

# MUNICIPAL SEPARATE STORM SEWER SYSTEM STORMWATER MANAGEMENT PROGRAM DOCUMENT

City of Portland, Oregon  
November 1, 2022



ENVIRONMENTAL SERVICES  
CITY OF PORTLAND  
working for clean rivers





# **MUNICIPAL SEPARATE STORM SEWER SYSTEM STORMWATER MANAGEMENT PROGRAM DOCUMENT**

November 1, 2022

Prepared by the  
City of Portland Bureau of Environmental Services  
Portland, Oregon

For National Pollutant Discharge Elimination System Municipal Separate Storm Sewer Systems  
Phase I Individual Permit #101314

# TABLE OF CONTENTS

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<b>EXECUTIVE SUMMARY .....</b>	<b>1</b>
<b>1 INTRO .....</b>	<b>3</b>
1.1 About This Document .....	5
1.1.1 Organization.....	5
1.1.2 Geography and Applicability .....	6
1.2 Maximum Extent Practicable .....	10
1.3 Waterway Impairments (TMDLs).....	12
1.4 Coordination Partnerships.....	13
1.4.1 Co-Permittee Coordination.....	13
1.4.2 Coordination with Other Partners .....	13
1.4.3 City Management Coordination.....	13
1.5 Legal Authority.....	14
<b>2 STORMWATER PROGRAM MANAGEMENT CONTROL MEASURES .....</b>	<b>16</b>
2.1 Public Education and Outreach Strategy.....	17
2.1.1 General Environmental Outreach.....	18
2.1.2 Clean Rivers Education Programs .....	19
2.1.3 Regional Clean Water Partnerships.....	21
2.1.4 Household Waste and Recycling .....	21
2.1.5 Parks and Pet Waste.....	22
2.1.6 Pollution Prevention Outreach.....	23
2.1.7 Alternative Transportation.....	23
2.1.8 City Leadership and Elected Officials .....	24
2.2 Public Involvement and Participation Strategy .....	26
2.2.1 Public Website.....	26
2.2.2 Watershed Education and Stewardship .....	30
2.2.3 Grants Programs.....	31
2.2.4 Community Engagement Initiative.....	32
2.3 Illicit Discharge Detection and Elimination Strategy.....	34
2.3.1 MS4 Map .....	34
2.3.2 Ordinance.....	35
2.3.3 Program to Detect and Eliminate Illicit Discharges .....	35

2.3.4	Dry-Weather Screening Program.....	37
2.3.5	Enforcement .....	40
2.3.6	Data Tracking .....	42
2.3.7	IDDE Staff Training and Education .....	42
2.3.8	Services Related to Homelessness .....	43
2.4	Erosion Control Strategy for Construction Site Runoff .....	45
2.4.1	Ordinance .....	45
2.4.2	Erosion Control Plan Requirements and Plan Review.....	46
2.4.3	Construction Site Inspections.....	47
2.4.4	Enforcement .....	48
2.4.5	Data Tracking .....	48
2.4.6	Erosion Control Education and Outreach .....	48
2.4.7	Erosion Control Staff Training and Education.....	49
2.5	Post-Construction Site Runoff Strategy for New and Re-Development.....	50
2.5.1	<i>Stormwater Management Manual</i> .....	50
2.5.2	Ordinance .....	51
2.5.3	Post-Construction Site Runoff Plan Review .....	53
2.5.4	Stormwater Management Facility Installation Inspections.....	53
2.5.5	Water Quality Benefit Offset Programs (Special Circumstances).....	54
2.5.6	Post-Construction Program Outreach .....	54
2.5.7	Post-Construction Staff Training and Education .....	55
2.5.8	Data Tracking .....	56
2.6	Post-Construction Long-Term Operation and Maintenance.....	57
2.6.1	Ordinance .....	57
2.6.2	Maintenance Inspection Strategy .....	57
2.6.3	Enforcement .....	58
2.6.4	Data Tracking .....	58
2.6.5	Long-Term O&M Outreach and Assistance.....	59
2.6.6	Long-Term O&M Staff Training and Education .....	59
2.7	Pollution Prevention and Good Housekeeping Strategy for Municipal Operations.....	60
2.7.1	MS4 Inspection, Maintenance, and Cleaning.....	60
2.7.2	Stormwater O&M Staff Training and Education .....	64
2.7.3	Roadways and Transportation .....	65
2.7.4	Winter Operations and Maintenance Strategy.....	67



2.7.5	Roadways and Winter O&M Staff Training and Education .....	68
2.7.6	Integrated Pest Management: Pesticide and Fertilizer Use.....	70
2.7.7	IPM Staff Training and Education .....	71
2.7.8	Sewage Release Prevention .....	71
2.7.9	Firefighting Training Activities .....	72
2.8	Industrial and Commercial Facilities Strategy.....	73
2.8.1	Industrial Stormwater Program .....	73
2.8.2	Industrial Stormwater Staff Training and Education .....	78
2.8.3	Source Control Manual .....	79
2.8.4	Commercial and Industrial BMP Outreach.....	80
<b>3</b>	<b>MONITORING and EVALUATION.....</b>	<b>84</b>
3.1	Compliance Assessment and Reporting .....	85
3.2	Program Review, Reporting and Adaptive Management .....	87

## LIST OF FIGURES

Figure 1 Storm System Type Coverage Map

Figure 2 Watershed Basins Map

## LIST OF TABLES

Table 1 Pollution Reduction Web Resources

Table 2 Engagement Activities and Audiences

Table 3 Pollutants Addressed by Stormwater Program Control Strategies

## **LIST OF APPENDICES**

### **Appendix A: IDDE Documents**

Illicit Discharge Detection and Elimination Outfall Basin Inspection Form

Dry-Weather Field Screening and Lab Sampling Standard Operating Procedure

### **Appendix B: Erosion Control Document**

Erosion Control Inspection Form

### **Appendix C: Post-Construction Document**

Maintenance Inspection Program Site Inspection Form

### **Appendix D: Industrial and Commercial Facilities Documents**

Columbia Slough Outfall Basin Inspection Form

Industrial Stormwater Program 1200-Z Inspection Form

Industrial Stormwater Program Non-Permitted Stormwater Inspection Form



# ACRONYMS and ABBREVIATIONS

ACWA	Oregon Association of Clean Water Agencies
BDS	City of Portland Bureau of Development Services
BES	City of Portland Bureau of Environmental Services
BMP	best management practice
BPS	City of Portland Bureau of Planning and Sustainability
City	City of Portland, Oregon
CWA	Clean Water Act
DEQ	State of Oregon Department of Environmental Quality
DMA	Designated Management Agency
ENB	Environment (Built)
EPA	United States Environmental Protection Agency
ESCM	Erosion and Sediment Control Manual
IDDE	Illicit Discharge Detection and Elimination
IGA	Intergovernmental Agreement
IPM	integrated pest management
ISW	Industrial Stormwater Program
LA	load allocation
LID	low-impact development
MEP	maximum extent practicable
MIP	Maintenance Inspection Program
MS4	municipal separate storm sewer system
NEC	No Exposure Certification
NPDES	National Pollutant Discharge Elimination System
O&M	operations and maintenance
ODOT	State of Oregon Department of Transportation
P2O	Pollution Prevention Outreach

PBOT	City of Portland Bureau of Transportation
PCC	Portland City Code
PF&R	City of Portland Fire and Rescue
PP&R	Portland Parks and Recreation
SCM	Source Control Manual
SMF	stormwater management facility
SPCR	Spill Protection and Citizen Response Program
SWMM	Stormwater Management Manual
SWMP	Stormwater Management Program
TMDL	Total Maximum Daily Load
UIC	Underground Injection Control
USR	Under Staff Review
WLA	waste load allocation
WPCF	Water Pollution Control Facility



# EXECUTIVE SUMMARY

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This is the City of Portland's updated Stormwater Management Program, or SWMP, Document. This SWMP Document reflects new knowledge and insights about environmental management practices, emerging pollution risks, and pollution prevention strategies relevant to the Portland community. It presents detailed stormwater program measures with up-to-date goals and milestones, along with a way to adapt to shifting community priorities and water quality developments.

This updated plan is a requirement of the City's newly reissued National Pollutant Discharge Elimination System (NPDES) permit for its stormwater system. Meeting the permit's requirements is how the City keeps its stormwater system compliant with the federal Clean Water Act (CWA).

## Background

Water from storms flows into and over roads, roofs, planted fields, and natural or landscaped areas. It picks up fertilizers, pesticides, industrial chemicals, gasoline, oils, construction materials, and bacteria from leaky sewers and pet waste. It delivers these pollutants through storm sewers and into our rivers, streams, lakes, and coastal waters.

The [Clean Water Act](#) aims to protect water sources from such pollutants. It includes an NPDES permitting program. The program requires permits not only for wastewater treatment plants and industrial processes, but also for stormwater runoff. The City's permit is in a category called MS4, which stands for municipal separate storm sewer system. This means that the City's permit covers a stormwater system that is separate from the wastewater collection system.

In Oregon, the Department of Environmental Quality (DEQ) is the issuing authority for NPDES permits. The DEQ issued the City's first MS4 permit in 1995, following an amendment to the CWA for stormwater runoff in 1987. DEQ reissued the permit in 2006, 2011, and most recently on Sept. 15, 2021, with an expiration date of Sept. 30, 2026. The Portland Bureau of Environmental Services (BES) oversees the permit, but multiple City bureaus carry out its requirements. The Port of Portland, which also maintains a storm sewer system, is the City's co-permittee.

The permit requires the City to maintain, adapt and enforce a Stormwater Management Program to reduce pollutants to the “maximum extent practicable.” The program must be described in a SWMP Document.

This SWMP Document describes best management practices (BMPs) and commitments for the length of the permit term to prevent and control pollution from stormwater discharges. These BMPs must address specific program elements, including:

- Conducting education and outreach to the public
- Providing opportunities for involving the public
- Detecting and eliminating illicit discharges
- Controlling runoff from construction sites (such as through erosion control)
- Implementing water quality design standards to address runoff from new and re-development projects
- Implementing good housekeeping procedures to prevent pollution associated with municipal operations and maintenance activities
- Preventing pollution from industrial and commercial facilities

This document describes how the City will fulfill each element and defines metrics to help track and evaluate effectiveness. The City drafts an annual report and sends it to the DEQ each year by November 1. These annual reports are available on the City’s [Stormwater Permit web page](#).

The permit also requires the City to monitor stormwater quality and local waterways. This SWMP Document includes an overview of the City’s [Monitoring Plan](#).



# 1 INTRO

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Rainfall in the Pacific Northwest is fundamentally important to communities throughout our region and natural landscape. Rain is necessary for the growth of our crops, gardens, and cherished wild areas. It nourishes critical habitat for salmon, birds, insects, and other wildlife. Rain falls on our mountains as snow and ice and then replenishes our drinking water, feeds our rivers and alpine streams, and supports some of the world's best recreation. These basic values ultimately rely on cool, fresh, clean water. The bottom line is this: we *must* consider rainfall as a vital resource for so many of the things that we as Oregonians hold dear.

Rainwater that falls onto the ground creates stormwater runoff that flows into and over different types of land surfaces, such as roadways, rooftops, agriculture, and natural or landscaped areas. Rain that falls onto urbanized areas picks up pollution as it moves over pavement and into storm drains, delivering it straight into our rivers, streams, lakes, and coastal waters. Pollutants in runoff can include things like household fertilizers and pesticides, industrial chemicals, gasoline and oils, and sediment from construction activities. Certain state and federal laws like the [Clean Water Act](#) (CWA) are aimed at protecting our water resources from these kinds of harmful pollution.

The CWA National Pollutant Discharge Elimination System (NPDES) program regulates stormwater discharges in 5-year timeframes from three main sources: the municipal separate storm sewer system (MS4), which is the subject of this Stormwater Management Program Document, runoff from construction sites, and runoff from industrial sites.

In Portland stormwater runoff discharging to local creeks and waterways via the municipal drainage system is regulated by the Oregon Department of Environmental Quality (DEQ) with an NPDES MS4 permit. DEQ issued the City of Portland's first MS4 permit in 1995, after the CWA regulations for municipal stormwater discharges were enacted. The permit was later reissued in 2006 and again in 2011. Most recently, DEQ renewed the City's fourth MS4 permit, effective October 1, 2021.

One of the primary requirements of an MS4 permit is to develop and implement a comprehensive Stormwater Management Program (SWMP). The program must be described in detail in a SWMP Document that describes the management activities, practices, and

commitments over the MS4 permit term to prevent and control pollution from the municipality's stormwater discharges.

This SWMP Document was prepared in compliance with the new MS4 permit and serves as a major update to the City's previous MS4 SWMPs (formerly referred to as Stormwater Management Plans). The City developed this SWMP Document based on a comprehensive evaluation of our pre-existing stormwater program activities along with insights about emerging pollution risks. The evaluation included:

- A thorough review of previous SWMPs and annual compliance reports;
- An in-depth gap analysis of existing program strategies and protocols when compared with new MS4 permit requirements;
- Detailed interviews, a "document discovery" effort, and collaboration with City managers and specialists responsible for MS4 implementation;
- Insights gained from decades of engaging community, non-profit, and business partners; and
- Subject matter expert input on ordinance administration and enforcement.

The City regularly evaluates stormwater strategies and best management practices, or BMPs, to determine adjustments that are needed to improve our pollution prevention efforts. This SWMP Document reflects the City's consideration of the best available technologies and practices relevant to municipal control of stormwater pollution. It also presents up-to-date goals and performance tracking measures, along with a process to evaluate resources to adaptively manage our stormwater activities.

The MS4 permit also requires a monitoring program plan (Monitoring Plan) to assess local water quality and potential impacts to waterways and to evaluate the effectiveness of SWMP activities. Monitoring requirements include the collection of water quality samples and analysis of environmental data. This SWMP Document includes an overview of the City's new [Monitoring Plan](#).

The BES leads administration of and compliance with the City of Portland's MS4 permit, including the SWMP Document and Monitoring Plan, but multiple City bureaus are responsible for implementation of the requirements. Our SWMP strategies and environmental monitoring results are evaluated continuously by the City's MS4 management team.

Detailed descriptions on all the MS4 SWMP elements are provided on the following pages.

# 1.1 About This Document

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## 1.1.1 Organization

This SWMP Document mirrors the primary structure of the MS4 permit, which is organized in a sequence of “schedules” that outline the requirements.

**Schedule A** lists “conditions for municipal stormwater discharges,” including the required Stormwater Management Program Control Measures. The City’s strategies and control measures are described in detail in Section 2. Each strategy includes performance indicators, goals, and milestones that will be used to evaluate program effectiveness.

**Schedule B** of the MS4 permit lists monitoring and reporting requirements that specify the water quality sampling that the City is required to undertake. Response to those requirements, including our Monitoring Plan and annual reporting evaluation, is described in Section 3.

SWMP implementation requires reliance on numerous codes, ordinances, policies, procedures, guidance manuals, checklists, forms, maps, and other related documents. Throughout this SWMP Document, relevant materials are referenced and linked within each major strategy. All major program components can also be found on the City’s [MS4 website](#).

**Stormwater Management Program Control Strategies**, described in detail in Section 2 of this SWMP, include the following:

- Public Education and Outreach Strategy (Section 2.1)
- Public Involvement and Participation Strategy (Section 2.2)
- Illicit Discharge Detection and Elimination Strategy (Section 2.3)
- Erosion Control Strategy for Construction Site Runoff (Section 2.4)
- Post-Construction Site Runoff Strategy for New and Re-Development (Section 2.5)
- Post-Construction Long-Term Operation and Maintenance (Section 2.6)
- Pollution Prevention and Good Housekeeping for Municipal Operations (Section 2.7)
- Industrial and Commercial Facilities Strategy (Section 2.8)



### 1.1.2 Geography and Applicability

The MS4 permit applies to all existing and new discharges of stormwater from the Municipal Separate Storm Sewer System (MS4) within the City of Portland's Urban Services Boundary. The MS4 is a drainage network that collects upland runoff from streets, properties, and natural areas and then conveys it to open waterways through hundreds of outfalls throughout the City. In Portland, this equates to roughly 20% of the area within City limits, or around 15,000 acres.<sup>1</sup> The remaining 80% of Portland's area is served by other means of conveying and discharging stormwater runoff. (See [Figure 1](#) for a geographical overview.)

Portland's topography results in several distinct watersheds that have unique ecological characteristics and urban influences. A *watershed* is an area of land that drains rainfall into a specific stream or river based on its topography. The City strives toward an integrated planning approach<sup>2</sup> for stormwater and wastewater management that addresses the specific issues and needs of each watershed. Yet at the same time, we recognize that fundamental and comprehensive BMP control measures are appropriate and necessary in every watershed. [Figure 2](#) shows the different watersheds, or subbasins, that make up Portland's MS4 coverage area.

There are other drainage areas of the City that are *not* covered by the MS4 permit but instead are regulated by other laws and include the following.

#### Combined Sewer Areas

In much of Portland's central area, including downtown, stormwater drains into the City's combined sewer system, which is not regulated by the MS4 permit. In a combined sewer system, rainwater flows into a shared pipe system that mixes with residential and commercial wastewater and sewage in a combined pipe system that then ends up at one of the City's municipal wastewater treatment plants and is treated prior to discharge. Discharges from wastewater treatment plants are covered by separate NPDES Wastewater Discharge permits<sup>3</sup> issued by DEQ.

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<sup>1</sup> The exact amount of acreage changes regularly as new development and re-development occurs. More precise numbers are provided each year in the City's Annual MS4 Compliance Reports.

<sup>2</sup> Integrated planning is a process for municipalities to achieve clean water and human health goals while addressing aging wastewater and stormwater infrastructure, changing population and rainfall patterns, and competing priorities for funding. Learn more at <https://www.epa.gov/npdes/integrated-planning-municipal-stormwater-and-wastewater>.

<sup>3</sup> NPDES Waste Discharge Permit 101505 (EPA Number OR0026905) applies to the Columbia Boulevard Wastewater Treatment Plant. NPDES Waste Discharge Permit 101614 (EPA Number OR0026891) applies to the Tryon Creek Wastewater Treatment Plant.

## Groundwater Discharge Areas

Large portions of the city drain stormwater into the ground through Underground Injection Control (UIC) devices. Common types of UICs include sumps, drywells, and trench drains. UICs help protect surface water, replenish groundwater supplies, and support low-impact development (LID) strategies for stormwater management. Areas that drain stormwater to the City's UICs are not subject to the MS4 permit but are instead regulated by a Water Pollution Control Facility (WPCF) permit<sup>4</sup> issued by DEQ under the federal [Safe Drinking Water Act](#).

## Non-Point Source Runoff Areas

A *non-point source* refers to potential pollution from overland runoff, atmospheric deposition, and other such disperse sources where the runoff is not conveyed through the City's MS4. In Portland, these areas are mostly located in forested areas or along riparian corridors. The term *riparian* refers to wetland or river-bank areas along waterways. While not regulated by the MS4 permit, the City still addresses non-point sources of pollution in Portland under the CWA's Total Maximum Daily Load (TMDL) requirements, described in more detail below.

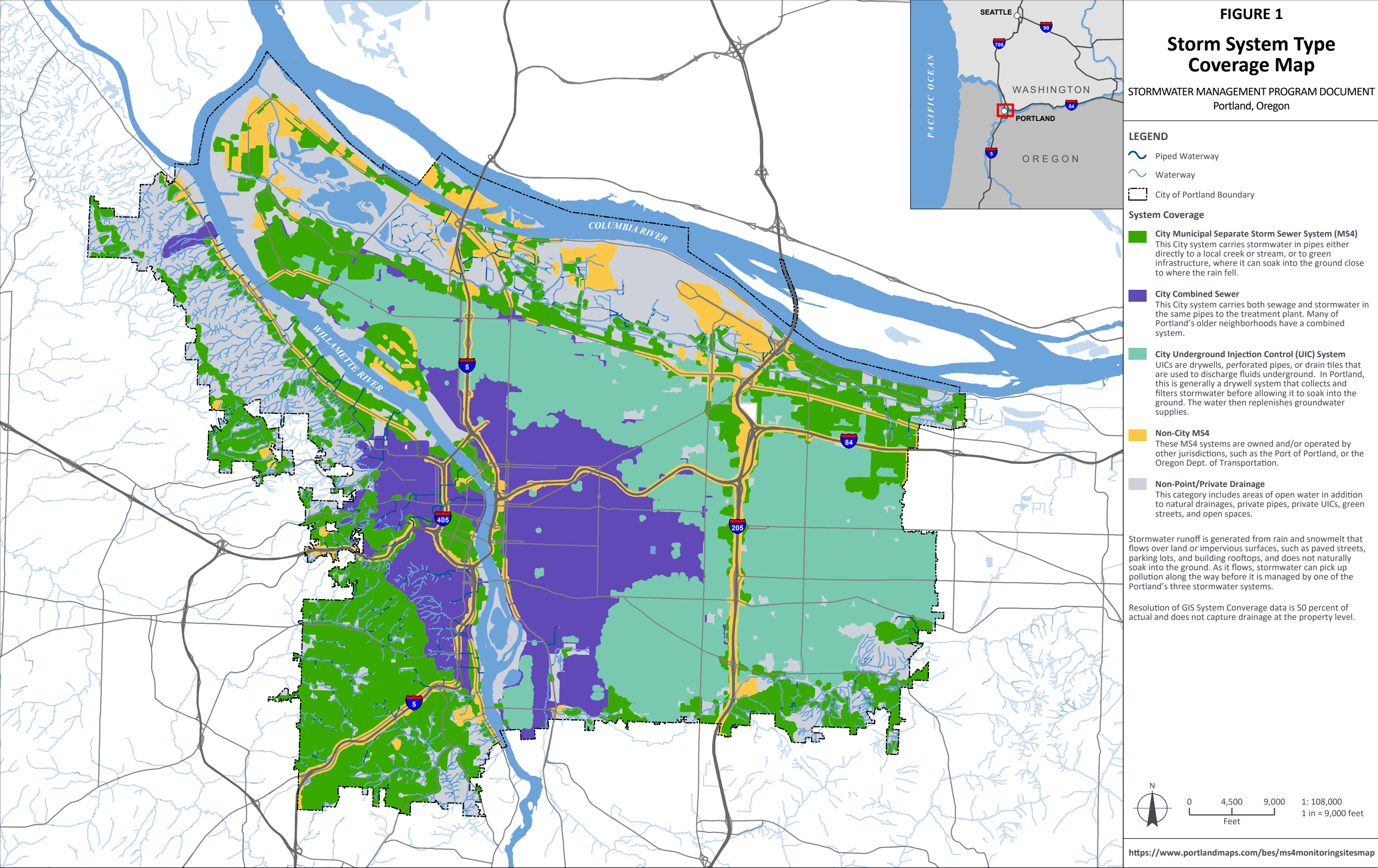
## Private Drainage and Other Non-City MS4s

There are substantial portions of Portland where stormwater runoff is managed by private parties and other governmental entities. This is especially the case in areas adjacent to waterways (i.e., riparian areas), where stormwater runoff is typically discharged via privately owned outfalls. These areas are not part of the City's MS4.

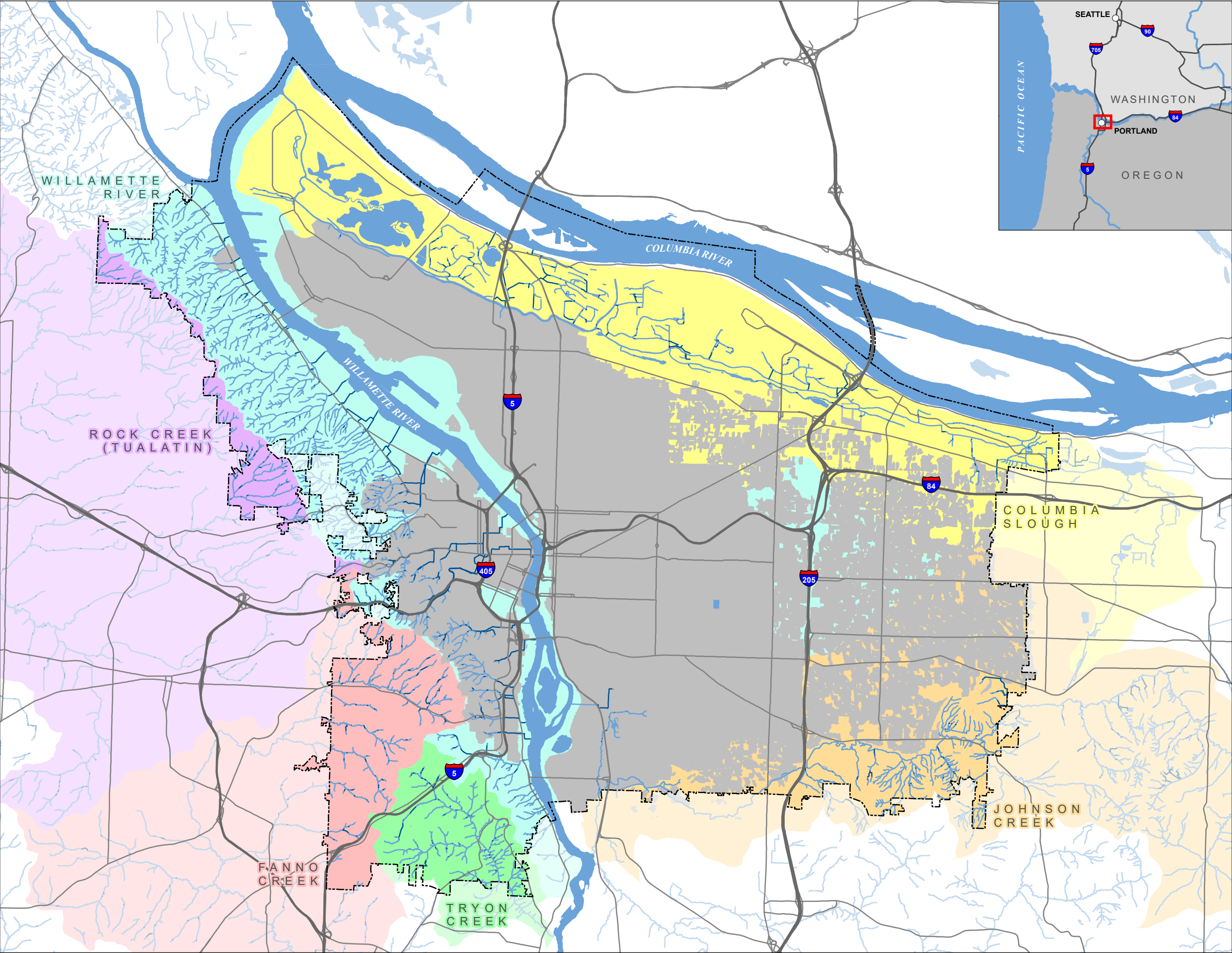
There are also other jurisdictional MS4 operators in the Portland area. These include the Port of Portland, which is the City's MS4 co-permittee, the Oregon Department of Transportation (ODOT), and Multnomah County. Both ODOT and Multnomah County have a separate MS4 permit for stormwater discharges from infrastructure that they own and operate.

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<sup>4</sup> Water Pollution Control Facilities Permit For Class V Stormwater Underground Injection Control Systems, City of Portland (Permit No. 102830).







**FIGURE 2**  
**Watershed Basins Map**  
STORMWATER MANAGEMENT PROGRAM DOCUMENT  
Portland, Oregon

**LEGEND**  
Piped Waterway  
Waterway  
City of Portland Boundary  
Combined Sewer/City UIC Area

N

0 4,500 9,000  
Feet

1: 108,000  
1 in = 9,000 feet

**PERCENT OF ENTIRE SUBWATERSHED  
WITHIN CITY LIMITS**

Willamette River & Tributaries	82%
Columbia Slough	0.5%
Johnson Creek	38%
Fanno Creek	23%
Tryon Creek	72%
Rock Creek (Tualatin)	8%

Percent of subwatershed describes the portion of each total watershed area located within City limits, indicating the extent to which the City's management strategies in the plan may be applied to each subwatershed.

**SUBWATERSHED AREA (ACRES)  
INSIDE CITY LIMITS**

Willamette River & Tributaries	17,319	21,575
Columbia Slough	17,189	10,027
Johnson Creek	5,322	7,864
Fanno Creek	4,635	
Tryon Creek	3,045	
Rock Creek (Tualatin)	1,798	

The acreage within each topographic subwatershed is the total of colored and gray bar segments. Fanno, Tryon and Rock Creeks are not served by combined systems or UICs. Colored segments show acreage flowing to surface waters potentially subject to the City's management strategies described in the plan. Gray segments represent areas managed by either the City's combined sewer or UIC systems, where stormwater is conveyed to the wastewater treatment plant or to groundwater through sumps.

*Gray shows acreage within combined sewer and UIC service areas*

9

## 1.2 Maximum Extent Practicable

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The City developed and has been refining a comprehensive SWMP since the first MS4 permit was issued in 1995 to reduce the discharge of pollutants to the *maximum extent practicable* (MEP). MEP is a defined standard under the CWA that sets the level of effort that an MS4 operator is expected to implement to prevent and control pollution over the 5-year permit term. The MEP standard is exclusive to MS4 permittees and designed to allow flexibility due to the unique circumstances that exist for every MS4 operator throughout the country. The U.S. Environmental Protection Agency (EPA) interprets MEP in a manner that provides the flexibility “to optimize reductions in stormwater pollutants on a location-by-location basis” due to the scale and complexity associated with municipal stormwater.

The control measures, or *strategies*, that the City will use to comply with the MS4 permit are described in detail in the following section of this SWMP Document. These strategies consist of a variety of different external and internal activities and are supported by many related City policies, legal authorities, procedures, and manuals. The SWMP and associated SWMP Document are a result of the City’s ongoing adaptive management since the original SWMP was submitted with the MS4 permit application in 1993 and subsequent MEP evaluations. Adaptive management, simply stated, is *learning by doing*. It is a process that identifies when program elements, strategies, activities, BMPs, etc. should be examined more deeply and adjusted. It informs the selection of alternatives that can be incorporated based on experience and performance (see Section 3 for further details).

In re-issuing the MS4 permit, DEQ has determined that permit requirements are achievable and protective of water quality. However, the permit itself and the MEP standard still allow the City flexibility to determine *how* the requirements are met, based on social, economic, and environmental influences unique to Portland. Therefore, to define what MEP means for the City, the City has developed, and continues to implement, appropriate BMPs to satisfy the control measures required by the permit, through the evaluative process described in Section 3. The decision-making process is designed to produce the kinds of results desired by the public, elected officials, DEQ, and City leadership. Most importantly, the results should continue to show the optimal water quality improvements for the resources invested.

The City’s comprehensive MS4 program and associated SWMP Document take a holistic approach to stormwater management and recognize the need to balance community and regulatory expectations with on-the-ground realities of funding limitations, urgent social issues,



and a constantly fluctuating local and regional economy. The City's broad suite of verified stormwater control strategies are built on many years of experience and the investment of public (and private) resources. This approach aligns stormwater management with other community priorities and what the public is willing to fund. For example, key strategies include outreach and education that focus on pollution prevention, rather than the more costly pollution treatment. Other program elements aim to manage stormwater through an optimized mix of affordable and sustainable green, gray, and natural infrastructure that integrates both community resiliency and quality of life that is important to Portlanders.

Stormwater management through a multi-dimensional watershed approach gives the City a unique opportunity to further advance sustainability, resiliency, and community livability. In a time of competing priorities, creating efficiencies between bureaus and seeking collaborative opportunities to share resources and achieve multiple objectives allows the City to better connect stormwater needs and investments with other community priorities and long-range planning efforts across City jurisdictions.

