>A coordinated decision-making and action process that uses the most appropriate pest control methods and strategy in an environmentally and economically sound manner to meet agency programmatic pest management objectives. The elements of integrated pest management include:</p> <ul style="list-style-type: none"> (a) Preventing pest problems; (b) Monitoring for the presence of pests and pest damage; (c) Establishing the density of the pest population, that may be set at zero, that can be tolerated or correlated with a damage level sufficient to warrant treatment of the problem based on health, public safety, economic, or aesthetic thresholds; (d) Treating pest problems to reduce populations below those levels established by damage thresholds using strategies that may include biological, cultural, mechanical, and chemical control methods and that must consider human health, ecological impact, feasibility, and cost-effectiveness; and (e) Evaluating the effects and efficacy of pest treatments.
Low Impact Development (LID)	A stormwater management and land development strategy applied at the parcel and subdivision scale that emphasizes conservation and use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely mimic pre-development hydrologic functions.
Material Storage Facilities	An area where bulk materials (liquid, solid, granular, etc.) are stored in piles, barrels, tanks, bins, crates, or other means.
Maximum Extent Practicable (MEP)	Refers to paragraph 402(p)(3)(B)(iii) of the federal Clean Water Act which reads as follows: Permits for discharges from municipal storm sewers shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques, and system, design, and engineering methods, and other such provisions as the Administrator or the State determines appropriate for the control of such pollutants.
Municipal Separate Storm Sewer (MS3)	<p>A conveyance, or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains):</p> <ul style="list-style-type: none"> - owned or operated by a state, city, town borough, county parish, district, association, or other public body (created by or pursuant to State Law) having jurisdiction over disposal of wastes, storm water, or other wastes including special districts under State Law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the U.S. - designed or used for collecting or conveying stormwater - which is not a combined sewer; and - which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.
Municipal separate storm sewer system (MS4)	All separate storm sewers that are defined as large” or “medium” or “small” municipal separate storm sewer systems. See also 40 CFR 122.26(b)(18).
National Pollutant Discharge Elimination System (NPDES)	The national program for issuing, modifying, revoking, and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 307, 402, 318, and 405 of the Federal Clean Water Act, for the discharge of pollutants to surface waters of the state from point sources. These permits are referred to as NPDES permits and, in Washington State, are administered by the Washington Department of Ecology.
Notice of Intent	The application for, or a request for coverage under a General NPDES Permit pursuant to WAC 173-226-200.
Outfall	Point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the State and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels, or other conveyances which connect segments of the same stream or other waters of the State and are used to convey waters of the State.
Permittee	Any Primary Permittee, Co-Permittee, or Secondary Permittee unless specifically stated otherwise for a particular section of this permit.



