CITY OF BEND

National Pollutant Discharge Elimination System Phase II

Underground Injection Control Water Pollution Control Facility

Integrated Stormwater Management Program Document

Permit Number: 102901

Submitted to:
Oregon Department of Environmental Quality

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Table of Contents

List of Figures

List of Tables

List of Abbreviations

BGS	Below Ground Surface
BMC	Bend Municipal Code
BMP(s)	Best Management Practice(s)
BPRD	Bend Park and Recreation District
CCTV	Closed-Circuit Television (for inspections)
City	City of Bend
COSM	Central Oregon Stormwater Manual
CWA	Clean Water Act
DEM	Digital Elevation Model
DEQ	Department of Environmental Quality
EIPD	Engineering and Infrastructure Planning Department
EPSC	Erosion Prevention and Sediment Control
GI	Green (Stormwater) Infrastructure
GWPD	Groundwater Protectiveness Demonstration
IDDE	Illicit Discharge and Elimination
IPM	Integrated Pest Management
ISWMP	Integrated Stormwater Management Program
LDC	Land Development Code
LID	Low Impact Development
LiDAR	Light Detection and Ranging
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollution Discharge Elimination System
NSRR	Numeric Stormwater Retention Requirement
PFAS	Per- and Polyfluoroalkyl Substances
Permit	NPDES MS4 Phase II Discharge Permit
ROW	Right-of-Way
SDWA	Safe Drinking Water Act
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Maximum Daily Load
UIC	Underground Injection Control
UICMP	Underground Injection Control Management Plan
UPAG	Utility Public Advisory Group
US EPA	United States Environmental Protection Agency
WPCF	Water Pollution Control Facility
YDO	Your DEQ Online

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Part 1 ISWMP Overview

1.1 Introduction

The purpose of an Integrated Stormwater Management Program is to meet federal and state clean water and safe drinking water requirements for both surface water and groundwater and to protect the quality of water resources. Maintaining healthy and resilient local water quality for human health and the environment is a key priority of the City of Bend.

This 2023 Integrated Stormwater Management Program (ISWMP) Document describes a framework for the City of Bend (City's) planned activities to minimize pollutants from reaching surface and groundwater sources including the Deschutes River and Deschutes Aquifer. This ISWMP contains best management practices (BMPs), which outline the specific tasks that the City will conduct to prevent and reduce stormwater pollution to the maximum extent practicable (MEP), to protect water quality, and satisfy the requirements of the National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System (NPDES MS4) Permit. The NPDES MS4 Permit is designed to meet requirements under the federal Clean Water Act (CWA), and the Water Pollution Control Facilities Permit for Underground Injection Controls (WPCF-UIC) is designed to meet requirements under the federal Safe Drinking Water Act (SDWA).

The United States Environmental Protection Agency (US EPA) defines BMPs as:

> *"…schedules of activities, prohibitions of practices, maintenance procedures or other management practices to prevent or reduce the pollution of waters of the state. BMPs for stormwater may include operational and structural source controls that minimize and prevent contaminants from entering stormwater as well as treatment BMPs that remove contaminants contained in stormwater runoff before disposal or discharge."*

This 2023 ISWMP was developed based on a review and evaluation of the City's stormwater management program, including activities and accomplishments implemented during the previous NPDES MS4 and WPCF permit terms and their administrative extension periods. The City used an adaptive management process to assess and modify, if necessary, BMPs to achieve reductions in stormwater pollutants and meet permit requirements. This 2023 ISWMP update considers available technologies and practices; review of ISWMP measurable goals and tracking measures; and evaluation of City resources available to implement programs.

The BMPs are evaluated annually during preparation of the MS4 and WPCF Annual Reports.

1.2 Regulatory Background

This 2023 ISWMP document is designed to reduce pollutants from entering municipal storm sewer systems and underground injection systems throughout the City to the MEP, to protect water quality, and to satisfy the appropriate water quality requirements of the federal CWA and SDWA.

An integrated approach to address stormwater management is conducted by the City to address NPDES MS4 and WPCF-UIC Permit requirements because:

- Consistent stormwater strategies (BMPs) are required under both the NPDES MS4 and WPCF-UIC permits to keep contaminants out of stormwater or, if necessary, remove contaminants before water is discharged underground or to the river.
- MS4 and UIC drainage areas overlap in the city.

- An integrated plan supports consistent and efficient application of management practices across the City.
- Integration of MS4 and UIC plans is recognized and encouraged by DEQ.

1.2.1 NPDES MS4 Permit

The City's first NPDES MS4 Permit (No. 102901) was issued by the Oregon Department of Environmental Quality (DEQ) under the CWA and Oregon Revised Statute 468B.050, on February 26, 2007. Phase II NPDES MS4 permits apply to smaller communities in Oregon with population less than 100,000 and located within a Census Bureau designated "urbanized area". The City's 2007 Phase II NPDES MS4 permit expired in 2012 and went into administrative extension until the City received its new, individual Phase II permit on December 15, 2021, effective January 1, 2022.

The City of Bend is the only Central Oregon community permitted under the municipal stormwater program for discharges to surface water and the only Phase II jurisdiction with an individual (as opposed to a general) NPDES MS4 permit in Oregon due to the unique nature and characteristics of the City's stormwater collection and conveyance system.

The following table outlines the Integrated Stormwater Management documents associated with each of the permit cycles outlined above:

Table 1-1. Integrated Stormwater Management Document History

Permit Issuance	Title of Document	Submitted to DEQ	Implementation Duration
1	Integrated Stormwater Management Plan	Nov. 2006	5 Years
2	Integrated Stormwater Management Plan 2022	Nov. 2012	10 Years
3	Integrated Stormwater Management Program Document	Nov. 2023	5 Years

1.2.2 WPCF Permit

The City owns and operates approximately 6,500 UIC devices (approximately 1,000 drill holes and 5,500 known drywells)[1] to manage stormwater runoff from the municipal property and right-of-way (ROW) through infiltration into subsurface soils. Underground injection systems include, but are not limited to, an assemblage of perforated pipes, drain tiles, drill holes, drywells, infiltration galleries, soakage trenches, or other mechanism intended to distribute fluids below the surface of the ground. Like private entities that manage stormwater runoff using UICs, the City is subject to regulations authorizing the discharge of stormwater runoff to groundwater under Oregon's UIC program.

Figure 1-1. Drill hole (top); drywell interior (bottom)

The City received its first WPCF-UIC Permit for public stormwater discharges to UICs from DEQ on May 14, 2013, with a 10-year permit term. The City's WPCF-UIC permit is currently in administrative extension and the City anticipates reissuance in early 2024. As required under the City's 2013 WPCF-UIC Permit, the City was required to prepare an Underground Injection Control Management Plan (UICMP) for City-owned drill holes and dry wells. This ISWMP is intended to fulfill requirements of a UICMP.

[1] Drill holes and drywells are different applications of underground injection controls. Both are configured as wells; drywells are typically 10 to 20 feet deep cylindrical structures constructed of 4-foot diameter concrete rings with weep holes (perforations) along the wall of the structure. Drill holes are typically 6-inch diameter open boreholes drilled up to 100 feet deep and completed with a steel surface casing (generally 10 to 20 feet).

1.2.3 TMDL/303(d)

Under Section 303(d) of the CWA, states, territories, and authorized tribes are required to develop lists of impaired waters that do not meet the state water quality standards. The law requires that these jurisdictions establish priority rankings for waters on the lists and develop Total Maximum Daily Loads (TMDLs) for these waters - a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards. A waterbody is listed as impaired if data or information indicates that at least one beneficial use is not being fully supported and a TMDL or other plan is needed to address the issue.

Many rivers, streams, and lakes in the Deschutes Basin do not meet Oregon water quality standards and have been identified as impaired on the state's 303(d) list. DEQ is required to develop TMDLs for waterbodies exceeding water quality standards, and for Bend, these efforts have historically focused on the Upper Deschutes and Little Deschutes subbasins. As of the date of publication of this ISWMP document, no TMDLs have yet been developed or implemented by DEQ for these subbasins.

For additional information about the active 303(d) listings for Bend, see Section 1.3.4.

1.3 City Overview and Program Responsibility

The City of Bend, located within Deschutes County, covers 32 square miles (with an extraterritorial jurisdiction of over 72 square miles). The City sits approximately 3,600-feet above sea level and is considered high-desert with an average of 11 inches of precipitation and 34 inches of snowfall annually. The regional topography is hilly to mountainous, the east side of Bend itself is relatively flat to gently sloping with some buttes located throughout town, and to the west of the river the City experiences a steeper terrain.

The City is located entirely in the upper Deschutes Basin (an approximately 4,500 square mile area) drained by the Deschutes River, which runs south to north through the City, and its tributaries. Tumalo Creek flows along the western border of the city limits through Shevlin Park, which is kept mainly in a natural state.

1.3.1 Geology

Due to its unique topography and geology, with hard volcanic rock underlying much of the area, the City's drainage system relies on a combination of surface water conveyance (MS4 system) and underground injection via dry wells and drill holes (UIC system) to manage much of its stormwater discharge. The City's complex geology is comprised of a transition zone where volcanic and geologic systems with distinct origins and characteristics come together, thus creating localized differences in surface and subsurface infiltration characteristics throughout the City.

Geology in the northwest part of Bend is dominated by Awbrey Butte, a small basaltic shield volcano, and surface and subsurface geologic conditions have indicated relatively low permeability (GSI, 2011). Geology in the southwest part of Bend is primarily characterized by tuff (i.e., volcanic ash) and pumice (a porous, permeable volcanic rock) originating from Cascade volcanism. Tuff is often encountered at or near ground surface and pumice may be present beneath the tuff. The fine-grained tuffs in Bend are unfractured and generally welded and, therefore, are characterized by a low permeability (GSI, 2023).

Geology in Bend east of the Deschutes River is characterized primarily by extensive lava flows that originated from Newberry Volcano south of the City, called the Newberry Basalt (Qbn). Compared to the basalt of Awbrey Butte, the Newberry basalt is a relatively young, unweathered basalt and is highly permeable. The Newberry Basalt is the most permeable geologic unit in the City and is characterized by the most rapid infiltration rates.

This hydrogeology supports complex and unique system where groundwater and surface water are inherently interconnected, and approximately 35-40 percent of drinking water the City provides to customers comes from a deep aquifer beneath the City fed by snow melt from the Cascade Mountains.

1.3.2 Demographics

Understanding the community makeup is key to implementing an effective stormwater program. Per the 2020 Census, the City of Bend has a population of about 99,178; up from a population of approximately 76,639 in 2010. The growth rate between 2000 and 2020 was 90.6 percent. Given such high community growth, the City's priorities include significant public outreach and a focus on development related BMPs.

1.3.3 Integrated Stormwater System

The City's MS4 system is distinguished by pipe or open channel conveyance that discharges stormwater to surface water bodies (i.e., Deschutes River) whereas the UIC systems discharge to a dry well or drill hole that injects water underground.

Surface water discharges typically require additional treatment to ensure aesthetic and beneficial uses of surface water body are maintained. UIC usage typically requires pretreatment of stormwater prior to discharge, but in Bend, there is also substantial vertical separation between the bottom of UICs and groundwater, thus providing additional treatment via filtration through the subsurface rock and soil. Specifically, the depth to the regional groundwater table in the City of Bend ranges from about 300 to 750 feet below ground surface (BGS). Areas of perched groundwater are highly localized levels but are still typically greater than 100 feet BGS. The most significant area of perched groundwater occurs in the northwest portion of the City. Thus, the City's UIC system significantly helps meet NPDES MS4 permit goals as well by minimizing stormwater flow volume and further removal of pollutants prior to reaching surface water bodies.

There are approximately 26 miles of active City-owned storm main pipe (8- to 48-inch diameter) throughout the City, and approximately 6 percent of the public pipe system outfalls directly to the Deschutes River, comprising MS4 area within the City. These outfalls generally drain the western portion of the City and are located along the west bank of the Deschutes River. There are select private development areas, such as the Old Mill District, that have privately owned and maintained storm sewer systems and outfalls outside of the City's jurisdiction with respect to the NPDES MS4 permit. Additionally, the Bend Park and Recreation District (BPRD), which oversees approximately 2,000 acres of developed and undeveloped park land and open space adjacent to the river, is a separate special District from the City and thus not regulated directly under the NPDES MS4 permit.

As noted in Section 1.2.2, the City owns and operates about 6,500 UICs, of which 5,500 are drywells and 1,000 are drill holes. This inventory does not include privately owned stormwater systems. Approximately 80 percent of the storm main line is connected to these public UICs, which are in ROWs and public easements. Drywells are typically 10 to 20 feet deep cylindrical structures constructed of 4-foot-diameter concrete rings with weep holes. Drill holes are typically 6-inch diameter open boreholes drilled up to 100 feet deep and completed with a steel surface casing (generally 10 to 20 feet). The drill holes are older facilities and are not currently allowed for new development in the City's Standards.

UICs and stormwater conveyance to outfalls is dispersed and intermixed throughout the City. Figure 1-2 and Figure 1-3 provide a general overview of the City area including estimate of areas primarily discharging to surface waters versus groundwater (via UICs).

The BMPs described within this ISWMP are generally applied throughout the entire City's urban services boundary and programs are operated on a city-wide basis, including areas primarily discharging to surface waters and groundwater.