## 1.3 Waterway Impairments (TMDLs)

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In addition to MS4 requirements, the City is subject to [TMDL](#) regulations under the CWA. A TMDL serves as a restoration plan for impaired or polluted waterways. In Oregon, TMDLs are established and developed by DEQ. They identify the maximum amount of a specific pollutant that a particular waterbody can receive and still meet water quality standards. The maximum amount of the pollutant is then divided up and “allocated” to the various dischargers to that waterway. These dischargers are referred to as designated management agencies (DMAs). Pollutant load allocations are identified for non-point sources of pollution and waste load allocations (WLAs) for point sources of pollution. Under the TMDL program, municipal stormwater discharges are regulated as a point source if covered by an MS4 permit, which means that relevant TMDL requirements are included directly in the permit (see Schedule D of the City’s MS4 permit). For non-point source areas, however, DMAs like the City are required to develop a TMDL Implementation Plan describing how pollution in these areas will be managed. It is important to note that most TMDL pollutants are related to stormwater runoff and are, therefore, managed under the MS4 program. But certain other waterway problems, like increased stream temperatures<sup>5</sup> or [harmful algal blooms](#), are less related to stormwater and more related to dynamics like climate change and lack of tree canopy shading.

This SWMP Document represents the City’s plan to address TMDL WLAs. Schedule D of the permit also includes TMDL-related requirements to for a mercury minimization assessment and a pollutant load reduction evaluation.

To address non-stormwater pollutants, strategies like riparian shade, wetland restoration, tree planting and protection, and land use zoning tools are covered in the [City’s TMDL Implementation Plan](#).

More information about the City’s TMDL program is available on our [TMDL website](#).

**TMDLs in effect for non-point sources of pollution and related controls are discussed and identified in Portland’s [TMDL Implementation Plan](#)**

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<sup>5</sup> Stormwater runoff is not a contributor of heat or “thermal loading” to surface waters. Temperature is designated as a non-point source pollutant and is specifically addressed under the TMDL program.

## **1.4 Coordination Partnerships**

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### **1.4.1 Co-Permittee Coordination**

The City and Port of Portland are co-permittees on the MS4 permit. The City is the lead permittee, as the Port's MS4 lies within the City's Urban Services Boundary. The City generally conducts stormwater program activities on a city-wide basis with some activities overlapping with the Port's MS4 service area. While the Port generally manages its own MS4 service area, some properties discharge to the City MS4. Because this relationship is complex, the Port and City coordinate permit compliance and related costs through an Intergovernmental Agreement (IGA). City and Port staff also communicate regularly to share information about program implementation, BMP effectiveness, inspections, monitoring, illicit discharges and other issues related to the permit. This coordination avoids duplication and helps ensure the cost-effective use of resources.

### **1.4.2 Coordination with Other Partners**

The City and the Port of Portland coordinate with other regional jurisdictions and authorities, including DEQ, to cooperatively address water quality issues. The City and Port also coordinate on MS4 permit implementation issues with other jurisdictions through the Oregon Association of Clean Water Agencies (ACWA). City and Port representatives participate in ACWA's water quality, stormwater, groundwater, and other committees.

### **1.4.3 City Management Coordination**

BES's Stormwater Program Manager (MS4 Program Manager) is responsible for overall program management, compliance reporting, policy development, and coordination within the City of Portland, as well as for coordination with Portland's co-permittee, the Port of Portland. BES section managers and staff members serve as leads for the BMPs that comprise the City's SWMP. Because the permit is applied city-wide, many City staff members outside BES are also involved with stormwater program development, implementation, and reporting.

## 1.5 Legal Authority

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The MS4 permit requires the adoption, update, and maintenance of “adequate legal authority through ordinance(s), code(s), interagency agreement(s), contract(s), and/or other mechanisms to control pollutant discharges into and discharges from its MS4 and to implement and enforce the conditions of [the] permit, to the extent allowable pursuant to the respective authority granted under state law.” The City maintains legal authority to implement and enforce the program strategies that comprise the SWMP to prevent discharges of pollution into and from the MS4. The City’s [legal authority](#) exists in the form of ordinances, Portland City Code (PCC), Administrative Rules, and other types of policy documents. The PCC rules listed below either directly address explicit MS4 permit requirements for legal authority or provide additional support to the City’s MS4 strategies. More details can be found under the related strategies in Section 2.

- **PCC Title 10, *Erosion and Sediment Control Regulations*.** This the ordinance/code giving the City authority to require controls for construction sites to prevent the offsite discharge of sediment and other pollutants from ground-disturbing activity. These requirements are intended to: (1) prevent sediment and pollutants caused by construction and development activities from entering storm systems and waterways, (2) prevent dirt and mud from accumulating on public streets and surrounding properties during construction and development, and (3) reduce or prevent airborne dust during ground-disturbing activities. Title 10 gives legal authority to the Bureau of Development Services (BDS) and the BES to administer and enforce erosion and sediment control requirements.
- **PCC Title 17, *Public Improvements*.** This title regulates public improvements, including the City’s sewer and stormwater collection systems. Relevant chapters include:
  - **Chapter 17.32, *Public Sewer and Drainage System Permits*.** This chapter regulates access and connection to, and the use, construction, modification, maintenance, repair, or removal of, components of the City sewer, storm sewer, and drainage systems and their easements. It operates in conjunction with Chapter 17.38 (below) to regulate the collection, conveyance, and disposal of sanitary and stormwater discharges from public and private properties.

- **Chapter 17.33, *Required Public Sewer Connection*.** This chapter requires connection of individual properties to the public sewer system when available, facilitates conversion of nonconforming private sewer systems, and provides for financial assistance to property owners required to make a new sewer connection.
- **Chapter 17.38, *Drainage and Water Quality*.** This chapter details requirements for the effective management of stormwater, groundwater, and drainage and to protect and improve water quality. It includes details for the protection of drainageways and stormwater management requirements related to new development and re-development.
- **Chapter 17.39, *Stormwater System Discharges*.** This chapter contains requirements for discharges to the City's storm system to convey, manage, and protect water quality. It includes details regarding allowable discharges, prohibited discharges, notifications, and control of illicit connections and discharges.
- **PCC Title 33, *Planning and Zoning*.** The City's zoning code supports Portland's [Comprehensive Plan](#) to protect the health, safety, and general welfare of Portlanders. Section 33.430 (Environmental Zones) describes the City's environmental conservation zones. Section 33.440 (Greenway Overlay Zone) protects; conserves; enhances; and maintains the natural, scenic, historical, economic, and recreational qualities of lands along Portland's rivers. Section 33.475 (River Overlay Zones) promotes the protection, conservation, restoration, enhancement, and maintenance of the economic, natural, scenic, and recreational qualities of lands along the central reach of the Willamette River.



## 2 STORMWATER PROGRAM MANAGEMENT CONTROL MEASURES

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This section of the SWMP Document contains detailed descriptions of the strategies the City will implement throughout the permit term to reduce the discharge of pollutants from the MS4 to Portland's waterways.

- Public Education and Outreach Strategy (Section 2.1)
- Public Involvement and Participation Strategy (Section 2.2)
- Illicit Discharge Detection and Elimination Strategy (Section 2.3)
- Erosion Control Strategy for Construction Site Runoff (Section 2.4)
- Post-Construction Site Runoff Strategy for New and Re-Development (Section 2.5)
- Post-Construction Long-Term Operation and Maintenance (Section 2.6)
- Pollution Prevention and Good Housekeeping for Municipal Operations (Section 2.7)
- Industrial and Commercial Facilities Strategy (Section 2.8)

Metrics have been developed for many but not all control measures in this SWMP Document. Metrics and other information about program activities will be reported annually and used to evaluate trends and program effectiveness. Metrics and objectives may be adjusted over time as new insights are gained, new goals created, or improved data tracking systems are implemented. The City aims to develop program elements that both push and measure incremental progress as well as clearly and deliberately work toward long-term goals.

The City follows an adaptive management approach described in Section 3 to assess and modify, as necessary, any or all existing SWMP activities and adopt new or revised SWMP activities to improve overall performance of key program elements and achieve reductions in stormwater pollutants to the MEP.

The permit provides procedures for changes to the actions and/or activities described in the approved SWMP Document for adaptive management purposes. Adding elements or deleting, adjusting, or replacing elements with an alternate action or activity may be made at any time, provided there is appropriate supporting information in the subsequent annual report.

## 2.1 Public Education and Outreach Strategy

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The City implements a robust Public Education and Outreach Strategy to inform the public and the business community about the impacts that certain activities can have on our waterways and the actions they can take to reduce pollution. The ultimate goal of this strategy is to change behaviors by encouraging practices that prevent harm to the environment and encourage stewardship of our natural resources. An important aspect to a good education and outreach strategy is removing barriers that may prevent people or certain demographics from adopting alternative behaviors and practices. The City's MS4 permit specifies that the strategy should promote information and actions to:

- Increase understanding of specific water quality problems in the community and the pollutants, products, and behaviors contributing to those problems;
- Communicate and demonstrate how to reduce pollution in stormwater runoff;
- Encourage participation in the protection and enhancement of local watershed ecosystems and wildlife; and
- Prevent wastes from entering waterways by publicizing and promoting the reporting of illicit discharges (see the Illicit Discharge Detection and Elimination Strategy, Section 2.3).

Our Public Education and Outreach Strategy is described below and includes details about specific programs and activities, priority audiences, and intended goals and metrics. [Table 1](#) is a list of important City pollution reduction web resources, and [Table 2](#) shows which activities are geared toward specific priority audiences.

**Permit  
Schedule  
A.3.a**

### 2.1.1 General Environmental Outreach

The City uses a mix of printed, web-based/electronic, and various social media tools and materials to distribute information directly to the public regarding stormwater, water quality, and water resources management. Materials typically include information and best practices on what residents, community groups, and business owners can do to:

- Implement practices that prevent pollution of waterways
- Manage stormwater on their property
- Enhance and restore natural resources
- Report spills
- Protect city sewer infrastructure
- Support and recognize the benefits of capital improvement projects

Much of the City’s environmental outreach content is produced by a team of communications and outreach experts in [BES](#), but several other City bureaus also contribute important environmental messaging, as described throughout this strategy. BES actively utilizes social media to engage Portlanders on important environmental and water quality issues and developments.

	<a href="#">BESPortland</a>	<b>Twitter</b>
	<a href="#">PortlandBES</a>	<b>Facebook</b>
	<a href="#">portlandbes</a>	<b>YouTube</b>

In addition, BES is building out its “GovDelivery” subscriber service. This is a relatively new marketing platform used to update interested parties on issues like capital improvement projects and other outreach events. Interested parties can [create a subscriber account](#) on the City’s public GovDelivery site.

## Key Performance Indicators

- Engagement rate on GovDelivery.<sup>6</sup>
- Number of social media “likes.”
- Other indicators as identified throughout the Public Education and Outreach Strategy (e.g., participation, number of programs).

## Goals

- Achieve an engagement rate of 50% or higher with GovDelivery subscribers over the permit term.<sup>7</sup>
- Increase “likes” across social media platforms.

## Reporting Milestones

- Annual GovDelivery engagement rate.

### 2.1.2 Clean Rivers Education Programs

Our [Clean Rivers Education](#) team provides *free* classroom and field science environmental education programs for students and youth, from kindergarten through college. Students learn about watershed health, the causes and effects of water pollution, stormwater management, wastewater treatment, and what they can do to protect rivers and streams. During our field-based offerings, students spend time outdoors observing, interpreting, exploring, and connecting to local natural areas. They also learn how our City’s natural and built (i.e., “green and gray”) infrastructure protects people and the environment. Our Clean Rivers BES educators strive to prepare the next generation of leaders with environmental knowledge and skills and inform young people about environmental careers that match their interests.

Clean Rivers Education staff work with teachers in the Portland area to develop a unit of study that fits their curricular focus, advance the City’s environmental mission and priorities, and support [Next Generation Science Standards \(nextgenscience.org\)](#). This includes modeling claim-evidence-reasoning, focusing on scientific practices such as asking questions, defining problems, and creating models to explain environmental or ecological events and design solutions.

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<sup>6</sup> Engagement rate is the number of email recipients who open a subscription message or click on an email link over a 90-day period, divided by the total number of email recipients. This represents program “interactions.”

<sup>7</sup> The MS4 permit term is 5 years, from October 1, 2021, to September 30, 2026. However, the permit may be administratively extended by DEQ, thus extending the effective time horizon for this SWMP and associated metrics.

Our BES Educators adapt standard program offerings to meet teacher and student needs and to promote culturally responsive teaching. During the COVID pandemic, BES Educators developed online and virtual resources to support teachers pre- and post-classroom and field study programs. While we understand that nothing can replace the value of in-person field trip and classroom learning, the City’s specially curated online resources provides us the opportunity to reach *more* students, support *varied learning styles*, and help teachers dive deeper into content and extend units of study.

### Key Performance Indicators

- Number of education programs (onsite or virtual) delivered.

### Goals

- Deliver 1,600 educational programs over the permit term.
- Increase environmental awareness among disenfranchised youth, by prioritizing historically under-represented students, under-resourced schools, and community-based education organizations that center on unhoused, black, indigenous, and people of color (BIPOC), and culturally specific students.

### Reporting Milestones

- Deliver 400 educational programs annually.
- Summarize challenges and accomplishments, partnership highlights, and work done in concert with historically under-served students and schools.
- Coordinate with regional educators on identification and development of equity-based metrics that more accurately represent under-served students, under-resourced schools, and community-based education organizations.<sup>8</sup>

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<sup>8</sup> It is difficult to define quantitative metrics for “under-served students and schools.” The metric historically used is the percentage of Title I schools served. (Title I is a designation for schools receiving federal funding support under a variety of criteria, one of which is a high percentage of students on free and reduced lunch programs). However, this metric is inadequate. Data are not available for non-public schools, community colleges, or culturally specific community groups. Also, some schools that have a high percentage of students qualifying for free/reduced lunch no longer have Title I status—that is, the bar has been getting higher for schools to receive Title I status. Another limitation is that basic demographic data is often not available.



### 2.1.3 Regional Clean Water Partnerships

The City participates in regional education and outreach opportunities with other organizations, both as a member of the Oregon ACWA and as other regional and seasonal campaign partnership opportunities arise. Our current partnerships include the following.

**Clean Rivers Coalition.** The City participates in coordination activities for the statewide [Clean Rivers Coalition](#). The coalition uses funds from participating jurisdictions to support and launch branded, statewide clean water communications campaigns, such as [Follow the Water](#). The initial campaign focus is on pesticides and insecticides. The City helps sponsor marketing campaign development, community feedback, and the identification of priority water issues in our state.

**Regional Coalition for Clean Rivers and Streams.** The City participates in clean water education programming in the Portland metropolitan area. This coalition seeks to help residents make informed decisions about their home and automobile practices that reduce stormwater pollution and improve watershed health through [The River Starts Here](#) campaign. The City's participation helps support awards for a student clean river practices video contest.

**Television Campaign.** The City participates and contributes to the development and delivery of the *Clean Water, It's Our Future* campaign with a group of regional clean water partners. The campaign comprises a series of public service announcements (PSAs), social media posts, and website content focusing on practical advice for implementing practices that are protective of water. The PSAs air during local televised news segments, and complementary information is posted on KPTV's [community webpages](#) and shared via social media posts. The City participates in the development and curation of the campaign's messages.

These partnerships provide tremendous outreach in getting clean water messages delivered to a diversity of Portlanders and beyond.

### 2.1.4 Household Waste and Recycling

The City's Bureau of Planning and Sustainability (BPS) administers residential and commercial solid waste and recycling programs in Portland to facilitate and promote [proper and sustainable waste management practices](#) and to prevent illegal dumping of solid and liquid wastes. BPS facilitates curbside collection services for household wastes, but also conducts related outreach on BMPs for residential garbage, recycling, yard debris, and food waste. Available in multiple languages, the City's annual [Curbsider](#) newsletter is a key outreach tool distributed to every address in Portland. It provides an overview of recycling and composting programs and other

BMPs for household waste. Information is also provided about [community cleanup resources](#) and public trash and litter disposal.

In addition, the City coordinates with regional and local waste collection programs conducted by community organizations, non-profits, and jurisdictional partners, such as Metro's [Master Recycler](#) Program, [SOLVE](#), and [Trash for Peace](#) to prevent and reduce waste and encourage recycling. These partnerships are critical for engaging the community around decreasing carbon emissions, reducing food waste, promoting the reuse and repair economy, and creating access points for under-represented communities to the residential and commercial solid waste and recycling programs.

### 2.1.5 Parks and Pet Waste

The City's Portland Parks and Recreation (PP&R) bureau conducts public outreach and education activities related to the care and maintenance of our parks and natural resources, including related water quality issues like pet waste cleanup, "leave no trace" principles, and fire awareness. PP&R routinely conducts the following types of activities:

- **Pet waste.** Portland is often ranked as one of the most dog-friendly cities in the country. With so many dogs, it's important to remind residents that waste cleanup is essential for the health of our streams. Dog waste contains pollutants that are harmful to our waterways, including nutrients that deplete the water of oxygen and fecal bacteria that can cause disease. PP&R encourages compliance with Portland's "leash and scoop" laws through education, such as park signage to increase awareness, provision of off-leash areas with waste bins, and conducting outreach at public events. PP&R also conducts related enforcement activities, where necessary.
- **Park Rangers.** The City's [Park Rangers](#) patrol our parks daily. They respond to calls for service and proactively engage with the community. Rangers provide park visitors with resources and information, help solve park user conflicts, and enforce City Code for park usage and related environmental issues. Rangers also perform tabling and outreach events where they provide "Leave No Trace, Urban Principles" information. Rangers are also often the first point of contact for issues related to homelessness (see Section 2.3, Illicit Discharge Detection and Elimination Strategy, for further details). In such cases, the team uses a harm reduction model to offer services and provides information to unsheltered people, for example, about fire awareness.
- **Nature and stewardship.** PP&R also conducts education, outreach, and engagement activities that focus on maintaining natural resources within the network

of parks and natural areas located in Portland. This includes things like stewardship opportunities, signage about [ecologically sustainable landscapes](#), and the popular and important [Portland Plant List](#) that PP&R coordinates with BPS.

### 2.1.6 Pollution Prevention Outreach

The City participates in the regional Pollution Prevention Outreach (P2O) Team, a multi-agency group of environmental professionals with expertise in air, water, wastewater, energy, hazardous waste, and solid waste practices. P2O promotes and implements comprehensive pollution prevention programs, including the Eco-Logical Business, or [EcoBiz](#) program, which certifies automotive and landscaping businesses that use environmentally responsible business practices. Topics covered by EcoBiz include spill prevention and response; implementation of BMPs for vehicle washing; and proper methods of stormwater management, which are important to reduce toxics in stormwater, wastewater, and the natural environment. The program includes free technical assistance as well as education and outreach to encourage participation in the program and BMP implementation.

### 2.1.7 Alternative Transportation

The City's Portland Bureau of Transportation (PBOT) actively promotes carpooling, public transit, and active modes of transportation. These modes include biking, walking, and rolling to reduce pollution and toxic emissions from cars and trucks, decrease traffic congestion, and support actions that mitigate climate change. PBOT conducts a variety of education and outreach activities and coordinates with partner organizations to encourage alternatives to single occupancy vehicles on our roadways. Outreach typically involves alternatives such as taking transit, cycling, and carpooling, which significantly decrease the number of cars on the road, which reduce pollution in our rivers and streams. Here are some alternatives:

- **Carpooling.** In partnership with Oregon's [Drive Less Connect](#) program, PBOT matches carpooling partners and provides [discounted carpool parking](#).
- **Cycling.** Portland is world-renowned as a bike-friendly city, and PBOT plays an important role in that achievement. PBOT maintains bilingual [Bike and Walk maps](#) for the Portland area, including a [mobile-friendly version](#). The City also provides a virtual format for Portland cyclists with [Bike Break](#), a webcast that covers topics of interest, and [Portland By Cycle](#), which offers free guided rides and skill-building classes. Portland also has a [bike-share system](#) that is always adapting to a dramatically changing transportation landscape.

- **General transportation awareness outreach.** The City also promotes the following types of events and activities through mailers, event tabling, and web/social media content.
  - Free [Sunday Parkways](#) events, a popular program that encourages alternative forms of transportation and a healthy, active lifestyle. The City hosts these events in its largest public space: streets.
  - Games and contests. One of the most recent examples is “[Go By Greenways](#),” a scavenger hunt that raises awareness about green spaces, parks, and schools.
  - The [Transportation Wallet](#) program offers passes and credits for use on public transit, bike-share, e-scooters, ride-share, and car-share in one package, giving Portlanders lots of choices on how to get around without the need to rely on a single occupancy vehicle. The program also reduces parking demand and congestion.

### 2.1.8 City Leadership and Elected Officials

BES leads administration of the City’s MS4 permit and the SWMP, but multiple bureaus are responsible for implementation. These MS4 regulations have significant influence and impact in Portland and beyond, which is why it is important to inform and engage City leaders. BES’s MS4 Permit managers brief, present, and discuss the SWMP, the SWMP Document, and other items of MS4 significance to City commissioners and bureau leadership teams at pertinent stages of development.

Engagement with the City’s elected officials, bureau directors, and public boards is important to ensure the long-term support for and success of our comprehensive MS4 SWMP. BES goals for this specific kind of engagement are to:

- Build awareness of local water quality issues and regulations
- Generate responsiveness to Portlanders’ environmental concerns at the organization’s highest levels
- Ensure that related questions and concerns are directed to appropriate City staff
- Inform leadership and decision-makers on key compliance issues

- Improve understanding of the relationship between critical urban issues and water quality, like land use and development, business and commercial influences, social dynamics, and the importance of natural area preservation and restoration

## 2.2 Public Involvement and Participation Strategy

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Our Public Involvement and Participation Strategy works in concert with our Public Education and Outreach Strategy. Where the Public Education and Outreach Strategy involves outward-facing information for the public, this involvement strategy is about directly engaging and gathering input from the community on the City's stormwater and environmental programs. This critical feedback loop helps the City adapt and orient its activities to best serve the Portland community and protect public health and the environment. The Public Involvement and Participation Strategy is described below.

### Permit Schedule A.3.b

### 2.2.1 Public Website

The City maintains and promotes a vast array of websites with information relevant to our MS4 program and related strategies. [Table 1](#) provides an extensive list of web-based pollution reduction resources. MS4-related websites are also linked throughout this SWMP Document. Our websites are maintained on an ongoing basis. Required MS4 web content is available, as noted:

- **MS4 Stormwater Program.** This [site](#) serves as the City's "MS4 hub" and includes a copy of the SWMP Document and other materials, as required.
- **Illicit Discharge reporting.** (See Section 2.3 for web links).
- **Pollution Reduction resources.** (See [Table 1](#)).
- **Ordinances and policies.** Linked throughout the SWMP Document.
- **Monitoring Plan.** The plan is provided [online](#) along with an interactive [map](#).
- **MS4 Web Map.** Our new interactive [map](#), available for the public to explore different MS4 features.




**Table 1: Pollution Reduction Web Resources**

**Pollution Reduction Topics**

 <p><b>1. Impacts of illicit discharges on receiving waters and how to report them.</b></p>	<ul style="list-style-type: none"><li>• Report a Spill or Pollution</li><li>• How You Can Help Keep Our Rivers Healthy</li><li>• Prevent Pollution from Sandblasting and Painting Operations</li><li>• Spill Prevention and Response Plans and Procedures for Business and Industry</li><li>• How to Properly Empty Your Pool or Hot Tub</li></ul>
 <p><b>2. Appropriate practices or techniques to avoid adverse water quality impacts due to impervious surfaces.</b></p>	<ul style="list-style-type: none"><li>• Managing Rain on Your Property</li><li>• Request Technical Assistance for Drainage Issues on Your Property</li><li>• Non-stormwater Discharges from Residential Properties</li></ul>
 <p><b>3. BMPs for proper use, application, storage, and disposal of pesticides, herbicides, fertilizers, and other household chemicals.</b></p>	<ul style="list-style-type: none"><li>• How to Properly Store Outdoor Materials to Prevent Pollution</li><li>• Prevent Pollution from Outdoor Manufacturing and Equipment Operations</li><li>• What You Can (and Can't) Flush</li></ul>
 <p><b>4. BMPs to avoid or reduce discharge of litter and trash to the MS4 or surface waters.</b></p>	<ul style="list-style-type: none"><li>• Community Cleanup Resources</li><li>• Community Waste Collection Events</li></ul>

**Table 1: Pollution Reduction Web Resources**

**Pollution Reduction Topics**

 <p><b>5. BMPs for recycling programs.</b></p>	<ul style="list-style-type: none"> <li>• Garbage, Recycling, and Compost</li> <li>• Recycling – what goes in the bin</li> <li>• Compost – what goes in the bin</li> <li>• Garbage – what goes in the bin</li> <li>• Large household waste disposal options</li> </ul>
 <p><b>6. BMPs to avoid discharges from power washing, carpet cleaning, and auto repair and maintenance.</b></p>	<ul style="list-style-type: none"> <li>• Guide to the Mobile Washer Program</li> <li>• Prevent Pollution when Washing Vehicles and Equipment</li> <li>• Prevent Pollution when Cleaning Your Building or Sidewalk</li> <li>• Prevent Pollution from Vehicle and Equipment Maintenance</li> <li>• Prevent Pollution from Pressure Washing and Graffiti Removal</li> </ul>
 <p><b>7. Low-impact development and green infrastructure approaches.</b></p>	<ul style="list-style-type: none"> <li>• Managing Rain on Your Property</li> <li>• Basins</li> <li>• Downspout Disconnection</li> <li>• Drywells</li> <li>• Ecoroofs</li> <li>• Permeable Pavement</li> <li>• Planters</li> <li>• Rain Barrels</li> <li>• Residential Rain Gardens</li> <li>• Roof Gardens</li> <li>• Soakage Trenches</li> <li>• Trees</li> <li>• About Green Streets</li> </ul>
 <p><b>8. Watershed awareness education, including how storm drains lead to local creeks and rivers, and potential impacts to fish and other wildlife.</b></p>	<ul style="list-style-type: none"> <li>• How You Can Help Keep Our Rivers Healthy</li> <li>• How We Manage Stormwater</li> <li>• Portland's Watersheds</li> <li>• Columbia Slough Watershed</li> <li>• Fanno Creek Watershed</li> <li>• Johnson Creek Watershed</li> <li>• Tryon Creek Watershed</li> <li>• Willamette River Watershed</li> </ul>



**Table 1: Pollution Reduction Web Resources**

**Pollution Reduction Topics**



**9. Operation & Maintenance practices for privately owned stormwater quality management facilities.**

- Post-Construction Maintenance Inspection Program
- Private Stormwater Facilities Maintenance Mailer
- O&M Form for Private Stormwater Facilities
- O&M Form for Private Street/Shared Stormwater Management Facilities
- O&M Form for Drainage Reserves



**10. Construction site control measures and BMPs, including information on where in-depth training on erosion prevention and sediment control can be obtained.**

- Preventing Pollution by Controlling Sediment and Material Track-Out
- Preventing Pollution from Sawcutting Slurry
- Erosion and Sediment Control for Preventing Pollution
- Dust Control for Pollution Prevention
- Prevent Pollution from Lead and Asbestos during Demolition or Abatement
- Asbestos and Lead-Based Paint Information



**11. Stormwater issues of significance identified by co-permittees.**

- City of Portland's TMDL Implementation Plan for Non-Point Source Pollution
- How to Reduce Vehicle Pollution by Using Alternative Forms of Transportation
- Environmental Grants and Incentives
- Get Involved! with Stewardship Opportunities
- Prevent FOG (Fats, Oils, Grease)
- Homelessness Impact Reduction

## 2.2.2 Watershed Education and Stewardship

The City engages Portlanders to foster public involvement in our stormwater and environmental protection programs. BES's stewardship activities typically vary by watershed to incorporate the unique dynamics inherent to each. In general, the efforts include event sponsorship, presentation, partnerships, and public participation events. The City actively works with and co-sponsors activities with PP&R, the Columbia Slough Watershed Council, Johnson Creek Watershed Council, Tryon Creek Watershed Council, Crystal Springs Partnership, Tualatin Basin Public Awareness Committee, Friends of Trees, and more.

The City conducts routine community outreach and engagement through presentations and workshops. Outreach also includes distribution of newsletters, brochures, open houses, and customized outreach to property owners. Topics include invasive species removal and riparian restoration, watershed stewardship, stormwater facility maintenance and [green street stewardship](#), [tree planting](#), community "greening," and other pollution prevention efforts. Stewardship activities also include technical data collection and distribution efforts. The City often partners with multiple agencies and jurisdictions on educational monitoring activities related to outreach; specifically, water quality and macroinvertebrate monitoring as immersive ways to explore the technical field aspects of environmental stewardship.

### Key Performance Indicators

- Number of participants and/or volunteers.

### Goals

- Involve at least 50,000 participants and volunteers in community events, workshops, stewardship projects, and restoration events over the 5-year permit term.
- All Portlanders are aware of environmental stewardship opportunities and feel empowered to engage in those opportunities—in particular, disenfranchised community groups and the organizations that serve them (e.g., BIPOC communities, culturally specific individuals, and other "at risk" populations).

### Reporting Milestones

- Involve approximately 10,000 participants and volunteers in community events, workshops, stewardship projects, and restoration events annually.

## 2.2.3 Grants Programs

The City implements a [variety of grant and financial incentive programs](#) to involve the public in watershed protection and enhancement. Current activities include:

- **Community Watershed Stewardship Grant Program.** BES has implemented a [Community Watershed Stewardship Grant Program](#) since 1995. The program provides grants of up to \$12,000 per project to community members and organizations. To qualify, projects must be within the city, promote community involvement in environmental stewardship, promote leadership from under-represented groups, encourage partnerships, and be of public benefit.
- **Neighborhood to the River.** The BES [Neighborhood to the River Program](#) actively builds partnerships with residents and businesses to manage stormwater runoff naturally and help improve the health of our rivers and streams. The program also [offers grants](#) for qualifying projects.
- **Percent for Green.** The [Percent for Green](#) grant program is open to community groups for large-scale green infrastructure projects that provide broad benefits for watershed health and the community. Grants range from \$20,000 to \$150,000.
- **Portland Harbor Community Grants.** This [grant program](#) encourages participation in the Portland Harbor Superfund<sup>9</sup> site cleanup process and specifically prioritizes BIPOC-led organizations and disproportionately impacted community groups.

### Key Performance Indicators

- Number of grants awarded.
- Dollar amounts/totals of grants awarded.

### Goals

- Award at least \$500,000 in grants over the 5-year permit term.

### Reporting Milestones

- Award at least \$100,000 in grants annually.

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<sup>9</sup> [U.S. EPA, What is Superfund?](#)

## 2.2.4 Community Engagement Initiative

BES recently initiated a project to engage Portlanders in the exploration of three topics: equity, affordability, and healthy neighborhoods. The project's initial phase is focused on engaging with under-represented community groups and members who have interacted with BES through a program or service, such as our fats, oils, and grease ([FOG](#)) or financial assistance programs. Focusing participation on community members who have participated in specific programs or services and/or traditionally under-represented community groups is a different approach than previous, more quantitative research efforts, such as focus groups and surveys.<sup>10</sup>

One objective is to repeat this rigorous engagement effort every few years to inform the City's environmental priorities, plan for appropriate resourcing, and to build strong, long-term relationships with our community.

### Key Performance Indicators

- Qualitative assessment (*no specific quantitative metrics at this time*).

### Goals

- Build stronger long-term relationships within the Portland community through a new method of engagement that informs priorities and clarifies resource and budget needs.