Term	Definition
Pest	But is not limited to, any insect, rodent, nematode, snail, slug, weed, and any form of plant or animal life or virus, bacteria, or other microorganisms on or in a living person or other animal or in or on processed food or beverages or pharmaceuticals, which is normally considered to be a pest, or which the director of the department of agriculture may declare to be a pest.
Physically Interconnected	One municipal separate storm sewer is connected to a second municipal separate storm sewer in such a way that it allows for direct discharges to the second system. For example, the roads with drainage systems and municipal streets of one entity are physically connected directly to a municipal separate storm sewer belonging to another entity.
Qualified Personnel	Staff members or contractors who have had professional training in the aspects of stormwater management for which they are responsible and are under the functional control of the Permittee.
Runoff	Water that travels across the land surface, or laterally through the soil near the land surface, and discharges to water bodies either directly or through a collection and conveyance system. Runoff includes stormwater and water from other sources that travels across the land surface. See also "Stormwater."
Secondary Permittee	An operator of municipal separate storm sewer which is not a city, town or county. Secondary Permittees include special purpose districts and other public entities identified in S1.D which operate municipal separate storm sewers.
Shared Waterbodies	Waterbodies, including downstream segments, lakes and estuaries, that receive discharges from more than one permittee.
Stormwater	Runoff during and following precipitation and snowmelt events, including surface runoff, drainage, and interflow.
Stormwater Associated with Industrial and Construction Activity	The discharge from any conveyance which is used for collecting and conveying stormwater, which is directly related to manufacturing, processing or raw materials storage areas at an industrial plant, or associated with clearing grading ,excavation, or both is required to have an NPDES permit in accordance with 40 CFR 122.26.
Stormwater facilities regulated by the Permittee	Permanent stormwater treatment and flow control BMPs located in the geographic area covered by the permit and which are not owned by the Permittee, and are known by the permittee to discharge into municipal separate storm sewers owned or operated by the Permittee.
Stormwater Management Manual for Western Washington	The 5-volume technical manual (Publication Nos. 05-10-029 through 05-10-033) published by Ecology in February 2005.
Stormwater Management Program (SWMP)	A set of actions and activities designed to reduce the discharge of pollutants from the regulated small MS4 to the maximum extent practicable and to protect water quality, and comprising the components listed in S5 or S6 of this Permit and any additional actions necessary to meet the requirements of applicable TMDLs.
Total Maximum Daily Load (TMDL)	A water cleanup plan. A TMDL is a calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources. The calculation must include a margin of safety to make certain that the water body can be used for the purposes the state has designated. The calculation must also account for seasonable variation in water quality. Water quality standards are set by states, territories, and tribes. They identify the uses for each water body, for example, drinking water supply, contact recreation (swimming), and aquatic life support (fishing), and the scientific criteria to support that use. The Clean Water Act, section 303, establishes the water quality standards and TMDL programs.
Urban/higher density rural sub-basins	All areas within or proposed to be within the urban growth area (UGA), or any sub-basin outside the UGA with 50 percent or more area comprised of lots less than 5 acres.
Vehicle Maintenance or Storage Facility	An uncovered area where any vehicles are regularly washed or maintained, or where at least 10 vehicles are stored.
Water Quality Standards	Surface Water Quality Standards, Chapter 173-201A WAC, Ground Water Quality Standards, Chapter 173-200 WAC, and Sediment Management Standards, Chapter 173-204 WAC.
Waters of the state	Includes those waters as defined as "waters of the United States" in 40 CFR Subpart 122.2 within the geographic boundaries of Washington State and "waters of the state" as defined in Chapter 90.48 RCW which includes lakes, rivers, ponds, streams, inland waters, underground waters, salt waters and all other surface waters and water courses within the jurisdiction of the State of Washington.



Table IV.1-2. Acronyms

Acronym	Definition
AKART	All known, available and reasonable methods of prevention, control and treatment (See definition in definitions table.)
AMC*	Asset Management Committee
BMP	Best Management Practice (See definition in definitions table.)
CDWAC*	Creeks, Drainage Water and Wastewater Authority Committee
CIP*	Capital Improvements Program
DPD*	Department of Planning and Development
Ecology*	Washington State Department of Ecology
EPA*	U.S. Environmental Protection Agency
ERTS*	Environmental Response Tracking System
FAS*	Department of Finance and Administrative Services (Formerly FFD)
FGD*	first ground disturbance
GIS*	Geographic Information System
HAZWOPER*	Hazardous Waste Operations and Emergency Response
IDDE	Illicit Connection and Discharge Detection and Elimination
IFPT*	Integrated Federal Permit Training
JARPA*	Joint Aquatic Resources Permit Application
LID	Low Impact Development (See definition in definitions table.)
MEP	Maximum Extent Practicable (See definition in definitions table.)
MLK*	Martin Luther King
MS3	Municipal separate storm sewer (See definition in definitions table.)
MS4	Municipal separate storm sewer system (See definition in definitions table.)
MTCA*	Model Toxics Control Act
NDS*	Natural Drainage System
NOI*	Notice of Intent (See definition in definitions table.)
NOV*	Notice of Violation
NPDES	National Pollutant Discharge Elimination System (See definition in definitions table.)
O&M*	operations and maintenance
ORC*	Operations Response Center
OSE*	Office of Sustainability and Environment
Parks*	Seattle Parks and Recreation
PASV*	Pre-Application Site Visit
PCHB*	Pollution Control Hearings Board
PE*	preliminary engineering
Permit*	NPDES Phase I Municipal Stormwater Permit
QA/QC*	quality assurance/quality control
RCW	Revised Code of Washington State
SCL*	Seattle City of Light
SCM*	Source Control and Monitoring
SDOT*	Seattle Department of Transportation
SEPA*	State Environmental Policy Act
SIC*	standard industrial classification
SKIP*	Spill Kit Incentive Program
SMC*	Seattle Municipal Code
SPU*	Seattle Public Utilities