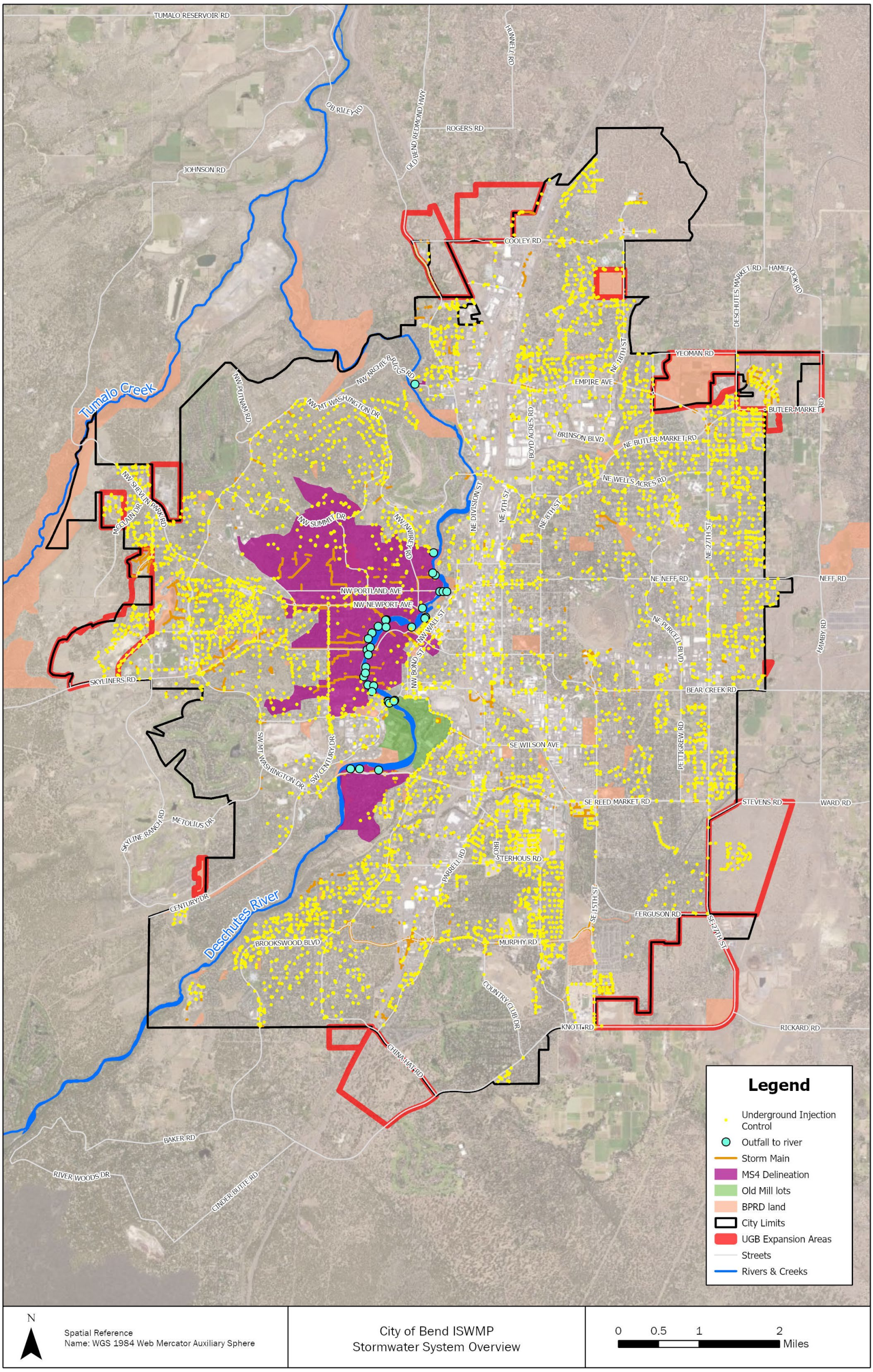

Figure 1-2. City of Bend's Stormwater System Overview

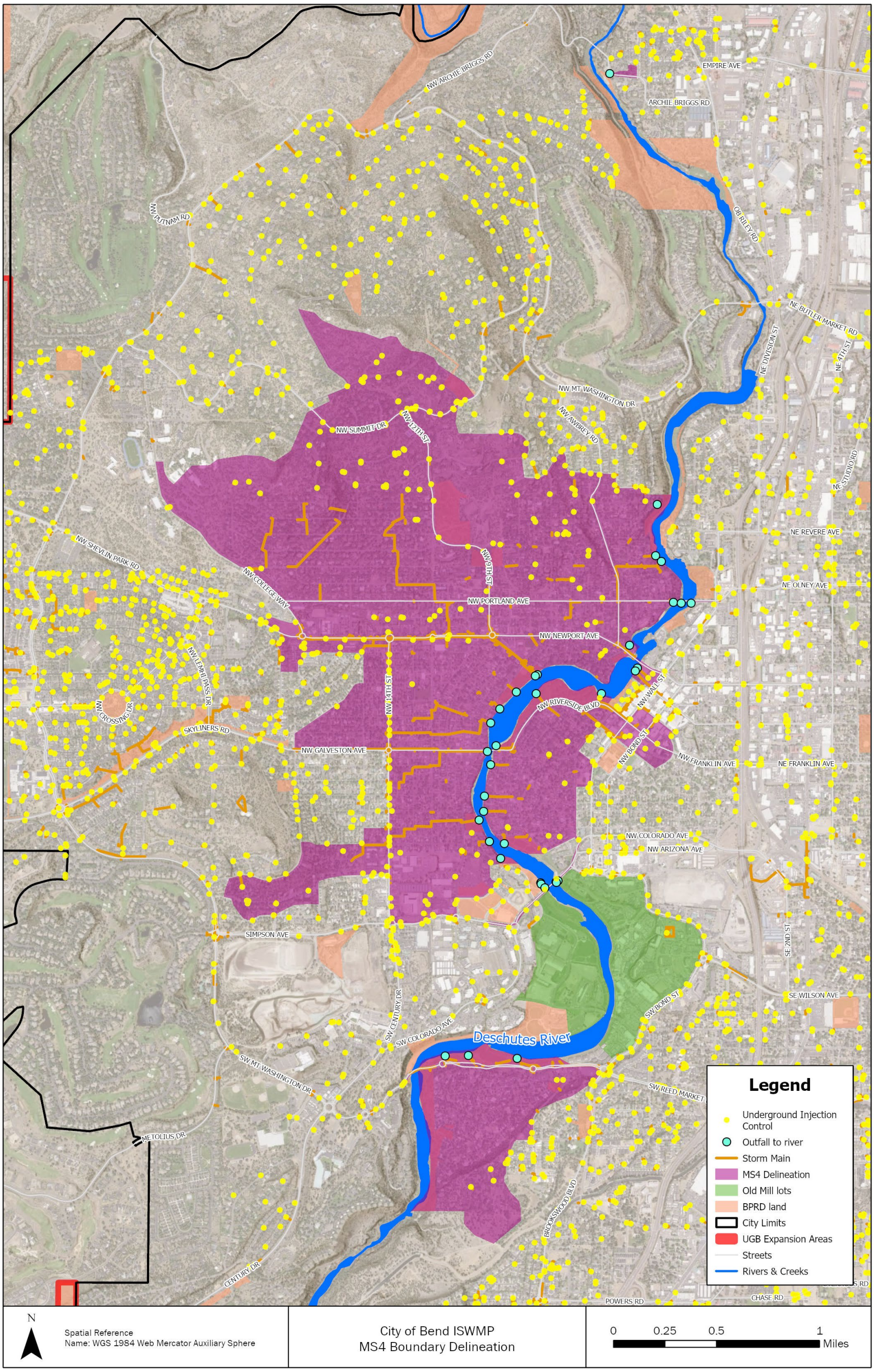

Figure 1-3. City of Bend Stormwater System MS4 Boundary

1.3.4 Pollutant(s) of Concern

This ISWMP is designed to help minimize the City's contribution of various pollutants of concern associated with urban runoff to its MS4 or UIC system.

DEQ's 2022 Integrated Report and 303(d) list was approved by the US EPA in September 2022. As such the 2022 303(d) list is the effective 303(d) list. The Deschutes River is currently on DEQ's list of impaired waterbodies for the following pollutants or potential pollutant indicators. Per the 2022 Integrated Report, river miles are no longer used to identify impairments and instead Assessment Unit IDs (AU_ID) are used. Applicable 303(d) parameters for Bend are identified in Table 1-2.

Table 1-2. 2022 303(d) Parameters Applicable to Bend[2]

Water body	AU Description	Year Listed	Parameter	Beneficial Use
OR_SR_1707030108_02_102627 – Deschutes River				
Deschutes River	North Unit Diversion Dam to Whychus Creek	2004	Temperature (Year-round)	Fish and Aquatic Life
OR_SR_1707030108_02_102628 – Deschutes River				
Deschutes River	Spring River to North Unit Diversion Dam	2004	Temperature (Year-round)	Fish and Aquatic Life
Deschutes River	Spring River to North Unit Diversion Dam	1998	Turbidity	Fish and Aquatic Life
Deschutes River	Spring River to North Unit Diversion Dam	2022	pH	Fish and Aquatic Life
Deschutes River	Spring River to North Unit Diversion Dam	1998	Sedimentation	Fish and Aquatic Life

In conjunction with the pending reissuance of the City's WPCF-UIC permit, the City was required to develop an emerging pollutant evaluation. The emerging pollutant evaluation assessed emerging pollutant types and concentrations and addressed the implications of any significant findings for protection of beneficial uses and for the application of BMPs. The City of Bend, as well as 11 other participating jurisdictions, hired an outside contractor to perform the evaluation in 2022 (GSI, September 2022). Seventeen (17) emerging pollutants were included in the evaluation, and results of the evaluation indicated that seven of the emerging pollutants (fipronil, diuron, PFAS, atrazine, simazine, 2,4-D, and 4-nonylphenol) were deemed to have the highest potential for groundwater impacts due to mobility, toxicity, and persistence. However, additional fate and transport modeling conducted as part of the emerging pollutant evaluation confirms that three parameters (fipronil, diuron, and 2,4-D) generally do not pose a risk of degradation of the quality of groundwater so long as a five-foot vertical separation is maintained between the bottom of the UIC and seasonal high groundwater. Fate and transport modeling for the four remaining emerging pollutants has not yet been performed so there is a level of uncertainty remaining related to these pollutants.

The BMPs described throughout this plan will focus on both the identified 303(d) parameters as well as the four emerging pollutants where no fate and transport modeling has been conducted (PFAS, atrazine, simazine, and 4-nonylphenol). PFAS is of particular interest given its risk factors and the limited amount of local/regional stormwater monitoring data needed to better characterize sources and use in future fate and transport modeling. Additional pollutants of concern, such as 6-ppd quinone, may also become more relevant over the permit cycle. The City conducts regular monitoring of the six pollutants listed in the WPCF-UIC Permit (Benzo(a)pyrene, Pentachlorophenol, Di(2-ethylhexyl)phthalate, Lead, Zinc, and Copper). Monitoring results for the six pollutants consistently meet permit requirements and are not considered pollutants of concern in the ISWMP.

[2] Oregon 2022 Integrated Report - Final (arcgis.com)

1.3.5 City Organization and Program Responsibility

The activities outlined in this ISWMP impact and are implemented by staff in many groups within the City's Utilities Department, Transportation and Mobility Department, Engineering and Infrastructure Planning Department (EIPD), and Community & Economic Development Department.

The Utilities Department Director oversees the overall stormwater program and is the designated Principal Executive Officer as defined by 40 CFR 122.22 as required by the permits. Within the Utility Department, the Environmental Resources Manager and Stormwater Program Manager provide permit compliance oversight, annual reporting, public involvement/education efforts and other planning, enforcement and tracking activities related to this ISWMP.

The City's Utility Department provides water service, wastewater collection and treatment, and stormwater management for residents, businesses, and visitors. The Utility Department is currently responsible for operations and maintenance of City public storm drainage facilities. The City's EIPD develops master plans, manages capital improvement projects, and oversees capital construction projects, including inspections. The Transportation and Mobility Department maintains existing roadways including street sweeping, deicing, ROW maintenance, and enhances street connectivity. The Community and Economic Development Department provides services to ensure that the City plans and develops in accordance with the Comprehensive Plan through services for building safety, planning, growth management, private development engineering, permitting, code enforcement, licensing and development services, and connects urban development and workforce development to emerging and future trends.

Figure 1-4 through Figure 1-7 outline the responsible groups within each department that have responsibility under the ISWMP, as well as a brief summary of their typical activities/responsibility.