### Reporting Milestones

- Complete the evaluation of initial project phase results and include a summary in the 3rd year MS4 Annual Report (due November 1, 2023).
- Provide insights and findings in 4th year MS4 Annual Report (due November 1, 2024).

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<sup>10</sup> BES anticipates results from the initial project phase to be available in the autumn of 2022 or winter of 2023. After compiling those initial results, there will be an assessment of how the findings inform our communications and engagement strategies, service levels, and priorities.

Table 2: Engagement Activities & Audiences																								
SECTION	ACTIVITY	GENERAL PUBLIC									LOCAL & REGIONAL OFFICIALS					CONSTRUCTION & POST-CONSTRUCTION PRACTITIONERS			BUSINESS					
		Youth	Students & Educators	Commuters	Outdoor Recreationalists	Visitors, Tourists	Renters	Homeowners	HOAs: Homeowner Associations	Community Advisory Bodies¹	Advocacy & Volunteer Groups	Elected Leaders	Land Use Planners	Engineers	Tribal, State, National Officials	MS4 Partners	Contractors/Site Developers	Public Works Contractors	Stormwater Facility Owners	Commercial Sites	Industrial Facilities	Food Service Establishments	Auto Repair Shops	Landscape Maintenance
Public Education & Outreach Strategy																								
2.1.1	General Environmental Outreach	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2.1.2	Clean Rivers Education Programs	●	●																					
2.1.3	Regional Clean Water Partnerships	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2.1.4	Household Waste & Recycling	●	●	●	●		●	●	●		●				●									
2.1.5	Parks & Pet Waste	●	●		●	●	●	●	●										●					
2.1.6	Pollution Prevention Outreach															●			●	●	●	●	●	●
2.1.7	Alternative Transportation			●	●	●	●	●		●	●	●	●											
2.1.8	City Leadership & Elected Officials								●		●	●	●	●	●									
Public Involvement & Participation Strategy																								
2.2.1	Public Website	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2.2.2	Watershed Education & Stewardship	●	●		●		●	●	●	●	●				●	●			●	●				●
2.2.3	Grants Programs	●	●		●		●	●	●	●	●				●	●			●	●	●	●	●	●
2.2.4	Community Engagement Initiative								●	●	●	●	●	●	●				●	●	●	●	●	●
Additional Activities																								
2.4.6	Erosion Control Education & Outreach						●	●	●	●	●	●	●	●	●	●	●	●	●					●
2.5.6	Post-Construction Outreach						●	●	●	●	●	●	●	●	●	●	●	●	●					●
2.6.5	Long-term O&M Outreach & Assistance						●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2.8.3	Commercial & Industrial BMP Outreach								●	●	●	●	●	●	●				●	●	●	●	●	●

1. Community advisory bodies include Portland Utility Board (PUB). Development Review Advisory Committee (DRAC) and others.



## 2.3 Illicit Discharge Detection and Elimination Strategy

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The City conducts a variety of activities as part of an Illicit Discharge Detection and Elimination, or IDDE, strategy described on the following pages. An illicit discharge is basically waste of any kind that is not supposed to be in the storm system. It is any discharge to the MS4 that is not stormwater, unless it is specifically identified as an “allowable discharge” in the MS4 permit. Examples include:

- Flows containing pollutants that are discharged to a storm system during dry weather.
- Sewage that has the potential to enter the MS4 through piped “cross-connections” or other means.
- Wastewater from activities like truck washing, commercial rinse water, or concrete cutting slurry.
- Illegal dumping, chemical or oil spills, and other such pollution that enters a storm drain.

### 2.3.1 MS4 Map

The City continues to conduct extensive mapping of the MS4 and related assets, including stormwater conveyance pipes, storm drains, outfalls, and structural controls in accordance with the MS4 permit. We have teams of technical mapping and database experts that locate, track, and record a huge range of MS4 system components and related information on a daily basis.

An MS4 permit-specific [web map application](#) is available to the public as a helpful involvement tool.

**Permit  
Schedule  
A.3.c**

### 2.3.2 Ordinance

As mentioned in Section 1 of this SWMP Document, the City developed and continues to maintain legal authority to address illicit discharges that enter or impact the MS4. The following items comprise key components of the City's IDDE-related ordinances:

- **PCC Chapter 17.39, *Stormwater System Discharges*** contains requirements and prohibitions for discharges to the City's MS4 to convey, manage, and protect water quality. Implementation of [PCC Chapter 17.39](#) is further supported by Administrative Rule [ENB-4.13](#).
- **PCC Chapter 17.32, *Public Sewer and Drainage System Permits*** regulates access and connection to the MS4, along with the maintenance, repair, or removal of the City's conveyance assets. [PCC Chapter 17.32](#) and associated Administrative Rule [ENB-4.22](#) aids in preventing or correcting cross-connections.
- **Administrative Rule [ENB-4.15](#)** supports the BES Enforcement Program and procedures for assessing violations of these ordinances, administrative rules, and discharge permits. A more detailed description of the BES Enforcement Program is included in Section 2.3.5.

### 2.3.3 Program to Detect and Eliminate Illicit Discharges

The City's Spill Protection and Citizen Response (SPCR) program operates a 24-hour pollution complaint hotline and administers a team of Duty Officers to respond to spills and pollution incidents that have the potential to impact the MS4. A detailed description of the program's activities is provided below.

#### Public Reporting of Pollution Complaints

The City operates a **Spill Response Hotline (503-823-7180)** 24 hours a day, 365 days a year, that the public and other agencies can use to report pollution complaints in the Portland area. The hotline is posted on the City [website](#), on signage at construction sites, in City vehicles, and at industrial facilities with stormwater or wastewater permits managed by the City. Reporting is also made available via [email](#).

**City of Portland  
Spill Response  
Hotline**

**503-823-7180**

Other City bureaus, including PBOT, BDS, and Portland Fire and Rescue (PF&R) also operate incident hotlines that take calls for spills, construction-related

discharges, or sanitary sewer releases. These bureaus coordinate with and refer complaints to BES through the hotline where appropriate.

### Response Investigation Procedures

The City initiates response and/or investigation within 24 hours of receiving a pollution complaint or notification. General procedures are as follows:

1. **Complaint intake.** Upon receipt of the complaint, BES SPCR staff gather incident details from the complainant and use online mapping tools to verify the location and ownership of the potentially impacted receiving system. As described in Section 1, the City manages multiple collection and conveyance systems where the MS4 permit may not apply. There are also drainage systems owned or operated by private parties or government agencies in the Portland area for which the City does not have code authority. Spills and pollution complaints that impact a non-City system are referred to the appropriate jurisdiction and/or DEQ within 1 working day, where appropriate. In cases where the discharge is in or originates from another jurisdiction, the other jurisdiction will be notified as soon as practicable and at least within 1 working day. The complaint intake process helps SPCR identify a proper response and/or referral.
2. **Complaint investigation.** If the City is identified as the responsible jurisdiction or if the jurisdiction is not immediately apparent, SPCR initiates a response to the complaint within 24 hours. The SPCR response may involve a field investigation to identify the source, extent, type, and amount of the potential illicit discharge. The investigation involves field observations and data gathering such as photo documentation. It may also involve system tracing, collection of samples for laboratory analysis, property records research, and coordination with the City's industrial permit managers or other City programs. In cases where it is unsafe or impractical (e.g., high water conditions, concern for personal safety), the field investigation is deferred until safety precautions can be put in place.
3. **Notice of investigation.** If the source of an illicit discharge is identified, SPCR directs the responsible party to immediately cease the discharge. SPCR staff informs the responsible party of potential City code violations, liabilities, and penalties, and provides technical assistance on the necessary cleanup or corrective action measures. A Notice of Investigation form is issued to the responsible party to formalize directives.
4. **Cleanup and corrective actions.** A key function of SPCR is to initiate and direct spill cleanup, when needed. The City ensures spills that enter the storm sewer system or have

the potential to enter the storm sewer system are cleaned up. SPCR refers the spill to PBOT or hires a contractor to conduct cleanup activities. The City also may direct the responsible party, if known, to conduct cleanup activities, corrective actions, and/or repairs, if appropriate.

5. **Enforcement.** In cases where a responsible party has been identified, the City conducts enforcement in accordance with BES Enforcement Program protocols, as described later in this strategy.

#### Key Performance Indicators

- Number of pollution complaints and inquiries received via the City's spill reporting hotline.

#### Goals

- Adhere to permit-required timelines for the investigation and enforcement of illicit discharges.

#### Reporting Milestones

- Number of pollution complaints and inquiries received via the City's spill reporting hotline annually.

### 2.3.4 Dry-Weather Screening Program

Dry-weather screening is a proactive method that the City uses to search for illicit discharges. It is essentially a monitoring activity conducted during the summer season (typically June through September) at priority locations in the MS4, which are primarily major stormwater outfalls. We refer to our dry-weather screening activity as the Outfall Basin Inspection (OBI), program. The goals of OBI are to:

- Discover and correct improper or illegal industrial, commercial, and residential sewer connections to the City's MS4.
- Identify and eliminate illegal discharges of pollution, including industrial wastes, that enter the City's MS4.

## Priority Locations

The City's IDDE experts, primarily SPCR staff with the assistance of our field science specialists, inspect major MS4 outfalls once a year and a rotating subset of high-risk MS4 outfalls three times a year to search for possible ongoing or intermittent illicit discharges.<sup>11</sup> The inspections are conducted in accordance with internal screening protocols and a sampling plan, provided in [Appendix A](#) and described below. Current dry-weather screening locations are shown on the [MS4 Map](#).

## Field Screening and Investigation Procedures

City staff responsible for conducting dry-weather screening activities use detailed procedures and a customized OBI inspection form to document:

- MS4 permit-required observations including pipe conditions, evidence of turbidity, oils, trash and debris, odors, and other non-stormwater flows indicating a presence of pollution and/or an illicit discharge.
- Field screening monitoring results, including a comparison of established pollutant parameter action levels, and samples collected for laboratory analyses, if needed.<sup>12</sup>

If dry-weather flow is sufficient and/or field observations warrant, field screening is conducted *in-situ* using field test instruments and compared with pollutant parameter action levels. (The OBI inspection form incorporates established pollutant parameter action levels and is available in [Appendix A](#).) Additional samples are collected for laboratory analysis depending on the nature and magnitude of the field screening results. Screening and sampling may then also occur at both downstream and upstream locations if further investigation is needed.

Field screening methods and sample collection procedures for laboratory analysis are detailed in the Dry-Weather Field Screening and Sampling SOP (April 2019), available in [Appendix A](#). This document describes the detailed sampling procedures based on the use of standardized equipment during dry-weather screening activities.

The City's Water Pollution Control Laboratory analysts notify and coordinate with field staff if sample analyses confirm elevated levels of pollutants, and a follow-up screening and/or investigation ensues. The follow-up investigation includes conducting additional sampling at

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<sup>11</sup> We intend to revise and update our dry-weather screening strategy and associated priority locations in accordance with the MS4 permit November 1, 2023, timeline. This may involve incorporating the dry-weather activity into our MS4 Monitoring Plan, consistent with other regional MS4s and new requirements in Schedule A.1.

<sup>12</sup> Pollutant parameter action levels were documented in an IDDE Field Screening Action Levels Update Memo, submitted to DEQ in 2014.

and upstream of the priority location within 3 working days. If follow-up sampling results do not show elevated pollutants, the location is flagged for future inspection and for consideration of a more frequent inspection schedule.

If the source of an illicit discharge is identified, response and enforcement activities are conducted as described in Section 2.3.5.

### Key Performance Indicators

- Number of dry-weather screening locations inspected.
- Number of inspections performed.
- Number of locations with flow observed, warranting field sampling and/or laboratory analyses.
- Number of source investigations initiated based on dry-weather field screening.
- Number of confirmed illicit discharges identified from dry-weather field screening.

### Goals

- Perform dry-weather screening inspections of all major and priority locations over the permit term.<sup>13</sup>

### Reporting Milestones

- Update dry-weather screening priority locations and strategy by November 2023.
- Perform dry-weather screening inspections at 25% or more of all major and priority outfall locations annually.

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<sup>13</sup> The City intends to revise and update our dry-weather screening strategy and associated priority locations in accordance with the MS4 permit November 1, 2023, timeline. This may involve incorporating the dry-weather activity into our MS4 Monitoring Plan, consistent with other regional MS4s and new requirements in Schedule A.1.

### 2.3.5 Enforcement

An important aspect of the City's IDDE program is enforcement of ordinances to protect the MS4 and prevent impacts to waterways. The City coordinates enforcement response activities for the Duty Officer program to ensure compliance with codes and administrative rules described previously in this section. Detailed violation response and escalating enforcement procedures are outlined in an internal guidance manual, but are summarized below.

#### Determining an Enforcement Response

Information collected during an IDDE investigation is reviewed to determine the appropriate level of enforcement response, including the source, extent, type, and amount of discharge along with the environmental and/or infrastructure impacts. The City uses an escalating enforcement strategy to ensure that parties responsible for an IDDE incident: 1) cease the offending discharge/activity immediately, 2) return to compliance as soon as possible, 3) perform and/or pay for all necessary cleanup measures, and 4) are deterred from any future occurrences. The level of the City's enforcement response is determined by the following:

- Severity and duration of the violation.
- Level of environmental and/or structural impact.
- The responsible party's compliance history and efforts to return to compliance.
- An evaluation of circumstances beyond the party's reasonable control.

The City uses a violation classification matrix to determine the appropriate enforcement response to an IDDE violation. Violation classes range from less to greater severity in the following order: Warning Notice, Class III, Class II, and Class I. These are based on the degree of departure from City regulations and/or the level of threat or harm to human health and safety, property, or the environment.

#### Enforcement Actions and Penalties

When a pollution complaint investigation identifies a violation and an associated responsible party, City staff will issue an enforcement action as classified above. The City's enforcement actions document the violating conditions, required corrective actions, civil penalties (if applicable), procedures for requesting an appeal, and compliance schedules, as applicable. Response dates associated with appealable enforcement actions are tracked, and a Final Determination is issued after 20 business days if no response has been received.



Escalating enforcement actions are issued in response to un-addressed or repeated violations. The City's formal actions include the following:

- **Warning Notice.** Issued in response to minor reporting or operational violations where there is no impact to the City's collection system, the environment, or public health.
- **Notice of Violation.** Issued in response to 1) Class I, II or III violations or 2) repeat offenses of the same violation within the cycle of violation. An NOV includes a civil penalty that is assessed using an algorithm incorporating base and gravity penalty components.
- **Compliance Order.** A formal order directing the responsible party to take specific corrective actions within a specified timeframe to resolve a violation. A CO is a unilateral action that is non-negotiable. If circumstances warrant the development of an action plan to achieve compliance, the action plan is incorporated into the CO with deadlines.
- **Voluntary Compliance Agreement.** An agreement between the responsible party and the City that combines the force of a CO with the flexibility of a negotiated settlement. A VCA is appropriate when the responsible party assumes responsibility for its non-compliance and is willing (in good faith) to correct its causes. The VCA contains compliance schedules, stipulated fines and/or remedial actions, and consequences for failure to comply.
- **Notice of Termination.** Issued when all other attempts to bring a site or a discharge into compliance have been exhausted. In situations where there is imminent danger to public health, welfare, or the environment, or an imminent threat of harm to the City sewer and drainage system, the Director of Environmental Services may immediately terminate an existing discharge, prevent a new discharge, or revoke a permit after providing notice to the violator.
- **Civil litigation or criminal prosecution.**

Enforcement actions can be issued individually or collectively to ensure compliance. For example, an NOV with monetary penalties may precede a CO. In addition to monetary penalties, the City performs cost-recovery to recoup all reasonable costs incurred by the City's spill and cleanup response activities by issuing a Notice of Assessment of Costs to the responsible party. Criminal prosecution and/or enforcement referral to DEQ and EPA may occur if the City has evidence of non-compliance showing intentional criminal intent or negligence.

### Key Performance Indicators

- Number of enforcement actions issued under PCC Chapter 17.39.
- Number of associated penalties and costs.

### Goals

- Prevent recurrences of illicit discharges by penalizing responsible parties accordingly through an escalating enforcement strategy.
- Update the current internal enforcement guidance as a revised, public-facing document by November 1, 2025.

### Reporting Milestones

- Number of enforcement actions issued under PCC Chapter 17.39 annually.
- Number of associated penalties and costs assessed annually.
- Initiate update of the current internal enforcement guidance by June 30, 2024, and report progress thereafter.

## 2.3.6 Data Tracking

SPCR staff tracks all complaints, referrals, investigation activities, and enforcement actions in at least two different databases:

- **SPCR Pollution Complaint database.** This database tracks details about pollution complaint intake calls, reported and investigated spill/incident details, and follow-up activities. A daily report of the previous day's incidents is distributed broadly to affected City programs each working day.
- **Enforcement database.** All enforcement activities, penalties, and corrective actions for violations of the City Code are tracked in a separate enforcement database.

## 2.3.7 IDDE Staff Training and Education

The training strategy for IDDE staff includes extensive onboarding of new employees on:

- Pollution prevention and source control techniques.
- Spill response procedures and safety.

- Coordination with laboratory and NPDES-permitting staff.
- Local IDDE ordinances, administrative rules, and “driver” regulations.
- Standard operating procedures, including pollution complaint response and investigation data tracking.

After initial onboarding, the SPCR team places a heavy focus on mentoring and job shadowing, to provide direct and real-time experience to new staff members on Portland’s environment, infrastructure, and governing authority for IDDE incidents. In addition, Duty Officers receive professional and field training experience through formal and regional coordination venues on documentation protocols, spill response equipment, vehicle and personal safety, investigative techniques, and enforcement strategies. The City conducts internal monthly meetings that include debriefs on IDDE case-studies and reviews of applied and/or needed procedures or rules. Annual refresher training is also conducted for dry-weather screening activities on sampling and safety protocols.

A variety of internal training and external professional development opportunities are made available to all IDDE staff annually.

### 2.3.8 Services Related to Homelessness

Homelessness is both an urgent and extremely complex challenge throughout our region with high impacts to community, safety, and the environment. The incidence of local populations that are unsheltered and/or living in camps, recreational vehicles (RVs), etc., without easy access to sanitation and waste services has resulted in a rise of IDDE complaints and events. While the City continues to address the issue of homelessness with partners on a broad scale, the SWMP seeks to prevent and mitigate water quality impacts from unhoused populations.

#### Impact Reduction

The City’s [Impact Reduction Program](#) provides garbage removal, hygiene access, resource referral and job opportunities to the homeless and removes campsites that pose the highest risk to health and safety. The program minimizes the impacts of homelessness *today* while partner programs expand long-term access to safe, affordable housing. Specific activities performed by the Impact Reduction Program include:

- **Cleanup and garbage removal.** Work teams help [remove trash and debris](#) at campsites—as much as 800,000 pounds per month.

- **Portable sanitation and hygiene stations.** The City provides [portable toilets and hygiene](#) stations to serve people experiencing homelessness.
- **Partnerships and job opportunities.** The City partners with others to [create jobs](#) for the homeless to compensate them for helping address the impacts of unsanctioned camping and educate peers about important public works projects.
- **Campsite assessments and removals.** When concerns are reported, a team is dispatched to assess health and safety. The highest-risk sites are scheduled for removal; personal property is safely stored.
- **Street services coordination.** The [Street Services Coordination Center](#) (SSCC) is a collaboration of City of Portland and Multnomah County with the purpose of providing streamlined services to those living outside. One purpose of the SSCC is to coordinate trash pickup and camp cleanup, reducing trash in the streets and ultimately, waterways and green infrastructure.

## RV Pollution Prevention

BES has created a new [RV Pollution Prevention Program](#) for pump-out and trash pickup. By providing sewage pump-outs to Portlanders living in RVs as well as trash collection, BES is keeping illicit discharges out of the storm system and local waterways.<sup>14</sup>

## Key Performance Indicators

- Number of RV pump-outs performed.
- Pounds of trash collected.

## Goals

- Establish regular coordination systems with inter-bureau partners to inform environmental policies and practices related to homelessness.
- Refine and adopt a BES homelessness strategy by the end of the permit term.

## Reporting Milestones

- Provide annual summary, outlining challenges, accomplishments, and partnerships.

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<sup>14</sup> Funding for the RV Pollution Prevention Program is secured through the end of 2024. BES will continue to evaluate program effectiveness and continue coordination with other City bureaus and regional partners.

## 2.4 Erosion Control Strategy for Construction Site Runoff

Erosion happens when soil is swept away by water, wind, and other forces. It strips our land and overwhelms our streams with silt. Ground-disturbing construction activities can be a significant source of erosion. Without proper controls, construction results in both onsite and offsite erosion and the discharge of sediment and other pollutants to our streams. The City's Erosion Control Program regulates construction projects in Portland to prevent environmental impacts from construction activity.

### Permit Schedule A.3.d

### 2.4.1 Ordinance

The City enacted legal authority for the [construction site runoff program](#) following its first MS4 permit. **PCC Title 10, *Erosion and Sediment Control Regulations*** is the ordinance giving the City authority to require BMP controls for construction sites to prevent the discharge of sediment and other pollutants to our waterways. Requirements are outlined in the City's [Erosion and Sediment Control Manual](#) (ESCM) and [appendices](#), which is primarily administered by BDS. PCC Title 10 and the ESCM apply to all ground-disturbing activities, unless such activities are otherwise exempted. [PCC Title 10](#) and the ESCM (Administrative Rule ENB-4.10) describe, in detail, requirements and technical guidance for temporary and permanent erosion prevention, sediment control, and other site development activities that may cause pollution during the construction process. The ESCM also has detailed requirements for site-specific erosion and sediment control plans, inspections, and industry-standard specs for installation and maintenance of construction-related BMPs.

The City also requires that construction sites 1 acre or more obtain an NPDES [1200-C Construction Stormwater General Permit](#) from the DEQ, which provides additional regulatory controls for large developments.

During the previous MS4 permit term, BDS and BES convened a cross-bureau committee to perform a full evaluation of the City's Erosion Control Program, which identified the need for updates to the existing ESCM and PCC Title 10. A comprehensive [update](#) to the ESCM is currently pending and has undergone a round of public comments.<sup>15</sup> The new ESCM provides clarity on project applicability; outlines site management requirements; and fully describes BMP controls, selection, and implementation criteria. An update to PCC Title 10 and development of a new administrative rule for enforcement is also forthcoming under the project.

### 2.4.2 Erosion Control Plan Requirements and Plan Review

Any City of Portland building, public works, or development permit involving ground-disturbing activity triggers a review for ESCM compliance. Project sites with 500 square feet or more of ground-disturbing activity are required to develop and submit an Erosion and Sediment Pollution Control Plan (ESPCP). The requirements for ESPCPs are described in detail in the ESCM. Certain low-risk sites may qualify for use of a "Simple Site" ESPCP if they meet all criteria. These are generally flat sites located outside of environmentally sensitive zones and do not have any known or suspected contamination.

BDS employs a team of plan review experts that review building permit applications with ground-disturbing activities. The team reviews all ESPCPs in accordance with checklist criteria and conducts the following activities:

- Review permit applications that have been identified to have to ground-disturbing activities.
- Determine if the site meets standard ESPCP criteria or Simple Site ESPCP criteria by reviewing the permit drawings, documents, details, and site location information.
- Review and verify ESPCPs for the following:
  - Plans are consistent with the proposed development and existing and proposed site topography.
  - The minimum number and type of BMPs is in conformance with the ESCM.
  - ESPCPs are prepared by a licensed design professional as required.

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<sup>15</sup> During the time this report was prepared, the City had conducted an initial round of public comments on the draft ESCM in October 2021. A second public comment period was scheduled for mid-August 2022. The PCC Title 10 code package was scheduled for City Council mid-to-late September 2022. Formal adoption of the updated ESCM is anticipated late 2022 or early 2023.

- Required construction notes and erosion control site manager contact information are included.
- For qualifying projects, the Simple Site ESPCP template is complete and accurate.
- For sites that exceed 1 acre or more of ground-disturbing activities, verify the DEQ 1200-C permit has been issued or document that DEQ is not requiring a 1200-C permit.

### 2.4.3 Construction Site Inspections

The City inspects construction sites for both temporary and permanent erosion control measures in accordance with the ESCM. Interim checks are conducted during overall project inspections, or as needed for problem or complaint-related sites. Inspections are performed:

- After initial installation of temporary erosion control measures and prior to ground-disturbing activity.
- Near completion of construction prior to project finalization.
- In response to complaints.
- To follow-up on identified deficiencies, corrective measures, or problem sites.

Trained City inspectors follow standardized procedures and utilize inspection checklists to perform inspections. Written or electronic inspection forms and correction notices are utilized to document compliance and observed deficiencies for BMP implementation, effectiveness, and maintenance. Site operators are required to implement corrective actions, if necessary. City inspections include detailed observations of:

- Site-specific BMPs in accordance with the approved ESPCP, ESCM, and PCC Title 10.
- The site perimeter and interior, including entrances and exits, inlet protection, material and waste storage areas, evidence of offsite discharges, onsite spill prevention, and good housekeeping practices as applicable.
- Environmentally sensitive areas, including discharge points to the City's MS4 and/or receiving waters.
- Maintenance records and site operator inspection reports as necessary.
- Any required corrective measures, accompanied by verification and documentation.



A copy of the current inspection checklist is provided in [Appendix B](#).

#### **2.4.4 Enforcement**

The City's new [ESCM Enforcement Rule](#) outlines the City's escalating enforcement process for the Erosion Control Program. It provides a description of the enforcement process procedures, including what constitutes a violation, compliance timelines, and escalating re-inspection fees and penalties based on potential threat, severity, and recurrence. The escalating enforcement process is built on common practices utilized for inspections, including notices of correction; correction timelines; re-inspection fees; stop-work orders; citations and civil penalties; voluntary compliance agreements; and administrative reviews.

Sites with ground-disturbing activities that are not permitted by BDS are subject to enforcement and penalties by the BES SPCR Program, as described in the IDDE Strategy (Section 2.3.5).

#### **2.4.5 Data Tracking**

Information and documents about construction projects that trigger the ESCM are entered and stored in a proprietary database administered by BDS and used by all permitting plan review and inspection staff. The database tracks construction projects from permit application through project completion. Details recorded include plan review activities and approvals, site inspection events and results, and enforcement actions and penalties.

#### **2.4.6 Erosion Control Education and Outreach**

The City conducts outreach and engagement on the ESCM when it is updated and to construction site operators. The ESCM has significant environmental and economic impact to development in Portland. Outreach on related updates is performed to gather input from site developers, home builders, the environmental community, and other important partners on this important policy. Typical outreach and engagement activities may include:

- A 30-day public comment period, followed by tracking and response to comments received.
- Draft ESCM "lunch and learn" discussions.
- Targeted outreach to interested parties and users of the ESCM, including contractors, design professionals, City practitioners, and interested community members.

- Briefings to relevant commissioners' offices and City advisory bodies, including the [Development Review Advisory Committee](#), and the [Portland Utility Board](#).

In addition, at the onset of each wet season, a newsletter is provided to construction site operators with information about appropriate wet weather BMPs and erosion control requirements. The newsletter also provides information on where ground-disturbing activities in Portland are prohibited between October 1 and April 30. It also includes references for erosion control training programs, certifications, and providers. This information is also provided on the program's webpage.

### 2.4.7 Erosion Control Staff Training and Education

All City Erosion Control Program inspectors and associated plan review staff receive training. The training strategy for both teams is primarily focused on new employee onboarding. Onboarding includes thorough review of applicable codes and rules, program procedures and processes, and database applications with a focus on job shadowing and supervised inspections or plan reviews. The Plan Review and Inspections teams meet regularly to ensure consistency with program implementation. The City requires that Senior Inspector positions obtain and maintain an ESC specialty certification. Also, the City provides ongoing refresher and professional/trade development opportunities for all program staff.

#### Key Performance Indicators

- Number of construction/development permits issued with ground-disturbing activity.
- Number of erosion control inspections performed.
- Number of enforcement actions issued.

#### Goals

- Inspect 100% of construction sites required to obtain a building or development permit that triggers the ESCM.

#### Reporting Milestones

- Number of construction/development permits issued annually.
- Number of erosion control inspections performed annually.
- Number of enforcement actions issued annually.

## 2.5 Post-Construction Site Runoff Strategy for New and Re-Development

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Increased urbanization results in more impervious surfaces, such as parking lots, buildings, and commercial storage yards, which in turn have a big impact on our watersheds. The sheer volume of runoff can be as harmful to a stream as any pollution carried with it. If not properly managed, more impervious surface means more runoff, faster runoff, more potential for stormwater to pick up pollution, and more instances of flooding and stream erosion. Our strategy to mitigate these impacts from new and re-development is detailed in the following pages. The City's Stormwater Management Manual (SWMM) and associated long-term O&M strategy regulate both the quantity and quality of runoff from development project sites.

### Permit Schedule A.3.e

### 2.5.1 *Stormwater Management Manual*

The City has multiple teams of specialists that implement and regularly update our post-construction runoff program, which has significant environmental and economic influence in Portland. Our [Stormwater Management Manual](#) provides policy and design requirements for post-construction stormwater runoff. All applicable new development, re-development, and improvement projects in Portland on both private and public property, including roadways, must adhere to the City's stormwater retention, treatment, and low-impact development (LID) requirements. LID refers to systems, policies, and practices that use or mimic natural ecosystem functions to protect water quality and watershed habitat.

Applicable development projects proposing new or replaced impervious surface area in accordance with the MS4 permit's 1,000-

square-foot threshold trigger the City's SWMM requirements.<sup>16</sup> This includes mandates for stormwater retention, flow control, and water quality treatment using green and/or gray infrastructure. The City imposes a site stormwater management "hierarchy" that first requires onsite infiltration of stormwater to the maximum extent feasible from the impervious area. The SWMM hierarchy prioritizes infiltration using vegetated or "green" stormwater management facilities. In cases where onsite infiltration of stormwater is not feasible, the City imposes water quality treatment and flow controls for runoff that then overflows to an offsite discharge location. Additional details are provided in the sections below.

### 2.5.2 Ordinance

The City instituted its legal authority for the post-construction site runoff program in the mid-to-late 1990s in response to its first MS4 permit. **PCC [Chapter 17.38 Drainage and Water Quality](#)** is the ordinance giving the City authority to regulate the volume, flow, and quality of stormwater runoff from new and re-development project sites. The SWMM itself is [Administrative Rule ENB 4.01](#). Both regulatory mechanisms are implemented and maintained by BES. This authority also includes rules and requirements for the site/facility owner to perform long-term O&M activities to ensure the stormwater management facilities, or SMFs, are performing as intended. (See Section 2.6, Post-Construction Long-Term Operations and Maintenance.)

#### Post-Construction Stormwater Management and LID Requirements

The SWMM prioritizes LID principles for new and re-development, including the use of green infrastructure and infiltration facilities for the management of stormwater. Site designers and project engineers are required to prioritize the use of vegetated infiltration facilities to retain stormwater onsite.

The SWMM also requires drainage reserve protections for sites with surface drainageways. A *drainageway* is a constructed or natural channel or depression that may at any time collect and convey water. A *drainage reserve* is the regulated area adjacent to and including a drainageway. The City's requirements typically overlay a 30-foot-wide buffer over a drainageway, which imposes more significant development restrictions and triggers a special review for potential impacts or encroachments to the drainageway.

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<sup>16</sup> The City's current SWMM threshold is 500 square feet; however, the new MS4 permit pairs an increase of the threshold with more robust performance standards overall. By the November 1, 2024, deadline, the City will evaluate alignment of the standards with the new permit requirements, which may include changing the City's threshold.