Acronym	Definition
SSCP*	Structural Stormwater Control Program
Stormwater Code*	Seattle Municipal Code, Chapter 22.800 – 22.808, <i>The Stormwater Code</i>
SWMP	Stormwater Management Program (See definition in table.)
SWPPP*	Stormwater Pollution Prevention Plan
TCWQC*	Thornton Creek Water Quality Channel
TESC*	Temporary erosion and sediment control
TMDL	Total Maximum Daily Load (See definition in table.)
TSS*	total suspended solids
USM*	Utility System Management, an organization within SPU
WSDOT*	Washington State Department of Transportation
ZPG*	zeolite/perlite/granular activated carbon, a trademarked term by CONTECH Stormwater Solutions, Inc.

* Acronyms that are specific to SPU that were added beyond what was listed in the Permit.

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APPENDIX 1

Mayor's Executive Order



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Office of the Mayor
City of Seattle
Gregory J. Nickels, Mayor

Executive Order: 01-08
NPDES Municipal Stormwater Permit

An Executive Order directing all City Departments to coordinate together to comply with the requirements of the City's National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, which has been issued to the City of Seattle by the Washington State Department of Ecology under the provisions of the federal Clean Water Act.

WHEREAS, the City of Seattle has long prided itself on its commitment to the environment;

WHEREAS, the Mayor's Executive Order 03-04 directs City departments with responsibilities for and connections to water quality and aquatic habitat issues to develop a shared, broad-based strategy know as 'Restore our Waters' to better protect and restore water quality and aquatic habitat within the City;

WHEREAS, managing municipal stormwater runoff is a critical component of any strategy to meet the City of Seattle's long-standing objective to protect, improve, and enhance the City's lakes, creeks, bays, rivers, and other surface and ground waters;

WHEREAS, the Washington State Department of Ecology has issued to the City a permit under the National Pollutant Discharge Elimination System (NPDES) of the federal Clean Water Act that contains a suite of conditions and requirements for managing municipal stormwater runoff;

WHEREAS, compliance with the City's NPDES Municipal Stormwater Permit is a responsibility of the entire city and all City departments;

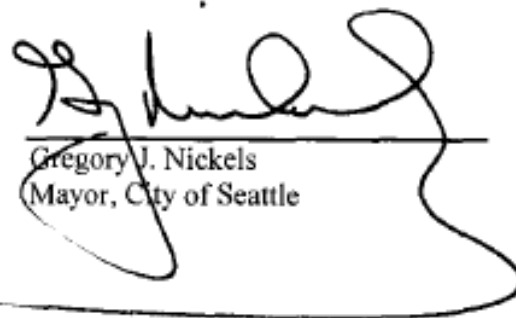
WHEREAS, the City's NPDES Municipal Stormwater Permit contains a specific requirement to establish in writing an Executive Directive requiring internal coordination among all departments affected by the permit;

FURTHERMORE, Seattle Public Utilities is directed to compile information received from other departments, and to prepare and submit on my behalf all reports to Ecology under the terms of the permit.

FURTHERMORE, the City of Seattle, is required by the permit to certify that all reports submitted to Ecology are true, accurate and complete. And the City of Seattle can be subject to penalties for submitting false information. Therefore, each department must ensure that documents and all attachments prepared in compliance with this permit are true, accurate, and complete before submitting them to Seattle Public Utilities. Seattle Public Utilities may issue additional direction to departments to ensure compliance with this requirement.

Questions regarding this Executive Order should be directed to Trish Rhay at 206-386-1832 (SPU), Darla Inglis, Ph.D. 206-233-7160 (SPU), and Robert D. Chandler, Ph.D., P.E., 206-386-4576 (SPU).

Dated this 29th day of January, 2008



Gregory J. Nickels
Mayor, City of Seattle

* Acronyms that are specific to SPU that were added beyond what was listed in the Permit.