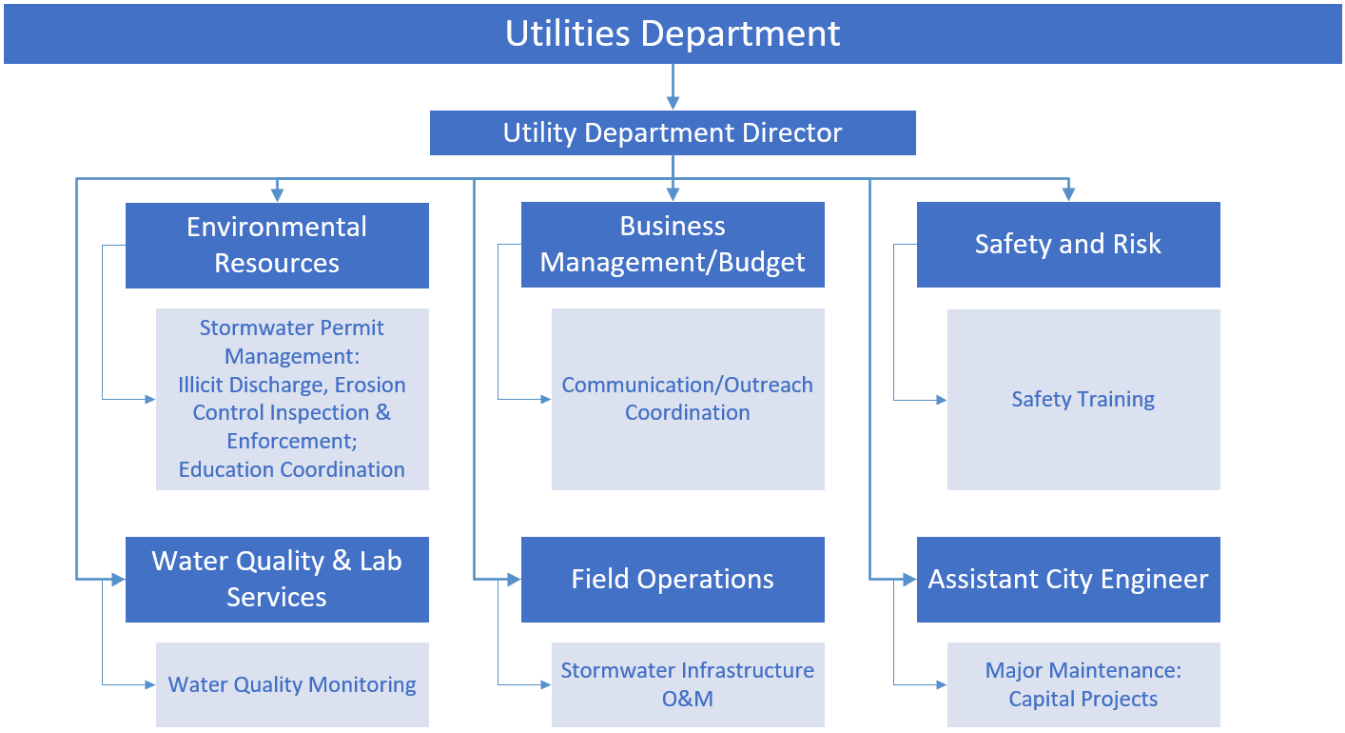

Figure 1-4. Utilities Department Org Chart

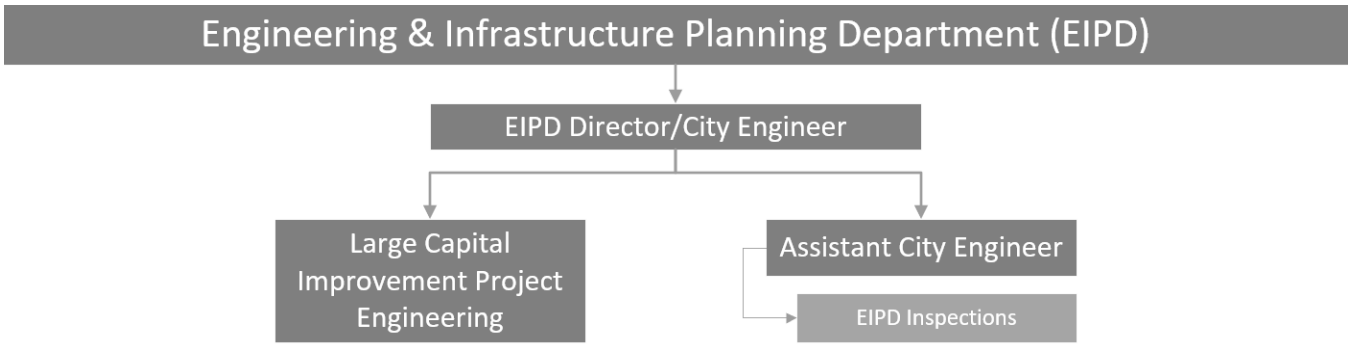

Figure 1-5. EIPD Org Chart

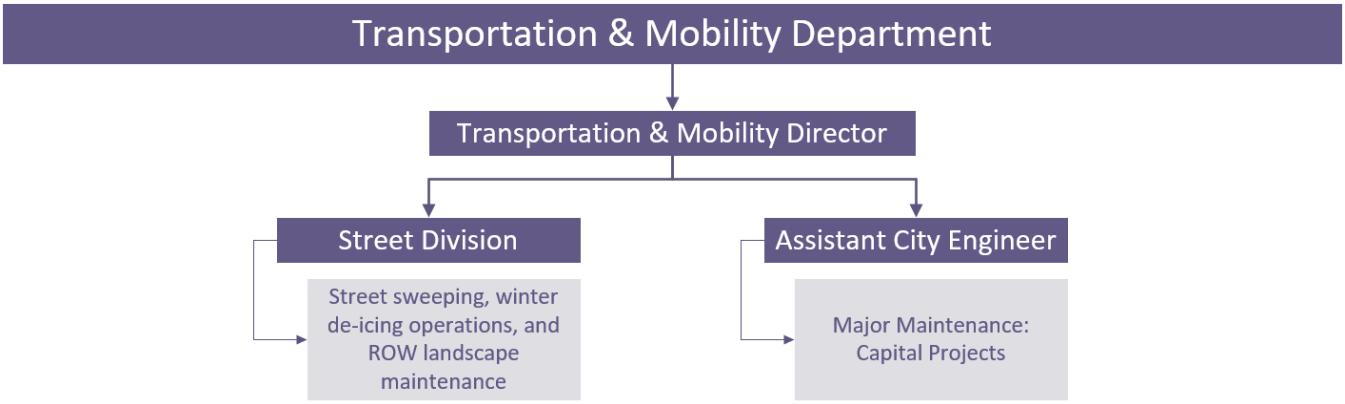

Figure 1-6. Streets and Mobility Department Org Chart

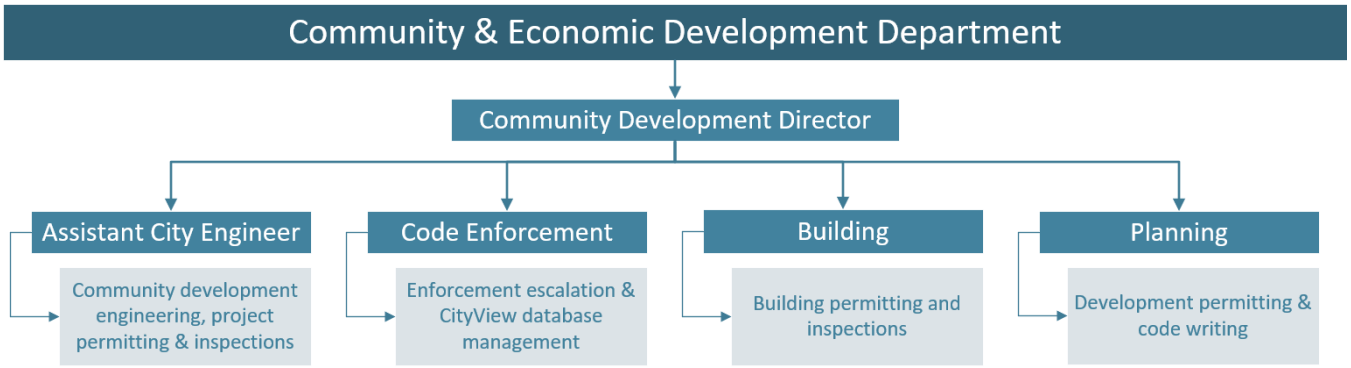

Figure 1-7. Community and Economic Development Department Org Chart

1.4 Stormwater Program Implementation

Implementing the stormwater program and the BMPs in this ISWMP requires significant resources and a coordinated effort among departments and groups. This section identifies some of the implementation elements that extend across multiple program categories.

1.4.1 Resource Documents

Stormwater program implementation requires numerous codes, ordinances policies, procedures, guidance manuals, checklists, forms, mapping, and other related documents. Throughout this ISWMP the relevant documents (reference documents) are noted within each program category or BMP.

1.4.2 Stormwater Program Website

In accordance with the 2022 NPDES MS4 permit requirements, the City maintains a publicly accessible website with information related to the SWMP Document and implementation[3], contact information, educational materials, illicit discharge reporting procedures, program documents, links to related ordinances and policy, and annual reports. See BMP **PI-1** for additional information.

See the City's Stormwater website at:
https://www.bendoregon.gov/government/departments/utilities/stormwater

1.4.3 Mapping

The City maintains a digital inventory of the stormwater system to aid in implementation of the SWMP control measures, and recently revised the MS4 boundary using GIS analysis tools.

The MS4 boundary delineation analysis used ArcGIS Pro to model drainage based on the City's stormwater infrastructure GIS data and a Digital Elevation Model (DEM) derived from Light Detection and Ranging (LiDAR) captured in March 2022. City outfalls that discharge stormwater to surface waterbodies either directly or indirectly were identified as points for analysis. UIC infrastructure was also analyzed to distinguish between infiltration-only basins and basins draining to the MS4.

Five rules were developed to account for UIC drainage and refine the MS4 basin areas.

1. Overland flow paths not modeled to drain to the river were excluded.
2. Modeled basin boundaries were adjusted to align with streets.
3. Subbasins connected to isolated UICs were included (i.e., 2-3 UICs spatially isolated from other groupings, or networks of UIC systems).
4. Topographic breaks were followed when adjacent streets were not available.
5. UICs that met uncertain performance thresholds as noted in the UIC Aging Evaluation (Infiltration Study 2020) were included in the basin areas.[4,5] UICs were excluded that were not located in watersheds associated with outfalls draining to the river, or where overland flow paths were modeled to drain to a network of dispersed UICs.

[3] City of Bend, "Stormwater, City of Bend Regulations," n.d., https://www.bendoregon.gov/government/departments/utilities/stormwater/regulations

[4] GSI, "Stormwater Infiltration Evaluation Update," October 2020, https://www.bendoregon.gov/home/showpublisheddocument/51362/637716230602830000

[5] The Infiltration Study (2020) measured average performance declines for drywells at 3% per year and drill holes at 6% per year. At the time of this analysis, performance declines were approximately 100% for drywells installed before 1991 and drill holes installed before 2008.

Mapping data is periodically updated as new information becomes available. See BMP **OM-1** for additional information.

The map and digital inventory include:

- The location of outfalls and outfall inventory (identifiers, locations, and receiving waters).
- Municipal stormwater collection and conveyance system.
- Publicly and privately owned structural stormwater control locations.
- MS4 boundary delineated by drainage area/catchment area.
- Annual dry-weather screening sites.
- Locations of confirmed illicit discharges to aid in identification of potential chronic illicit discharges.
- Additional geographic data to support implementation of the stormwater program.

Mapping Standards: The City uses a digital MS4 mapping system through Esri GIS and AutoCAD formats. Mapping accuracy and processes are consistent with industry standards.

Portions of the map and digital inventory may be viewed on the City's public website, Bend Data Viewer, at: https://experience.arcgis.com/experience/34a4bc300bfe4f028929b2c708b8e175/

The complete digital inventory can be made available to DEQ upon request.

1.4.4 Monitoring and Reporting

In accordance with the NPDES MS4 and WPCF-UIC permit requirements, the City submits annual reports to DEQ to evaluate the City's progress towards implementing the ISWMP control measures. The annual reports are compiled using the annual report forms provided by DEQ and submitted via Your DEQ online (YDO). The tracking measures outlined in each BMP table are used to evaluate the effectiveness of the BMPs and inform future priorities and actions. The annual reports are submitted to DEQ by November 1st each year.

In conjunction with the conditions of the WPCF-UIC Permit, the City conducts stormwater monitoring at six locations for permit-listed parameters in accordance with the City of Bend UIC Stormwater Monitoring Plan.[6] Monitoring data is submitted annually to DEQ. Based on exceedances of permit-identified action levels, the City will initiate corrective actions and document activities conducted to resolve or address exceedances in the annual report. The City has experienced no exceedances to date.

Records of data and information used in the development and implementation of the ISWMP will be retained by the City for 5 years or for the permit term, whichever is longer. Annual reports are posted on the City's website[7] and are made available to the public and to DEQ upon request.

1.5 ISWMP Organization

The City has developed and implemented a broad range of stormwater pollution prevention projects and programs. The ISWMP is organized into the major stormwater program categories and BMPs are listed for each category to effectively address NPDES MS4 and WPCF-UIC Permit requirements.

For this ISWMP update, current BMPs have been evaluated and modified or expanded as necessary to comply with permit requirements. A gap analysis of the existing ISWMP (2012-2022) was conducted to compare program documentation to the 2022 NPDES MS4 permit requirements.[8] The City's available standard operating procedures (SOPs) were also reviewed, and a series of BMP implementation workshops

[6] Most recent update is October 2022.

[7] Stormwater Annual Reports are available on the City's website at: https://www.bendoregon.gov/government/departments/utilities/stormwater/about-stormwater/annual-reports

[8] The City's WPCF-UIC permit reissuance is pending and thus not used to inform program modifications directly.

were conducted to solicit input from City staff responsible for implementing each BMP. As a result, some BMPs were streamlined to reflect work previously completed or adjusted to better reflect the way the city operates. New BMPs were identified to increase program effectiveness and accommodate new NPDES MS4 permit requirements.

BMP tables reflected in Part 2 are provided by organizational category (see Table 1-3). The organization categories correspond directly to the Schedule A.3 requirements of the NPDES MS4 permit. Additional activities within the City's stormwater program to address WPCF-UIC permit-specific needs and other planning activities are also categorized and listed.

Each BMP includes a short description of each control measure, implementation schedule, measurable goals, annual tracking measures, and pollutants of concern addressed for each BMP. The BMPs are numbered by organizational category. The measurable goals and tracking measures will be used to report progress to DEQ on an annual basis. The reporting period is July 1st through June 30th with annual reports on activities due to DEQ by November 1st of each year.

Table 1-3. Stormwater Program Organizational Categories

Control Measure	Permit Reference	BMP Category Abbreviation
Public Education and Outreach	Schedule A.3.a.i.-vi.	ED
Public Involvement and Participation	Schedule A.3.b.i-iii.	PI
Illicit Discharge Detection and Elimination	Schedule A.3.c.i.-vii.	ID
Construction Site Runoff Control	Schedule A.3.d.i.-viii.	EC
Post-Construction Site Runoff for New Development and Redevelopment	Schedule A.3.e.i.-vii.	PC
Pollution Prevention and Good Housekeeping for Municipal Operations	Schedule A.3.f.i.-xii.	OM
Planning and Retrofit	Various	PL
Underground Injection Control-specific	WPCF-UIC Permit	UIC

Part 2 ISWMP Control Measures

The following sections detail the BMPs applicable to the City's Stormwater Management Program Control Measures. The Program Control Measures are implemented to address both NPDES MS4 and WPCF-UIC Permit compliance. The control measures addressed in this ISWMP are organized according to the following categories:

- Category 1: Public Education and Outreach
- Category 2: Public Involvement and Participation
- Category 3: Illicit Discharge Detection and Elimination
- Category 4: Construction Site Runoff Control
- Category 5: Post-Construction Site Runoff for New Development and Redevelopment
- Category 6: Pollution Prevention and Good Housekeeping for Municipal Operations
- Category 7: Planning and Retrofit
- Category 8: Underground Injection Controls

Summary tables included for each respective category indicate which of the City's BMPs correspond to the specific requirements from Schedule A.3. of the NPDES MS4 permit. The summary write ups for each BMP include information regarding whether the BMP is also implemented to meet WPCF-UIC Permit requirements.

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Category 1: Public Education and Outreach

Public education and outreach is an integral component of a successful stormwater pollution prevention program. Increasing public knowledge of local water quality issues is key to obtaining public support and ownership of stormwater programs. The objectives of the City's education and outreach program are to:

- Provide the public with a comprehensive understanding of stormwater runoff and its capacity to transport pollutants to surface water and groundwater.
- Instill the importance of clean water and protecting water resources.
- Develop relevant knowledge and skills to address and modify behaviors that lead to adverse impacts to surface and groundwater.
- Provide information to the community about the steps that can be taken to reduce, prevent, and report pollutants in stormwater runoff.

Table 2-1 outlines the BMPs that the City implements to address the NPDES MS4 permit requirements for Schedule A.3.a. Training requirements for City staff are reflected throughout the NPDES MS4 Permit (not just Schedule A.3.a), and those collective activities are detailed in BMP ED-4.

Table 2-1. Public Education and Outreach Permit Requirements and Associated BMPs

Schedule A.3.a Permit Requirements	Applicable BMPs			
	ED-1	ED-2	ED-3	ED-4
i. Education and Outreach Program	✓			
ii. Stormwater Education Activities	✓	✓		
iii. Priority Audiences and Topics	✓	✓	✓	✓
iv. Tracking and Assessment	✓	✓	✓	✓

The following Public Education and Outreach centered BMPs are described in detail in the Category 1 BMP tables:

- ED-1: Provide Public Education Regarding Stormwater Management
- ED-2: Implement a School Stormwater Education Program
- ED-3: Provide Stakeholder Outreach Regarding Stormwater Management
- ED-4: Provide Staff Education Related to Stormwater Management

The City conducts a wide variety of public education and outreach programs to address stormwater issues that are significant in the community. The Category 1 Education and Outreach BMP tables provide a description, implementation schedule, measurable goals, annual tracking measures, and priority pollutants addressed for each public education and outreach BMP. Measurable goals and tracking measures will be evaluated annually to assess the impact of the BMPs and to inform future education and outreach activities.

Category 1. Education and Outreach BMPs		
ED-1: Provide Public Education Regarding Stormwater Management	**City BMP Number**	ED-1
	City BMP Name	Provide Public Education Regarding Stormwater Management
	Permit Applicability	WPCF-UIC, MS4
	BMP Implementation Responsibility	• Environmental Resources Group, Utilities Department • Business Management/Budget Group, Utilities Department
	Reference Document(s)	Stormwater Public Education & Involvement Plan FY 2023-2026
	Permit Year	Ongoing
	BMP Description	Implement the education and outreach program as outlined in the City's Stormwater Public Education & Involvement Plan. Major topics of the City's education and outreach program include general watershed awareness and pollution prevention, illicit discharge prevention for businesses, hazardous waste disposal practices, and construction site controls. The plan details education and outreach activities that the City employs through media, school presentations (see BMP ED-2), community events, interpretive signage, and professional trainings. The City's education program is intended to address stormwater issues of significance in the community, provide approaches to reduce pollutant discharges in stormwater, and allow for participation in stewardship activities. The plan includes goals, objectives, priority audiences, and planned schedules for each related activity.
	Measurable Goal(s)	Conduct outreach and education activities as outlined in the Stormwater Public Education & Involvement Plan.
	Annual Tracking Measure(s)	1. Number of public educational events held. 2. Number of attendees (when applicable). 3. Educational topic(s) and the target audience(s).
	Primary Pollutant(s) or Parameter(s) Addressed	• Temperature • Sediment/Turbidity • Pesticides/Herbicides • PFAS • pH

Category 1. Education and Outreach BMPs		
ED-2: Implement a School Stormwater Education Program	**City BMP Number**	ED-2
	City BMP Name	Implement a School Stormwater Education Program
	Permit Applicability	WPCF-UIC, MS4
	BMP Implementation Responsibility	• Environmental Resources Group, Utilities Department • Business Management/Budget Group, Utilities Department
	Reference Document(s)	Stormwater Public Education & Involvement Plan FY 2023-2026
	Permit Year	2023
	BMP Description	Coordinate with local organizations to develop a stormwater education program for Bend students. As outlined in the Stormwater Public Education & Involvement Plan, the program will provide information on stormwater issues, and methods to protect water quality. During the permit term the City will coordinate with partners, fund development of curriculum for the program, and coordinate with schools for program participation.
	Measurable Goal(s)	• Develop the stormwater education program and secure funding sources. • Implement stormwater education program in schools.
	Annual Tracking Measure(s)	1. Number of educational events provided to schools. 2. Number of attendees (when applicable).
	Primary Pollutant(s) or Parameter(s) Addressed	• Temperature • Sediment/Turbidity • Pesticides/Herbicides • PFAS • pH