Stormwater management controls are required for all project sites that create or replace (i.e., develop or redevelop) impervious surface area. Controls are also required for projects proposing new “routes of conveyance” or connections. For example, sites that decommission onsite UICs (sumps) and re-route stormwater to the MS4 are required to comply with the SWMM.

The City imposes specific *performance standards* and site stormwater management feasibility criteria using an infiltration and discharge hierarchy. At the top of the hierarchy is a *numeric stormwater retention standard* for the infiltration of stormwater. Treatment and flow-control standards are specified for sites where retention is infeasible.

Foremost, project designers must evaluate the feasibility of onsite stormwater infiltration according to the City’s required retention standard, which is infiltration of the 10-year, 24-hour design storm event.<sup>17</sup> In Portland, this is equivalent to about 3.5 inches of rainfall in 24 hours. If deemed feasible, then the site is required to design and install controls to meet that standard. If, however, onsite retention of the 10-year storm event is infeasible, project designers are required to install stormwater controls that provide water quality treatment and flow control designed to target pre-development hydrology. In such cases, the City imposes a water quality treatment standard, requiring treatment of 90-percent of the average annual runoff. In Portland, this equates to a little over 1.5 inches in 24 hours. In addition, the City imposes flow-control requirements when needed to slow the runoff down and protect receiving waterways from erosion and flooding. Our flow-control standards address small, frequent events and larger, more infrequent events. Specifically, flow-control requirements apply for 50% of the 2-year, 24-hour storm event, and the, 5-, 10-, and 25-year, 24-hour storm events.

For projects where all or a portion of the site is entirely infeasible for installation of stormwater management facilities, a “Special Circumstances” offsite management fee is imposed to meet the intent of the City’s post-construction requirements. This is further described below in Water Quality Benefit Offset Programs (Section 2.5.5) and in the SWMM.

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<sup>17</sup> A “design storm” is a hypothetical storm event for the purposes of performing engineering analysis for facility sizing. It is typically defined by the amount of rain, the duration of the event, and the intensity or patterning of rainfall over the course of the event.

### **2.5.3 Post-Construction Site Runoff Plan Review**

BES employs a team of plan reviewers that research all development permits and project sites that may be subject to SWMM requirements. The team conducts the following activities:

- Review and confirm project site SWMM triggers.
- Review site development plans, including stormwater facility engineering designs, geotechnical reports, and storm-event design calculations.
- Approve development permitting applications if/when SWMM requirements are met or require corrections, if needed.
- Coordinate with the BDS during the building permit intake process to screen for land use reviews, new construction, structural additions or alterations, tenant improvements, change of use/occupancy, site excavation, and sewer utility connections.
- Record relevant data in tracking system (see description in Section 2.5.8, Data Tracking).
- Provide technical assistance to site developers and engineers to promote understanding of SWMM requirements.
- Review and approve or reject Special Circumstances applications based on adequate justification of infeasibility (see description below in Section 2.5.5, Water Quality Benefit Offset Programs [Special Circumstances]).
- Ensure that required O&M Agreements are submitted and recorded in county property records, as required.

### **2.5.4 Stormwater Management Facility Installation Inspections**

In addition to performing site plan reviews, City staff conduct onsite inspections during the project's construction phase to assess and ensure proper installation of the approved site design and stormwater controls. (Post-construction O&M inspections are described in Section 2.6.) Inspectors also evaluate the quality of materials and construction methods to optimize performance and prevent future failure or non-compliance with long-term O&M requirements. City inspectors require corrective actions if non-compliance is observed with SMF installation. This situation can result in delaying final approval for the entire building development permit, which in turn delays "occupancy approval" for the project.

### 2.5.5 Water Quality Benefit Offset Programs (Special Circumstances)

On projects where installation of stormwater controls for all or a portion of the site is entirely infeasible, the City requires that site developers/engineers submit a Special Circumstances application to qualify for an exemption. Site conditions that render controls infeasible include the following:

- Presence of steep slopes or landslide hazards.
- Presence of high groundwater.
- Presence of environmental contamination.
- Zoning laws that prevent adequate setbacks for infiltration.

Applicants must provide site-specific details documenting why onsite infiltration and/or treatment of stormwater is infeasible. Special Circumstance applications are thoroughly reviewed by experts specializing in site development plan review, SWMM policy administration, and engineering design. A consensus is required to determine if the applicant's rationale for infeasibility is valid. If so, then the applicant must pay an offsite management fee to receive site permit approval. Qualifying sites must pay a fee, which is rated and assigned per square foot of "unmanaged" impervious surface area.

Monies collected are used to fund the City's [Percent for Green](#) grant program, described in Section 2.2. Percent for Green projects often include multiple green infrastructure improvements such as de-paving, adding rain gardens, constructing green streets, or completing large-scale LID stormwater drainage improvements. The City works with grantees to develop and implement projects that will improve the environmental condition of Portland's watersheds.

### 2.5.6 Post-Construction Program Outreach

The City conducts robust outreach and engagement on the SWMM, especially when it is updated. The purpose is to gather input from land use planners, engineers, site developers, and other important partners, and to provide technical training for SWMM users. Outreach and engagement typically consist of:

- A 30-day public comment period and opportunity for a public hearing, followed by tracking and response to comments received.



- Proactive outreach to interested parties and regular users of the SWMM (e.g., engineers, landscape architects, design professionals, City practitioners, and interested community members). This includes sharing information on the City's website and conducting presentations prior to, during, and after publication to highlight and explain the requirements and changes. We also have SWMM [training videos](#) available online.
- Briefings to City advisory bodies, including the [Development Review Advisory Committee](#) and the [Portland Utility Board](#).
- Direct outreach to vendors for green infrastructure, soil specifications, and quality design of manufactured treatment technologies.
- Updated website details about [stormwater facility design](#).

### 2.5.7 Post-Construction Staff Training and Education

All staff responsible for implementing the City's SWMM receive training on a routine and ongoing basis. New hires are onboarded with training that covers all aspects of SWMM requirements. This includes a mandatory training presentation with management and plan review test exercises, which is then followed by job shadowing with lead mentors. After the initial training phase is completed, staff utilize specialized check lists and guidance documents summarizing the City's post-construction requirements and development permitting plan review procedures. "Live" permit review and approvals/disapprovals are screened by management until new employees have reached an acceptable level of competency. Site-specific plan reviews are then assigned to staff based on project complexity and staff level of proficiency and experience. One-on-one reviews are routinely conducted to address specific questions, and regular team meetings occur where cases and scenarios are discussed. Upon updates to the SWMM, plan review staff receive additional training that focuses on regulatory and procedural changes and implementation.

Staff involved in the development of our post-construction rulemaking engage regularly with regional professional organizations, such as the Green Infrastructure Leadership Exchange, regional and nationwide MS4s, and the local Association for Civil Engineers Environmental Working Group, among others.

## 2.5.8 Data Tracking

Information about development projects that trigger the SWMM is entered and stored in a proprietary database administered by BDS and used by all permitting plan review staff. Details recorded include property information, impervious area managed, stormwater facility type(s) and their performance objectives (e.g., infiltration, water quality), and infiltration testing information. Plans and permit-related documents such as storm and geotechnical reports, O&M Agreements, and Special Circumstances applications are uploaded into the system. Plan review status and site/facility inspections are also tracked. This information is then spatially mapped, which allows staff to evaluate SWMM trends on a city-wide scale.

### Key Performance Indicators

- Number of SWMM-related permits/projects with constructed SMFs.
- Number of land use reviews conducted.
- Impervious area acreage managed by SMFs.

### Goal

- Maintain and update the SWMM to align with performance standard requirements in the MS4 permit.
- Finalize a SWMM update by November 1, 2024.
- Conduct a technical evaluation of the current SWMM threshold related to new MS4 performance standards by June 30, 2024.<sup>18</sup>

### Reporting Milestones

- Annual number of SWMM-related permits/projects with constructed SMFs.
- Annual number of land use reviews conducted.
- Annual amount of impervious area acreage managed by SMFs.
- Progress on technical evaluation of SWMM threshold and update.

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<sup>18</sup> The City's current SWMM threshold is 500 square feet; however, the new MS4 permit pairs an increase of the threshold with more robust performance standards overall. By the November 1, 2024, deadline, the City will evaluate alignment of the standards with the new permit requirements, which may include changing the City's threshold.

## 2.6 Post-Construction Long-Term Operation and Maintenance

The City's Maintenance Inspection Program (MIP) ensures that SMFs installed under the SWMM are properly operated and maintained. The MIP team inventories, maps, and inspects SMFs. They conduct outreach, assistance, and enforcement activities in accordance with SWMM-required O&M Agreements. Details are provided below.

**Permit  
Schedule  
A.3.a.vi**

### 2.6.1 Ordinance

[MIP](#) operates under the same ordinance described previously, PCC Chapter 17.38 *Drainage and Water Quality*. In addition to imposing stormwater volume, flow, and quality standards, PCC Chapter 17.38 also authorizes the City to implement rules for the long-term O&M of controls installed under the SWMM. City [Administrative Rule ENB-4.31](#) further supports the regulation of source controls and SMF O&M. These rules are implemented in conjunction with the BES Enforcement Program Administrative Rules (Portland Policy Documents item ENB-4.15), described previously as part of the City's IDDE strategy.

### 2.6.2 Maintenance Inspection Strategy

MIP staff screens for new O&M Agreements finalized under the SWMM on a quarterly basis. Site and facility details are entered into a database, as described in the following section, which allows the team to map and plan the inspection strategy. There are currently around 16,000 SMFs in the MIP inventory, of which, roughly 40% are on single-family residential property. Inspections are conducted in accordance with the MS4 permit. Inspection criteria, as required by Chapter 3 of the SWMM, include the following types of observations. A copy of the current MIP inspection form is provided in Appendix B.

- **Infiltration and flow.** Inlet/outlet conveyance, filter media, sediment accumulation, site grading.

- **Vegetation.** Plant coverage, invasives coverage, dead or stressed vegetation, pruning, debris.
- **Structural.** Broken or damaged components, missing components, liner integrity, evidence of erosion.

Each inspection results in a rating of 1 to 3 (respectively, no corrective actions required, routine corrective actions required, corrective actions required with a deadline to correct), issuance of an inspection letter to the SMF operator detailing any required maintenance activities and setting a next inspection target date. Re-inspection dates are set based on SMF type and overall performance condition and/or potential for future non-compliance. MIP staff uses a flow-chart matrix to assign re-inspection dates. Most SMFs are set at 2-4 years for re-inspection. New SMFs that have not been inspected since installation are assigned a target inspection date of 1 year after the development permit is finalized.

MIP staff uses a risk-based inspection approach, prioritizing O&M inspections of SMFs on sites with higher pollution potential, which includes industrial, commercial, and multi-family residential properties. MIP further prioritizes inspections of SMFs furthest past their targeted next inspection date. MIP's enforcement strategy is described below.

### 2.6.3 Enforcement

MIP has an escalating enforcement approach to non-compliance with City O&M requirements. Enforcement actions are issued when: 1) corrective action deadlines outlined in the inspection follow-up are not met, 2) inspection access is not granted, or 3) there has been modification to or removal of an SMF. Any enforcement action not addressed by the responsible party will continue to escalate in accordance with the BES Enforcement Program Administrative Rules as described in the IDDE Strategy.

### 2.6.4 Data Tracking

The City records and maintains O&M details of SMFs in a database, which includes info on location, type, related development permit, property zoning, inspection dates, inspection results, corrective actions, and more. The City is in the process of migrating existing MIP data into a proprietary and more comprehensive asset management system, which will allow more functionality, the use of electronic/mobile inspection forms, and direct linking to the BDS permitting database. Enforcement actions are tracked in the BES enforcement program application (described in the IDDE strategy).

### 2.6.5 Long-Term O&M Outreach and Assistance

The MIP team conducts outreach and technical assistance to SMF owners and operators. When possible, MIP staff coordinates inspections with site and/or SMF operators to provide direct education and guidance on the SMF functions, appropriate maintenance techniques, current deficiencies, and ongoing O&M responsibilities. Each inspection is then followed up with a detailed letter that provides instructions specific to each SMF type onsite, including routine and required maintenance activities. MIP staff also sends annual outreach mailers to all single-family residential properties with vegetated SMFs. The mailer reminds or notifies the SMF owner of their required maintenance obligations and provides instructions on when and how often to complete important maintenance activities. The program also maintains a detailed [website](#) on all relevant BMPs for the long-term operation and maintenance of SMFs.

### 2.6.6 Long-Term O&M Staff Training and Education

MIP's training strategy is focused on new employee/inspector onboarding and ongoing refresher and professional development opportunities. Onboarding includes thorough review of existing regulations, program procedures and processes, and database applications. A heavy focus on job shadowing is emphasized with supervised inspections. Staff attend professional and trade conferences as available and receive training when SWMM regulations are updated. The MIP team meets regularly to discuss program activities to help ensure consistent implementation. Training and development for team members is conducted on an ongoing basis.

#### Key Performance Indicators

- Number of new SWMM O&M Agreements.
- Number of SMFs covered by new O&M Agreements.
- Number of SMFs inspected for long-term O&M.
- Number of corrective actions required and/or enforcement actions issued.

#### Goals

- Inspect 7,500 private stormwater facilities over five years.

#### Reporting Milestones

- Inspect 1,500 private stormwater facilities annually.

## 2.7 Pollution Prevention and Good Housekeeping Strategy for Municipal Operations

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It is important for MS4 operators to evaluate and properly manage their own actions and facilities to help prevent and reduce pollution in the stormwater conveyance system, on municipal roadways, storage lots, waste and maintenance facilities, parks and open spaces, and other such City-owned and -operated sites and services. The City conducts many activities to prevent pollution from its municipal operations. Our strategy includes a wide range of environmental BMPs that encompass the following:

- Maintenance of the MS4.
- Maintenance of roadways and transportation facilities.
- Deicing and anti-icing activities.
- Chemical usage in parks and natural areas.
- Waste management and litter control.
- Wastewater conveyance and treatment.
- Discharges from firefighting activities.

A detailed description of our strategy for these municipal/public operations is provided throughout this section.

### 2.7.1 MS4 Inspection, Maintenance, and Cleaning

The City has three different stormwater conveyance systems based on Portland's history and geography. Stormwater from most of the older, more historic areas of town, including much of Downtown and the Central Eastside, drain to the combined sanitary system, which ultimately flows to the City's Columbia Boulevard Wastewater Treatment Plant. Stormwater managed by City systems outside of the

**Permit  
Schedule  
A.3.f**



combined sewer area either flow deep into the ground via UICs or to surface water rivers and streams via the MS4. (See [Figure 1](#) for details.)

The City uses an integrated asset management approach for the inspection, maintenance, and cleaning of MS4 components. Core to this approach is the technical evaluation of both the “likelihood” and “consequence” of system failure in order to determine the highest priorities. This often involves considering a range of environmental, economic, and social factors. The City’s approach is balanced within a strategy that prioritizes environmental and public health risks from and between each of the four City conveyance systems (sanitary sewer, combined sewer, UIC system, and MS4).

BES owns and operates much of the City’s storm and wastewater utilities with the assistance of a critical partnership with PBOT, which performs much of the in-field maintenance and cleaning work. BES determines specific maintenance schedules and needs and generates work orders for PBOT actions. Respective roles and responsibilities are set out in a Cooperative Work Agreement between bureaus. The inspection and maintenance regimen is based on “asset type” (e.g., storm inlets, pipes, and structural treatment controls). MS4 components are grouped into two broad categories: conveyance assets and water quality assets.

### Stormwater O&M Inspection and Cleaning Activities

BES maintains a highly detailed *Stormwater Operations and Maintenance Manual* that serves as internal guidance to City staff on specific levels of service, maintenance procedures, and disposal methods for the different types of infrastructure components.

- **Storm inlets.** The City currently has over 55,000 storm inlets, or catch basins, in its asset inventory. O&M activities include:
  - Inspection for evidence of cracks or exposed aggregate. Repair or replacement as needed.
  - Inspection for obstructions and clogs. Remove obstructions and/or schedule cleaning if needed.
  - Cleaning if sediment has filled 50% or more of the design capacity or is blocking the pipe.
- **Drainage ditches.** There are currently nearly 100 miles of open roadside channels that convey stormwater runoff. Ditches may be native soil, or lined with rock or vegetation. Vegetation is usually prevalent and encouraged because it stabilizes the

channel against erosion, reduces flow velocity, and removes pollutants. O&M activities include:

- Inspection for overall condition and function, erosion, sediment, and debris build-up and vegetation overgrowth.
- Inspection of the road edge and shoulder, which should be largely free of erosion, sediment, and debris build-up and vegetation overgrowth. Schedule erosion repair or shoulder scraping if needed.
- Inspection of ditch channels to ensure they are largely free of erosion, sediment, and debris build-up and vegetation overgrowth.
- Cleaning if ditch capacity is blocked by 50% or more.
- **Trash racks.** There are currently over 300 trash racks in our MS4 that catch large debris. Trash racks are typically located where surface stormwater flows out of unimproved areas.
  - Inspection and cleaning multiple times each year, with a goal to inspect quarterly and in response to severe weather events for high-priority trash racks. Inspection for function, access, debris, and defects posing an immediate hazard.
  - Clear debris from racks at each inspection. Rack grates shall be structurally sound and clear of vegetation, debris, and sediment. Schedule cleaning or structural repair if needed. Rack frames or structures shall be structurally sound. Schedule structural repair if needed.
  - Observe trash rack identification signage to ensure it is intact, legible, and unobscured by vegetation. Schedule repair or vegetation clearing if needed.
  - Ensure access routes are clear and safe to use. Schedule vegetation clearing if needed. Schedule installation or repair of trail and/or steps if needed.

- **Structural water quality treatment facilities.** The City owns many different types of water quality treatment systems throughout the MS4. This includes features such as dry and wet ponds, infiltration basins, green streets, sedimentation traps, vegetated swales, and proprietary filter systems and hydrodynamic separators.

- Wet ponds, spill ponds, dry ponds, and infiltration basins. All ponds and basins are inspected at least twice each year: spring and fall. Observations are made for overall condition and function, structural aspects, vegetation, access, sediment level, signage, and more.

Vegetation maintenance, grading, repair, cleaning, or other restoration is scheduled if needed. Triggers: Pipe capacity is blocked by 25% or more. Forebays are not structurally sound and/or have less than 50% of design volume remaining for sediment accumulation. Pond capacity has filled 50% or more with sediment. Embankments and slopes have significant erosion, settlement, and/or holes. Schedule restoration if needed.

- Vegetated swales. All vegetated swales are inspected a minimum of twice each year: spring and fall. Observations are made for overall condition and function, vegetation health and coverage, structural components, access, sediment level, signage, and more.

Vegetation maintenance, grading, repair, cleaning, or other restoration is scheduled if needed. Triggers: Pipe capacity is blocked by 25% or more. Forebays are not structurally sound and/or have less than 50% of design volume remaining for sediment accumulation. Swale capacity has filled 50% or more with sediment. Embankments and slopes have significant erosion, settlement, and/or holes. Accumulated sediment is 2 inches or greater in depth, or is harming vegetation. Schedule restoration if needed.

- Green streets. During the first 2 years after construction (i.e., the establishment period), vegetation maintenance and irrigation is conducted as specified:
  1. Maintenance and/or inspection at least four times per year.
  2. Irrigation 12 to 16 times per growing season (May 15 to September 30). Irrigation may be adjusted to an as needed basis if quantifiable precipitation allows.
  3. Replanting, as needed, to achieve 90% vegetative cover.

4. Tree replanting, as needed, if trees have failed.

Beginning in year three after construction, all green streets are maintained on an as needed basis with guidelines for specified minimums based on functional condition assessment:

1. Maintenance and/or inspection at least three times per year.
  2. Irrigation on an as needed basis or up to 12 to 16 times per growing season (May 15 to September 30) for 2 years, for green streets that have been replanted in the previous planting season.
  3. Replanting to occur, as needed, to achieve 75% vegetative cover.
  4. Tree replanting, as needed, if trees have failed.
- Manufactured or proprietary treatment devices. All manufactured water quality treatment structures are inspected concurrently with planned maintenance of the facility, or independently for a minimum of once each year in the summer. Summer inspections are timed to identify any maintenance needs prior to the wet season. Inspections are conducted for overall condition and function, structural defects, access, and sediment levels.

Cleaning trigger: Sediment has filled 50% or more of design capacity.

Manufactured water quality treatment structures have specialized inspection and maintenance procedures that vary depending on the specific type and manufacturer. Manufacturer documentation shall be referenced to effectively perform inspection and maintenance on these facilities.

## 2.7.2 Stormwater O&M Staff Training and Education

Staff training and education related to stormwater O&M includes the following:

- Comprehensive onboarding for all new employees.
- Periodic, annual or seasonal training for specific job classes and specialized tasks.

### Key Performance Indicators

- Number of inspections by asset type.

- Number of repairs and/or cleanings by asset type.
- Percentage of inspections versus total MS4 asset inventory.

### Goals

- Adapt the current internal O&M guidance as a public-facing document by November 1, 2025.
- Provide or reference in the SWMP Document an alternate risk-based inspection and maintenance schedule for inlets in accordance with permit Schedule A.3.f.ii. by November 1, 2025.

### Reporting Milestones

- Annual number of inspections by asset type.
- Annual number of repairs and/or cleanings by asset type.
- Initiate update of the current O&M guidance by June 30, 2024, and report progress thereafter.

## 2.7.3 Roadways and Transportation

The City is responsible for a complex network of roadways. In fact, the very definition of an MS4 means a “conveyance or system of conveyances including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made channels, or storm drains...”

Transportation corridors are critical for commuters and moving commercial goods, but they can also convey pollution from traffic, including heavy metals from tires, brakes, and engines, along with gasoline, petroleum, and other toxic fluids. Proper environmental management of our roadways is a key principle of the MS4 permit, but also critically important is public safety and hazard prevention. In some cases, necessary or even mandated safety measures can be at odds with the environment, such as the activity of road-salting (see the Winter Operations and Maintenance Strategy, next section). The City continuously strives to find the proper balance between public safety and watershed health in our roadway O&M practices.

We implement a variety of BMPs in and around City roadways to prevent and control pollution. These BMPs include both structural and non-structural controls, such as street sweeping, spill prevention, green streets, storm drain cleaning, erosion control, eco-friendly product procurement, and other controls related to the O&M of City roadways.

PBOT is responsible for maintaining the City's roads and related infrastructure. There are also other MS4-permitted jurisdictions in the greater Portland area that own and operate their own roadway systems, such as ODOT, Multnomah County, and the Port of Portland.<sup>19</sup>

The PBOT *Maintenance Environmental Handbook* is an internal guide developed under our former MS4 permit to ensure PBOT field crews have easily accessible information on handling wastes, erosion, control measures, spill control and prevention practices, vehicle fueling/washing, invasive plant management, and working near or in waterways. Several key BMPs described in the handbook and used to manage the City's roadways include:

- **Material removal.** The Street Leaf Removal Program removes about 5,000 tons of leaves and debris from roadways each year for both environmental and public safety purposes. The [service area](#) includes routes with mature street trees and dense canopy where fallen leaves tend to clog catch basins and cause hazardous road conditions or localized flooding.
- **Street sweeping.** The City's [street cleaning program](#) removes dirt and debris from our roadways. Removal of sediment, litter, leaves, and debris helps prevent street flooding and the discharge of pollutants to waterways. The City sweeps over 4,000 lane miles of curbed streets in Portland each year, including residential streets and major arterial streets. The public can even access an interactive [map showing day and night routes](#) for street cleaning.
- Additional BMPs that the City uses for roadways include the following:
  - Referencing and adopting key BMPs from ODOT's "Blue Book," or [Routine Road Maintenance Water Quality and Habitat Guide](#).
  - Using low-disturbance sign installation methods to avoid or minimize digging and using mild cleaners, with no solvents, to clean signage.
  - Monitoring weather conditions during asphalt grinding to avoid runoff.
  - Hand-applying asphalt where necessary to prevent materials from entering the MS4.

### Key Performance Indicators

- Street sweeping frequency by major roadway type.
- Amount of material removed from City roadways (tons or cubic yards).

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<sup>19</sup> The Port of Portland is a co-permittee on the City of Portland's MS4 permit.



## Goals

- Review the PBOT *Maintenance Environmental Handbook* for needed updates by November 1, 2024 and, if determined appropriate, revise and make available as a public facing document by November 1, 2025.

## Reporting Milestones

- Annual number of inspections by asset type.
- Annual number of repairs and/or cleanings by asset type.
- Initiate review of the PBOT *Maintenance Environmental Handbook* by June 30, 2024, and report progress thereafter.

### 2.7.4 Winter Operations and Maintenance Strategy

The City has established procedures to address the operational and safety challenges that arise from serious snow and ice events. PBOT maintains and follows a detailed *Snow and Ice Response Plan* that includes specifications on equipment, materials, critical routes, coverage areas, and stormwater and other environmental controls and protocols.

PBOT's anti-icing and deicing strategies are consistent with guidance from the Federal Highway Administration's *Manual of Practice for an Effective Anti-Icing Program*, the Pacific Northwest Snowfighters Association, ODOT, and other local or regional agencies. Public safety and travel during extreme inclement weather in Portland is most efficiently managed with liquid deicer, magnesium chloride ( $MgCl_2$ ) and solid, granular "road salt" (sodium chloride, or NaCl). PBOT also provides information about snow and ice response to the public:

- [PBOT \(Winter\) Weather hub](#) page with links to maps, information, and programs.
- [Webmap of snowplow routes](#), locations, cameras, and closure notices.

The City's Winter Operations and Maintenance Strategy outlines procedures and BMPs to ensure compliance with the MS4 permit. The City strives to keep Portlanders safe while minimizing the impact of operations on the environment and waterways. Details related to materials management, tracking, training, and more are listed below:

- **Materials storage.** Solid materials (road salt, gravel) are stored in dedicated bins at a PBOT facility located in the combined sewer area. Salt is covered and shielded from the wind, and all truck-based salt spreaders are fitted with specially made tarps to

keep the salt dry and in solid form while stored and/or transported. Long-term storage for deicing liquid ( $\text{MgCl}_2$ ) has secondary containment.

- **Conservative application rates.** PBOT applies the appropriate amount of salt, deicing liquid, and gravel as necessary to create safe conditions on City streets. All salt spreaders are calibrated, and all salt and sand spreaders are capable of variable application rates. Crews are instructed each year to apply only the amounts needed and no more. Each salt and deicing crew is supervised by staff that are trained and familiar with salt application procedures and best practices and use appropriate application rate guidelines. Gravel is used in targeted areas for greatest impact and reduced cost of cleanup.
- **Tracking.** PBOT maintains anti-icing and deicing logs in the form of GPS-enabled maps and provides these map logs that show application rates, locations, and times of application of each material used across the City. Coordination with BES on location and frequency of application is ongoing in order to identify areas where water quality impacts may be greater on sensitive habitats and listed species and to protect environmentally sensitive areas.
- **Coordination.** Every regional roadway operator, including the State of Oregon; Port of Portland; Multnomah, Clackamas, and Washington counties; and the City of Portland performs snow and ice response operations on streets under their jurisdiction in accordance with established priorities and protocols. The connectedness of our roadway system mirrors the need for an interconnected snow and ice response plan. As such, the City coordinates and maintains partnerships with these jurisdictions to ensure effective and responsible management of roadways during snow and ice events. Each year a pre-winter season interagency coordination meeting is held to prepare for a proper and coordinated response. This includes representatives of PBOT, Portland Water Bureau, Portland Police Bureau, PF&R, Portland Bureau of Emergency Management, Multnomah County, ODOT, and local hospitals and school districts. The goal is to share the snow and ice plan with the agencies and organizations, receive feedback and guidance, and foster communication and cooperation.

### 2.7.5 Roadways and Winter O&M Staff Training and Education

The City continues to provide educational training to staff on O&M and construction practices to protect water quality. Specific training efforts related to roadway maintenance include the following:

- Training on the PBOT *Maintenance Environmental Handbook* for street maintenance crews. This ensures that crews have easily accessible information on handling wastes, erosion control measures, spill control and prevention practices, vehicle fueling/washing, invasive plant management, and working near or in waterways. The handbook is used to guide employee training sessions and made available for reference by PBOT staff.
- This training is given to all new employees and to specific work crews as needed thereafter.
- All crews directly responsible for winter maintenance activities receive training on BMPs associated with the Pacific Northwest Snow Fighters Association prior to the start of the winter season in October.
- Each year, the Snow and Ice Working Group organizes a series of trainings for all staff to learn new information, share knowledge, and test equipment. Drivers are trained in the use of plows, chaining, spreader controls, deicing and anti-icing procedures, snow routes, and communications.
- Salt and anti-icing crews are trained in snow and ice application rate guidelines and procedures and on how to operate application tracking map logs annually. They are reminded of the environmental harm that results from non-compliance and why it is so important to be careful stewards of the environment while making the roadways open for emergency services and safe for the traveling public.

#### Key Performance Indicators

- Deicing and anti-icing materials used.
- Number of winter weather events where deicing and/or anti-icing material are used.
- Quantities and general location(s) of materials used (e.g., estimates of salt used based on routes or distance).

#### Goals

- Minimize, to the MEP, the environmental impacts or potential environmental impacts from the storage and deployment of deicing and anti-icing materials.

#### Reporting Milestones

- Deicing and anti-icing materials used annually.

- Number of winter weather events where deicing and/or anti-icing material was used annually.
- Quantities and general location(s) of materials used (e.g., estimates of salt used based on routes or distance annually).

## 2.7.6 Integrated Pest Management: Pesticide and Fertilizer Use

The City has a well-established strategy to minimize the use and exposure of pesticides and fertilizers. This is especially relevant to our management of the City's extensive parks network. PP&R's strategic plan and asset inventory, [Park System by the Numbers](#), emphasizes a parks program that integrates with operations, financial planning, and performance management. PP&R implements many BMPs that prevent stormwater pollutants from the City's diverse parks system. For example, PP&R became the first City bureau to achieve [Salmon-Safe certification](#) in 2004.<sup>20</sup>

The City's use of pesticides and fertilizers is centered around the principles of integrated pest management (IPM), which focuses on long-term prevention of pests and their damage to the natural environment through a combination of techniques, such as biological controls, strategic habitat management, responsible cultural practices, and use of resistant plant varieties. The goal is to manage pests that are harmful to the health, function, or aesthetic value of park landscapes in an efficient, effective, and environmentally responsible manner, while paying careful attention to public and employee safety. The City's [IPM strategy](#) is available online. Our IPM [principles](#) first dictate a determination of whether a pest actually needs to be managed, and if so, when, where, and how best to do it.

The IPM process ensures that the most effective, low-risk methods and materials are used to manage pests. IPM and the program guidelines are used by staff in multiple City bureaus, including PP&R for the City's parks and recreational facilities, PBOT for vegetated areas adjacent to roadways, and BES for natural and green infrastructure areas. Examples of IPM principles include:

- Mulching planting beds to prevent new weeds.
- Proper mowing and irrigation of park turf to increase vigor and reduce weed populations.

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<sup>20</sup> The certification was renewed in 2012 and again in 2018. Practices and principles required for Salmon-Safe certification generally align with water quality objectives of the MS4 permit and SMWP but are not directly related or interdependent.

- Pruning plants to increase air circulation, helping to suppress some diseases.
- Using correct fertilization rates to encourage plant health and pest resistance.
- Using plants with natural pest resistance.
- Aerating and overseeding turf to encourage healthy grass.
- Applying carefully selected herbicides to control invasive weeds.
- Release of natural biological control insects.

The City's IPM efforts also include reducing water and fertilizer inputs on park properties, restoring riparian and upland habitats, and using alternatives to pesticides. The IPM program is regularly evaluated and adapted through reliance on the best available scientific expertise and assessments from the EPA, the World Health Organization, and regional universities.