Category 1. Education and Outreach BMPs		
ED-3: Provide Stakeholder Outreach Regarding Stormwater Management	**City BMP Number**	ED-3
	City BMP Name	Provide Stakeholder Outreach Regarding Stormwater Management
	Permit Applicability	WPCF-UIC, MS4
	BMP Implementation Responsibility	• Environmental Resources Group, Utilities Department • Business Management/Budget Group, Utilities Department
	Reference Document(s)	Stormwater Public Education & Involvement Plan FY 2023-2026
	Permit Year	Ongoing
	BMP Description	As documented in the Stormwater Public Education & Involvement Plan, the City holds monthly Utility Public Advisory Group (UPAG) Meetings to gain input on programs and policies related to stormwater management, water conservation, and other City water system topics. The UPAG is comprised of community leaders and stakeholders representing different segments of the community that are affected by ISWMP implementation. Periodic updates are provided to the UPAG for ongoing program implementation.
	Measurable Goal(s)	Hold regular UPAG meetings to update stakeholders and solicit feedback and advice on stormwater program implementation.
	Annual Tracking Measure(s)	1. Number of meetings held. 2. Number of attendees (when applicable). 3. Topics covered.
	Primary Pollutant(s) or Parameter(s) Addressed	• Temperature • Sediment/Turbidity • Pesticides/Herbicides • PFAS • pH

Category 1. Education and Outreach BMPs		
ED-4: Provide Staff Education Related to Stormwater Management	**City BMP Number**	ED-4
	City BMP Name	Provide Staff Education Related to Stormwater Management
	Permit Applicability	WPCF-UIC, MS4
	BMP Implementation Responsibility	• Environmental Resources, Utilities Department • Safety and Risk Group, Utilities Department
	Reference Document(s)	Bend Municipal Staff Training Strategy Table (Appendix A).
	Permit Year	Ongoing
	BMP Description	Provide annual training for City employees on topics associated with stormwater quality and management in accordance with the City's Municipal Staff Training Strategy Table (Appendix A). The trainings are used to educate staff on illicit discharges and illicit discharge elimination procedures including dry weather screening; proper spill response procedures; appropriate erosion control measures, plan reviews, and inspections; post construction design standards, plan reviews, and inspections; operation and maintenance BMPs for stormwater facilities and municipal activities; industrial and commercial inspection procedures; safe work practices; and record keeping. Training sessions, facilitated in-person, online, or through the City's internal training platform, will be used to present materials related to stormwater quality and the NPDES MS4 and WPCF-UIC permit requirements.
	Measurable Goal(s)	• Implement and update, as necessary, the City's Municipal Staff Training Strategy Table. • Conduct municipal training for employees associated with stormwater management within the timeframes and frequencies specified in Appendix A.
	Annual Tracking Measure(s)	1. Track the number of active staff certifications. 2. Track number and responsibilities of staff participating in training. 3. Track conference attendance and participation in accordance with Appendix A.
	Primary Pollutant(s) or Parameter(s) Addressed	• Temperature • Sediment/Turbidity • Pesticides/Herbicides • PFAS • pH

Category 2: Public Involvement

The public provides valuable input and assistance to the City's stormwater pollution prevention program. The goal of the public involvement and participation program is to effectively involve a diverse cross-section of people who can participate in stormwater pollution prevention activities. The public involvement efforts are closely tied with the public education and outreach efforts that form another component of Bend's stormwater program. An active and involved community will be crucial to the success of the stormwater management program because it allows for:

- Opportunities for the public to participate effectively in the implementation of the program leading to ownership and community support of the stormwater program.
- Connections and open communications between community and government groups involved in stormwater and sustainability related work.
- Valuable input from a wide audience with diverse perspectives and expertise.

Table 2-2 outlines the BMPs that the City implements to address the permit requirements for Schedule A.3.b.

Table 2-2. Public Involvement Permit Requirements and Associated BMPs

Schedule A.3.b Permit Requirements	Applicable BMPs	
	PI-1	PI-2
i. Publicly Accessible Website	✓	
ii. Stewardship Opportunity		✓
iii. Tracking and Assessment	✓	✓

The following Public Involvement centered BMPs are described in detail in the Category 2 BMP tables:

- PI-1: Maintain a Stormwater Program Website
- PI-2: Provide Stormwater Volunteer/Stewardship Opportunities

The City conducts a wide variety of public involvement programs to provide opportunities for the public to effectively participate in the development of the ISWMP control measures. Notice of all public hearings will be distributed in a variety of formats to reach a wide array of residents, and to meet public notice requirements. The Category 2 Public Involvement BMP tables provide a description, implementation schedule, measurable goals, annual tracking measures, and priority pollutants addressed for each public involvement BMP. Measurable goals and tracking measures will be evaluated annually to assess the impact of the BMPs and to inform future public involvement activities.

Category 2. Public Involvement and Participation BMPs		
PI-1: Maintain a Stormwater Program Website	**City BMP Number**	PI-1
	City BMP Name	Maintain a Stormwater Program Website
	Permit Applicability	MS4
	BMP Implementation Responsibility	• Environmental Resources Group, Utilities Department • Business Management/Budget Group, Utilities Department
	Reference Document(s)	https://www.bendoregon.gov/government/departments/utilities/stormwater
	Permit Year	Ongoing
	BMP Description/Rationale	Periodically update the publicly available stormwater utility webpage to include up to date stormwater program information including the ISWMP, annual reports, links to mapping information, contact information for relevant staff, educational materials, stormwater program ordinances, and guidance documents. Highlight pollution prevention topics, spill/illicit discharges reporting requirements, stream enhancement projects, and opportunities for volunteering. Continue to provide general stormwater quality information, ways to prevent, detect and report illicit discharges, and other topics of interest to the public. Internal SOPs referenced in this ISWMP are not linked on the website but are available to DEQ upon request.
	Measurable Goal(s)	• Update information on the website by November 1, 2023. • Conduct annual website reviews to check for accuracy, working links, staff changes, new documents, and policy updates.
	Annual Tracking Measure(s)	1. Track updates and adjusted content as part of the annual website review
	Primary Pollutant(s) or Parameter(s) Addressed	• Temperature • Sediment/Turbidity • Pesticides/Herbicides • PFAS • pH

Category 2. Public Involvement and Participation BMPs		
PI-2 Provide Stormwater Volunteer/Stewardship Opportunities	**City BMP Number**	PI-2
	City BMP Name	Provide Stormwater Volunteer/Stewardship Opportunities
	Permit Applicability	MS4
	BMP Implementation Responsibility	Environmental Resources Group, Utilities Department
	Reference Document(s)	Stormwater Public Education & Involvement Plan FY 2023-2026
	Permit Year	Ongoing
	BMP Description/Rationale	Coordinate stewardship activities that align with the Stormwater Public Education & Involvement Plan. The City currently coordinates and sponsors several stewardship opportunities including the annual Upper Deschutes Watershed Council River Cleanup, riparian restoration efforts, storm drain marking, and adoption of roundabouts, corridors, and bridges for litter pickup. Volunteer/stewardship opportunities are selected to allow the public to participate effectively in the implementation of the program leading to ownership and community support of the stormwater program.
	Measurable Goal(s)	Provide or sponsor stewardship opportunities over the NPDES MS4 permit term.
	Annual Tracking Measure(s)	1. Number of stewardship events held or sponsored. 2. Number of attendees where applicable.
	Primary Pollutant(s) or Parameter(s) Addressed	• Temperature • Sediment/Turbidity • Pesticides/Herbicides • PFAS • pH

Category 3: Illicit Discharge Detection and Elimination

An illicit discharge is defined in EPA's Phase II stormwater regulations as any discharge to an MS4 that is not composed entirely of stormwater unless exempt by the permit. Stormwater is defined as the portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, channels, or pipes into a defined surface water channel or a constructed infiltration facility. Illegal discharges to the storm sewer from industrial facilities, commercial businesses, or the public can be a significant source of water pollution. Common types of illicit discharges in the City of Bend include vehicle oil leaks or fuel spills, grease spills, and sediment from construction activities.

The goal of the Illicit Discharge Detection and Elimination (IDDE) Program is to detect and eliminate illegal discharges and illicit connections to the storm drain system. The City accomplishes this through the following programs: MS4 mapping, code and ordinance requirements, enforcement procedures, a spill prevention and IDDE program, a dry weather field screening program, and through training and education. Information on the dry weather screening program can be found in the City's Dry Weather Screening and Outfall Reconnaissance Inventory Plan. Additional information on the IDDE program can be found in the Illicit Discharge, Compliance, Prevention, Identification, Notification and Response SOP; Bend Municipal Code Title 16; Illicit Discharge Best Management Practices Minimization Manual; and the City's Illicit Discharge Response Flow Chart.

Table 2-3 outlines the BMPs that the City implements to address the permit requirements for Schedule A.3.c.

Table 2-3. Illicit Discharge Detection and Elimination Permit Requirements and Associated BMPs

Schedule A.3.c Permit Requirements	Applicable BMPs				
	ID-1	ID-2	ID-3	ED-4*	OM-1*
i. MS4 Map					✓
ii. Ordinance and/or Other Regulatory Mechanisms	✓				
iii. Enforcement Procedures		✓			
iv. Program to Detect and Eliminate Illicit Discharges		✓			
v. Dry Weather Screening Program			✓		
vi. Illicit Discharge Detection and Elimination Training and Education				✓	
vii. Tracking and Assessment	✓	✓	✓	✓	✓

**BMP is part of a different control measure category, described elsewhere in this document.*

The following IDDE centered BMPs are described in detail in the Category 3 BMP tables:

- ID-1: Implement Illicit Discharge Regulations
- ID-2: Implement Spill and Illicit Discharge Reporting and Response Procedures
- ID-3: Dry Weather Outfall Screening

Supporting BMPs that also assist in meeting the requirements of this permit category are as follows:

- ED-4: Provide Staff Education Related to Stormwater Management
- OM-1: Maintain an MS4 Map

The Category 3 IDDE BMP Tables provide a description, implementation schedule, measurable goals, annual tracking measures, and priority pollutants addressed for each IDDE BMP. Measurable goals and tracking measures will be evaluated annually to assess the impact of the BMPs and to inform future IDDE priority areas and activities.

Category 3. Illicit Discharge Detection and Elimination BMPs		
ID-1: Implement Illicit Discharge Regulations	**City BMP Number**	ID-1
	City BMP Name	Implement Illicit Discharge Regulations
	Permit Applicability	WPCF-UIC, MS4
	BMP Implementation Responsibility	Environmental Resources Group, Utilities Department
	Reference Document(s)	• BMC 16.20 Illicit Discharge Controls • BMC 16.05.050 Enforcement • Illicit Discharge Best Management Practices Minimization Manual (IDDE Manual) • Illicit Discharge Response Flow Chart • SOP: Illicit Discharge, Compliance, Prevention, Identification, Notification and Response
	Permit Year	Ongoing
	BMP Description/Rationale	Continue to prohibit non-stormwater illicit discharges, consistent with NPDES MS4 Permit Schedule A.1.d and the City's WPCF-UIC permit, into the storm drainage systems by implementing and enforcing BMC Title 16 and related SOPs. Review and update the current IDDE Manual, as needed, to reflect current requirements and City processes specific to spill prevention and response. Review municipal codes and enforcement procedures and establish internal policies related to illegal camps and clean-up efforts.
	Measurable Goal(s)	• Continue to implement BMC Title 16 measures related to IDDE prevention and enforcement. • Propose and adopt updates to codes and standards, as needed.
	Annual Tracking Measure(s)	1. Status on manual, SOP, and/or code updates.
	Primary Pollutant(s) or Parameter(s) Addressed	• Temperature • Sediment/Turbidity • Pesticides/Herbicides • PFAS • pH • Additional pollutants depending on nature of illicit discharge

Category 3. Illicit Discharge Detection and Elimination BMPs		
ID-2: Implement Spill and Illicit Discharge Reporting and Response Procedures	**City BMP Number**	ID-2
	City BMP Name	Implement Spill and Illicit Discharge Reporting and Response Procedures
	Permit Applicability	WPCF, MS4
	BMP Implementation Responsibility	Environmental Resources Group, Utilities Department
	Reference Document(s)	• SOP: Illicit Discharge, Compliance, Prevention, Identification, Notification and Response • Illicit Discharge Minimization Best Management Practices Manual (IDDE Manual) • Illicit Discharge Response Flow Chart • Illicit Discharge Reporting Fact Sheet • Spill Prevention, Control and Clean up Fact Sheet
	Permit Year	Ongoing
	BMP Description/Rationale	Maintain the City's spill hotline (number available on City website) that citizens/staff can call to report suspected illicit discharges, connections, or spills. Respond and/or begin investigation into spills and other reports of illicit discharges within the timeframes specified in the SOP: Illicit Discharge, Compliance, Prevention, Identification, Notification and Response. Implement cleanup activities outlined in the Spill Prevention, Control, and Clean up Fact Sheet as applicable. Follow procedures as outlined in the SOP to notify applicable parties and record reported illicit discharge incidents. The following information for illicit discharge reports (if available) is entered into CityView: date of complaint, complainant's name and contact information, name of staff responding to the complaint, date the investigation was initiated, the outcome of the staff investigation, corrective action(s) taken to eliminate the illicit discharge, the responsible party for the corrective action(s), the status of enforcement procedure(s), when necessary, and the date the corrective action(s) was completed and staff that evaluated final compliance.
	Measurable Goal(s)	• Implement spill and IDDE response procedures within the required timeframes and in accordance with the SOP. • Document spill and IDDE reports in CityView or other IDDE database/tracking system. • Update the MS4 map digital inventory for chronic illicit discharge locations. • Following reissuance of the WPCF permit, update spill response protocols as applicable for permit compliance • By November 1, 2024, update the fact sheets, SOP and/or IDDE Manual to refine reporting and documentation procedures specific to spill notification and the spill hotline to facilitate future training. This may include follow up to calls initially routed to 911.

Category 3. Illicit Discharge Detection and Elimination BMPs		
ID-2	**Annual Tracking Measure(s)**	1. Calls and complaints, the City's follow-up and enforcement actions, and average response/investigation times including referral to other agencies. 2. Number of known chronic illicit discharges. 3. Status on updates to the SOP, fact sheet, and the IDDE Manual.
	Primary Pollutant(s) or Parameter(s) Addressed	• Temperature • Sediment/Turbidity • Pesticides/Herbicides • PFAS • pH • Additional pollutants depending on nature of illicit discharge

Category 3. Illicit Discharge Detection and Elimination BMPs		
ID-3: Dry Weather Outfall Screening	**City BMP Number**	ID-3
	City BMP Name	Dry Weather Outfall Screening
	Permit Applicability	MS4
	BMP Implementation Responsibility	• Environmental Resources Group, Utilities Department • Water Quality & Lab Services Group, Utilities Department
	Reference Document(s)	Dry Weather Screening and Outfall Reconnaissance Inventory Plan
	Permit Year	2023
	BMP Description/Rationale	Develop and implement the Dry Weather Screening Program to include protocols for testing, pollutant parameter action levels, and procedures for ongoing or recurrent problems (including any required sampling, field analysis, and laboratory analysis). Dry weather outfall screening will occur at 50% of identified MS4 outfalls by September 30, 2023, to identify illicit discharges or connections. Based on findings, document and/or map illicit connections or potential chronic illicit discharges. Review and update the outfall prioritization criteria by the third-year annual report. Continue to track and report outfall screening results to confirm locations of chronic illicit discharges.
	Measurable Goal(s)	• By September 30, 2023, screen at least 50% of the identified MS4 outfalls and conduct dry weather screening at an additional 25% of MS4 the outfalls each year after. • By November 1, 2023, finalize the Dry Weather Screening Plan with testing protocols and pollutant parameter action levels. • By November 1, 2024, review and update the outfall prioritization criteria and develop a geographic schedule for future dry weather field screening activities.
	Annual Tracking Measure(s)	1. Status on updates to Dry Weather Screening Plan 2. Number and percent of outfalls screened. 3. Number of illicit connections or discharges identified and inspected as part of dry weather outfall screening and any follow up and enforcement activities conducted.
	Primary Pollutant(s) or Parameter(s) Addressed	• Temperature • Sediment/Turbidity • Pesticides/Herbicides • PFAS • pH • Additional pollutants depending on nature of illicit discharge

Category 4: Construction Site Runoff Control

Construction projects typically involve the removal of vegetation and excavation of soils. When vegetation is removed stormwater runoff velocity increases and unnatural levels of disturbed soils can be carried offsite to storm inlets or receiving waters. Soil particles can transport attached pollutants to waterways, contribute to increases in stream temperature, reduce pipe and channel capacity, and negatively impact aquatic organisms. Other potential pollutant causing activities conducted at construction sites include materials storage, fueling, concrete washout, and vehicle and equipment use. A robust and enforceable construction site runoff control program is vital in reducing pollution in stormwater runoff.