### **2.7.7 IPM Staff Training and Education**

The cornerstone of PP&R's IPM program is our trained staff, which includes horticulturalists, ecologists, technicians, and specialists. Their understanding of plant and landscape needs makes decision-making about which IPM option to use in individual cases possible. PP&R's policies require that personnel who apply pesticides of any kind are required to maintain an Oregon Public Pesticide Applicators license, administered by the State of Oregon. To keep this license, personnel are also required to attend continuing training and education where they learn about the latest pest management techniques and materials. Our licensing requirements exceed state and federal standards. PP&R is committed to this higher level of training for our applicators. PP&R's IPM Coordinator develops and refines the overall program and ensures that regulatory requirements are met. The coordinator also researches IPM science, develops pest management strategies, trains staff, and communicates with the public and other bureaus.

### **2.7.8 Sewage Release Prevention**

The City actively works to identify, prevent, and repair sanitary sewer problems that can cause harmful releases, or seepage, of wastewater to the MS4 and surface waters. Under the City's NPDES wastewater regulations and as part of a risk-based asset management program, BES performs in-depth technical analyses, preventative source control programs, and robust maintenance activities on combined and sanitary sewer systems. This includes identifying areas where collection system infrastructure may be in poor condition or at risk of failure. The City uses a variety of tools such as scoping pipes using TV equipment, O&M inspections of sewer

manholes, jetting and cleaning sewer pipes, and prevention programs to reduce sewer blockages, such as our [Cut Through the FOG](#) program. The City also uses an integrated planning approach to asset management that further helps identify sewer release risks, such as spatial and condition analysis of sewer pipe and stream crossing intersections.

BES also implements PCC Title 17.33 for [Mandatory Sewer Connections](#), which requires properties using onsite wastewater disposal systems or [non-conforming](#) private sewer systems to connect to an available public sanitary sewer collection system.

Many of these activities are tracked and reported under the City's NPDES [wastewater](#) regulations and associated Capacity, Management, Operation, and Maintenance requirements.

### 2.7.9 Firefighting Training Activities

PF&R is Oregon's largest fire and emergency services provider. PF&R operates and maintains a network of fire stations and associated fleet equipment to fulfill its mission for public health and safety.

Discharges to the MS4 from fire hydrant flushing and emergency firefighting activities are allowed under the MS4 permit. However, such discharges from PF&R activities are appropriately managed by the City's infrastructure and BMP controls. The potential for harmful discharges from PF&R activities are prevented from entering the storm system as follows:

- **Discharges from training exercises.** Firefighting training activities occur at PF&R's training facility located at 4800 NE 122nd Avenue. Discharges from these non-emergency training activities are routed to the City's sanitary sewer.
- **Equipment washing.** Equipment washing is generally conducted at all fire stations. Per PF&R policy, all washing occurs inside station apparatus bays, where water is discharged to the City's sanitary sewer, typically through an oil/water separator.
- **Equipment maintenance.** Equipment maintenance and repair is performed at PF&R's logistics facility, located at 1135 SE Powell Boulevard, which is in the City's combined sewer area and drains to the sanitary sewer system.



## 2.8 Industrial and Commercial Facilities Strategy

The City's strategy to reduce pollutants in stormwater discharges from industrial and commercial facilities consists of two primary activities. Our Industrial Stormwater Management Program and the Source Control Manual work in tandem to control pollution from both pre-existing and development sites that pose high pollution risks from onsite activities and land uses. The City also conducts outreach activities to industrial and commercial facilities as part of its Public Education and Outreach Strategy.

### Permit Schedule A.3.g

### 2.8.1 Industrial Stormwater Program

The City's [Industrial Stormwater Program](#) (ISW) prevents and reduces pollution from industrial and commercial facilities, primarily through an agreement with DEQ to administer General NPDES Industrial Stormwater [1200-Z and 1200-A discharge permits](#). ISW also implements legal [code authority](#) to ensure that facilities posing an elevated pollution risk to the City's MS4 are properly controlled.

#### 1200-Z and 1200-A NPDES Permit Administration

ISW operates under an IGA with DEQ to administer 1200-Z and 1200-A Industrial Stormwater Discharge Permits for required sites within the City of Portland. The City coordinates regularly with DEQ on all matters related to program administration and enforcement. This program is implemented both within and outside the City's MS4 (areas that discharge directly to water bodies without being conveyed by the MS4 are outside of the MS4). Portland has been using this approach since the mid to late 1990s. It is highly effective for preventing and reducing pollution from sites with the potential to contribute significant pollutant loads to Portland's waterways.

DEQ's 1200-Z and A permits include a robust set of water quality requirements for runoff from certain industry types. The requirements

are especially comprehensive for sites with stormwater discharges to the [Portland Harbor](#) region of the Lower Willamette River and to the [Columbia Slough](#). Those areas serve as the main industrial corridors in Portland. Dischargers to Portland Harbor or the Columbia Slough are required to apply for 1200-Z or A permit coverage based on the exposure of certain onsite industrial activities to rainfall. ISW's administrative activities for this program include:

- **Site screening.** Identification of, and notification to sites requiring permit coverage. (See "Facility Screening" below).
- **Document review.** Review and approval or disapproval of the site's permit application, including the Stormwater Pollution Control Plan, prior to a public comment period.
- **Inspections.** Detailed compliance inspections of permitted sites. (See "Site Inspections" below).
- **Monitoring evaluation.** Review of facilities' stormwater monitoring results.
- **Enforcement.** Enforcement actions for permit violations, including referral to DEQ for formal state enforcement and/or City Code violations. (See "Enforcement" below).
- **Technical assistance.** Technical assistance and outreach to permitted facilities. (See also the Public Education and Outreach Strategy in Section 2.1.)
- **Assessment of exemptions.** Identification and inspection of sites that qualify for exemption from 1200-Z/A permit coverage via the No Exposure Certification (NEC) process. Review and renewal of expiring NECs.

### Facility Screening

ISW screens existing and new industrial and commercial facilities to assess whether they may be subject to the 1200-Z/A permit and/or have the potential to contribute high levels of pollution to the MS4. The City's screening activity is conducted on an ongoing basis through a variety of methods:

- **Surveys.** Review of industrial surveys administered by the City's [Industrial Pretreatment Program](#), which contains relevant site drainage and activity details.
- **EPA toxics info.** Regular review of the [EPA Toxics Release Inventory](#) report for facilities subject to [Section 313 of Title III of the Superfund Amendments and Reauthorization Act \(SARA\)](#) to scan for compliance with state and local stormwater regulatory requirements.

- **Referrals and complaint response.** Assessment and follow-up of referrals and complaints from internal and external parties.
- **Field reconnaissance.** Oversight of regulated facilities is typically organized on a geographic or watershed basis within Portland. The team spends a considerable amount of time in the field performing investigations and site inspections. This approach allows our ISW experts to become familiar with the environmental and business dynamics of their assigned watershed area.
- **Priority area screening.** ISW works with other bureau partners and DEQ to research and conduct inspections of certain priority areas in Portland. This may be related to waterway contamination drivers, capital project improvement areas, or other drivers. ISW's current focus is to evaluate non-permitted industrial and commercial facilities in targeted areas of the Columbia Slough Watershed in coordination with the City's [Columbia Slough Sediment Program](#). This involves proactive site assessment and inspections to determine if additional pollution controls, stormwater permitting, and/or City Code requirements may be necessary to ensure additional water quality protections.

ISW's screening typically results in one of the following outcomes:

- No further action required.
- Requirement to apply for 1200-Z or A NPDES permit or certify a condition of "no exposure" via the NEC process.
- Requirement to implement controls to reduce or eliminate the potential significant pollutant load to the MS4, which may include submittal of a Source Control Plan.
- Onsite inspection to further categorize activities and stormwater discharge destination(s) to determine DEQ and City stormwater control requirements. This is typically referred to as an Under Staff Review (USR) inspection, which results in one or more of the three outcomes above.

## Site Inspections

Inspection procedures and frequency vary depending on the type of inspection. Inspections are documented using a detailed inspection form, site maps where applicable, and photographs. Copies of ISW inspection forms are included in Appendix D. Each inspection is followed up with a detailed letter documenting the results of the inspection, including any deficiencies. Inspection

results and follow-up and/or enforcement actions are entered into a database, as described later under “Data Tracking.”

The ISW Program performs different types of facility inspections that include the following:

- **1200-Z or A permit compliance inspections.** Procedures involve conducting pre-inspection preparation, including a detailed review of the site file (including the site’s Storm Water Pollution Control Plan, monitoring data, compliance history, and previous inspection). Onsite inspections involve observations of all outdoor areas with a focus on activity and stormwater drainage areas, interior loading/unloading areas, and detailed document and recordkeeping review. ISW inspectors then conduct an overall assessment and determination of compliance with the requirements. Enforcement actions are assessed and issued, as described below.
- **Non-permitted site inspections.** This includes sites identified through the general screening process described above and NEC sites. New sites identified through screening are referred to as USR sites and have a particular inspection form and protocol. Preparation procedures for USR sites usually involve extensive property research, including business activities and site plumbing/drainage infrastructure and generation of a site file. NEC sites already have an established site file.

In preparation for a site inspection, ISW reviews the existing site file, prior correspondence, any City-required Source Control Plans, and facility details in the tracking database. Onsite inspections include a discussion of applicable regulations with site operators and technical assistance, inspection of all outdoor activity and stormwater drainage areas, interior loading/unloading areas, and a check for potential illicit discharges or connections. Post-inspection activities include a follow-up letter describing the results and a determination of NPDES permit, NEC renewal eligibility, and/or City Code requirements. Details are entered and tracked into a database as described below.

- **Priority area screening inspections.** The process and preparation for these sites are similar to the non-permitted site inspections, as described above, but are catered to the needs of the particular area and environmental driver. Onsite inspections include a thorough observation of potential high-risk pollution areas, necessary BMPs and source controls, and a discussion of applicable regulations. Post-inspection activities include a follow-up letter describing the results and a determination of the NPDES permit, NEC renewal eligibility, and/or City Code requirements. Details are entered and tracked into a database as described below in “Data Tracking.”

## City Requirements for Additional Stormwater Controls

Some commercial and industrial facilities with the potential to contribute elevated pollution to the MS4 are *not* subject to Oregon's NPDES Industrial Stormwater Discharge permit. Also, some sites may qualify for an NEC but still pose a water quality risk to the MS4, as determined by the City. In these types of situations, ISW uses City Code authority to impose pollution source controls. The City exercises the ability to require an enforceable Source Control Plan to ensure ongoing implementation of BMPs. ISW has identified the following types of sites or activities that have high potential to discharge pollutants to the MS4:

- Sites that removed exposure of industrial activities to qualify for exemption from 1200-Z/A permitting (i.e., NECs, but have higher potential to lapse if BMPs are not strictly implemented).
- Sites *not* subject to Oregon's 1200-Z/A permit, but still have elevated risk of spills or pollution discharge to the MS4, such as from outdoor storage of liquids or onsite fueling, sediment track-out, or other high-risk activities.
- Discharges of allowable non-stormwater to the MS4 that require BMPs to reduce potential pollution.<sup>21</sup> ISW issues discharge authorizations for short- or long-term discharges. Examples include dewatering from construction sites, groundwater from well-pump tests, and dechlorinated commercial swimming pool discharges.

## Enforcement

The City's ISW Program has a two-pronged enforcement approach. Enforcement related to 1200-Z/A permit violations are referred to DEQ as the formal permitting authority. Enforcement related to local code violations are processed by the City. Details are as follows:

- **1200Z/A enforcement.** ISW coordinates directly with the DEQ on NPDES related enforcement and adheres to DEQ's water quality violation guidance. For "warning" level violations (e.g., first time), the City issues a Warning Letter enforcement action noting the permit violation(s) and corrective measures required. Any escalating violations, including failing to comply with a Warning Letter and failure to apply for a permit, are referred to DEQ's Office of Compliance and Enforcement via a Pre-Enforcement Notice (PEN). The notice is a more extensive packet of information detailing the permit violation(s), violation history, and other details as required by the DEQ Office of Compliance and Enforcement.

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<sup>21</sup> Allowable non-stormwater discharges are listed in the MS4 permit on page 2 (Schedule A.1.d).

- **City Code enforcement.** ISW issues enforcement actions to commercial and industrial sites (both permitted and non-permitted) for non-compliance with [PCC Chapter 17.39](#) and the BES Enforcement Program as described in the IDDE Strategy (Section 2.3). This is typically for violations related to required preventative BMPs and pollution source controls for stormwater runoff to the City's MS4.

### Assessment and Tracking of Compliance with Municipal Ordinances

All sites evaluated and inspected by ISW are subject to compliance with [PCC Chapter 17.39, Storm System Discharges](#) (described in the IDDE Strategy) and associated [Administrative Rule ENB 4.13, Administrative Rules for Discharges to the City Storm Sewer and Drainage System](#).

Compliance is assessed primarily through the inspection process and tracked electronically, as described in the following section. Non-compliance results in escalating enforcement in accordance with BES Enforcement Program administrative rules, described in detail in the IDDE Strategy.

### Data Tracking

ISW Program activity data is primarily stored and tracked in a proprietary software application. Data includes details on facility location and activity type, City or State water quality permitting status, and permit administration specifics (monitoring data, inspection dates/types, violations, and enforcement actions). Additional records, including correspondence, discharge monitoring reports, compliance documents, and enforcement actions are stored electronically and available in either hard copy and/or the City's electronic file storage network. City-issued enforcement actions are also tracked in an enforcement-specific database described in the IDDE Strategy.

## 2.8.2 Industrial Stormwater Staff Training and Education

The training strategy for ISW staff focuses on onboarding for new employees and ongoing refresher and professional development for all team members. New employees receive training on existing state and federal industrial stormwater regulations, program procedures, and management systems. ISW has a heavy focus on job shadowing and management and/or mentor-supervised inspections for newer employees. All ISW staff attend professional and trade conferences, which often occur on an annual basis. Trainings and discussions are also facilitated when relevant regulations change. Staff receive refresher training periodically on subjects such as inspection expectations and monitoring report compliance review. The ISW team meets regularly to discuss program activities to help ensure consistency in program implementation. Training and development for team members are conducted on an ongoing basis.

### Key Performance Indicators

- Number of 1200-Z/A permits administered.
- Number of 1200-Z/A site inspections.
- Number of 1200-Z/A violations with enforcement actions.
- Number of non-permitted site inspections.
- Number of NECs issued/reissued.
- Number of new City-required Source Control Plans approved.

### Goals

- Reduce pollution from industrial and commercial sites by performing over 1,000 site inspections and associated follow-up over 5 years.

### Reporting Milestones

- Inspect all 1200-Z/A permitted facilities and review associated monitoring results once per year.
- Perform ongoing screening to identify new facilities subject to industrial stormwater permitting or City Code requirements.
- Conduct 30 inspections of non-permitted sites per year.
- Inspect NEC sites upon or prior to the 5-year NEC expiration date.

## 2.8.3 Source Control Manual

The City's [Source Control Manual](#) (SCM) is another substantial policy that prevents pollution from high-risk activities in Portland. Similar to the SWMM, it is an administrative rule that is adopted, implemented, and enforced by BES. The purpose of the SCM is to describe source control requirements specific to certain higher-risk types of development and post-development activities that have the potential to discharge pollutants to surface waters, groundwater, or the City's storm, sanitary, or combined sewer systems. A source control is a structural, treatment, or operational BMP to prevent or control the release of pollutants generated by certain site activities or characteristics. The SCM requires BMP controls for [site uses](#) like food cart pods, commercial waste storage, loading docks, fleet storage, materials processing areas, fuel transfer and fuel dispensing, equipment and vehicle washing, repair and maintenance areas, exterior



storage, and dewatering. The SCM is authorized by PCC Chapters [3.13](#), [17.34](#), [17.38](#), and [17.39](#) and their respective administrative rules. It was most recently updated in 2020.

#### **2.8.4 Commercial and Industrial BMP Outreach**

Various City programs provide both direct and indirect education and technical assistance outreach to commercial and industrial facilities. The ISW Program, described previously, conducts ongoing pollution prevention outreach to facilities. Technical assistance is provided during inspections and in correspondence with both permitted and non-permitted sites. ISW also maintains web-based guidance and BMP fact sheets focused on specific pollution controls for higher-risk activities. This information is kept up to date and coordinated with additional team efforts.

As discussed in the Public Education and Outreach Strategy, the City also supports the P2O team and [EcoBiz](#) program efforts. Technical assistance is provided to businesses at no cost on BMPs for spill prevention, fleet washing, and many other pollution prevention techniques.

The City also implements a [Groundwater Protection Program](#) that conducts outreach to commercial and industrial facilities in the Columbia South Shore Well Field Wellhead Protection Area for compliance with Portland's drinking water regulations. The rules and policies are designed to prevent contamination of local groundwater sources used as our community's drinking water when necessary. Since much of the [area](#) overlaps with the City's MS4, the outreach is beneficial to both the stormwater and drinking water programs. Businesses are required to implement structural and operational BMPs to manage harmful chemicals and prevent and mitigate spills. The City's outreach to facilities includes activities like technical assistance inspections, workshops, and distribution of free spill kits, containment pallets, and spill response signage.

Table 3. Pollutants Addressed by Stormwater Program Control Strategies																		
SECTION    MANAGEMENT STRATEGY		POLLUTANTS ADDRESSED							STRATEGIES SUPPORTED									
		Bacteria	Heavy Metals <sup>1</sup>	Nutrients	Toxic Organic Compounds	Sediment / Solids	Mercury	BOD	Temperature	Education & Outreach	Public Involvement & Participation	Illicit Discharge Detect/Eliminate	Erosion Control	Post-Construction (New, Re-Dev)	Post-Construction Long-Term O&M	O&M, Pollution Prevention	Industrial & Commercial	Ecosystems
Public Education & Outreach Strategy																		
2.1.1	General Environmental Outreach	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2.1.2	Clean Rivers Education Programs	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2.1.3	Regional Clean Water Partnerships	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2.1.4	Household Waste & Recycling	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2.1.5	Parks & Pet Waste	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2.1.6	Pollution Prevention Outreach	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2.1.7	Alternative Transportation	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2.1.8	City Leadership & Elected Officials	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Public Involvement & Participation Strategy																		
2.2.1	Public Website	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2.2.2	Watershed Education & Stewardship	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2.2.3	Grants Programs	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2.2.4	Community Engagement Initiative	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Illicit Discharge Controls																		
2.3.1	MS4 Map	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2.3.2	Ordinance	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2.3.3	Illicit Discharge Detection & Elimination Program	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2.3.4	Dry-Weather Field Screening Program	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2.3.5	Enforcement	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2.3.7	Staff Training & Education	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2.3.8	Services Related to Homelessness	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Table 3. Pollutants Addressed by Stormwater Program Control Strategies																		
SECTION    MANAGEMENT STRATEGY		POLLUTANTS ADDRESSED							STRATEGIES SUPPORTED									
		Bacteria	Heavy Metals¹	Nutrients	Toxic Organic Compounds	Sediment / Solids	Mercury	BOD	Temperature	Education & Outreach	Public Involvement & Participation	Illicit Discharge Detect/Eliminate	Erosion Control	Post-Construction (New, Re-Dev)	Post-Construction Long-Term O&M	O&M, Pollution Prevention	Industrial & Commercial	Ecosystems
Erosion Control for Construction Site Runoff																		
2.4.1	Ordinance	●	●	●	●	●	●	●		●	●	●	●	●		●		
2.4.2	Erosion Control Plan Requirements & Plan Review	●	●	●	●	●	●	●		●	●	●	●	●		●		
2.4.3	Construction Site Inspections	●	●	●	●	●	●	●		●	●	●	●	●		●		
2.4.4	Enforcement	●	●	●	●	●	●	●		●	●	●	●	●		●		
2.4.6	Erosion Control Education & Outreach	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●
2.4.7	Staff Training & Education	●	●	●	●	●	●	●		●	●	●	●					
Post-Construction Site Runoff for New & Re-Development																		
2.5.1	Stormwater Management Manual	●	●	●	●	●	●	●	●		●		●	●	●	●		●
2.5.2	Ordinance	●	●	●	●	●	●	●	●		●		●	●	●	●		●
2.5.3	Post-Construction Site Runoff Plan Review	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2.5.4	Stormwater Management Facility Installation Inspections	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	
2.5.5	Water Quality Benefit Offset Programs - Special Circumstances	●	●	●	●	●	●	●	●				●	●	●	●		●
2.5.6	Post-Construction Outreach	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2.5.7	Staff Training & Education	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Post-Construction Long-term Operation & Maintenance																		
2.6.1	Ordinance	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
2.6.2	Maintenance Inspection Strategy	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	
2.6.3	Enforcement	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●
2.6.5	Long-term O&M Outreach & Assistance	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●
2.6.6	Staff Training & Education	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●

Table 3. Pollutants Addressed by Stormwater Program Control Strategies

SECTION    MANAGEMENT STRATEGY		POLLUTANTS ADDRESSED								STRATEGIES SUPPORTED								
		Bacteria	Heavy Metals <sup>1</sup>	Nutrients	Toxic Organic Compounds	Sediment / Solids	Mercury	BOD	Temperature	Education & Outreach	Public Involvement & Participation	Illicit Discharge Detect/Eliminate	Erosion Control	Post-Construction (New, Re-Dev)	Post-Construction Long-Term O&M	O&M, Pollution Prevention	Industrial & Commercial	Ecosystems
Pollution Prevention & Good Housekeeping Strategy for Municipal Operations																		
2.7.1	MS4 Inspection, Maintenance & Cleaning	●	●	●	●	●	●	●	●			●	●	●	●	●	●	
2.7.2	Roadways & Transportation	●	●	●	●	●	●	●				●		●	●			
2.7.3	Winter Operations & Maintenance Strategy		●	●		●	●	●							●			
2.7.4	Integrated Pest Management: Pesticide and Fertilizer Use		●	●	●			●				●			●			●
2.7.5	Sewage Release Prevention	●		●		●	●	●		●		●	●	●		●		
2.7.6	Firefighting Training Activities	●	●	●	●	●	●	●				●			●	●		
Industrial & Commercial Controls																		
2.8.1	Industrial Stormwater Program	●	●	●	●	●	●	●		●	●	●	●		●	●	●	
2.8.2	Source Control Manual	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	
2.8.3	Commercial & Industrial BMP Outreach	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●

1. See separate column for Mercury.

### 3 MONITORING and EVALUATION

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The City is required to develop and implement a monitoring program for the collection and analysis of stormwater, surface water and macroinvertebrate samples. The monitoring requirements and objectives are outlined in Schedule B of the MS4 permit.

In response to the permit's new monitoring requirements, our team of monitoring and field science experts collaborated on a comprehensive update to the City's previous Monitoring Plan. The new [Monitoring Plan](#) describes our monitoring objectives, strategy, and procedures for the collection and analysis of stormwater, instream, and macroinvertebrate samples. Objectives include the evaluation of pollution sources, characterization of stormwater runoff quality, assessment of water quality trends in Portland waterways, pollutant load reduction evaluation, and adaptive management of our stormwater programs. The Monitoring Plan strategy includes both new and existing monitoring locations, sampling frequencies, updated pollutant parameters, analytical methods, quality control procedures, staffing resources, and a summary of field operating procedures.

#### Permit Schedule B.1

## 3.1 Compliance Assessment and Reporting

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The City conducts a self-evaluation of MS4 permit compliance on a regular basis, with ongoing compliance coordination conducted by the City's MS4 permit management team. A formal compliance assessment is completed at least once per year, resulting in the Annual MS4 Compliance Report submitted to the DEQ on November 1. The formal assessment includes an evaluation of progress toward implementing the SWMP control measures, and actions to comply with any additional permit requirements, such as Schedule B monitoring components and Schedule D TMDL components.

The City has developed a process of continual improvement for assessing and vetting stormwater program controls. We evaluate funding sources and other structures and/or processes needed to meet MS4 permit requirements and protect water quality.

The City's SWMP has a strong foundation and has been updated over time to reflect evolving regulations and water quality conditions. The City developed and submitted its first MS4 SWMP Document in 1993. Since that time, regular evaluation and reporting have occurred every year. The history of the SWMP Document includes these milestones:

- Original 1993 permit application and proposed SWMP Document, followed by 1995 permit issuance.
- Permit renewal application in 2000.
- A 2006 Interim Evaluation Report.
- The 2008 permit renewal application.
- The 2015 permit renewal application.

A description of the adaptive management process conducted to assess the existing MS4 program and develop a proposed SWMP Document for the next permit term was included in the 2015 permit application. There was also information provided to support DEQ's

### Permit Schedule B.2 and B.3

assessment of the City's comprehensive program with respect to compliance with the MEP standard.

Given the rigor of the City's ongoing self-evaluation and improvement process, and DEQ's subsequent review and approval of submittals, the City plans to follow the established process to ensure continued compliance with the permit and the MEP standard.

### City Compliance Evaluation Process

Planning, implementing, checking and corrective action are all essential components in the continual improvement of the program elements needed to sustain efficient and effective management of stormwater discharges. The purpose of the evaluation and update process is to ensure:

- Compliance with all aspects of the MS4 permit.
- Best available and practicable technologies and ideas are considered.
- The elements of the stormwater program that have an adaptive management component are meeting the MEP standard.
- Funding is available and sufficient.
- City leadership, elected officials, the community and DEQ are all on board.

The City engages in a review process following the end of each fiscal year to produce the annual report and also conducts a more comprehensive evaluation process at the end of the permit term in preparation of the permit renewal application. In addition to these formal reviews, the MS4 program collaborates throughout the year with other responsible City bureaus to assess the status of BMP implementation and identify if any adjustments are needed.

The City also works with its co-permittee, the Port of Portland, and other jurisdictions to discuss comprehensive program issues, identify potential opportunities for future coordination, and share information about permit term activities such as monitoring results that may inform the adaptive management process.



## 3.2 Program Review, Reporting and Adaptive Management

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As described in the previous section, the City implements an annual adaptive management process that reflects the collective knowledge acquired from within City bureaus and through collaborative interactions with other jurisdictions, including DEQ, ACWA, peer MS4s, and other supporting organizations. The MS4 program collects information about SWMP implementation during the previous fiscal year from each responsible City bureau. As part of this process, and in accordance with MS4 permit requirements, the City produces an annual compliance report that describes SWMP implementation, including accomplishments, achievement of tracking measures, and progress toward key metrics. Compliance reports for each reporting period (July 1 to June 30) are submitted to DEQ each year by November 1st.

Information gathered for the annual compliance reports is used to conduct a thorough assessment of whether applicable BMP tasks have been implemented as planned, or conclude that adjustments are needed to more efficiently and/or effectively achieve the desired outcomes. Progress toward or achievement of goals is also part of the review. The results of this adaptive management process are used to assess whether any program adjustments are needed to continue to reduce the discharge of pollutants from the MS4 to the MEP and to meet permit requirements.

In addition, the City produces an annual Monitoring Report summarizing results from stormwater and surface water quality sampling activities conducted throughout the year. An evaluation and summary of monitoring data is submitted along with the MS4 Annual Compliance Report. This evaluation includes a review of long-term water quality trends that may also be used to support adaptive management decisions.

The City understands the importance of well-documented compliance and a well-maintained record management system. An effective system ensures regulatory requirements and other commitments are met, any documentary evidence is easily available, and exposure to risk is reduced. As part of the annual review, the City evaluates the program documentation requirements and makes adjustments as needed to improve record-keeping and ensure complete and accurate reporting.

In addition to annual reviews, the City conducts a comprehensive adaptive management process at the end of each 5-year permit term. Results are used to identify proposed program modifications submitted as part of the permit renewal package. The process includes a review of

cumulative results of the annual adaptive management process and considers new areas of focus for the upcoming permit term. The City continues to self-evaluate and prioritize program elements using objective criteria based on effectiveness, local applicability, and availability of resources to assess the adequacy of the MS4 Program, and compliance with the MEP standard.

# APPENDICES

## **APPENDIX A: IDDE DOCUMENTS**



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IDE

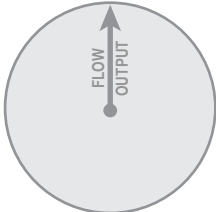
## OUTFALL BASIN INSPECTIONS (OBI)

Illicit Discharge Detection & Elimination  
MS4 Permit Compliance Program

City Info: 503.823.4000 BES Info: 503.823.7740  
SPCR: 503.823.7180 Non-Emerg: 503.823.3333  
BDS: 503.823.0900 AMR 1st Aid: 503.230.2243  
MS4: 503.823.7858 Emergency: 911

Event & Context		Personnel & Outfall Basin		Inspection Location	
Start Date	Start Time (24 hr)	Inspector1		Inspection Location Name	
End Date	End Time (24 hr)	Inspector2		Inspection Location Type	<input type="radio"/> Outfall <input type="radio"/> Manhole
Time Since Last Rain (hours) <input type="radio"/> <48 <input type="radio"/> 48-72 <input type="radio"/> >72		Outfall Name		Inspection Location Description (add for new locations)	

Pipe Conditions		Evidence of Pollutants		Odor		Flow Rate		Appearance	
Check All That Apply		Check All That Apply		Check All That Apply		Choose One		Check All That Apply	
<input type="checkbox"/> No Concerns for Pipe Conditions	<input type="checkbox"/> Trash	<input type="checkbox"/> No Evidence	<input type="checkbox"/> No Odor	<input type="radio"/> None	No visible active flow (includes wet pipe)	<input type="checkbox"/> Clear		<input type="checkbox"/> Cloudy / Turbid	
<input type="checkbox"/> Sediment	<input type="checkbox"/> Root Intrusion	<input type="checkbox"/> Toilet Paper	<input type="checkbox"/> Sewage	<input type="radio"/> Low	Trickle, shallow (leak)	<input type="checkbox"/> Color		<input type="radio"/> Brown	
<input type="checkbox"/> Organic Debris	<input type="checkbox"/> Iron Floc Sediment rusty, orange	<input type="checkbox"/> Concrete	<input type="checkbox"/> Sulfide	<input type="radio"/> Med	Steady, visibly moving (garden hose)	<input type="radio"/> Gray		<input type="radio"/> Rusty / Orange	
<input type="checkbox"/> Structural Damage	<input type="checkbox"/> Organic Foam due to mixing at spill point	<input type="checkbox"/> Suds / Foam soap/sewage, travels	<input type="checkbox"/> Chemical	<input type="radio"/> High	Substantial, rapid, surging, turbulent (tank)	<input type="radio"/> Green		<input type="radio"/> Other: Describe below	
<input type="checkbox"/> Channel Corrosion	<input type="checkbox"/> Organic Sheen reflective, fractured	<input type="checkbox"/> Paint	<input type="checkbox"/> Soap	<input type="radio"/> ND	Not Determined (use when cannot assess)				
		<input type="checkbox"/> Oil Sheen rainbow, continuous	<input type="checkbox"/> Petroleum/Fuel						

Hydraulics		Map Flow Inputs		Describe Flow Inputs				
If Flow Present, Choose One		Sketch Flow Inputs to Support Data Table		Location Name	From Node	Description	Flow Rate	Note #
<input type="radio"/> Freeflowing	Moving by gravity, no obstructions (riffle)			Ex: InspLocID-1	Hansen ID	Diameter, Direction, Material	None-Low-Med-High-ND	at other side
<input type="radio"/> Impeded	Downstream barrier or constriction slows flow rate, but still visibly moving (river run)			Example: XYZ123-1				
<input type="radio"/> Surcharging	Actively filling, exceeding pipe capacity, more water in than out (flooding)			Example: XYZ123-2				
<input type="radio"/> Static / Stagnant	Manhole shows water present but no visible flow in or out (ponded/backwatered)			Example: XYZ123-3				
<input type="radio"/> Submerged	Outfall invert inundated and located below elevation of receiving water							

Field Screening where: 1. No Evidence of Pollutants and 2. Flow = Med or High						Evidence of Pollutants or Screening Exceedances	
Device/Menu Code	Parameter	Units	Action Level	Result	Exceedance Trigger	Samples Taken: Related Evidence	
ORION 4 STAR	pH	na	under 5 over 9		Sample: Total Metals	<input type="checkbox"/> E. coli: Human Waste/Foam-Suds/Toilet Paper/Color/Odors	
	Conductivity	µS/cm	over 500		Sample: Total Metals	<input type="checkbox"/> TSS: Sediment/Concrete/Turbidity/Color	
	Temperature	°C	over 18		If both temperature and ammonia out of range, sample: E. coli	<input type="checkbox"/> Oil & Grease: Oil Sheen/Color/Odor	
LaMotte SMART3	05 Ammonia (AM or NH <sub>3</sub> )	mg/L	over 1.0			<input type="checkbox"/> Total Metals: Sediment/Concrete/Turbidity/Color/Odor	
	83 Potassium (POT or K)	mg/L	over 10		Sample: Total Metals	<input type="checkbox"/> Other: List sample parameters on COC	
	98 Turbidity	FAU	over 500		If sheen/foam visible, sample: TSS, O&G, Total Metals		
	43 Hardness	mg/L	under 10 over 1000		Sample: Total Metals		
	14 Chlorine (Cl)	mg/L	over 0.3				
YSI ProODO	Dissolved Oxygen (DO)	mg/L	under 5.0				
						Investigation: Exceedances or Evidence	
						Upstream Investigation Needed? Yes / No Circle One SPCR Incident #	
						Records Created	
						<input type="checkbox"/> Chain of Custody (COC) <input type="checkbox"/> Fact Sheet <input type="checkbox"/> Photos	
						Notes & Comments:	
						see other side	
						OFFICE USE ONLY INITIAL & DATE COMPLETED STEPS OFFICE USE ONLY	
						Form Reviewed by Inspector(s) Database Entry in iPACS	
						Photos Uploaded & Renamed Form Scanned & Renamed	



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**OUTFALL BASIN INSPECTIONS (OBI)**  
Illicit Discharge Detection & Elimination  
MS4 Permit Compliance Program

City Info: 503.823.4000    BES Info: 503.823.7740  
SPCR: 503.823.7180    Non-Emerg: 503.823.3333  
BDS: 503.823.0900    AMR 1st Aid: 503.230.2243  
MS4: 503.823.7858    Emergency: 911

Notes & Comments: Continued from front page of inspection form. ~~Use strike through to show edits.~~ For changes made after the inspection, record the date and initials.

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# Dry Weather Field Screening and Lab Sampling SOP

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## Outfall Basin Inspection (OBI) Program

Illicit Discharge Detection & Elimination (IDDE) Program

Version 1.0

Prepared for  
Bureau of Environmental Services  
Portland, Oregon  
April 1, 2018



**ENVIRONMENTAL SERVICES**  
**CITY OF PORTLAND**  
**working for clean rivers**



6500 SW Macadam Avenue, Suite 200  
Portland, OR 97239  
503.244.7005



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# Table of Contents

1. Introduction.....	1-1
1.1 Applicability of the SOP .....	1-1
1.2 Related MS4 Permit Language.....	1-1
1.3 Terms and Definitions .....	1-2
2. Preparation .....	2-1
2.1 Considerations Prior to Field Work .....	2-1
2.2 Meter Calibration .....	2-2
2.2.1 Thermo Scientific Orion 4-Star Meter.....	2-2
2.2.2 YSI ProODO Optical Dissolved Oxygen Meter.....	2-4
3. Grab Collection Standard Operating Procedure .....	3-1
3.1 Equipment and Materials.....	3-1
3.2 Procedure – Direct Grab Collection .....	3-1
3.3 Procedure - Indirect Grab Collection.....	3-3
4. Field Screening Standard Operating Procedures .....	4-1
4.1 Temperature, pH, and Conductivity Field Measurement SOP .....	4-1
4.1.1 Procedure.....	4-1
4.1.2 Quality Assurance/Quality Control .....	4-1
4.2 Field Dissolved Oxygen.....	4-2
4.2.1 Procedure.....	4-2
4.2.2 Quality Assurance/Quality Control .....	4-2
4.3 Field Ammonia, Potassium, Turbidity, Hardness, and Chlorine Field Measurement SOP .....	4-2
4.3.1 Equipment and Materials .....	4-2
4.3.2 Procedure.....	4-4
4.4 Equipment and Materials Clean-up.....	4-7
5. Follow-up to Field Screening and/or Lab Sampling .....	5-1
5.1 Relinquishing Samples.....	5-1
5.2 Post-Measurement Checks of Meters .....	5-1
5.2.1 Post-Measurement Check (Orion 4 Star Meter) .....	5-2
5.1.2 Post-Measurement Check (YSI Pro ODO Meter).....	5-2
5.3 Hold Times per Analytical Methods .....	5-3
5.4 Equipment Maintenance.....	5-3
5.5 Resources .....	5-4
Appendix A: Orion 4-Star Calibration and Check Log.....	A-1
Appendix B: YSI ProODO Calibration and Check Log.....	B-1
Appendix C: Chain-of-Custody (COC) Form .....	C-1

## List of Figures

---

Figure 2-1. Image from Orion Star Series Meter User's Guide .....	2-3
Figure 2-2. Image from ProODO User Manual.....	2-4
Figure 2-3. Image from ProODO User Manual.....	2-5
Figure 3-1. Labeling field screening sample bottles.....	3-2
Figure 4-1. Equipment overview for SOP 4.3 .....	4-3
Figure 4-2. Ammonia reagents with dropper (code 3642-SC) .....	4-3
Figure 4-3. Potassium reagents with scoop (code 3639-SC).....	4-3
Figure 4-4. Unit dose vile (UDV) adapter .....	4-3
Figure 4-5. Hardness UDV with reagent (code 4309-C) .....	4-4
Figure 4-6. Chlorine tablets (code 3643-SC) .....	4-4
Figure 4-7. Image from Smart3 Colorimeter operator's manual .....	4-5

## List of Tables

---

Table 2-1. Meter Calibration and Inspection Schedule .....	2-2
Table 5-1. Pollutant Parameters and Analytical Methods .....	5-3

## List of Abbreviations

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BES	Bureau of Environmental Services
City	City of Portland
COC	chain of custody
DO	dissolved oxygen
ID	identification
IDDE	Illicit Discharge Detection and Elimination
NPDES	National Pollutant Discharge Elimination System
MDL	Method Detection Limit
MPN	most probable number
MS4	Municipal Separate Storm Sewer System
OB	Outfall Basin Inspection
PRT	primary reference thermometer
SOP	Standard Operating Procedure
SPCR	Spill Protection and Citizen Response
UDV	unit dose vial

## Section 1.0

# Introduction

Implementation of an effective dry weather inspection program is required to detect and eliminate illicit discharges to the separated stormwater system. In order to investigate the potential source(s) of unidentified dry weather flows, the collection of grab samples for field screening and lab sampling may be required. This document details the procedures and methods to collect and analyze grab samples used by the dry weather inspection program.

The City of Portland's (City's) National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit includes specific requirements related to the implementation of an Illicit Discharge Detection & Elimination (IDDE) Program. One requirement of the IDDE Program is to perform dry weather inspections in the stormwater system, currently defined by Portland's Bureau of Environmental Services (BES) as the Outfall Basin Inspection (OBI) Program. BES's Spill Protection and Citizen Response (SPCR) section is responsible for implementing the OBI Program. SPCR performs inspections, and where needed, investigates and responds to illicit discharges that enter, threaten, or discharge from the City's stormwater collection system.

## 1.1 Applicability of the SOP

This Field Screening and Lab Sampling Standard Operating Procedure (SOP or IDDE OBI SOP) describes detailed sampling procedures based on the use of standardized equipment during field inspections in the OBI Program. This IDDE OBI SOP will be updated as permit requirements, equipment, and/or sampling methods change. Updates will be documented as subsequent versions of this document. For information about overall program implementation, including the procedures governing the decision to collect grabs for field screening and lab samples and the subsequent responses based on those findings, refer to SPCR's IDDE Procedures Manual (January 2014).

## 1.2 Related MS4 Permit Language

Per Schedule A.4.a.iv of the NPDES MS4 permit (effective date: January 31, 2011), the IDDE Program must include annual dry-weather inspection activities including field screening of identified priority locations. Field screening efforts must include both field and laboratory sampling based on the observance of flow and documentation of observed illicit discharges. The applicable permit excerpt per Schedule A.4.a.iv is listed below for reference.

2. *Field Screening – If flow is observed, and the source is unknown, a field analysis must be conducted to determine the cause of the dry-weather flow. The field analysis must include sampling for pollutant parameters that are likely to be found based upon the suspected source of discharge or by other effective investigatory approaches or means to identify the source or cause of the suspected illicit discharge. Where appropriate, field screening pollutant parameter action levels identified by the permittee must be considered. Suspected sources of discharge include, but are not limited to, sanitary cross-connections or leaks, spills, seepage from storage containers, non-stormwater discharges or other residential, commercial, industrial or transportation-related activities.*

SPCR meets the field screening requirement through the OBI Program. When flow is sufficient and/or field observations warrant, grab collection and field screening of indicator parameters is conducted. Field screening results help guide actions related to source investigations. Lab samples may be collected if field screening efforts indicate specific parameters exceed action levels or if field observations warrant.

## 1.3 Terms and Definitions

The following terms are used throughout this SOP and refer to city-specific sampling activities:

- **Field screening (verb):** Refers to collection of a grab sample and field analysis using handheld field meters, test kits and/or colorimeter. Results are determined and recorded in the field during the inspection event and used by field crews to determine the course of action according to program procedures. Mutually exclusive with the meaning of “lab sampling”. Noun = field screen
- **Lab sampling (verb):** Refers to collection of a grab sample for analysis using laboratory techniques. Results are reported by the lab and may be used to determine the course of action during subsequent investigation activities. Mutually exclusive with the meaning of “field screening”. Noun = lab sample
- **Combo-Meter:** Refers to the hand-held meter Thermo Scientific Orion 4-Star used to measure pH, temperature and conductivity.

## Section 2.0

# Preparation

This section provides background information related to the preparation, protocols, and processes to use when conducting field screening in conjunction with the activity-specific SOPs in Sections 3.0 and 4.0.

Section 2.1 summarizes sample preparation and site set up considerations prior to field work. Section 2.2 outlines calibration activities specific for meters used in field screening for dissolved oxygen (DO), pH, conductivity, and temperature.

## 2.1 Considerations Prior to Field Work

The following activities should be considered and/or adhered to, to expedite sample collection activities and minimize potential for issues or delays. Activities listed are intended to be considered based on the location and accessibility of each OBI location.

### OBI Preparation

- Review historic monitoring results and sample collection efforts for familiarity of the site.
- Determine the need for traffic control and safety protocols.
- Confirm adherence to the required antecedent dry period (72 hours).
- Obtain equipment and materials for potential use at the site (confirm with SOPs).

### Site Set-Up, Screening, and Sampling

- Park vehicle out of direct sunlight.
- Take picture of sampling location.
- Conduct screening and sampling activities according to the IDDE Procedures Manual. Screening and sampling activities and sample storage should be conducted out of direct sunlight to maintain temperature and to prevent UV-sensitive reagent from degrading.
  - If evidence of pollutants is observed during the OBI, and results of the field screening are likely to warrant collection of a grab sample for laboratory testing, it may be more efficient to collect the analytical grab sample while at the sampling location instead of returning to the sampling location after field screening efforts at the vehicle.
- If the OBI site is a manhole as opposed to an outfall, consider the following activities after collection of the sample to ensure new materials are not added to the sample:
  - Tagging the exterior surface of the manhole lid at the center (with spray paint or other material) to expedite the identification of the OBI site for future inspection efforts.
  - Sweeping the inside lip of the manhole to ensure a flush setting.

### Field Screening and Sample Processing at the Vehicle

- Immediately place analytical samples (if collected) on ice.
- Perform field screening in accordance with the order of SOPs listed in Section 4.
- Document all screening results and additional site considerations/conditions on the field form. Review field screening results and, if necessary, collect additional grab samples for analysis at the laboratory.
- Complete the chain-of-custody (COC) form if analytical samples were collected and will be submitted to the Laboratory.

## 2.2 Meter Calibration

Prior to collecting any field data for the day, field meters need to be calibrated against reference tools or standards to ensure accuracy.

Table 2-1 outlines the required meter calibration and inspection frequencies. Detailed calibration processes are provided below for the Thermo Scientific ORION 4-star meter (used for pH, conductivity, and temperature) and the YSI ProODO meter (used for dissolved oxygen).

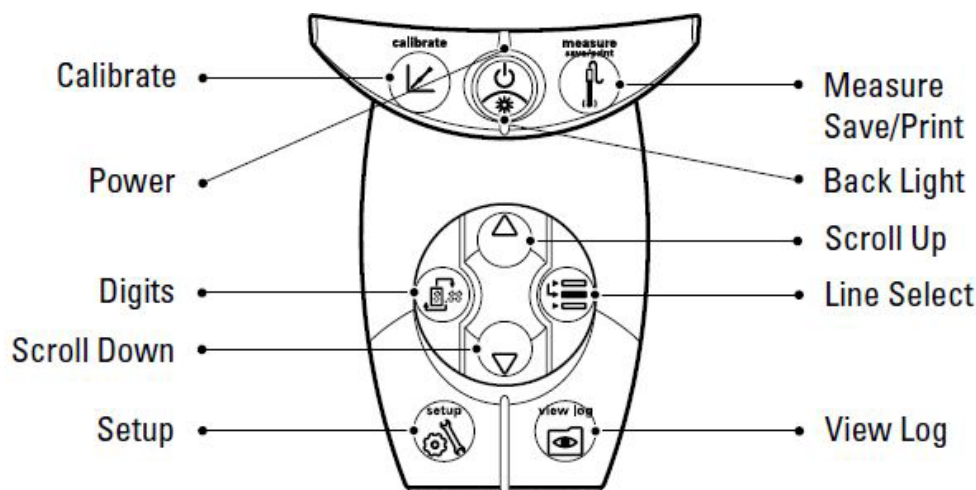
Table 2-1. Meter Calibration and Inspection Schedule			
Meter	Analytes	Calibration Frequency	Inspection Frequency
YSI ProODO	Dissolved Oxygen	Daily (prior to use)	Daily (prior to use)
ORION 4-star	pH Conductivity Temperature	Daily (prior to use)	Daily (prior to use)
LaMotte Smart3 Colorimeter	Ammonia Potassium Turbidity Hardness Chlorine	Not Applicable	Daily (prior to use)

### 2.2.1 Thermo Scientific Orion 4-Star Meter

The following procedure (Steps 1-16) should be followed in conjunction with Figure 2-1 below.

1. Turn meter on using the power button.
2. Locate the Orion 4-Star Calibration and Check Log (Appendix A) for the meter. Log should be stored with the meter. Fill in the project, date and time. Record all readings in the 'OUT' row as the meter is being 'checked out' for field work.
3. Fill three flasks for calibration efforts. Fill one flask with fresh conductivity standard solution (typically 146.9 microSiemen per centimeter); one flask with fresh pH 4 buffer solution, and one flask with fresh pH 7 buffer solution.





**Figure 2-1. Image from Orion Star Series Meter User's Guide**

*Source: Thermo Electron Corporation, 2006.*

### Temperature Confirmation

4. Remove the pH sensor storage cap. Make sure to hold cap upright to retain storage solution (pH 7 buffer solution and potassium chloride [KCl]) for the pH probe. Rinse both the conductivity/temperature and pH probes with deionized water and place both in the large flask containing the primary reference thermometer (PRT).
5. Once the meter has stabilized for temperature, record the temperature readings of both the meter and the PRT in the log. The meter should be within  $\pm 0.5$  °Celsius of the PRT. If the meter is outside this range, it must be sent in for factory calibration or the probe can be replaced.

### Conductivity Calibration:

6. Remove both probes (conductivity/temperature and pH) from the flask containing the PRT referenced in Step 4. Rinse with deionized water.
7. Place probes in flask with fresh conductivity standard solution.
8. Record the conductivity meter reading in the log. The meter should be within  $\pm 15$  uS/cm. If the meter is outside this range, then it should be calibrated.
9. If calibration is necessary, press the 'line select' button, scroll down to the second line for conductivity, and push the 'calibration' button (refer to Figure 2-1).
  - a. The meter will display a cell constant value on the top line and the conductivity value on the middle line. Use the scroll and 'digit' buttons to adjust the cell constant value to the conductivity standard solution.
  - b. Note: if you do not start adjusting the cell constant value within 5 seconds, the meter will automatically proceed to AutoCal. If this occurs, push the 'Measure Save/Print' button and restart calibration.

### pH Calibration:

10. Remove both probes (conductivity/temperature and pH) from the flask containing the fresh conductivity standard solution, rinse with deionized water, and place in fresh pH 7 buffer solution.
11. Push 'calibration' button (refer to Figure 2-1).

12. The meter screen will display 'CAL. 1' at the bottom of the screen. A small pH symbol will flash as the meter stabilizes. Upon stabilization, the pH symbol will become solid and the temperature correct pH value of the buffer solution will be displayed (typically 7.01). Record value in the log.
13. Press the calibrate button to move to the next calibration point (i.e., pH 4) and meter screen will display 'CAL. 2'. Rinse both probes with deionized water and place in fresh pH 4 buffer solution. Wait for the meter to stabilize by having the pH symbol stop flashing. Once stabilized, the temperature correct pH value of the buffer solution is displayed. Record value on the log.
14. Press the 'Measure Save/Print' button to save the calibration. Record the slope that will briefly flash on the screen in the log.
15. Rinse the probes with deionized water. Confirm that storage solution is in the pH storage cap and place on pH probe.
16. Turn meter off.

### 2.2.2 YSI ProODO Optical Dissolved Oxygen Meter

Although temperature confirmation is included for this meter, the YSI ProODO meter is not the meter used for collecting field temperature. The following procedure pertains to confirming temperature and calibrating DO prior to use. The following procedure (Steps 1-10) references Figures 2-3 and 2-4 on the following two pages.

1. Turn meter on using the power button.
2. Locate the YSI ProODO Calibration Log (log; Appendix B) for the meter. Log should be stored with the meter. Fill in the date, initials, project, and time in the log.

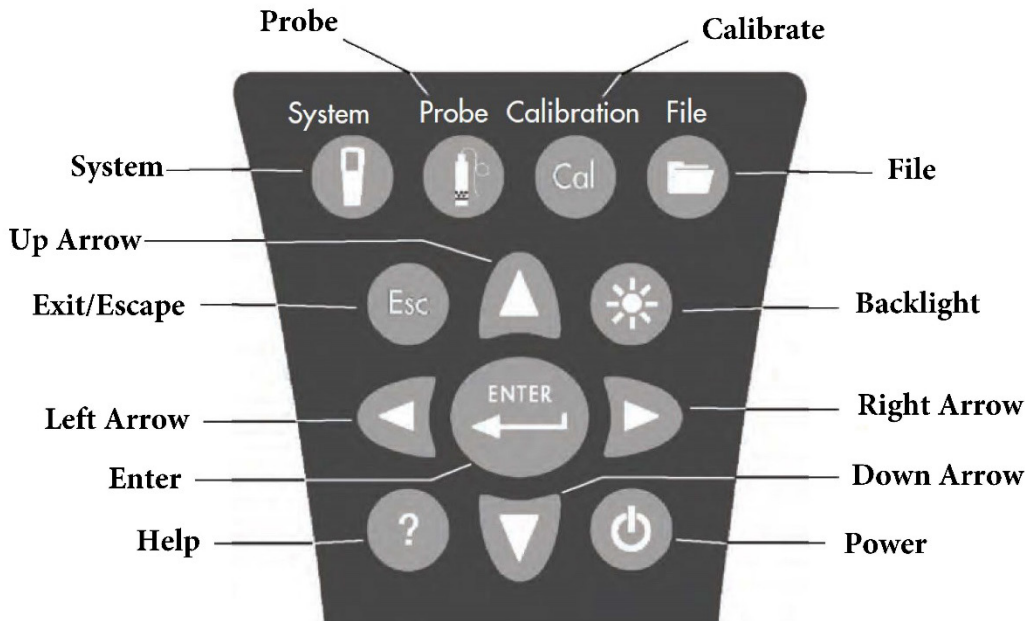


Figure 2-2. Image from ProODO User Manual

Source: YSI Incorporated, 2009.

**Temperature Confirmation:**

3. Remove storage sleeve, rinse the probe with deionized water, and place in the large flask containing the primary reference thermometer (PRT).
4. Once the meter has stabilized for temperature, record the temperature reading of both the meter and the PRT in the log. The meter should be within +/- 0.5 °Celsius of the PRT. If the meter is outside this range, it must be sent in for factory calibration or replacement of the cap on the optical dissolved oxygen meter.

**Dissolved Oxygen Calibration:**

5. Remove storage sleeve, rinse the probe with deionized water to ensure the probe is moist and replace the storage sleeve. The storage sleeve ensures venting to the atmosphere, keeps probe at ambient barometric pressure, and creates a water saturated air environment.
6. Wait approximately 5 to 10 minutes for storage sleeve to become completely saturated and to allow sensor to stabilize.
7. Press the 'calibration' button and select the first line for dissolved oxygen by pushing the 'enter' button (refer to Figure 2-2).
8. The next window will have the dissolved oxygen percentage (DO%) on the first line. Select by pushing the 'enter' button.
9. The meter will use the internal barometer during calibration and display this value in brackets at the top of the screen as shown in Figure 2-3 below. The second line will read Accept Calibration and is highlighted. Below the second line are the sensor readings for DO% and temperature. Push the 'enter' button to accept the calibration. Read the DO% and record it on the log.
10. Turn meter off.

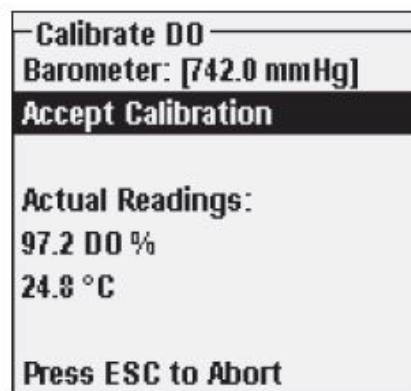


Figure 2-3. Image from ProODO User Manual

Source: YSI Incorporated, 2009.

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## Section 3.0

# Grab Collection Standard Operating Procedure

The purpose of this Grab Collection SOP (SOP 3.0) is to describe the guidelines of collecting a direct and indirect grab water sample from an outfall or manhole for field screening and/or analytical testing. Grab sample collection is conducted to obtain samples for analysis in the field (i.e., using a meter) and to collect samples for offsite transport and analysis (i.e., for laboratory analysis offsite).

Direct sampling pertains to sample collection directly into sample bottles or containers for testing. Indirect sampling pertains to the collection of flow in a secondary vessel that will be used to fill sample bottles or containers prior to testing. Collection of a direct or indirect grab sample is not location specific (outfall or manhole) and is determined based on the sample collector's judgement. Location-specific guidelines are referenced under both direct and indirect sampling procedures.

Section 3.1 outlines required equipment and materials. Section 3.2 outlines procedures for direct grab sample collection. Section 3.3 outlines procedures for indirect grab sample collection.

## 3.1 Equipment and Materials

The following list of equipment and materials is for collecting direct or indirect grab water samples.

- Vinyl or latex gloves
- Deionized water in squirt bottle
- Sani-Cloth Plus (germicidal disposable cloth)
- Permanent marker
- Manhole puller
- Flashlight
- Sampling extension rod
- Stainless steel bucket with cord
- Orange safety cones
- Two field screening sample bottles (500 milliliter unpreserved poly)
- Analyte-specific sample bottles
- Cooler with ice
- Chain-of-custody (COC) Form (Appendix C)

## 3.2 Procedure – Direct Grab Collection

The following procedure pertains to sampling preparation and direct grab sample collection for purposes of conducting field screening or laboratory analysis.

Direct grab sample collection is the preferred grab sample method if site conditions allow, due to the reduced potential for outside contamination or imprecise sampling in the water column. It may be conducted at either an outfall or manhole but is more commonly conducted at an outfall. Where

possible, complete steps at the field vehicle to minimize risk and reduce the number of actions completed in traffic areas.

1. For laboratory analytical samples, label the appropriate analyte-specific sample bottles with the following information prior to grab collection:
  - Outfall basin identification (ID) and Sample Location ID (in parenthesis, as applicable). See Figure 3-1.
  - Date and time
2. Bring gloves, field screening sample bottles, any labeled analyte-specific bottles, manhole puller and flashlight (if applicable), and sampling extension rod (if necessary) to the sampling location.
3. Assess the sampling location to:
  - Confirm that the sampling area is safe for staff. This may require orange safety cones, use of the sampling vehicle with lights as a barrier, or traffic control.
  - Ensure that the flow is sufficient to collect a sample.
  - If sampling from an outfall, the following guidelines are applicable:
    - Confirm that the sampling location is freely discharging (i.e., the water surface elevation of the receiving water is lower than the point of sample collection).
    - Ensure that flowing water from the sampling location is free of debris (e.g., vegetation or trash). Clear the sampling location if necessary so debris does not bias the sample.
    - Confirm whether staff can easily reach the flow of water. If not, affix the sample bottles to a sampling extension rod to obtain the sample or follow guidelines described in Section 3.3 for indirect grab sample collection.
  - If sampling from a manhole, the following guidelines are applicable:
    - Identify the direction of water moving in the manhole.
    - If multiple lines are discharging into manhole, identify sample location as the downstream line so that the sample will include all flow from lines coming into the manhole.
    - Assess whether water can be reached using a sampling extension rod. If the depth to water in the manhole is greater than the length of the sampling extension rod, then use the stainless steel bucket with cord and follow guidelines described in Section 3.3 for indirect sample collection.
4. Put on gloves.
5. Remove lid from the sample bottle.
6. Move the sample bottle to catch water free-flowing from the sampling location. Make sure that the rim does not touch any surfaces that could contaminate the sample. Try to minimize sediments from entering the bottle and attempt to not have the sample bottle touch anything except the water. Minimizing sediments from entering the bottle is especially important for the *E. coli* sample.
7. Fill sample bottle to the shoulder; do not over fill bottle.



**Figure 3-1. Labeling field screening sample bottles**

8. Place lid on sample bottle.
9. Repeat Steps 5 through 7 for the remaining field screening sample bottles or analyte-specific sample bottles.
10. Gather all materials and equipment from the sampling location and return to field vehicle.
11. Place any analyte-specific sample bottles immediately in a cooler with ice if collecting grab samples for laboratory analysis.
12. Conduct field screening in conjunction with SOPs detailed in Section 4.0.
13. Remove gloves and place in trash container.
14. For all grab samples collected for laboratory analysis, complete the COC form with the following information:
  - Location ID (i.e., Outfall ID)
  - Date
  - Time
  - 'G' for grab sample
  - 'W' for sample matrix
  - Analyses (i.e., *E. coli*, total metals, total suspended solids, oil and grease)
  - Number of containers

### 3.3 Procedure - Indirect Grab Collection

The following procedure pertains to sampling preparation and indirect grab sample collection for purposes of conducting field screening or laboratory analysis.

Indirect grab sample collection is commonly conducted due to limited site accessibility and confined space situations. It may be conducted at either an outfall or manhole. Where possible, complete steps at the field vehicle to minimize risk and reduce the number of actions completed in traffic areas.

1. For laboratory analytical samples, label the appropriate sample bottles with the following information prior to grab collection (shown in Figure 3-1):
  - Outfall basin ID and Sample Location ID (in parenthesis, as applicable).
  - Date and time
2. Clean the inside of the container or stainless steel bucket with the Sani-Cloth Plus wipe.
3. Rinse the container or stainless steel bucket with deionized water.
4. Bring gloves, labeled secondary sampling vessels or containers, manhole puller (if applicable), and sampling extension rod and/or stainless steel bucket with cord to the sampling location.
5. Assess the sampling location to:
  - Confirm that the sampling area is safe for staff. This may require orange safety cones, use of the field vehicle with lights as a barrier, or traffic control.
  - Ensure that the flow is sufficient to collect a sample.
  - If sampling from an outfall, the following guidelines are applicable:
    - Confirm that the sampling location is freely discharging (i.e., the water surface elevation of the receiving water is lower than the point of sample collection).
    - Ensure that flowing water from the sampling location is free of debris (e.g., vegetation or trash). Clear the sampling location if necessary so debris does not bias the sample.



- Assess whether water can be reached using a sampling extension rod. If not, use the stainless steel bucket with cord.
  - If sampling in a manhole, the following guidelines are applicable:
    - Identify the direction of water moving in the manhole.
    - If multiple lines are discharging into manhole, identify sample location as the downstream line so that sample will include flow from all lines coming into the manhole.
    - Assess whether water can be reached using a sampling extension rod. If not, then use the stainless steel bucket with cord.
6. Put on gloves.
  7. If using the sampling extension rod, lower the container to the downstream line to collect sample. Try to minimize sediments from being collected and attempt to not to have the container or bottle touch anything except the water.
  8. If using a stainless steel bucket with cord, keep the cord from touching the inside of the bucket. Lower the bucket. When at the bottom, tip the bucket to fill with water. Bring bucket up to the surface.
  9. Using gloved hands, swirl the water in the container or bucket to rinse the inside of the container or bucket with sample water. Dump water back into waterbody or manhole.
  10. Repeat Steps 7 or 8, as applicable.
  11. Remove lid from the sample bottle and fill with water from the container or bucket to the shoulder; do not overfill. Try to minimize sediments from entering the bottle, especially for *E. coli* samples.
  12. Repeat Steps 7 or 8 to fill the remaining field screening sample bottles and analyte-specific sample bottles.
  13. Gather all materials and equipment from the sampling location and return to field vehicle.
  14. Place any analyte-specific sample bottles immediately in a cooler with ice if collecting grab samples for laboratory analysis.
  15. Conduct field screening in conjunction with SOPs detailed in Section 4.0.
  16. Clean the container or bucket with Sani-Cloth Plus wipe and rinse with deionized water.
  17. Remove gloves and place in trash container.
  18. For all grab samples collected for laboratory analysis, complete the COC form with the following information:
    - Location ID (i.e., Outfall ID)
    - Date
    - Time
    - 'G' for grab sample
    - Analyses (i.e., *E. coli*, total metals, total suspended solids, oil and grease)
    - Number of containers

## Section 4.0

# Field Screening Standard Operating Procedures

The purpose of these SOPs is to describe the collection of field measurements for indicator pollutant parameters referenced in the IDDE Procedures Manual. Results of the field measurements are used to determine whether additional sampling efforts (i.e., grab sample collection for laboratory analysis) and/or investigation are warranted at an outfall location.

Indicator pollutant parameters have been grouped according to the required sampling device. Section 4.1 outlines the SOP for temperature, pH, and conductivity. Section 4.2 outlines the SOP for dissolved oxygen. Section 4.3 outlines the SOP for ammonia, potassium, turbidity, hardness, and chlorine.

For efficiency, field screening efforts should follow the order of SOPs outlined in this section (i.e., conduct activities under Section 4.1 first, then Section 4.2, and finally Section 4.3). Implementation of SOPs 4.1, 4.2, and 4.3 assumes that the collection of grab samples for field measurement per Section 3.0 has been conducted.