The goal of the construction site runoff control program is to prevent sediment and other construction site pollutants from leaving construction sites through municipal requirements, permitting, the implementation of properly selected and installed BMPs, education on erosion prevention and sediment control principles for the design and construction communities, site plan review, inspections, enforcement, and tracking mechanisms.

Table 2-4 outlines the BMPs that the City implements to address the permit requirements for Schedule A.3.d.

Table 2-4. Construction Site Runoff Control Permit Requirements and Associated BMPs

Schedule A.3.d Permit Requirements	Applicable BMPs			
	EC-1	EC-2	EC-3	ED-4*
i. Ordinance and/or Other Regulatory Mechanisms	✓			
ii. Compliance with Other NPDES Permits	✓			
iii. Erosion and Sediment Control Plans (ESCPs)		✓		
iv. Erosion and Sediment Control Plans Review		✓		
v. Construction Site Inspections			✓	
vi. Enforcement Procedures			✓	
vii. Construction Runoff Control and Training Education				✓
viii. Tracking and Assessment	✓	✓	✓	✓

**BMP is part of a different control measure category, described elsewhere in this document.*

The following Construction Site Runoff Control centered BMPs are described in detail in the Category 4 BMP tables:

- EC-1: Implement Erosion and Sediment Control Code and Ordinances
- EC-2: Conduct Erosion Control Plan Review and Permitting
- EC-3: Conduct Erosion Control Site Inspections

Supporting BMPs that also assist in meeting the requirements of this permit category are as follows:

- ED-4: Provide Staff Education Related to Stormwater Management

Category 4 Construction Site Control BMP Tables provide a description, implementation schedule, measurable goals, annual tracking measures, and priority pollutants addressed for each construction site runoff control BMP. Additional information on the erosion and sediment control program can be found in BMC Title 16, referenced SOPs (see BMP tables), and the Central Oregon Stormwater Manual (COSM). Measurable goals and tracking measures will be evaluated annually to assess the impact of the BMPs and to inform future construction site runoff control BMPs.

Category 4. Construction Site Runoff Control BMPs		
EC-1: Implement Erosion and Sediment Control Code and Ordinances	**City BMP Number**	EC-1
	City BMP Name	Implement Erosion and Sediment Control Code and Ordinances
	Permit Applicability	MS4
	BMP Implementation Responsibility	• Environmental Resources Group, Utilities Department • Code Enforcement Group, Community & Economic Development Department • Planning Group, Community & Economic Development Department • Engineering Infrastructure and Planning Department
	Reference Document(s)	• BMC Title 16 (16.10 and 16.05) • COSM • SOP: Clearing, Grading, and Erosion Control on Construction Sites • Erosion and Sediment Control Inspection Guidance Document
	Permit Year	Ongoing
	BMP Description/Rationale	Continue to implement the current construction site runoff control program in accordance with BMC Title 16, the COSM, and the SOP: Clearing, Grading, and Erosion Control on Construction Sites. Update applicable City code, SOPs, and the COSM to reflect needed modifications to meet the NPDES MS4 permit requirements. Potential modifications, as identified in a previously completed codes and standards gap analysis, include the following: • Require ESCPs for all sites meeting the 5,000 sq-ft site disturbance threshold. • Include requirements for construction site waste management, storage, and proper disposal. • Update construction site inspection and enforcement processes to include escalating enforcement provisions.
	Measurable Goal(s)	• By November 1, 2024, review and, as necessary, adopt updates to City codes and standards to integrate applicable enforcement guidance and timelines to meet MS4 permit requirements. • By November 1, 2024, update the ESCP SOP. • By November 1, 2025, update the COSM and/or City Engineering Standards & Specifications
	Annual Tracking Measure(s)	1. Status on updates to SOPs, the COSM, and related municipal codes.
	Primary Pollutant(s) or Parameter(s) Addressed	• Temperature • Sediment/Turbidity • pH

Category 4. Construction Site Runoff Control BMPs		
EC-2: Conduct Erosion Control Plan Review and Permitting	**City BMP Number**	EC-2
	City BMP Name	Conduct Erosion Control Plan Review and Permitting
	Permit Applicability	MS4
	BMP Implementation Responsibility	• Environmental Resources Group, Utilities Department • Large Capital Improvement Project Engineering, EIPD Department • Assistant City Engineer Group, Community & Economic Development Department • Building Group, Community & Economic Development Department
	Reference Document(s)	• BMC Title 16 (16.10 and 16.05) • COSM • SOP: Clearing, Grading, and Erosion Control on Construction Sites • Small Site ESCP Template (Draft)
	Permit Year	Ongoing
	BMP Description/Rationale	Review construction runoff control site plans to assess compliance with Title 16 and the COSM requirements for all sites that exceed the 5,000 square feet site disturbance threshold (including sites that qualify for a 1200-C permit) and issue approvals in conjunction with applicable development permits. Update the COSM plan review checklist (or develop a new plan review checklist) to incorporate updates from BMP EC-1 to aid in consistency with ESCP reviews. Implement the Small Site ESCP Template, and additional templates as needed, to ensure ESCP requirements are in place for all developments disturbing 5,000 sf or greater. Refer applicable sites to DEQ for 1200-C permitting.
	Measurable Goal(s)	• Ongoing, conduct and confirm that all ESCP plan review and permitting protocols are implemented for qualifying projects. • By November 1, 2024, establish internal roles and responsibilities for expanded erosion control requirements including structure for implementing and plan review checklists. • By November 1, 2025, update the COSM plan review requirements list for consistency with EC-1. • Refer applicable sites to DEQ for 1200-C permitting.

Category 4. Construction Site Runoff Control BMPs		
EC-2	**Annual Tracking Measure(s)**	1. Number of ESCPs submitted, reviewed, and approved. 2. Status on update of plan review checklist and COSM update
	Primary Pollutant(s) or Parameter(s) Addressed	• Temperature • Sediment/Turbidity • pH

Category 4. Construction Site Runoff Control BMPs		
EC-3: Conduct Erosion Control Site Inspections	**City BMP Number**	EC-3
	City BMP Name	Conduct Erosion Control Site Inspections
	Permit Applicability	MS4
	BMP Implementation Responsibility	• Environmental Resources Group, Utilities Department • Large Capital Improvement Project Engineering, EIPD Department • Building Group, Community & Economic Development Department • Assistant City Engineer Group, Community & Economic Development Department
	Reference Document(s)	• BMC Title 16 (16.10 and 16.05) • COSM • SOP: Clearing, Grading, and Erosion Control on Construction Sites • Erosion and Sediment Control Inspection Guidance Document
	Permit Year	Ongoing
	BMP Description/Rationale	Conduct erosion control inspections on all qualifying project construction sites to ensure compliance with approved ESCPs and Schedule A.3.d.iii-iv, including inspections required as part of the escalating enforcement protocol SOP and/or when a complaint is received. Update the Erosion and Sediment Control Inspection Guidance SOPs and related checklist(s) to include all elements of Schedule A.3.d.v. and ensure city staff involved with plan review and inspections are properly trained, certified, and work consistently from the same SOP. Apply ESCP inspection protocol to applicants and construction sites (including those sites with a 1200-C permit from DEQ). Track inspections and outcomes in CityView (or equivalent) digital tracking system. When necessary, implement the escalating enforcement procedures to address non-compliance. Look for opportunities to provide consistency between DEQ's 1200-C permit inspections and the City's erosion control program.
	Measurable Goal(s)	• Conduct EPSC inspections at all qualifying construction sites and implement escalating enforcement protocols as necessary to ensure compliance. • Enter all construction site inspection results in a digital tracking system. • By November 1, 2024, update documentation and tracking procedures for public capital projects to ensure consistency across City departments. • By November 1, 2024, establish internal staff roles and responsibilities for inspection requirements at various types of construction projects.

Category 4. Construction Site Runoff Control BMPs		
EC-3	**Annual Tracking Measure(s)**	1. Number of construction site inspections conducted. 2. Number of violations, follow-up inspections, and enforcement actions. 3. Number of individual projects inspected. 4. Number of erosion control complaints received that trigger project inspections.
	Primary Pollutant(s) or Parameter(s) Addressed	• Temperature • Sediment/Turbidity • pH

Category 5: Post Construction Site Runoff for New Development and Redevelopment

Development and redevelopment of urban areas impacts the quality and quantity of stormwater discharges. Stormwater that flows through developed areas has the potential to carry pollutants such as sediment, nutrients, hydrocarbons, other contaminants, and litter to surface water bodies and groundwater potentially degrading water quality. Degraded water quality negatively impacts aquatic habitats, groundwater resources, and threatens human uses. Increases in impervious area associated with development decreases the amount of stormwater surface flow that can percolate into the ground which increases the flow rate and quantity of stormwater discharges. Retention of stormwater onsite can minimize the downstream impacts. Bend currently requires on-site retention for development when practicable.

The NPDES MS4 Permit requires that the City develop a site performance standard based on a Numeric Stormwater Retention Requirement (NSRR). The site performance standards should target natural surface or predevelopment hydrologic function and encourage a retention first approach to stormwater controls. If onsite retention is not feasible for a given site, the permit requires standards for stormwater treatment or alternative compliance to address the goals of the retention requirement.

In the NPDES MS4 Permit, Low Impact Development (LID) is a stormwater management approach that seeks to mitigate impacts of increased runoff and stormwater pollution using a set of planning, design, and construction approaches and stormwater management practices that promote the use of natural systems for infiltration, evapotranspiration, and reuse of rainwater. In practice, LID includes site planning principals that minimize disturbances to native landscapes, reduce impervious areas, and integrate natural processes for stormwater management.

In the NPDES MS4 Permit, Green Infrastructure (GI) is a specific type of stormwater control using vegetation, soils, and natural processes to manage stormwater. At the site level, such measures may include the use of plant or soil systems, permeable pavement or other pervious surfaces or substrates, among other approaches. LID and GI strategies work to reduce pollution by retaining and treating stormwater near the source. Properly designed UICs are considered GI as they use soils and natural processes to retain and infiltrate stormwater onsite. The City's codes and standards will be evaluated and updated to incorporate the NSRR and alternative treatment options required in the permit.

Table 2-5 outlines the BMPs the City implements to address the permit requirements for Schedule A.3.e.

Table 2-5. Post Construction Site Runoff for New Development and Redevelopment Permit Requirements and Associated BMPs

Schedule A.3.e Permit Requirements	Applicable BMPs					
	PC-1	PC-2	PC-3	PC-4	ED-1*	OM-1*
i. Ordinance and/or Other Regulatory Mechanisms	✓					
ii. Prioritization of Low Impact Development & Green Infrastructure	✓					
iii. Post-Construction Stormwater Management Requirements	✓					
iv. Post-Construction Site Runoff Plan Review		✓				✓
v. Long-Term Operation and Maintenance (O&M)			✓	✓		✓
vi. Training and Education					✓	
vii. Tracking and Assessment	✓	✓	✓	✓	✓	✓

**BMP is part of a different control measure category, described elsewhere in this document.*

The following Post Construction Site Runoff for New Development and Redevelopment centered BMPs are described in detail in the Category 5 BMP tables:

- PC-1: Implement and Update Post-Construction Stormwater Code and Standards
- PC-2: Implement Stormwater Plan Review and Structural Stormwater Facility Installation Inspections for New/Redevelopment
- PC-3: Public Structural Stormwater Facility Inspection and Maintenance Program
- PC-4: Private Structural Stormwater Facility Inspection and Maintenance Program

Supporting BMPs that also assist in meeting the requirements of this permit category are as follows:

- ED-1: Provide Public Education Regarding Stormwater Management
- OM-1: Maintain an MS4 Map

Category 5 Post Construction Controls Tables provide a description, implementation schedule, measurable goals, annual tracking measures, and priority pollutants addressed for each Post Construction BMP. Measurable goals and tracking measures will be evaluated annually to assess the impact of the BMPs and to inform future post construction stormwater management activities.

Category 5. Post-Construction Site Runoff BMPs		
PC-1: Implement and Update Post-Construction Stormwater Code and Standards	**City BMP Number**	PC-1
	City BMP Name	Implement and Update Post-Construction Stormwater Code and Standards
	Permit Applicability	WPCF-UIC, MS4
	BMP Implementation Responsibility	• Environmental Resources Group, Utilities Department • Code Enforcement Group, Community & Economic Development Department • Engineering, Infrastructure, and Planning Department
	Reference Document(s)	• COSM • BMC Title 16 • Bend Standards and Specifications
	Permit Year	2025
	BMP Description/Rationale	Continue to implement the current post-construction stormwater pollutant and runoff control program, in accordance with the COSM, BMC Title 16, and the Bend Standards and Specifications while updating and implementing standards that comply with Schedule A.3.e. of the NPDES MS4 permit. In 2022, the City completed a review of the post-construction requirements outlined in the COSM and Bend Municipal and Development Code to identify gaps with updated permit requirements. Gaps were identified for integration with the required code and standards updates in 2025. In 2023, the City conducted a subsequent review of the Bend Municipal and Development Code to identify barriers related to the use of LID. No barriers were identified that prevent the use of LID; however, sections of code were identified where LID could be better encouraged. By November 1, 2025, the City will update applicable City codes, standards, and the COSM to reflect needed modifications and adjustments identified by the previously completed codes and standards gap analysis to meet the requirements from Schedule A.3.e.i through vii including: • Refinement of exemptions for qualifying projects. • Inclusion of a Numeric Stormwater Retention Requirement (NSRR), formalization of an alternative compliance approach to stormwater management, and establishment of standards and permitting pathways to provide offsite stormwater management for qualifying projects. • Additional guidance and encouragement for various LID options. • Procedural adjustments to ensure implementation of the City's LID/GI Strategy (i.e., confirmation of DEQ approval of private UICs during development review, etc.). • Establishment of standards and permitting pathway for qualifying development to provide offsite stormwater management.