## 4.1 Temperature, pH, and Conductivity Field Measurement SOP

SOP 4.1 is for field screening of temperature, pH, and conductivity. Measurements shall use the Thermo Scientific Orion 4-Star meter (meter). Refer to Section 2.2 and Figure 2-1 for an overview of the meter and calibration procedures. Post-measurement guidelines and maintenance considerations for this meter are described in Section 5.0.

This SOP should be conducted first due to the required (15-minute) holding time for pH.

### 4.1.1 Procedure

1. Obtain freshly collected water sample (collected per Section 3.0).
2. Remove pH sensor storage cap, rinse both probes with deionized water, and place probes into the sample. Make sure that both probes are adequately submerged.
3. Turn on meter using the power button.
4. The flashing units on the right indicate that the meter is stabilizing. Once the units for specific conductance ( $\mu\text{S}/\text{cm}$ ) and pH stop flashing, record the values for specific conductance, pH, and temperature on the field form.
5. Rinse probes with deionized water, replace storage cap with storage solution, and turn meter off.

### 4.1.2 Quality Assurance/Quality Control

Record all calibrations, post-measurement checks, maintenance, and repair notes in the Orion 4-Star Calibration and Check Log (Appendix A).

## 4.2 Field Dissolved Oxygen

SOP 4.2 is for field screening of dissolved oxygen. Measurements shall use the YSI ProODO Optical Dissolved Oxygen meter (meter). Refer to Section 2.3 and Figure 2-2 for an overview of the meter and calibration procedures. Post-measurement guidelines and maintenance considerations for this meter are described in Section 5.0.

### 4.2.1 Procedure

1. Obtain freshly collected water sample (collected per Section 3.0).
2. Turn meter on using the power button.
3. Remove the storage sleeve, rinse sensor with deionized water, and place into the sample. Make sure that the sensor is adequately submerged.
4. Record the dissolved oxygen reading, which is listed in milligrams per liter (mg/L) on the fourth line on the field form.
5. Rinse the sensor with deionized water, replace storage sleeve, and turn meter off.

### 4.2.2 Quality Assurance/Quality Control

Record all pre-measurement calibrations, post-measurement checks, maintenance, and repair notes in the YSI ProODO Calibration and Check Log (Appendix B).

## 4.3 Field Ammonia, Potassium, Turbidity, Hardness, and Chlorine Field Measurement SOP

SOP 4.3 is for the field screening of ammonia, potassium, turbidity, hardness, and chlorine. Measurements shall use the LaMotte Smart3 colorimeter. Sample preparation guidelines are extensive and should be completed in the order indicated.

### 4.3.1 Equipment and Materials

The following materials are needed to collect field measurements for ammonia, potassium, turbidity, hardness, and chlorine:

- Vinyl or latex gloves
- Water sample (approximately 500 mL)
- Deionized water in squirt bottle
- Wastewater container
- Field form
- LaMotte Smart3 colorimeter
- Two, 3-mL syringes, typically stored in field vehicle (Figure 4-1 below)
- Three glass vials (included with the colorimeter) (Figure 4-1 below)
- Turbidity blank, typically stored in sample vehicle (Figure 4-1 below)



Figure 4-1. Equipment overview for SOP 4.3

- Ammonia materials, typically stored with colorimeter (Figure 4-2 to the right)



Figure 4-2. Ammonia reagents with dropper (code 3642-SC)

- Potassium materials, typically stored with colorimeter (Figure 4-3 to the right)



Figure 4-3. Potassium reagents with scoop (code 3639-SC)

- Hardness materials (hardness unit dose vial (UDV) and adapter), typically stored with colorimeter (Figure 4-4 to the right and Figure 4-5 on the next page). Additionally, one empty/used hardness UDV, typically stored in field vehicle.



Figure 4-4. Unit dose vial (UDV) adapter



Figure 4-5. Hardness UDV with reagent  
(code 4309-C)

- Chlorine tablets materials, typically stored with colorimeter (Figure 4-6 to the right)



Figure 4-6. Chlorine tablets  
(code 3643-SC)

### 4.3.2 Procedure

For field measurements to be conducted efficiently and ensure the highest degree of accuracy, it is essential that all equipment and materials are easily accessible prior to collecting the sample. Particularly for this SOP, a shaded workspace is essential as the hardness reagent is light sensitive. The following procedure is organized to most efficiently field screen ammonia, potassium, turbidity, hardness and chlorine.

#### Equipment and Materials Preparation

- Put on gloves.
- Obtain freshly collected water sample (collected per SOP 3.0).
- Set out ammonia, potassium, and chlorine materials, two syringes, three glass vials, and turbidity blank.
- Rinse the syringes and glass vials with the water sample. Do this by adding the water sample to syringes and glass vials, inverting to rinse all surfaces, and then dispense water onto the ground.
- Fill two syringes from the top of the water sample bottle (to reduce sediment in syringe). Tap/flick syringe and remove air bubbles and gently depress the plunger to reduce the volume of sample to 3 mL. Set the syringes aside.
- Fill three glass vials with water sample to the indicator line (10 mL). Try to minimize sediment in glass vials.
  - One glass vial is for the ammonia measurement (ammonia vial).
  - One glass vial is for the potassium measurement (potassium vial).
  - One glass vial is for the turbidity measurement. This vial subsequently provides the blank measurement for ammonia, potassium, and chlorine. With the addition of chlorine reagent, this vial ultimately will be used to measure chlorine.

### Ammonia and Potassium Preparation

7. Add 8 drops of the Ammonia Reagent #1 (squeeze bottle with dropper head). Shake. Set aside for 1 minute and proceed to Step 8.
8. In the potassium vial, add four (4) drops of the first potassium reagent (squeeze bottle with dropper head). Shake. Add one scoop (0.05 g) of Potassium Reagent #2 (amber glass bottle). Shake.
9. After approximately 1 minute has elapsed since preparing the ammonia vial (Step 7), use the eye dropper to add 1 mL of Ammonia Reagent #2 to the ammonia vial. Shake.
10. Let both vials rest for 5 minutes and proceed to Step 11.

### Field Turbidity Measurement

11. Conduct the field screening for turbidity using the Smart3 Colorimeter (refer to Figure 4-7 on the next page).
  - a. Turn on the colorimeter using power button
  - b. Use the up and down arrows to scroll to turbidity (test 98). Select the test using the enter button.
  - c. Clean any residue from the turbidity blank vial and insert into sample chamber. Close lid and select 'Scan blank' on screen by pushing the enter button. Remove turbidity blank.
  - d. Wipe off the sample/blank vial and insert into sample chamber. Close lid and select 'Scan sample' on screen by pushing the enter button. Record value on field form. Remove sample/blank vial.
  - e. Push the exit button on colorimeter to move back to the test list.

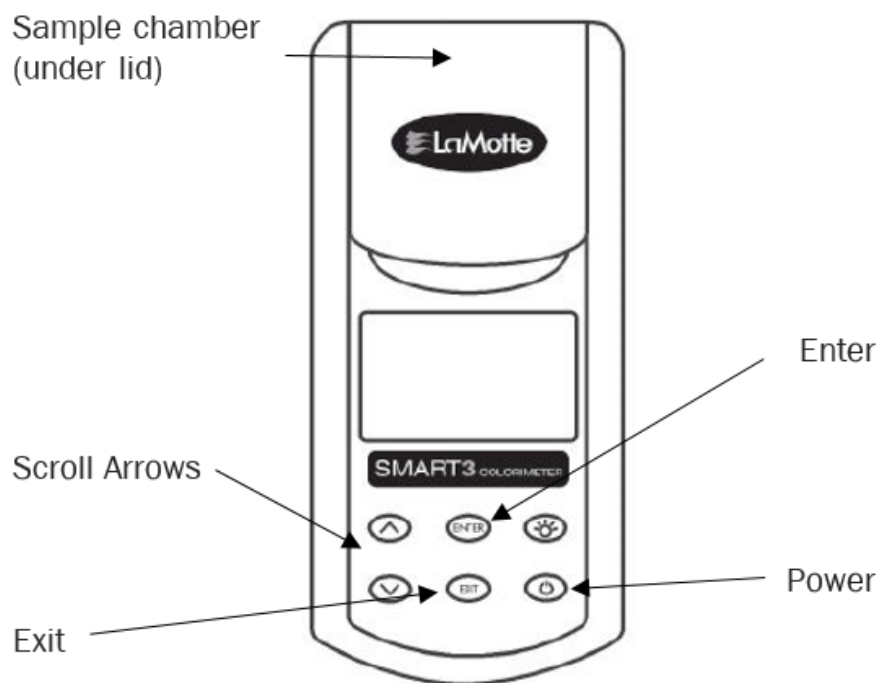


Figure 4-7. Image from Smart3 Colorimeter operator's manual

Source: LaMotte, 2012.

**Field Hardness Measurement**

12. Locate one 3-mL syringe with water sample and no air bubbles. Remove one hardness UDV with reagent from foil pouch. Keep the UDV out of sunlight.
13. Peel back corner of foil lid of the UDV and add 3 mL of sample water from syringe.
14. Replace foil on UDV, hold foil lid in place with finger or thumb, and shake for 10 seconds. Wait 1 minute and invert the UDV 3 times to mix. Make sure the reagent in the corner of UDV is dissolved. Tap/flick to remove air bubbles.
15. Locate the second 3-mL syringe with water sample and no air bubbles. Find the empty/used hardness UDV. Add 3 mL of sample water from syringe into UDV to create a blank. Tap/flick to remove air bubbles.
16. Insert the UDV adapter into sample chamber of colorimeter.
17. Conduct the field screening for hardness using the Smart3 Colorimeter (refer to Figure 4-7).
  - a. Turn on meter using the power button.
  - b. Use the up and down arrows to scroll to hardness (test 43). Select the test using the enter button.
  - c. Wipe off the blank created in Step 15. Insert the sample/blank into the sample chamber. Close lid and select 'Scan blank' on screen by pushing the enter button. Remove the hardness blank.
  - d. Wipe off the hardness UDV created in Step 14 and insert into sample chamber. Close lid and select 'Scan sample' on screen by pushing the enter button. Record value on field form. Remove UDV and UDV adaptor.
  - e. Push the exit button on the colorimeter to move back to the test list.

**Field Ammonia Measurement**

18. After approximately 5 minutes have elapsed since preparing the ammonia vial (Step 7), locate the ammonia vial and shake again. Locate the sample/blank vial.
19. Conduct the field screening for ammonia using the Smart3 Colorimeter (refer to Figure 4-7 on the previous page).
  - a. Turn on colorimeter using the power button.
  - b. Use the up and down arrows to scroll to ammonia (test 5). Select the test using the enter button.
  - c. Insert the sample/blank vial into sample chamber. Close lid and select 'Scan blank' on screen by pushing the enter button. Remove sample/blank vial.
  - d. Wipe off the ammonia vial and insert into sample chamber. Close lid and select 'Scan sample' on screen by pushing the enter button. Record value on field form. Remove ammonia vial.
  - e. Push the exit button on the colorimeter to move back to the test list.



**Field Potassium Measurement**

20. Locate the potassium vial prepared in Step 8 and shake again. Locate the sample/blank vial.
21. Conduct the field screening for potassium using the Smart3 Colorimeter (refer to Figure 4-7 on the previous page).
  - a. Turn on the colorimeter using the power button.
  - b. Use the up and down arrows to scroll to potassium (test 83). Select the test using the enter button.
  - c. Insert into sample chamber. Close lid and select 'Scan blank' on screen by pushing the enter button. Remove the sample/blank vial.
  - d. Wipe off the potassium vial and insert into sample chamber. Close lid and select 'Scan sample' on screen by pushing the enter button. Record value on field form. Remove potassium vial.
  - e. Push the exit button on the colorimeter to move back to the test list.

**Field Chlorine Measurement**

22. Locate the sample/blank vial and chlorine reagent/tablets.
23. Conduct the field screening for chlorine using the Smart3 Colorimeter (refer to Figure 4-7 on the previous page).
  - a. Turn on the colorimeter using the power button.
  - b. Use the up and down arrows to scroll to chlorine (test 14). Select the test using the enter button.
  - c. Insert the sample/blank vial into sample chamber. Close lid and select 'Scan blank' on screen by pushing the enter button. Remove sample/blank vial.
  - d. Add one chlorine tablet to sample/blank vial and shake for 10 seconds. Invert slowly 5 times. Ensure that the tablet is fully dissolved.
  - e. Wipe off the vial and insert into sample chamber. Close lid and select 'Scan sample' on screen by pushing the enter button. Record value on field form. Remove vial.
  - f. Turn the colorimeter off.

## **4.4 Equipment and Materials Clean-up**

The following guidelines pertain to the cleanup of equipment and materials associated with Sections 4.1, 4.2, and 4.3.

1. Any water remaining in the water samples should be returned to its origin.
2. Per Section 4.3, all water in the three glass vials (not including the turbidity blank) and two UDV's should be placed in a wastewater container. At the end of the day and back at the lab, wastewater from the container can be discharged to the sanitary sewer via any sink.
3. Per Section 4.3, rinse the three glass vials, two UDV's, and two syringes with plungers using deionized water.
4. Put away all equipment and materials. Used UDV's are stored in the field vehicle for future use.
5. Remove gloves and put in trash container.



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## Section 5.0

# Follow-up to Field Screening and/or Lab Sampling

This section provides general post-measurement guidelines and activities following completion of daily field screening efforts. Upon return to the lab, field screening activities need to be logged, analytical samples relinquished to the laboratory in conjunction with the COC, and equipment needs to be checked and stored.

Section 5.1 provides general information related to the relinquishing of grab samples for laboratory analysis and documentation of field screening and upstream investigation results. Section 5.2 outlines the post-measurement procedures for the Orion 4 Star Meter (see Section 4.1 for reference) and the YSI ProODO Meter (see Section 4.3 for reference). Section 5.3 details typical hold times per analytical methods. Section 5.4 summarizes maintenance and storage requirements for meters and other equipment. Resources referenced in the development of this IDDE OBI SOP are listed in Section 5.5.

## 5.1 Relinquishing Samples

At the end of the day, turn over signed COC to custodian at the Sample Receiving area in the lab. If no one is in Sample Receiving to accept the samples, then call 3-5696 or ask lab personnel for help. If after hours, place samples in the left side of the refrigerator labeled “AL” in the sample receiving room; leave the signed and dated COC on the lab counter across from the refrigerator.

## 5.2 Post-Measurement Checks of Meters

Each day, when returning from the field, meters used to conduct field screening efforts need to be checked to ensure the calibration hasn’t drifted.

If measurements collected during the post-measurement check are outside of the defined acceptance range, field measurements for that parameter and meter will have to be considered estimated. If this occurs, the measurements for the affected parameter(s) need to be flagged as estimated. The following phrase must be added to the Notes and Comments section of the inspection form (either directly to the electronic database or paper forms, if those are used):

“The result for [offending parameter] should be considered an estimate due to the post-measurement check of the field meter being outside the acceptance range.”

Post-measurement check procedures for the Orion 4 Star Meter and YSI ProODO Meter are listed on the next page.

### 5.2.1 Post-Measurement Check (Orion 4 Star Meter)

1. Turn meter on using the power button.
2. Locate the Orion 4-Star Calibration and Check Log for the meter (Appendix A). When conducting the post-measurement check, record all readings in the 'IN' row as the meter is being checked in after field work.

#### Temperature Post Measurement Check

3. Remove the pH sensor storage cap. Make sure to hold cap upright to retain storage solution. Rinse both the conductivity/temperature and pH probes with deionized water and place both in the large flask containing the PRT.
4. Once the meter has stabilized for temperature, record the temperature reading of both the meter and the PRT in the log. The meter should be within  $\pm 0.5$  °Celsius of the PRT.

#### Conductivity Post Measurement Check

5. Remove both probes from the flask and rinse with deionized water.
6. Wait for the meter to stabilize (flashing ' $\mu\text{S}/\text{cm}$ ' becomes solid) and record the specific conductance reading in the log. The meter should be within  $\pm 15$   $\mu\text{S}/\text{cm}$  of the conductivity standard solution.

#### pH Post Measurement Check

7. Remove both probes, rinse with deionized water, and place in pH 7 buffer solution. The same buffer solution from the calibration can be used.
8. Wait for the meter to stabilize (flashing 'pH' becomes solid) and record the pH reading in the log. The meter should be within  $\pm 0.20$  units of the pH 7 buffer solution.
9. Remove both probes, rinse with deionized water, and place in pH 4 buffer solution. The same buffer solution from the calibration can be used.
10. Wait for the meter to stabilize (flashing 'pH' becomes solid) and record the pH reading in the log. The meter should be within  $\pm 0.20$  units of the pH 4 buffer solution.
11. Note the temperature and consult the table and graphs for pH Value vs. Temperature (Appendix A) to find the actual pH value at that temperature. The table and graphs allow the user to account for variation in the pH buffer solutions from the standard 25 °C.
12. Rinse the probes with deionized water. Confirm that storage solution (pH 7 buffer solution and KCl) is in the pH storage cap and place the cap on the pH probe.
13. Turn meter off.

### 5.1.2 Post-Measurement Check (YSI Pro ODO Meter)

1. Turn meter on using the power button. Wait approximately 5 to 10 minutes for the air within the storage sleeve to become completely saturated and to allow sensor to stabilize.
2. Locate the YSI ProODO Calibration Log (log) for the meter (Appendix B).
3. Record the check-in time.
4. Once the readings have stabilized, record the DO% in the log. The acceptable range is between 90.0% and 110.0%.
5. Turn meter off.

### 5.3 Hold Times per Analytical Methods

Based on results of the field sampling and screening, additional grab samples may be required for laboratory analysis. Table 5-1 summarizes the analytical methods and technical holding times specific for the analysis of additional parameters in the laboratory.

Table 5-1. Pollutant Parameters and Analytical Methods							
Type (field or lab)	Analyte	Sample type (grab or time-spaced composite)	Unit	Target MDL	Preferred analytical method	Alternative analytical methods	Technical holding time
Lab	Solids: total suspended	grab	mg/L	1.0	<b>SM 2540 D</b>	ASTM D5907-13 USGS I-3765-85	7 days
Lab	Oil and grease	grab	mg/L	N/A	<b>EPA 1664B</b>	SM 5520	28 days
Lab	<i>E. coli</i>	grab	MPN/100 mL	1.0	<b>Colilert QT</b>	SM 9223 B-2004 AOAC 991.15	24 hours <sup>a</sup>
Lab	Copper, total	grab	µg/L	0.1	<b>EPA 200.8</b>	SM 3125 B	6 months
Lab	Lead, total	grab	µg/L	0.01	<b>EPA 200.8</b>	SM 3125 B	6 months
Lab	Zinc, total	grab	µg/L	1	<b>EPA 200.8</b>	SM 3125 B	6 months

*If the sample is intended to be used for compliance or enforcement purposes, ensure the sample incubation is started within 8 hours of time of collection.*

### 5.4 Equipment Maintenance

In accordance with SOPs documented in Section 4.0, meters and reagents must be stored in dry, temperature-controlled environment when not in use. Calibration logs (Appendix A and B) and reagents should be stored with their applicable meters. Liquids should be stored upright with caps securely in place to avoid potential for leaking.

Specific for SOP 4.2 and use of the YSI ProODO Meter, it is necessary to keep a small sponge inside the storage sleeve to retain moisture for the probe when not in use. The sponge should be rewetted (if the probe has not been in use for several days) and then placed inside the sleeve. Ensure the storage sleeve is securely in place when not in use. Specific to SOP 4.3, hardness UDVs must be stored in foil bags or any UV blocking container.

Clean all equipment used for collecting grabs (stainless steel buckets, extension pole, cords, etc.) at the end of the day, and place in dry storage for retrieval and use during future inspections.

## 5.5 Resources

EPA Compendium of ERT Surface Water and Sediment Sampling Procedures, U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Washington, DC, 1991.

EPA Guidance for Quality Assurance Project Plans, U.S. Environmental Protection Agency, Office of Research and Development, Washington, DC, 1998.

LaMotte. 2012. *Smart3 Colorimeter Operator's Manual*.

National Field Manual for the Collection of Water-Quality Data, U.S. Department of the Interior, U.S. Geological Survey, United States Government Printing Office: 1998-99.

Thermo Electron Corporation. 2006. *Orion Star™ Series Meter User's Guide*.

U.S. Geological Survey, National field manual for the collection of water-quality data: U.S. Geological Survey Techniques of Water-Resources Investigations, book 9, chaps. A1-A9, 2 v., variously paged.

Water Quality Monitoring, Technical Guide Book, The Oregon Plan for Salmon and Watersheds, 1999.

YSI Incorporated. 2009. YSI ProODO User Manual.

## **Appendix A: Orion 4-Star Calibration and Check Log**







City of Portland  
Environmental Services  
Field Operations

## COMBO pH & CONDUCTIVITY METER CALIBRATION & CHECK LOG

Meter #: \_\_\_\_\_

Model #: ORION 4-Star

Serial #: \_\_\_\_\_

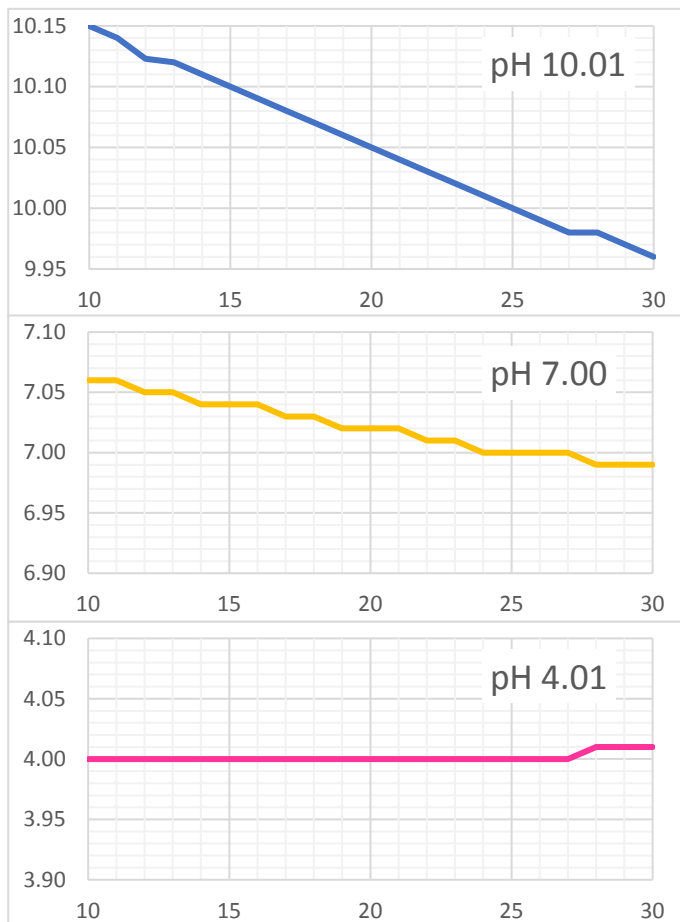
Project	Date		Time	Initials	Temperature		Conductivity		pH		Comments
					PRT temperature	combo meter temperature	Cond. Standard	Cond. meter reading	pH 7 reading	pH 4 or 10 reading	
					° C	° C	uS/cm	uS/cm	std. units	std. units	
		OUT									slope:
		IN									
		OUT									slope:
		IN									
		OUT									slope:
		IN									
		OUT									slope:
		IN									
		OUT									slope:
		IN									
		OUT									slope:
		IN									
		OUT									slope:
		IN									

**POST-MEASUREMENT  
ACCEPTANCE  
RANGES**

**pH:** 3.80 - 4.20, 6.80 - 7.20, and 9.80 - 10.20 at 25C (see graphs for range at other temperatures)  
**Cond.:** +/- 15 uS/cm for specific conductance (132-162 for a standard of 147)  
**Temp:** +/- 0.5 deg. C

## Value of pH Buffers by Temperature

Temperature degrees C	pH 4.01	pH 7.00	pH 10.01
10	4	7.06	10.15
11	4	7.06	10.14
12	4	7.05	10.12
13	4	7.05	10.12
14	4	7.04	10.11
15	4	7.04	10.10
16	4	7.04	10.09
17	4	7.03	10.08
18	4	7.03	10.07
19	4	7.02	10.06
20	4	7.02	10.05
21	4	7.02	10.04
22	4	7.01	10.03
23	4	7.01	10.02
24	4	7	10.01
25	4	7	10
26	4	7	9.99
27	4	7	9.98
28	4.01	6.99	9.98
29	4.01	6.99	9.97
30	4.01	6.99	9.96



## **Appendix B: YSI ProODO Calibration and Check Log**

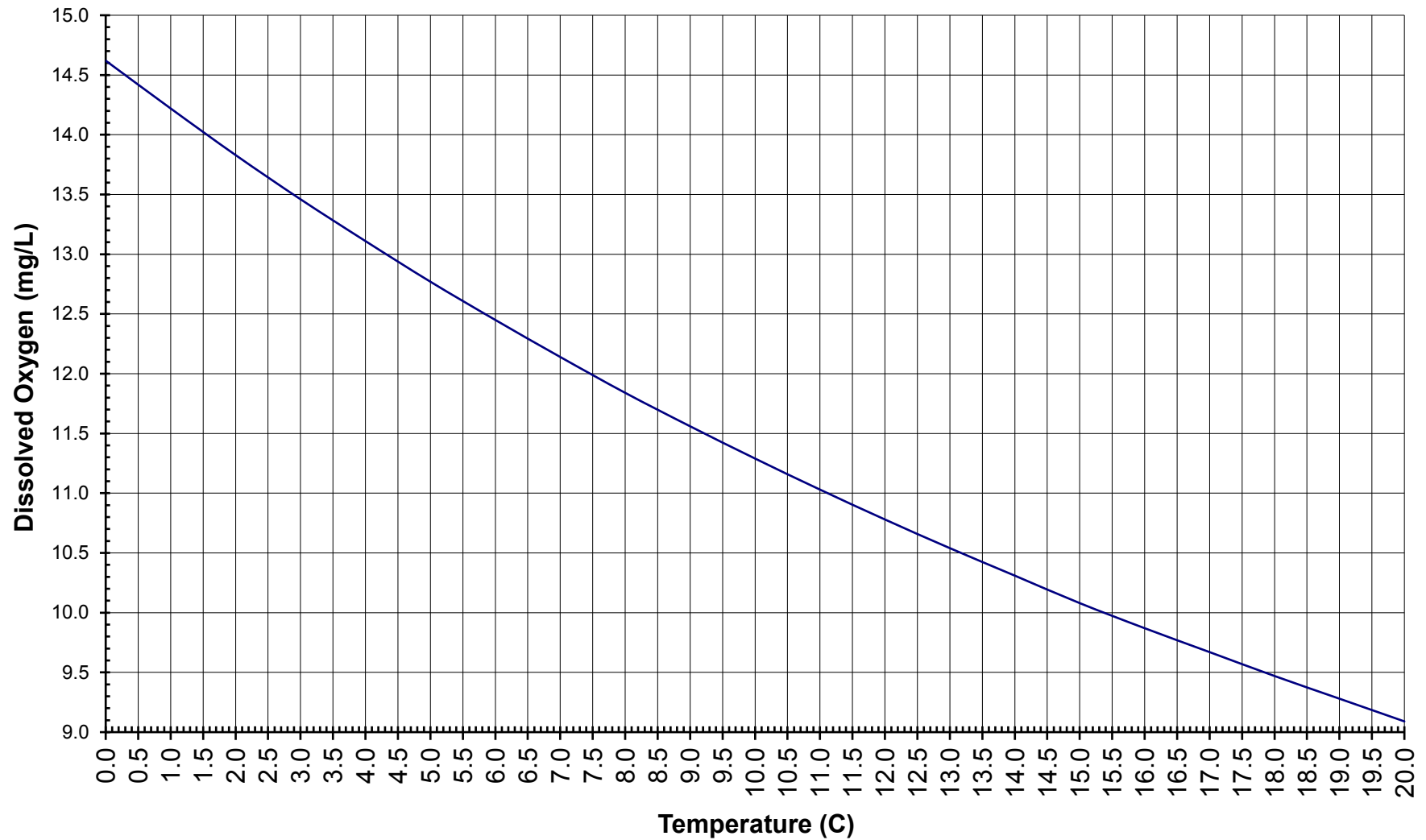




Meter #: \_\_\_\_\_ Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_

**acceptable range = 90.0 - 110.0 % sat. for post-measurement DO check; +/- 0.5 C for pre-measurement temperature check**

## Solubility of Oxygen at 100% Saturation (at 0 ft. elevation)



## Conversion of Dissolved Oxygen Values from % Saturation to mg/L

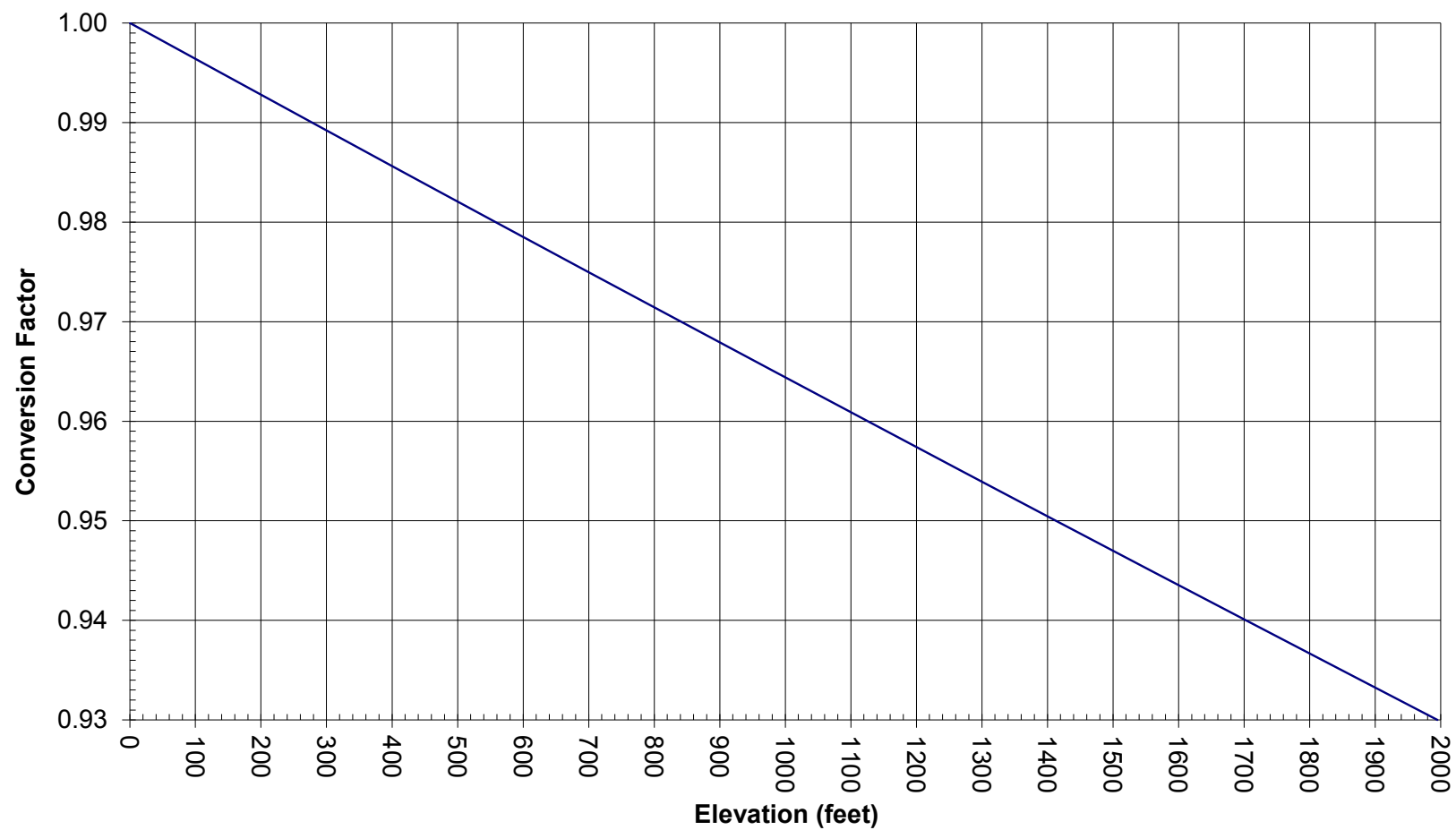
**Step 1.** To calculate the dissolved oxygen in mg/L, you will need to know the % saturation and temperature values of the sample, and the approximate elevation of the sampling location. Any sample location under 250 feet can be considered to have an elevation of zero for the purposes of this conversion.