Category 5. Post-Construction Site Runoff BMPs		
PC-1	**Measurable Goal(s)**	• Implement the post-construction stormwater pollutant and runoff control program as outlined in the BMC Title 16, Engineering Standards, and COSM. • By November 1, 2024, submit a LID/GI Strategy and identify updates to codes and the COSM related to LID/GI with the annual report. • By November 1, 2025, update the COSM, BMC Title 16, and internal roles and responsibilities as necessary to address compliance gaps.
	Annual Tracking Measure(s)	1. Status on updates to the COSM, Engineering Standards, and BMP Title 16.
	Primary Pollutant(s) or Parameter(s) Addressed	• Temperature • Sediment/Turbidity • Pesticides/Herbicides

Category 5. Post-Construction Site Runoff BMPs		
PC-2: Implement Stormwater Plan Review and Structural Stormwater Facility Installation Inspections for New/Redevelopment	**City BMP Number**	PC-2
	City BMP Name	Implement Stormwater Plan Review and Structural Stormwater Facility Installation Inspections for New/Redevelopment
	Permit Applicability	WPCF-UIC, MS4
	BMP Implementation Responsibility	• Assistant City Engineer, Community & Economic Development Department • Building Group, Community & Economic Development Department • Planning Group, Community & Economic Development Department • Engineering, Infrastructure, and Planning Department
	Reference Document(s)	• COSM • BMC Title 16 • Bend Standards and Specifications • SOP: Stormwater Infrastructure Inventory (see BMP OM-1)
	Permit Year	Ongoing
	BMP Description/Rationale	Review new and redevelopment stormwater management plans to assess compliance with the Bend Standards and Specifications, COSM, BMC Title 16, and related SOPs for all sites that exceed the 5,000 square foot of new and redeveloped impervious surface thresholds. Implement plan review and new facility inspection protocol updates, that incorporate updates from BMP PI-1, to aid in consistency with stormwater review/controls between public ROW and private developments. Require confirmation of DEQ approval of private UICs prior to issuing plan approvals and/or permits.
	Measurable Goal(s)	• Conduct and confirm that all stormwater management plan review, permitting, and inspection protocols are implemented for qualifying projects. • By November 1, 2025, revise inspection protocol for new public facility installations. • By November 1, 2025, develop a Stormwater Management Plan Review checklist or updated COSM plan review checklist to address updates per BMP PC-1.
	Annual Tracking Measure(s)	1. Number of development applications submitted, reviewed for stormwater compliance, and approved. 2. Status on development/update of plan review checklist and inspection protocol.
	Primary Pollutant(s) or Parameter(s) Addressed	• Temperature • Sediment/Turbidity • Pesticides/Herbicides

Category 5. Post-Construction Site Runoff BMPs		
PC-3: Public Structural Stormwater Facility Inspection and Maintenance Program	**City BMP Number**	PC-3
	City BMP Name	Public Structural Stormwater Facility Inspection and Maintenance Program
	Permit Applicability	WPCF-UIC, MS4
	BMP Implementation Responsibility	• Field Operations Group, Utilities Department • Environmental Resources Group, Utilities Department
	Reference Document(s)	• SOP: City of Bend Public Stormwater Drainage Facility Maintenance Inspections (4-2023) • SOP: Routine Stormwater Inspection/Maintenance SOP - Triggers for required maintenance or repair • SOP: Stormwater Facility Operation and Maintenance Compliance • SOP: Stormwater Infrastructure Inventory (See OM-1)
	Permit Year	Ongoing
	BMP Description/Rationale	Implement inspection programs for public, City-owned structural stormwater management facilities (swales, water quality facilities, drywells) following processes identified in the relevant SOPs and ensure all facilities are inspected at least once every 5 years. Identify maintenance needs and complete maintenance work orders for municipal facilities. Continue to update digital inventory of stormwater treatment and management facilities per BMP OM-1.
	Measurable Goal(s)	• Inspect all City-owned structural stormwater management facilities in accordance with the SOPs. • Perform maintenance on public, City-owned stormwater management facilities in accordance with the SOPs. • Add all newly constructed stormwater management facilities to the digital inventory and map when they come into public ownership and maintenance responsibility. • By November 1, 2024, update and finalize the SOP: Public Stormwater Drainage Facility Maintenance Inspections to integrate applicable maintenance guidelines and requirements in Schedule A.3.e.v of the permit.
	Annual Tracking Measure(s)	1. Number of stormwater management facility inspections. 2. Submitted and completed facility maintenance work orders. 3. Number of stormwater management facilities in the digital inventory.
	Primary Pollutant(s) or Parameter(s) Addressed	• Temperature • Sediment/Turbidity • Pesticides/Herbicides

Category 5. Post-Construction Site Runoff BMPs		
PC-4: Private Structural Stormwater Facility Inspection and Maintenance Program	**City BMP Number**	PC-4
	City BMP Name	Private Structural Stormwater Facility Inspection and Maintenance Program
	Permit Applicability	MS4
	BMP Implementation Responsibility	Environmental Resources Group, Utilities Department
	Reference Document(s)	• SOP: Routine Stormwater Inspection/Maintenance SOP - Triggers for required maintenance or repair • SOP: Stormwater Facility Operation and Maintenance Compliance • Stormwater Infrastructure Inventory (See OM-1)
	Permit Year	Ongoing
	BMP Description/Rationale	Continue to require maintenance agreements for newly constructed private stormwater management facilities citywide. By November 2024, develop a strategy for ensuring private facilities are properly maintained within the MS4 boundary as well as an SOP for City inspections of private facilities within the MS4 boundary. The strategy is to include frequency of inspections and reporting requirements to the City by private facility owners. The SOP is to include City inspection procedures, inspection schedules, and follow up and enforcement procedures. Develop an electronic inspection confirmation/documentation option for private facility owners. In accordance with finalization of the SOP, conduct inspections of select private stormwater management facilities within the MS4 to track long term maintenance.
	Measurable Goal(s)	• Require maintenance agreements for new development Citywide. • By November 1, 2024, develop a strategy and SOP to confirm inspections and maintenance of private stormwater management facilities within the MS4 boundaries, including procedures for selection of applicable facilities for inspection. • City inspection of select private stormwater management facilities in accordance with the schedule provided in the new SOP.
	Annual Tracking Measure(s)	1. Private stormwater management facilities in the digital inventory. 2. Status of SOP updates. 3. Private stormwater management facility inspections conducted. 4. Enforcement actions conducted.
	Primary Pollutant(s) or Parameter(s) Addressed	• Temperature • Sediment/Turbidity • Pesticides/Herbicides

Category 6: Pollution Prevention and Good Housekeeping for Municipal Operations

The goal of the pollution prevention and good housekeeping category is to reduce the discharge of pollutants to receiving waters and groundwater by properly operating and maintaining City facilities using good housekeeping BMPs. Municipal operations include a wide variety of activities conducted to maintain City-owned property and facilities such as public streets, buildings, and utility infrastructure. Some municipal activities can potentially lead to pollutant discharges--such as sediment, chemicals from pesticides, nutrients from fertilizers, and litter—reaching the MS4 system and receiving waters. The City implements a variety of pollution prevention and good housekeeping BMPs to protect water quality during municipal operations.

During this permit term, the City will work to develop written pollution prevention polices and strategies, to document the procedures that are already in place for many municipal operations. Table 2-6 outlines the BMPs the City implements to address the permit requirements for Schedule A.3.f.

Table 2-6. Pollution Prevention and Good Housekeeping for Municipal Operations Permit Requirements and Associated BMPs

Schedule A.3.f Permit Requirements	Applicable BMPs											
	OM-1	OM-2	OM-3	OM-4	OM-5	OM-6	OM-7	ED-1*	PC-3*	PC-4*	PL-1*	PL-2*
i. O&M Strategy for Existing Controls	✓								✓	✓		
ii. Inspection, Maintenance, and Cleaning of the MS4		✓										
iii. Pollution Prevention in Facilities and Operations			✓		✓				✓			
iv. Permittee-owned NPDES Industrial Stormwater Permitted Facilities	N/A											
v. Winter O&M Program				✓								
vi. Requirements for Pesticide and Fertilizer Applications						✓						
vii. Litter Control							✓					
viii. Materials Disposal	✓	✓	✓	✓								
ix. Flood Control, Transportation, and Other Infrastructure											✓	
x. Stormwater Quality Retrofit Strategy											✓	✓
xi. Stormwater Infrastructure Staff Training								✓				
xii. Tracking and Assessment												

**BMP is part of a different control measure category, described elsewhere in this document.*

The following Pollution Prevention and Good Housekeeping for Municipal Operations centered BMPs are described in detail in the Category 6 BMP tables:

- OM-1: Maintain an MS4 Map
- OM-2: Conduct Stormwater Infrastructure Maintenance
- OM-3: Conduct Street Sweeping and Roadway Maintenance Activities
- OM-4: Implement a Winter Maintenance Program

- OM-5: Implement Stormwater Controls on Municipal Property
- OM-6: Implement Pesticide and Fertilizer Controls for Publicly Owned Facilities & Right of Way
- OM-7: Implement Litter Controls

Supporting BMPs that also assist in meeting the requirements of this permit category are as follows:

- ED-1: Provide Public Education Regarding Stormwater Management
- PC-3: Public Structural Stormwater Facility Inspection and Maintenance Program
- PC-4: Private Structural Stormwater Facility Inspection and Maintenance Program
- PL-1: Stormwater Planning for Water Quality Improvements
- PL-2: Conduct Retrofit or Decommissioning of Public UICs

Category 6 Pollution Prevention and Good Housekeeping Tables provide a description, implementation schedule, measurable goals, annual tracking measures, and priority pollutants addressed for each pollution prevention and good housekeeping BMP. Measurable goals and tracking measures will be evaluated annually to assess the impact of the BMPs and to inform future pollution prevention and good housekeeping BMPs.

Category 6. Pollution Prevention for Municipal Operations and Stormwater Management Facilities Operation and Maintenance BMPs		
OM-1 Maintain an MS4 Map	**City BMP Number**	OM-1
	City BMP Name	Maintain an MS4 Map
	Permit Applicability	WPCF-UIC, MS4
	BMP Implementation Responsibility	• Office of Performance Management • Environmental Resources Group, Utilities Department • Large Capital Improvement Project Engineering Group and Assistant City Engineer, EIPD
	Reference Document(s)	• https://www.bendoregon.gov/services/resources/mapping-services • SOP: Stormwater Infrastructure Inventory
	Permit Year	2023
	BMP Description/Rationale	The City's Office of Performance Management maintains a publicly available interactive overview of the City's boundaries, parcels, and utilities on the Bend Maps & Open Data webpage. Asset information is updated digitally when new as-builts are received. The following stormwater assets are included as layers in the City's digital inventory: • Underground Injection Controls (UICs) • Stormwater Facilities – outfalls, catch basins, inlets, storm and sediment manholes, vaults, gravel filters, etc. • Conveyance System – stormwater mains and laterals • Swales • Drainage Areas • Impervious Surface • Drinking Water Wells and Drinking Water Protection Areas • Areas with Potentially Perched Groundwater • Geographic information such as tax lot parcels, zoning, parks, street names, railroads, streams and waterbodies, the City boundary, the UGB, and school names The above asset attributes include information such as owner, facility type, facility ID, location (address, northing and easting), drainage destination, elevation, facility characteristics (material, diameter, length, volume, etc.), life cycle status, installation date, and inspection route. The City uses a digital MS4 mapping system through ESRI GIS. Mapping is used to aid in facility inspections, maintenance activities, and enforcement response. If mapping discrepancies are observed, maps are updated accordingly. Mapping accuracy and processes are consistent with industry standards. Maps are provided publicly on the City's website, and the digital inventory may be provided to DEQ upon request. In addition, the City does not have any current 1200-Z permits, so that mapping requirement is not applicable. While the permit requires mapping of chronic illicit discharges, there are currently no known areas with chronic illicit discharges within the City. Dry weather screening is currently conducted at 50% of accessible stormwater outfalls, but

Category 6. Pollution Prevention for Municipal Operations and Stormwater Management Facilities Operation and Maintenance BMPs		
OM-1 Maintain an MS4 Map		as screening locations are revised, updated mapping will reflect priority screening locations.
	Measurable Goal(s)	• Continually maintain the online GIS mapping for public viewing. • Add all newly constructed private and public stormwater management facilities to the digital inventory within 1 year of receiving as-builts. • As necessary, create a tracking system for chronic illicit discharges over time and integrate into the MS4 map. • By November 1, 2023, initiate updates to the SOP and mapping inventory to reflect private stormwater facilities in accordance with facility category naming.
	Annual Tracking Measure(s)	1. Number of public UICs. 2. Number of curb inlets, sedimentation manholes, and catch basins in the GIS inventory. 3. New public and private structural stormwater facilities added to the MS4 mapping inventory. 4. Chronic illicit discharges as integrated into the MS4 mapping.
	Primary Pollutant(s) or Parameter(s) Addressed	• Temperature • Sediment/Turbidity • Pesticides/Herbicides

Category 6. Pollution Prevention for Municipal Operations and Stormwater Management Facilities Operation and Maintenance BMPs		
OM-2 Conduct Stormwater Infrastructure Maintenance	**City BMP Number**	OM-2
	City BMP Name	Conduct Stormwater Infrastructure Maintenance
	Permit Applicability	WPCF-UIC, MS4
	BMP Implementation Responsibility	• Environmental Resources Group, Utilities Department • Fields Operations Group, Utilities Department
	Reference Document(s)	SOP: City of Bend Stormwater Infrastructure Operation & Maintenance (2023)
	Permit Year	Ongoing
	BMP Description/Rationale	Conduct annual inspections and assessments of catch basins and manhole structures in accordance with maintenance zone information as outlined in the SOPs. Identify and document maintenance needs using INFOR or other asset management program. Conduct inspection of stormwater pipe and other conveyance channels in accordance with recurring maintenance or public complaints. Perform identified maintenance to remove sediment from catch basins and sediment manholes when sediment accumulation exceeds acceptable levels. Track and document catch basin and/or manhole inspections and cleaning. Periodically review the maintenance schedules to improve maintenance efficiencies and ensure measurable goals are met.
	Measurable Goal(s)	• Inspect all of City/Agency owned or operated catch basins, manholes, and inlets at least once every 5 years. Remove sediment from catch basin structures when sediment exceeds acceptable levels. • In conjunction with BMP PC-3, complete updates to the SOP: City of Bend Public Stormwater Drainage Facility Maintenance Inspections to integrate inspection zones or other qualifiers. • Maintain records of inspection and cleaning activities. • By November 1, 2025, evaluate opportunities to initiate a prescribed stormwater pipeline inspection program (CCTV) to evaluate system condition and maintenance needs.
	Annual Tracking Measure(s)	1. Status of SOP updates. 2. Number of catch basin and/or manholes inspected. 3. Number of catch basin and/or manholes cleaned. 4. Estimated volume of debris removed from catch basin and/or manholes.
	Primary Pollutant(s) or Parameter(s) Addressed	• Temperature • Sediment/Turbidity

Category 6. Pollution Prevention for Municipal Operations and Stormwater Management Facilities Operation and Maintenance BMPs		
OM-3 Conduct Street Sweeping and Roadway Maintenance Activities	**City BMP Number**	OM-3
	City BMP Name	Conduct Street Sweeping and Roadway Maintenance Activities
	Permit Applicability	WPCF-UIC, MS4
	BMP Implementation Responsibility	Street Division, Streets & Mobility Department
	Reference Document(s)	• City of Bend Stormwater Utility Street Sweeping for Stormwater Plan (7-2023) • Street Sweeping Fact Sheet • Utility/Road Repair & Maintenance Fact Sheet • City of Bend Street Sweeping Webpage
	Permit Year	Ongoing
	BMP Description/Rationale	Conduct the street sweeping program and road repair activities in accordance with the Stormwater Utility Street Sweeping for Stormwater Plan and the Street Sweeping and Utility/Road Repair and Maintenance Fact Sheets. Currently, curbed public streets that drain to the MS4 are swept quarterly (min. 4 times/year) on a prescheduled basis. Additional sweeping occurs to support storm clean up and leaf collection activities citywide. Sweeping operations and scheduling are highly dependent on the season and winter weather conditions (see BMP OM-4). Citywide sweeping schedules are available on the webpage. The City periodically reviews and modifies to the street sweeping program to increase efficiencies and reduce transport of trash, cinders, leaf litter, and sediments to drywells and the Deschutes River. Messaging is provided to the public to keep streets clear when street sweeping or road maintenance is scheduled to occur.
	Measurable Goal(s)	• Sweep streets in accordance Stormwater Utility Street Sweeping for Stormwater Quality Plan. • Schedule and conduct routine road repair activities during dry-weather conditions, if possible. • By November 1, 2024, update the SOP: City of Bend Utility Street Sweeping for Stormwater Plan to reflect seasonal changes to schedule and frequencies (in accordance with winter maintenance plan) and coverage of bike paths.
	Annual Tracking Measure(s)	1. Miles swept. 2. Volume of debris removed during sweeping activities. 3. Status of updates to SOP.
	Primary Pollutant(s) or Parameter(s) Addressed	• Temperature • Sediment/Turbidity • pH

Category 6. Pollution Prevention for Municipal Operations and Stormwater Management Facilities Operation and Maintenance BMPs		
OM-4 Implement a Winter Maintenance Program	**City BMP Number**	OM-4
	City BMP Name	Implement a Winter Maintenance Program
	Permit Applicability	WPCF, MS4
	BMP Implementation Responsibility	Street Division, Streets & Mobility Department
	Reference Document(s)	• Street Sweeping Fact Sheet • Winter Road Care – Salts, Mag Chloride, Ice Melt Fact Sheet • City of Bend Stormwater Utility Street Sweeping for Stormwater Plan (7-2023) • Winter Street Operations Plan: https://www.bendoregon.gov/government/departments/streets/street-operations/winter • City of Bend Corporation Yard Stormwater Pollution Prevention Plan (SWPPP) (3-2023)
	Permit Year	Ongoing
	BMP Description/Rationale	Continue to conduct winter maintenance activities in accordance with the Stormwater Utility Street Sweeping for Stormwater Quality Plan and the Winter Street Operations Plan (available online). Plowing and sanding is prioritized based on geographic zones (major collector and arterials, selected collector streets, residential/other). Spring cleanup is conducted during spring thaw to remove sediments from winter maintenance activities. Magnesium Chloride is used only in specific locations and circumstances in accordance with the fact sheet. Store winter maintenance materials in accordance with the BMPs outlined in the fact sheets and the City of Bend Corporation Yard SWPPP for the facility to prevent the discharge of materials to surface or groundwater. Update the Winter Street Operations Plan to include prioritization criteria for roads necessitating expedited sweeping operations and additional best management practices for winter maintenance to address stormwater quality issues. Update best practices guidance to reflect new information and updated MS4 map areas (see BMP OM-1).
	Measurable Goal(s)	• Continue current winter maintenance operations while implementing BMPs to prevent stormwater pollution. • Continue to implement the SWPPP at the 15th Street Yard Facility. • By November 1, 2025, update the Winter Street Operations Plan and/or applicable fact sheets or SWPPP to reflect updated BMP information related to material storage and updated MS4 map areas.
	Annual Tracking Measure(s)	1. Amount of material applied. 2. Amount of material removed during street sweeping operations. 3. Quantities and application areas of deicing materials used and the number of winter weather events. 4. Updates to the Winter Streets Operations Plan, relevant SOPs, or SWPPP.

Category 6. Pollution Prevention for Municipal Operations and Stormwater Management Facilities Operation and Maintenance BMPs		
OM-4	**Primary Pollutant(s) or Parameter(s) Addressed**	• Temperature • Sediment/Turbidity • pH

Category 6. Pollution Prevention for Municipal Operations and Stormwater Management Facilities Operation and Maintenance BMPs		
OM-5 Implement Stormwater Controls on Municipal Property	**City BMP Number**	OM-5
	City BMP Name	Implement Stormwater Controls on Municipal Property
	Permit Applicability	WPCF-UIC, MS4
	BMP Implementation Responsibility	• Street Division, Streets & Mobility Department • Environmental Resources Group, Utilities Department
	Reference Document(s)	• Paint Use and Disposal Fact Sheet • Pressure Washing & Surface Cleaning Fact Sheet • Vehicle and Equipment Washing Fact Sheet • Concrete Use and Disposal Training Fact Sheet • Leaky Equipment and Fueling Fact Sheet • City of Bend Illicit Discharge Minimization Best Management Practices Manual (IDDE Manual) • City of Bend Corporation Yard Stormwater Pollution Prevention Plan (SWPPP) (3-2023)
	Permit Year	Ongoing
	BMP Description/Rationale	Maintain/update the Corporation Yard SWPPP for applicable municipal properties (Boyd Acres and 15th Street Corporation Yard) to outline best practices for stormwater pollution prevention for municipal operations for the required activities outlined in Schedule A.3.f.iii. of the NPDES MS4 permit. The SWPPP includes many pollution prevention procedures and industry best practices that the City currently implements during municipal storage activities and operations. Additional fact sheets are used for employee training. Conduct targeted outreach to tenant properties at the Bend Airport related to pollution prevention and illicit discharge prevention and detection.
	Measurable Goal(s)	• By November 1, 2025, update the Corporation Yard SWPPP to directly reflect activities and BMPs outlined in Schedule A.3.f.iii. of the NPDES MS4 permit and incorporate relevant fact sheet content. • By November 1, 2025, create targeted outreach materials for airport tenants.
	Annual Tracking Measure(s)	1. Outreach material distribution frequency to Airport tenants. 2. Status of SWPPP updates to promote increased stormwater pollution prevention.
	Primary Pollutant(s) or Parameter(s) Addressed	• Temperature • Sediment/Turbidity • pH

Category 6. Pollution Prevention for Municipal Operations and Stormwater Management Facilities Operation and Maintenance BMPs		
OM-6 Implement Pesticide and Fertilizer Controls for Publicly Owned Facilities and Right of Way	**City BMP Number**	OM-6
	City BMP Name	Implement Pesticide and Fertilizer Controls for Publicly Owned Facilities & Right of Way
	Permit Applicability	WPCF, MS4
	BMP Implementation Responsibility	• Environmental Resources Group, Utilities Department • Streets Division, Transportation & Mobility Department
	Reference Document(s)	• Landscape Maintenance Fact Sheet • City of Bend Corporation Yard Stormwater Pollution Prevention Plan (SWPPP) (3-2023)
	Permit Year	Ongoing
	BMP Description/Rationale	Ensure proper application of pesticides during routine landscape maintenance at City owned public facilities and Rights of Way. Coordinate and provide information to the Bend Parks and Recreation District, the Old Mill District, and specific homeowner's associations who are responsible for their own pesticide and fertilizer application and controls. Incorporate integrated pest management practices to reduce the need for pesticides and fertilizers. Implement best management practices for application of pesticides and fertilizers to reduce overspray or transport of pesticides and fertilizers into water systems. Require employees and contractors to follow label requirements for application methods, rates, frequency, and disposal of wastes. Store and dispose of pesticides and fertilizers properly.
	Measurable Goal(s)	• By November 1, 2025, develop an SOP for pesticide and fertilizer storage, application, and disposal for City-owned vegetated areas. • Provide Integrated Pest Management (IPM) information to external agencies and HOAs at least once during the permit term in coordination with Water Conservation.
	Annual Tracking Measure(s)	1. Track status of SOP development. 2. Track outreach and communication to external agencies and Homeowners Associations (HOAs).
	Primary Pollutant(s) or Parameter(s) Addressed	• Pesticides/Herbicides

Category 6. Pollution Prevention for Municipal Operations and Stormwater Management Facilities Operation and Maintenance BMPs		
OM-7 Implement Litter Controls	**City BMP Number**	OM-7
	City BMP Name	Implement Litter Controls
	Permit Applicability	MS4
	BMP Implementation Responsibility	• Field Operations Group, Utilities Department • Street Division, Streets & Mobility Department • Business Management/Budget Group, Utilities Department • Bend Parks and Recreation District *(separate entity)*
	Reference Document(s)	N/A
	Permit Year	2024
	BMP Description/Rationale	Assist in the collection and disposal of litter in the Downtown area, and removal of trash and debris during vegetation maintenance. Continue to coordinate with the Bend Parks and Recreation District which manages parks areas independently from City operations. Continue to participate in the annual Deschutes River Cleanup.
	Measurable Goal(s)	• Review litter control requirements in Right of Way permits for events. • Coordinate with Bend Parks and Recreation to confirm litter control practices.
	Tracking Measure(s)	1. Status of litter control requirements in Right of Way permits 2. Track the amount of material removed during the annual Deschutes River Cleanup
	Primary Pollutant(s) or Parameter(s) Addressed	N/A

Category 7: Planning and Retrofit Program

The City is currently developing an updated Stormwater Master Plan to inform long term stormwater planning and retrofit needs comprehensively.

Category 7 includes the activities conducted to assess the City's progress in stormwater planning and installation of additional water quality treatment including long term planning of stormwater capital projects, assessment of retrofit needs, and water quality technical evaluations. Table 2-6 outlines the BMPs the City implements to address the permit requirements in Schedule A.3.f.

Table 2-7. Planning and Retrofit Permit Requirements and Associated BMPs

Schedule A.3.f Permit Requirements	Applicable BMPs	
	PL-1	PL-2
ix. Flood Control, Transportation, and Other Infrastructure	✓	
x. Stormwater Quality Retrofit Strategy	✓	✓

The following Planning and Retrofit centered BMPs are described in detail in the Category 7 BMP tables:

- PL-1: Stormwater Planning for Water Quality Improvements
- PL-2: Conduct Retrofit or Decommissioning of Public UICs

The Category 7 Planning and Retrofit Permit Requirements Tables provide a description, implementation schedule, measurable goals, annual tracking measures, and priority pollutants addressed for each planning and retrofit program BMP. Measurable goals and tracking measures will be evaluated annually to assess the impact of the BMPs and to inform future planning and retrofit program BMPs.

Category 7. Planning and Retrofit Program		
PL-1: Stormwater Planning for Water Quality Improvement	**City BMP Number**	PL-1
	City BMP Name	Stormwater Planning for Water Quality Improvements
	Permit Applicability	WPCF-UIC, MS4
	BMP Implementation Responsibility	• Environmental Resources Group, Utilities Department • Engineering Infrastructure and Planning Department
	Reference Document(s)	ISWMP 2023
	Permit Year	2023
	BMP Description/Rationale	Implement the updated ISWMP BMPs and goals. Annually review the ISWMP and revise to reflect specific activities, goals, regulations, or processes for the upcoming year. By the third-year annual report for the MS4, assess whether BMPs outlined in the ISWMP are effective at addressing 303(d) pollutants. In conjunction with stormwater master planning efforts, develop a stormwater retrofit strategy to identify locations or approaches to incorporate structural stormwater controls to retrofit the stormwater system for increased water quality treatment and reflect goals, tools, priorities, or potential projects. Prepare a written assessment of the City's retrofit progress and outcomes and submit to DEQ.
	Measurable Goal(s)	• Review the ISWMP annually. • By November 1, 2024, conduct a 303(d) Evaluation to confirm whether BMPs in the existing ISWMP are effective at addressing 303(d) pollutants. • By November 1, 2025, develop a stormwater retrofit strategy and submit a summary of outcome to DEQ.
	Annual Tracking Measure(s)	1. ISWMP updates. 2. Number of retrofits installed in the MS4. 3. Status of 303(d) Evaluation and Retrofit Strategy Development.
	Primary Pollutant(s) or Parameter(s) Addressed	• Temperature • Sediment/Turbidity • Pesticides/Herbicides • PFAS • pH

Category 7. Planning and Retrofit Program		
PL-2: Underground Injection Control Removal and Closure Procedures	**City BMP Number**	PL-2
	City BMP Name	Conduct Retrofit or Decommissioning of Public UICs
	Permit Applicability	WPCF-UIC, MS4
	BMP Implementation Responsibility	Field Operations Group, Utilities Department
	Reference Document(s)	SOP: UIC Removal and Closure Procedures
	Permit Year	Ongoing
	BMP Description/Rationale	Continue to evaluate UICs for improvements/retrofits or decommissioning based on the systemwide assessment, groundwater protectiveness demonstration (GWPD), results of stormwater monitoring, and stormwater master planning efforts. Decommission UICs following the Underground injection Control Removal and Closure Procedures SOP. Prioritize improvements/retrofits and/or decommissioning on a risk-based schedule.
	Measurable Goal(s)	• By November 1, 2025, create a risk-based schedule for improvements/retrofits and/or decommissioning of public UICs.
	Annual Tracking Measure(s)	1. Number of public UIC retrofits completed. 2. Number of public UICs decommissioned.
	Primary Pollutant(s) or Parameter(s) Addressed	• Temperature • Sediment/Turbidity • Pesticides/Herbicides • PFAS • pH

Category 8: Underground Injection Controls

One of the highest priorities for the City is protecting drinking water wells from contamination. To do this, the City needs to know where and how it should focus its protection efforts to meet UIC requirements that are protective of groundwater. The City was issued their latest WPCF-UIC permit in 2013, and it is currently in administrative extension following a 10-year permit term.

A systemwide assessment of all City owned and operated UICs was completed in March 2023 in conjunction with the renewal application for the City's WPCF-UIC permit. The assessment provided locations, construction details, land use and activities for the drainage areas, and identification of hazardous substances and toxic materials in the drainage areas for each UIC. During the WPCF-UIC permit term, monitoring of UICs along with evaluation of UIC operation and coverage will continue to provide water quality data.

The following UIC centered BMPs are described in detail in the Category 8 BMP tables:

- UIC-1: Regulate UIC Installations and Closures
- UIC-2: Conduct Stormwater Monitoring for UICs

Category 8 UIC BMP Tables provide a description, implementation schedule, measurable goals, annual tracking measures, and pollutants of concern addressed for each UIC-related BMP. Measurable goals and tracking measures will be evaluated annually to assess the impact of the BMPs and to inform future UIC BMPs. Updates are anticipated to address requirements of the City's pending, reissued WPCF-UIC permit.

Category 8. Underground Injection Controls		
UIC-1: Regulate UIC Installations and Closures	**City BMP Number**	UIC -1
	City BMP Name	Regulate UIC Installations and Closures
	Permit Applicability	WPCF-UIC
	BMP Implementation Responsibility	• Environmental Resources Group, Utilities Department • Field Operations Group, Utilities Department
	Reference Document(s)	• City of Bend Standards and Specifications for Drywell Facility Testing • SOP: UIC Removal and Closure Procedures (2023) • SOP: UIC Registration Coordination • City of Bend Systemwide Assessment (2023)
	Permit Year	Ongoing
	BMP Description/Rationale	A systemwide assessment of all City owned and operated UICs was completed in March 2023. The assessment provides the following information for each UIC: location, construction details, land use and activities in the drainage area, and identification of hazardous substances and toxic materials in the drainage area. The City will continue to map and track relevant information for new or newly known UICs to maintain an accurate inventory of City owned UICs. Pretreatment facilities that are associated with City owned UICs will also continue to be mapped (see BMP OM-1). The City will investigate areas of potential perched groundwater along the Deschutes River originally identified in a 2020 Stormwater Infiltration Evaluation Report developed by GSI by conducting field investigations of existing UIC's within these areas. Field investigation data will be used to refine existing perched groundwater maps and inform the groundwater protectiveness demonstration. A groundwater protectiveness demonstration (GWPD) will be created to include emerging pollutants and inform design standards updates related to the potential use of infiltration facilities. UICs installed for private development will continue to be registered with DEQ as required in City of Bend Standards and Specifications. The City will track public UIC Closures in conjunction with the SOP.
	Measurable Goal(s)	1. Continue mapping pretreatment and City-owned drywells facilities. Update systemwide assessment in conjunction with timeframes outlined in the WPCF-UIC permit. 2. By November 1, 2024, develop an updated horizontal and vertical GWPD to inform updates to City Development Standards and COSM and refine existing perched groundwater maps. 3. By November 1, 2024, update SOP: Stormwater UIC Registration to confirm processes for authorization, UIC registration, and data tracking for capital projects and private development in the ROW, transferring UIC ownership to the City. 4. Update this BMP after receiving a new WPCF-UIC permit from DEQ.