**Step 2.** On the *Solubility of Oxygen at 100% Saturation* chart, find the dissolved oxygen solubility value (in mg/L) that corresponds to the temperature of the sample.

**Step 3.** Multiply the value generated in *Step 2* by the % saturation value originally measured in the field. If the sample elevation is less than 250 feet, this result is the correct dissolved oxygen concentration value (in mg/L). If the elevation is greater than 250 feet, proceed to *Step 4*.

**Step 4.** Refer to the *Dissolved Oxygen Altitude Compensation* chart and look up the correction factor that corresponds to the altitude of the sampling location. Multiply this correction factor by the value generated in *Step 3*. This result is the correct dissolved oxygen concentration value (in mg/L).

## Dissolved Oxygen Altitude Compensation Factor





## **Appendix C: Chain-of-Custody (COC) Form**



Collected By:

Client Name:	Spill Protection & Citizen Response	
Project Name:	<b>SPCR IDDE</b>	SPCR Contact Name: _____

[illegible]

<b>Relinquished By:</b>		<b>Received By:</b>		<b>Relinquished By:</b>		<b>Received By:</b>	
Signature:	Date:	Signature:	Date:	Signature:	Date:	Signature:	Date:
Printed Name:	Time:	Printed Name:	Time:	Printed Name:	Time:	Printed Name:	Time:

## **APPENDIX B: EROSION CONTROL DOCUMENT**



# CITY OF PORTLAND, OREGON - BUREAU OF DEVELOPMENT SERVICES

1900 SW Fourth Avenue, Portland, Oregon 97201, [www.portlandoregon.gov/bds](http://www.portlandoregon.gov/bds)



Permit/IVR:		
Site Address:		Date Issued :
Inspector:		
<b><u>CORRECTION OF THE FOLLOWING ITEMS REQUIRED</u></b>		<b><u>Code Section</u></b>
<input type="checkbox"/> 1. Visible or measureable offsite sedimentation, wind erosion, signs of erosion.		10.30.020
<input type="checkbox"/> 2. Erosion prevention or sediment control measures have not been installed, are improperly installed, missing, or require maintenance.		10.30.020 (Installation) 10.30.040 (maintenance)
<input type="checkbox"/> 3. Site deficiencies have not been corrected since last inspection.		10.70.010
<input type="checkbox"/> 4. Required documentation not available / not maintained (Inspection Log, Hotline Sign, or ESCP)		10.30.040
<input type="checkbox"/> 5. Encroachment of environmental protection areas (tree protection zones, wetlands, etc.).		Refer to Urban Forestry or Code Enforcement
<input type="checkbox"/> 6. Improper pollutant management (concrete washout, litter, chemical storage, etc.).		10.30.020
<input type="checkbox"/> 7. Failure to request inspection		10.50.030
<input type="checkbox"/> 8. Failure to meet stabilization/groundcover requirements. (temporary, permanent, seasonal)		10.30.020
<input type="checkbox"/> 9. Excavation, grading or site work endangers adjacent public or private property.		Refer to Building Inspection OSSC
<input type="checkbox"/> 10. Drainage control does not comply with PCC 17.38 and/or 17.39		10.30.030
<input type="checkbox"/> 11. Dewatering activities occurring without BES approval		10.30.020 Refer to BES Source Control
<b>Make required correction(s) and request re-inspection using the IVR system</b> Portland City Code- Chapter. 10.70: Failure to correct noted deficiencies can result in re-inspection fees, civil penalties, administrative enforcement fees, and stop work orders. <input type="checkbox"/> Inspection Fees Added <input type="checkbox"/> Stop Work Order Issued <b>APPEALS:</b> Pursuant to City Code Chapter 10.70, the Owner/Contractor may appeal any code provision cited in this Correction Notice by providing written request to the BDS Director within 10 calendar days from the date of the inspection for which the Correction Notice was issued. Permit expiration may not be extended pending resolution of any appeal.		
<b>Inspector Comments</b> (precede comment with item number)		
<b>Correction Required By [Date]</b>		

## **APPENDIX C: POST-COSTRUCTION DOCUMENT**

## MIP SITE INSPECTION FORM

Site Address:	Business Name:
Receiving System:	
Inspection Date:	
Inspector Name:	

Contact Name:	<b>Inspection Outcome</b>	
Telephone Number:	Send Inspection Letter	<input type="checkbox"/>
Email:	Send Warning Notice (WN)	<input type="checkbox"/>
Mailing Address:	Send Class III Violation Notice	<input type="checkbox"/>
Permit #:	Reinspection Date:	
Final Date:		

Facility ID:	Final Rating:      1      2      3
Type:	Deadline to Correct:
X:	
Y:	

No SMF Access ☐

<b>SW Infiltration/ Flow Through Rating</b>	
Inlet/Outlet (Open, <50%, >50%)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Clogged/Compacted Filter Media (ie, soil)	<input type="checkbox"/>
Sediment Accumulation (Depth in Inches #)	
Poor Grading/Elevations	<input type="checkbox"/>

<b>Vegetation Rating</b>	
Native Coverage (Full, <90%, <50%)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Invasive Coverage (<10%, >10%, >50%)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Dead or Stressed Vegetation	<input type="checkbox"/>
Landscape Maint. (Pruning, Weeding, Remove Debris)	<input type="checkbox"/>

<b>Structures Rating</b>	
Broken/Damaged/Missing Structures	<input type="checkbox"/>
Erosion/drain rocks or splash pads needed	<input type="checkbox"/>
Liner Damaged	<input type="checkbox"/>

### Notes

#### Results:

OK – Minor Issues ☐

Deficiencies - Revisit ☐

Deficiencies - Required ☐

#### Ratings

1 = No Corrective Actions

2 = Corrective Actions

3 = Deadline to Correct

S:\StormWater MIP\Templates\inspection

Revised Dec. 2020

<b>Facility ID:</b>	<b>Final Rating:</b> 1      2      3
<b>Type:</b>	<b>Deadline to Correct:</b>
X:	
Y:	

No SMF Access ☐

<b>SW Infiltration/ Flow Through Rating</b>	
---	--

Inlet/Outlet (Open, <50%, >50%) ☐ ☐ ☐

Clogged/Compacted Filter Media (ie, soil) ☐

Sediment Accumulation (Depth in Inches #)

Poor Grading/Elevations ☐

<b>Vegetation Rating</b>	
--------------------------	--

Native Coverage (Full, <90%, <50%) ☐ ☐ ☐

Invasive Coverage (<10%, >10%, >50%) ☐ ☐ ☐

Dead or Stressed Vegetation ☐

Landscape Maint. (Pruning, Weeding, Remove Debris) ☐

<b>Structures Rating</b>	
--------------------------	--

Broken/Damaged/Missing Structures ☐

Erosion/drain rocks or splash pads needed ☐

Liner Damaged ☐

Notes

Results:

OK – Minor Issues ☐

Deficiencies - Revisit ☐

Deficiencies - Required ☐

<b>Facility ID:</b>	<b>Final Rating:</b> 1      2      3
<b>Type:</b>	<b>Deadline to Correct:</b>
X:	
Y:	

No SMF Access ☐

<b>SW Infiltration/ Flow Through Rating</b>	
---	--

Inlet/Outlet (Open, <50%, >50%) ☐ ☐ ☐

Clogged/Compacted Filter Media (ie, soil) ☐

Sediment Accumulation (Depth in Inches #)

Poor Grading/Elevations ☐

<b>Vegetation Rating</b>	
--------------------------	--

Native Coverage (Full, <90%, <50%) ☐ ☐ ☐

Invasive Coverage (<10%, >10%, >50%) ☐ ☐ ☐

Dead or Stressed Vegetation ☐

Landscape Maint. (Pruning, Weeding, Remove Debris) ☐

<b>Structures Rating</b>	
--------------------------	--

Broken/Damaged/Missing Structures ☐

Erosion/drain rocks or splash pads needed ☐

Liner Damaged ☐

Notes

Results:

OK – Minor Issues ☐

Deficiencies - Revisit ☐

Deficiencies - Required ☐



## MIP Inspection Form Sheet Two

Address:

Permit:

Date:

Facility ID:	Final Rating: 1 2 3
Type:	Deadline to Correct:
X:	
Y:	

No SMF Access

☐

### SW Infiltration/ Flow Through Rating

Inlet/Outlet (Open, <50%, >50%)

☐ ☐ ☐

Clogged/Compacted Filter Media (ie, soil)

☐

Sediment Accumulation (Depth in Inches #)

Poor Grading/Elevations

☐

### Vegetation Rating

Native Coverage (Full, <90%, <50%)

☐ ☐ ☐

Invasive Coverage (<10%, >10%, >50%)

☐ ☐ ☐

Dead or Stressed Vegetation

☐

Landscape Maint. (Pruning, Weeding, Remove Debris)

☐

### Structures Rating

Broken/Damaged/Missing Structures

☐

Erosion/drain rocks or splash pads needed

☐

Liner Damaged

☐

Notes

Results:

OK – Minor Issues

☐

Deficiencies - Revisit

☐

Deficiencies - Required

☐

Facility ID:

Final Rating: 1 2 3

Type:

Deadline to Correct:

X:

Y:

no SMF access

☐

### SW Infiltration/ Flow Through Rating

Inlet/Outlet (Open, <50%, >50%)

☐ ☐ ☐

Clogged/Compacted Filter Media (ie, soil)

☐

Sediment Accumulation (Depth in Inches #)

Poor Grading/Elevations

☐

### Vegetation Rating

Native Coverage (Full, <90%, <50%)

☐ ☐ ☐

Invasive Coverage (<10%, >10%, >50%)

☐ ☐ ☐

Dead or Stressed Vegetation

☐

Landscape Maint. (Pruning, Weeding, Remove Debris)

☐

### Structures Rating

Broken/Damaged/Missing Structures

☐

Erosion/drain rocks or splash pads needed

☐

Liner Damaged

☐

Notes

Results:

OK – Minor Issues

☐

Deficiencies - Revisit

☐

Deficiencies - Required

☐

Facility ID:	Final Rating: 1 2 3
Type:	Deadline to Correct:
X:	
Y:	

No SMF Access ☐

SW Infiltration/ Flow Through Rating	
--------------------------------------	--

- Inlet/Outlet (Open, <50%, >50%) ☐ ☐ ☐
- Clogged/Compacted Filter Media (ie, soil) ☐
- Sediment Accumulation (Depth in Inches #)
- Poor Grading/Elevations ☐

Vegetation Rating	
-------------------	--

- Native Coverage (Full, <90%, <50%) ☐ ☐ ☐
- Invasive Coverage (<10%, >10%, >50%) ☐ ☐ ☐
- Dead or Stressed Vegetation ☐
- Landscape Maint. (Pruning, Weeding, Remove Debris) ☐

Structures Rating	
-------------------	--

- Broken/Damaged/Missing Structures ☐
- Erosion/drain rocks or splash pads needed ☐
- Liner Damaged ☐

Notes

- Results:
- OK – Minor Issues ☐
- Deficiencies - Revisit ☐
- Deficiencies - Required ☐

Facility ID:	Final Rating: 1 2 3
Type:	Deadline to Correct:
X:	
Y:	

no SMF access ☐

SW Infiltration/ Flow Through Rating	
--------------------------------------	--

- Inlet/Outlet (Open, <50%, >50%) ☐ ☐ ☐
- Clogged/Compacted Filter Media (ie, soil) ☐
- Sediment Accumulation (Depth in Inches #)
- Poor Grading/Elevations ☐

Vegetation Rating	
-------------------	--

- Native Coverage (Full, <90%, <50%) ☐ ☐ ☐
- Invasive Coverage (<10%, >10%, >50%) ☐ ☐ ☐
- Dead or Stressed Vegetation ☐
- Landscape Maint. (Pruning, Weeding, Remove Debris) ☐

Structures Rating	
-------------------	--

- Broken/Damaged/Missing Structures ☐
- Erosion/drain rocks or splash pads needed ☐
- Liner Damaged ☐

Notes

- Results:
- OK – Minor Issues ☐
- Deficiencies - Revisit ☐
- Deficiencies - Required ☐

## MIP Inspection Form Sheet Two

Address:

Permit:

Date:

Facility ID:	Final Rating: 1 2 3
Type:	Deadline to Correct:
X:	
Y:	

No SMF Access

☐

### SW Infiltration/ Flow Through Rating

Inlet/Outlet (Open, <50%, >50%)

☐ ☐ ☐

Clogged/Compacted Filter Media (ie, soil)

☐

Sediment Accumulation (Depth in Inches #)

Poor Grading/Elevations

☐

### Vegetation Rating

Native Coverage (Full, <90%, <50%)

☐ ☐ ☐

Invasive Coverage (<10%, >10%, >50%)

☐ ☐ ☐

Dead or Stressed Vegetation

☐

Landscape Maint. (Pruning, Weeding, Remove Debris)

☐

### Structures Rating

Broken/Damaged/Missing Structures

☐

Erosion/drain rocks or splash pads needed

☐

Liner Damaged

☐

Notes

Results:

OK – Minor Issues

☐

Deficiencies - Revisit

☐

Deficiencies - Required

☐

Facility ID:	Final Rating: 1 2 3
Type:	Deadline to Correct:
X:	
Y:	

no SMF access

☐

### SW Infiltration/ Flow Through Rating

Inlet/Outlet (Open, <50%, >50%)

☐ ☐ ☐

Clogged/Compacted Filter Media (ie, soil)

☐

Sediment Accumulation (Depth in Inches #)

Poor Grading/Elevations

☐

### Vegetation Rating

Native Coverage (Full, <90%, <50%)

☐ ☐ ☐

Invasive Coverage (<10%, >10%, >50%)

☐ ☐ ☐

Dead or Stressed Vegetation

☐

Landscape Maint. (Pruning, Weeding, Remove Debris)

☐

### Structures Rating

Broken/Damaged/Missing Structures

☐

Erosion/drain rocks or splash pads needed

☐

Liner Damaged

☐

Notes

Results:

OK – Minor Issues

☐

Deficiencies - Revisit

☐

Deficiencies - Required

☐

Facility ID:	Final Rating: 1 2 3
Type:	Deadline to Correct:
X:	
Y:	

No SMF Access ☐

SW Infiltration/ Flow Through Rating	
--------------------------------------	--

- Inlet/Outlet (Open, <50%, >50%) ☐ ☐ ☐
- Clogged/Compacted Filter Media (ie, soil) ☐
- Sediment Accumulation (Depth in Inches #)
- Poor Grading/Elevations ☐

Vegetation Rating	
-------------------	--

- Native Coverage (Full, <90%, <50%) ☐ ☐ ☐
- Invasive Coverage (<10%, >10%, >50%) ☐ ☐ ☐
- Dead or Stressed Vegetation ☐
- Landscape Maint. (Pruning, Weeding, Remove Debris) ☐

Structures Rating	
-------------------	--

- Broken/Damaged/Missing Structures ☐
- Erosion/drain rocks or splash pads needed ☐
- Liner Damaged ☐

Notes

- Results:
- OK – Minor Issues ☐
- Deficiencies - Revisit ☐
- Deficiencies - Required ☐

Facility ID:	Final Rating: 1 2 3
Type:	Deadline to Correct:
X:	
Y:	

no SMF access ☐

SW Infiltration/ Flow Through Rating	
--------------------------------------	--

- Inlet/Outlet (Open, <50%, >50%) ☐ ☐ ☐
- Clogged/Compacted Filter Media (ie, soil) ☐
- Sediment Accumulation (Depth in Inches #)
- Poor Grading/Elevations ☐

Vegetation Rating	
-------------------	--

- Native Coverage (Full, <90%, <50%) ☐ ☐ ☐
- Invasive Coverage (<10%, >10%, >50%) ☐ ☐ ☐
- Dead or Stressed Vegetation ☐
- Landscape Maint. (Pruning, Weeding, Remove Debris) ☐

Structures Rating	
-------------------	--

- Broken/Damaged/Missing Structures ☐
- Erosion/drain rocks or splash pads needed ☐
- Liner Damaged ☐

Notes

- Results:
- OK – Minor Issues ☐
- Deficiencies - Revisit ☐
- Deficiencies - Required ☐

## **APPENDIX D: INDUSTRIAL & COMMERCIAL FACILITIES DOCUMENTS**

# Columbia Slough Outfall Basin Inspection Form

Outfall Basin: \_\_\_\_\_

Inspection entered in Linko ☐ MIP form completed ☐

Site Name: \_\_\_\_\_ Org #: \_\_\_\_\_

Site Address: \_\_\_\_\_ Date/time: \_\_\_\_\_

Site Contacts: \_\_\_\_\_ Inspector(s): \_\_\_\_\_

\_\_\_\_\_ Prop. Owner: \_\_\_\_\_

Contact email: \_\_\_\_\_ SIC Code: \_\_\_\_\_ ☐ In Table 1 ☐ Not in Table 1

Contact phone: \_\_\_\_\_ ECSI # & Name: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

☐ Previous Orgs: \_\_\_\_\_

☐ Linko & IPM notes: \_\_\_\_\_

☐ NP\_Customers notes: \_\_\_\_\_

**Drainage Description** ☐ Portlandmaps.com ☐ Amanda permits ☐ Portlandoregon.gov/bds/plumbing\_permits

## Operations & Exposure to SW

## Stormwater Drainage & Flow - Prepare a GIS map showing stormwater drainage features

- ☐ catch basins, # \_\_\_\_\_ ☐ to MS4 ☐ to private outfall ☐ infiltrates ☐ trench drain(s)  
☐ downspout to surface ☐ downspouts piped below ground ☐ trackout to street/MS4  
☐ drywells, # \_\_\_\_\_ and are they registered with DEQ? Yes ☐ No ☐ ☐ MS4 via sheet flow

## Regulatory Applicability

- ☐ 1200-Z Permit ☐ NEC ☐ No permit required ☐ City SWPCP ☐ City Code Violation

## Referrals Needed (check when referral made)

- ☐ DEQ UIC Program ☐ City Code Enforcement ☐ DEQ Solid Waste Program  
☐ Industrial Pretreatment ☐ DEQ Cleanup Program ☐ Other \_\_\_\_\_

## Follow-Ups for Letter

## Notes



## 1200-Z INSPECTION FORM

Industry \_\_\_\_\_ Inspection Date \_\_\_\_\_ Time \_\_\_\_\_

Date of Previous Inspection \_\_\_\_\_ Connection to MS4 Yes ☐ No ☐ MIP: Yes ☐ No ☐

City Personnel \_\_\_\_\_ Industry Personnel \_\_\_\_\_

Current Monitoring Waiver Yes ☐ No ☐ Parameters \_\_\_\_\_

Applicable Sectors \_\_\_\_\_ Additional Sector Requirements \_\_\_\_\_

### MONITORING

Is sampling occurring per Schedule B & E as required? Yes ☐ No ☐ NA ☐ Detection limits adequate? Yes ☐ No ☐ NA ☐

Are proper sampling methods in place to meet pH and *e. Coli* hold times? Yes ☐ No ☐ NA ☐

Dissolved metals field filtered? Yes ☐ No ☐ NA ☐

Sample Dates	Exceedances? YES   NO	Parameters	Tier I Prepared? YES   NO	Date Report Completed	Corrective Actions completed/proposed	Date Action Completed
	<input type="checkbox"/> <input type="checkbox"/>		<input type="checkbox"/> <input type="checkbox"/>			
	<input type="checkbox"/> <input type="checkbox"/>		<input type="checkbox"/> <input type="checkbox"/>			
	<input type="checkbox"/> <input type="checkbox"/>		<input type="checkbox"/> <input type="checkbox"/>			
	<input type="checkbox"/> <input type="checkbox"/>		<input type="checkbox"/> <input type="checkbox"/>			

Tier 1s for impairment pollutant exceedances submitted on time? Yes ☐ No ☐ NA ☐

Notes: \_\_\_\_\_

Deficiencies or Recommendations: \_\_\_\_\_

### SPILLS

If any spills have occurred, have they been properly reported and documented? Yes ☐ No ☐ NA ☐

Describe spill and date(s): \_\_\_\_\_

### STORMWATER POLLUTION CONTROL PLAN

Is the SWPCP kept on-site? Yes ☐ No ☐

Are all spill notification phone numbers included in the SWPCP? Yes ☐ No ☐

Are all name, ownership, and contact information current and documented? Yes ☐ No ☐

Is the existing SWPCP reflective of current activities, site developments and Tier 1s prepared? Yes ☐ No ☐

SWPCP Revisions Required: \_\_\_\_\_

## EMPLOYEE EDUCATION

Date of Last Training \_\_\_\_\_

Records Available?

Yes ☐ No ☐

Done Annually? Yes ☐ No ☐

New Hires w/in 30 days?

Yes ☐ No ☐

Does the education program include: site specific control measures, spill response and housekeeping, monitoring, facility inspections, reporting and documentation?

Yes ☐ No ☐

Deficiencies or Recommendations: \_\_\_\_\_

## FACILITY INSPECTIONS AND VISUAL OBSERVATIONS

Facility Inspections: Completed monthly? Yes ☐ No ☐ Months Missing: \_\_\_\_\_

Visual Observations: Completed monthly? Yes ☐ No ☐ Months Missing: \_\_\_\_\_

When discharge is occurring? Yes ☐ No ☐ At all discharge points? Yes ☐ No ☐

Foam, discoloration, oil and grease, floating solids, settleable solids, odor? Yes ☐ No ☐

Corrective Measures implemented, if Needed? Yes ☐ No ☐ NA ☐

Dates and Times of Visual Observations: Rainfall or Discharge during observation Y/N (record date since last inspection)


Deficiencies or Recommendations: \_\_\_\_\_

## PREVENTATIVE MAINTENANCE

Feature	Records Available YES   NO	Frequency (SWPCP)	Implementation per SWPCP YES   NO	Dates Maintained	Comments
CBs	<input type="checkbox"/> <input type="checkbox"/>		<input type="checkbox"/> <input type="checkbox"/>		
CB Filters	<input type="checkbox"/> <input type="checkbox"/>		<input type="checkbox"/> <input type="checkbox"/>		
Sweeping	<input type="checkbox"/> <input type="checkbox"/>		<input type="checkbox"/> <input type="checkbox"/>		Vendor/Self Vendor name:
Infiltration Facility	<input type="checkbox"/> <input type="checkbox"/>		<input type="checkbox"/> <input type="checkbox"/>		
Treatment Facility	<input type="checkbox"/> <input type="checkbox"/>		<input type="checkbox"/> <input type="checkbox"/>		Type:
Other:	<input type="checkbox"/> <input type="checkbox"/>		<input type="checkbox"/> <input type="checkbox"/>		

Deficiencies or Recommendations: \_\_\_\_\_



## NARRATIVE TECHNOLOGY-BASED EFFLUENT LIMITS

NTBELs Requirement	Adequate Implementation			Comments
	YES	NO	NA	
<b>Containment (A.1.a)</b>				
– Substances w/o potential to contaminate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
– Materials/equipment in containment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
– Drip pans used as needed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
– No evidence of leaking containers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Discharge log used for tank farm? Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>
<b>Mobile Washing occurs on site? (A.1.a)</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Name of mobile washer:
– No Evidence of washwater discharge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Mobile washer authorized for discharge to sanitary: Y/N Days/Times mobile washing occurs on site:
<b>Cleaning operations (A.1.a)</b>				
– Conducted indoors, under cover or within a bermed area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
– No overspray, or runoff observed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Grading or curbing to divert SW (A.1.a)</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Oil/Grease minimized in SW (A.1.b)</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Fixed Fueling (A.1.a)</b>				
– w/ containment, cover, spill kit, shut-off valve or other appropriate BMPs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Waste storage (A.1.c) (if applic. Sch. E Sector N)</b>				
– Recycling & waste bins covered	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
– Other materials covered	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
– No leaking containers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Discharge/exposed soils stabilized to prevent erosion/discharge of debris or contaminated sediment or significant materials from past activities (A.1.d)</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Areas with contaminated sediment? Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/>
<b>No evidence of tracking off-site (A.1.f)</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Housekeeping (A.1.g)</b>				
– Proper routine cleaning occurring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
– Orderly storage occurring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
– Prompt clean-up of spills and leaks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
– Proper maintenance of vehicles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
– Proper stowing of materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
– Implemented per SWPCP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Spill Prevention and Response (A.1.h)</b>				Discussed notification requirements: Yes <input type="checkbox"/>
– Materials labeled	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Highest risk of spills:
– Barriers adequate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
– Spill kit(s) at locations in SWPCP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
– Notification numbers posted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
				Describe:
<b>No Non-stormwater discharges (A.1.k)</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>NTBELS implemented as described in SWPCP?</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Additional NTBELS required to be added to SWPCP?</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

**STORMWATER SYSTEM INSPECTION**

Requirement	Adequate Implementation			Description/Comments/ Maintenance Required
	YES	NO	NA	
<b>Stormwater catch basins</b>				
- Is area surrounding catch basin free of heavy sediment accumulation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
- Filter inserts in good condition and present as described in SWPCP?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Stormwater Treatment or Infiltration Facility adequately maintained?</b>				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Discharge Points</b>				
- No Evidence of Pollutants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
- All discharge points included on map	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
- No Non-stormwater discharge observed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>No Run-on from neighboring properties observed</b>				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

**OVERALL INSPECTION NOTES**

Deficiencies \_\_\_\_\_

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Recommendations/ Notes \_\_\_\_\_

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Inspected by:\_\_\_\_\_ Date:\_\_\_\_\_



## NP Stormwater Inspection Form: Code Compliance & Exposures

Industry Name: \_\_\_\_\_ Org ID: \_\_\_\_\_  
Site Address: \_\_\_\_\_  
Contact: \_\_\_\_\_ Telephone: \_\_\_\_\_  
Date/Time: \_\_\_\_\_ Inspector: \_\_\_\_\_  
SIC Code(s): \_\_\_\_\_

### Site Records Research

Former Orgs, Tenants: \_\_\_\_\_

#### Environmental Information

<input type="checkbox"/>	Wastewater / Pretreatment	<input type="checkbox"/>	Maintenance Inspection Program – O & M Recorded?
<input type="checkbox"/>	Hazardous Waste	<input type="checkbox"/>	Contaminated Sediment Program Area (PHarbor/COLS)
<input type="checkbox"/>	ECSI site #	<input type="checkbox"/>	Other

Notes:

#### Building & Plumbing Records Review (check box if present)

☐ Illicit Connections ☐ Interior Floor Drains to Storm ☐ Exterior Drains to Sanitary

Notes:

#### Stormwater Drainage and Outfalls

(Identify ALL outfalls and the associated basin & attach maps)

Discharge Point (MS4, Private OF, Sanitary/CSO, Drywell, Ground/Infiltration, Recycled, Other)	Drainage Basin Description (Outfall #, basin, receiving water body, connection node, etc.)

Notes:

## Inspection Questions

1. Number Employees:                      Days of Operation: M T W T F S S                      Hours:
2. Business activities. (Manufacturing, processes, products, services, loading, unloading)
3. **Raw materials** are in use on-site?
4. **Scrap or waste materials** are produced and stored on-site? (Waste oil, scrap metal, dumpster materials, hazardous waste. Covered or uncovered. Who collects the waste?)
5. Trucks or heavy equipment on-site?                      YES    NO    How many and what type?

	<b>Washing</b>	<b>Fueling</b>	<b>Maintenance</b>
Performed on-site?	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
By Contractor or Self?		Fuel Isl <input type="checkbox"/> Mobile <input type="checkbox"/>	
Service Provider (if applicable)	ADCM? <input type="checkbox"/> Wash Plan? <input type="checkbox"/>	Spill Response Plan? <input type="checkbox"/>	
Frequency:			
Location:			
Point of Discharge:			

6. Outdoor housekeeping practices: Routine sweeping and yard cleanliness, storm system maintenance (CB cleaning, line flushing, etc.)?
7. Stormwater treatment device on-site? Type? Maintenance Practices?
8. Is any other water or material discharged to the ground or to the storm system?  
(Non-contact cooling water, condensate, boiler blow down, process wastewater, groundwater, potable water, etc.)

## Field Observations (check if applicable & describe)

Exposure	Site Specific Description
<b>General Yard</b>	
<input type="checkbox"/> CBs Full of Sediment	
<input type="checkbox"/> CBs not Functioning (elbow, etc)	
<input type="checkbox"/> Heavy Yard or Lot Sediment	
<input type="checkbox"/> Debris or Garbage	
<input type="checkbox"/> Building Materials (zinc roof, etc)	
<input type="checkbox"/> Electrical Equipment (transformers)	
<b>Vehicles &amp; Equipment</b>	
<input type="checkbox"/> Maintenance	
<input type="checkbox"/> Fueling	
<input type="checkbox"/> Washing	
<b>Products &amp; Materials Usage</b>	
<input type="checkbox"/> Product Storage	
<input type="checkbox"/> AST Containment	
<input type="checkbox"/> Product Transfer Areas	
<input type="checkbox"/> Evidence of Spills (check MHs & CBs)	
<input type="checkbox"/> Dust/Air Deposits/Rooftop	
<input type="checkbox"/> Paints, Painting	
<b>Waste Storage &amp; Handling Practices</b>	
<input type="checkbox"/> Dumpsters/Compactors	
<input type="checkbox"/> Hazardous Waste Handling	
<input type="checkbox"/> Scrap/Waste Material Storage	
<b>Additional Observations</b>	
<input type="checkbox"/> Other:	

## Discussion/Findings

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**City Code Concerns:** (non-allowable discharges, evidence of past spills or non-allowable discharges, illicit connection, lack of spill prevention and/or spill cleanup materials onsite, previously unidentified drainage structures)

Discussed Allowable vs. Non-allowable Discharges: Yes ☐ No ☐

Discussed City Code Reporting Requirements: Yes ☐ No ☐

**Exposures of Concern:** (Describe areas that may or do represent exposure of industrial pollutants to stormwater)

Corrective Measures Needed:

Permit Required? Yes No City Code ADCM NEC N/A

Reason for determination:

City Code Violations? Yes No

**Additional Comments & Follow-up Items:** (Provide additional details, map documentation during inspection, and photos)

**Inspected by:**\_\_\_\_\_ **Date:**\_\_\_\_\_



## ENVIRONMENTAL SERVICES CITY OF PORTLAND

**working for clean rivers**

The City of Portland Bureau of Environmental Services is committed to providing meaningful access. To request translation, interpretation, modifications, accommodations, or other auxiliary aids or services, please call 503-823-7740, or use City TTY 503-823-6868, or Oregon Relay Service: 711.

口笔译服务 | Chiaku me Awewen Kapas | अनुवादन तथा व्याख्या | Traducere și interpretariat |  
Устный и письменный перевод | Turjumaad iyo Fasiraad | Traducción e interpretación |  
Письмовий і усний переклад | Biên Dịch và Thông Dịch |

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