Category 8. Underground Injection Controls		
UIC-1	**Annual Tracking Measure(s)**	1. Number of City-owned pretreatment facilities and new UICs installed. 2. Number of new private UICs registered with DEQ. 3. Status of GWPD update. 4. Status of SOP updates.
	Primary Pollutant(s) or Parameter(s) Addressed	• Sediment/Turbidity • Pesticides/Herbicides • PFAS

Category 8. Underground Injection Controls		
UIC-2: Conduct Stormwater Monitoring for UICs	**City BMP Number**	UIC-2
	City BMP Name	Conduct Stormwater Monitoring for UICs
	Permit Applicability	WPCF-UIC
	BMP Implementation Responsibility	Water Quality & Lab Services Group, Utilities Department
	Reference Document(s)	• Underground Injection Control Monitoring Plan • Emerging Pollutant Evaluation for Individual UIC Permit Renewals (2022)
	Permit Year	Ongoing
	BMP Description/Rationale	Continue monitoring stormwater for WPCF-UIC permit compliance in accordance with the City's Monitoring Plan. In conjunction with reissuance of the City's WPCF-UIC permit, update the Monitoring Plan to meet frequencies, parameters and coverage as outlined. Comply with the sampling frequency established in the Stormwater Monitoring Plan unless circumstances beyond the City's reasonable control arise. Review monitoring results per the action levels in WPCF-UIC Permit. Compile and submit monitoring results annually to DEQ. Should any action level exceedance occur, corrective actions (planned and implemented) will be reported in the City's annual report.
	Measurable Goal(s)	• Monitor stormwater in accordance with the City's Stormwater Monitoring Plan. • In conjunction with reissuance of the City's WPCF-UIC Permit, prepare one update to the City's existing Stormwater Monitoring Plan to address new monitoring requirements.
	Annual Tracking Measure(s)	1. Any corrective actions resulting from stormwater monitoring. 2. Updates to the Stormwater Monitoring Plan.
	Primary Pollutant(s) or Parameter(s) Addressed	• Sediment/Turbidity • Pesticides/Herbicides

Appendix A: **Municipal Staff Training Strategy**

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Appendix A
Municipal Staff Training Strategy

The Municipal Staff Training Strategy Table (Table A-1) presents the City of Bend's multi-year and multi-topic training strategy to address stormwater education for municipal staff. The City of Bend's 2022 NPDES MS4 Permit and Underground Injection Control (UIC) Water Pollution Control Facility (WPCF-UIC) Permit requires training for municipal staff in several stormwater-related areas. Trainings conducted by the City aim to cover both MS4 and UIC related topics and Best Management Practices. In general, new staff will be trained in the duties of their position upon hire. Existing staff will be trained in the duties of their position on an annual basis. All staff will be trained on updated or changed procedures throughout the permit term, as those changes or updates occur.

This strategy covers training in the following categories:

- Illicit discharge detection and elimination, including spill response
- Erosion and sediment control for construction sites
- Post construction stormwater management
- Stormwater pollution prevention for municipal facilities and operations

The following table outlines the City of Bend's strategy for conducting the required stormwater training for municipal staff. This strategy is specific to NPDES MS4 Permit requirements. City of Bend staff participate in trainings for topics and programs beyond those listed in this strategy, including field safety training and equipment training. General Employee Training is included as BMP ED-4.

Reference Permit Language

Schedule A.3.c.vi - Illicit Discharge Detection and Elimination Training and Education The permittee must ensure that all persons responsible for investigating and eliminating illicit discharges and illicit connections into the MS4 are appropriately trained to conduct such activities. All staff directly responsible for conducting dry weather screening activities or responding to reports of illicit discharges and spills into the MS4 must be properly trained to conduct such activities, and training strategies and frequencies for staff must be documented and included or referenced in the ISWMP Document.

Schedule A.3.d.vii – Construction Runoff Control Training and Education The permittee must ensure that all staff responsible for ESCP reviews, site inspections, and enforcement of the permittee's requirements are trained or otherwise qualified to conduct such activities.

Schedule A.3.e.vi – Post-Construction Site Runoff for New Development and Redevelopment – Training and Education The permittee must ensure that staff responsible for performing post-construction runoff site plan reviews, administrating the post-construction program requirements and performing O&M practices or evaluating compliance with long-term O&M requirements are trained or otherwise qualified to conduct such activities.

Schedule A.3.f.xi – Pollution Prevention and Good Housekeeping for Municipal Operations – Stormwater Infrastructure Staff Training The permittee must ensure that staff responsible for evaluating O&M practices, evaluating compliance with long-term O&M requirements or ensuring pollution prevention at facilities and during operations are trained or otherwise qualified to conduct such activities.

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Table A-1. Municipal Staff Training Strategy

Category	Permit Section	Stormwater Training Topic	Target Groups	Frequency/Years for Training	Potential Resources	Notes
Illicit Discharge Detection and Elimination	A.3.c.vi	Identifying and reporting illicit discharges (including procedures for enforcement and follow-up actions)	• Stormwater Program Utility Compliance Technician	Once per permit term	• Spill Prevention, Control, & Cleanup - Vector Solutions • Illicit Discharge Recognition & Reporting - Vector Solutions • Illicit Discharge Detection & Elimination SOP • HAZWOPER Training • Other third-party online training presentations	
		Identifying and reporting illicit discharges	• All Public Works Departments	Annually	• Illicit Discharge Recognition & Reporting - Vector Solution	
		Dry weather screening procedures, documentation, reporting, and follow-up actions	• Stormwater Program Utility Compliance Technicians	Annually	• Illicit Discharge Detection & Elimination SOP • Dry Weather Screening Plan	
Construction Runoff Control	A.3.d.vii	Best practices and new technologies for erosion prevention and sediment control	• Stormwater Program Utility Compliance Technicians & program managers	• Once per permit term • Within 30 days for new staff	• Third party online ESC trainings • Conferences • ACWA Stormwater Group	
		Plan Review	• Community Development Engineers • Engineering and Infrastructure Planning Department Engineers		• Review checklists and update as necessary • Internal staff trainings, associated handouts/guidance documents • Third party online ESC trainings	Plan review training should be conducted during development (or following adoption) of new or updated City codes, standards, and internal process procedures.
		Construction site ESC inspection processes and documentation procedures (including violations enforcement processes)	• Stormwater Program Utility Compliance Technicians • Inspectors from Community Development Department conducting ESC inspections • Capital Project ESC site inspectors		• CECSL Certifications • Internal ESC trainings and associated guidance documents • Third party online ESC trainings	
Post Construction Stormwater Management	A.3.e.vi	Proposed or adopted changes to stormwater design standards and stormwater related land use policies.	• Capital Engineering Staff • Community Development Engineering Staff • Planning staff involved with land use reviews and approvals	• Once per permit term • Within 30 days for new staff	• Internal Staff Training associated handouts/guidance documents • City municipal code, development code, and design standards • Any COSM updates	Training should be conducted during development (or following adoption) of new or updated stormwater design standards or stormwater related land use policies
		Plan Review	• Capital Engineering Staff • Community Development Engineering Staff • Planning staff involved with land use reviews and approvals			
		City of Bend site inspection processes and documentation procedures (including violations enforcement processes)	• Stormwater Program Utility Compliance Technicians • Field operations staff responsible for maintaining stormwater management facilities		• Internal Staff Training associated handouts/guidance documents • Any COSM updates	

Table A-1. Municipal Staff Training Strategy

Category	Permit Section	Stormwater Training Topic	Target Groups	Frequency/Years for Training	Potential Resources	Notes
Pollution Prevention and Good Housekeeping for Municipal Operations	A.3.f.xi	Performing inspection, maintenance and cleaning of MS4 and stormwater related structures	• Field operations staff responsible for maintaining stormwater management facilities	• Annually and • Within 30 days for new staff	• Stormwater O&M SOP • On the job training/mentoring from senior field operations staff	
		Conducting O&M related activities and good housekeeping to reduce discharge of pollutants	• Utility Department • Transportation and Mobility Department • Fleet Management Department • Facilities Department		Vector Solutions Training Sheets including: • Vehicle & Equipment Washing • Concrete Use & Disposal • Road Repairs & Maintenance • Illicit Discharge Recognition & Reporting • Pump Station O&M • Pressure Washing & Surface Cleaning • Paint Use & Disposal • Landscape Maintenance • Leaky Equipment & Fueling • Street Sweeping • Spill Prevention, Control, & Cleanup	Includes field staff and managers
		Conducting winter O&M program to limit impact activities to water quality	• Transportation & Mobility Department		Winter Road Care Training Sheet: • Vector Solutions	Includes field staff and managers
		Implementing best practices on pesticide and fertilizer application; litter control; material disposal; flood control; transportation; and other infrastructure	• Utility Department • Transportation & Mobility Department • Fleet Management Department • Facilities Department		Vector Solutions Training Sheets including: • Vehicle & Equipment Washing • Concrete Use & Disposal • Road Repairs & Maintenance • Illicit Discharge Recognition & Reporting • Pump Station O&M • Pressure Washing & Surface Cleaning • Paint Use & Disposal • Landscape Maintenance • Leaky Equipment & Fueling • Street Sweeping • Spill Prevention, Control, & Cleanup	Includes field staff and managers

Appendix B: Stormwater Public Education & Involvement Plan

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Stormwater Public Education & Involvement Plan
FY 2023-2026

CITY OF BEND

Stormwater Public Education FY2023-2026

Topic: General Watershed Awareness & Pollution Prevention	MS4 & UIC

Description: Watershed awareness education, including how storm drains lead to the Deschutes River or underground drinking water and how to prevent pollution for various activities (stormwater BMPs for outdoor chemical use, power washing, auto repair & maintenance, proper waste disposal, etc.)
Target Audience: General public,
Pollutants of Concern: all
Materials: Educational public service announcements through radio, television, social media, or print (newspaper/magazines, utility bill inserts, etc.).
Schedule:
Monthly to bi-monthly media messaging for watershed awareness with specific stormwater pollution prevention themes linked to season, time of year, public events, or specific weather events (i.e., snow/ice). Hard copies of general educational materials may be provided throughout the year at in-person City events, in the Utility Department public lobby, and as utility bill inserts.

Topic: Illicit Discharge Prevention for Businesses	MS4 & UIC

Description: Distribute information to businesses highlighting the importance of preventing illicit discharges. Explore different methods to distribute the information such as coordinating through the City's business registration and renewal process and providing tailored information specific to the type of business activity classifications based on the North American Industrial Classification System (NAICS).
Target Audience: Businesses
Pollutants of Concern: fats, oils, grease, pesticides, and other hazardous wastes associated with business practices.
Materials: Review existing available resources and create new outreach material for identified high-risk categories (food services, automobile maintenance, fueling stations, dry cleaning, mobile washing, landscaping, etc.).
Schedule:
FY2023-24 Review and/or create illicit discharge prevention outreach material targeted to high-risk businesses. Coordinate with the City staff in the business license program to evaluate the ability to incorporate outreach materials in the online certification database and registration website.
FY2024-25 Begin distributing business focused illicit discharge outreach material with business license registrations and annual renewals through the City's online permit center and/or through other identified pathways. Post the educational materials on the stormwater website.
FY2025-2026 Continue distribution of outreach materials though the City's business licensing & renewal process or other identified pathways, and post materials on the stormwater website.

Topic: Household Hazardous Waste Disposal	MS4 & UIC

Description: Education on the importance of proper household hazardous waste disposal and prevention of dumping in storm drains or waterways. Provide resources and guidance for proper waste disposal. Coordinate messaging with free waste drop off events offered through Deschutes County.
Target Audience: General public, renters, homeowners, and homeowner associations

Pollutants of Concern: household hazardous wastes (paints, solvents, fuels, antifreeze, aerosols, cleaners, poisons, pesticides, herbicides, fertilizers, oil filters, rechargeable batteries, fluorescent bulbs, propane tanks, pool & spa chemicals, etc.)
Materials: Educational public service announcements through radio, television, social media, or print.
Schedule:
FY2023-2024: Create outreach materials targeted to Household Hazardous Wastes, their impact to waterways, and proper disposal. Coordinate efforts or campaigns with Deschutes County, Knott Landfill waste drop off services.
FY2024-FY2026: Provide at least two outreach messages coordinated with the timing of free household hazardous waste drop off events at Deschutes County, Knott Landfill.
FY24 and ongoing: Post link to the hazardous waste drop off event page on the stormwater website and developed guidance documents and outreach messages.

Topic: Construction Site Controls

MS4 & UIC

Description: Provide resources, guidance, and training opportunities to the construction community for best practices on erosion prevention and sediment control at construction sites.
Target Audience: Construction site operators, homebuilders, developers, landscapers
Pollutants of Concern: sediment, concrete waste
Materials: Print resources and live or recorded training opportunities
Schedule:
FY2023-2024: Provide at least one in person or virtual construction site control training open to the public
FY2025-2026: Provide at least one in person or virtual construction site control training open to the public
Ongoing: Continue to post general guidance documents and resources for construction site controls on the stormwater public website.

Topic: Stormwater Program Public Website

MS4 & UIC

Description: Continue to maintain the City's publicly accessible stormwater webpages. Post educational resources, BMP guidance, training opportunities, permit-required public documents, program contact information, instructions to report illicit discharges, ordinances or policies, and other relevant news. Refer to the summary list of website resources for more information.
Target Audience: General public, businesses, school aged children
Pollutants of Concern: all
Materials: Website pages, printable resources, educational videos, & relevant links
Schedule:
Ongoing: Continue to post relevant information and update the website annually.

Topic: Bend Maps & Open Data

MS4 & UIC

Description: The City maintains a robust open data site for all publicly available GIS data. The site includes interactive maps, printable maps, and downloadable GIS data. The open data site serves as resource for the public to learn about stormwater infrastructure in their own neighborhood and visualize how stormwater is connected to surface and groundwater resources. The stormwater layer includes location and descriptive data for UIC's, stormwater piping, catch basins, drinking water wells, swales, outfalls, impervious surfaces, perched groundwater, and drainage areas.
Target Audience: General public, businesses, students

Pollutants of Concern: all
Materials: Digital website https://data.bendoregon.gov/
Schedule: Ongoing, continue to maintain the publicly viewable stormwater map and downloadable data.

Topic: Stormwater/ Illicit Discharge PSA's Utility Hold Music	MS4 & UIC

Description: The City's Utility Department regularly receives calls from the public. The department's phone system was programmed to use a 30 second public service announcement sound bite about stormwater and preventing illicit discharges when calls need to be placed on hold.
Target Audience: General public
Materials: Website pages, printable resources, educational videos, & relevant links
Schedule:
Ongoing: Continue to post relevant program information and annually update the website.

Topic: Utility Watershed Education Program	MS4 & UIC

Description: Coordinate with local nonprofits and Utility Department staff groups to develop an education program for Bend students focused on stormwater and other drinking water and wastewater topics for the Utility Department.
Target Audience: children and students
Materials: In-classroom lectures with curriculum about what stormwater is and how to protect water quality, hands on activities, or field trips to view stormwater systems in the City.
Schedule:
FY 2023-2024 Establish coordination with partners, fund development of the program, provide input on curriculum content, and coordinate with schools for program participation.
FY2024-2025: Begin implementation of the education program in classrooms.

Stormwater Public Involvement FY2023-2026

Activity: River Cleanup Stewardship Opportunity	MS4 & UIC

Description: The City promotes and supports public watershed cleanup activities such as the annual Deschutes River Cleanup hosted by the Upper Deschutes Watershed Council.
Target Audience: General public
Materials: Utility department staff participate in the annual river cleanup event by providing resources for collection and disposal of the trash the day of the event (ex: coordination/planning, labor, ATV's, pickup trucks, transportation of bagged waste to the landfill)
Pollutants of Concern: trash, hazardous wastes
Schedule: Annual Deschutes River Cleanup (summer)

Activity: Bend Beautification Program Stewardship Opportunity	MS4 & UIC

Description: The Bend Beautification Program is an opportunity for volunteers to improve the esthetics of Bend Oregon by improving its appearance through litter pickup, planting native pollinators, and removing non-native invasive plants. The program includes:

- Adoption of Roundabouts, Corridors, Bridges: Adopt an area meaningful to your group and help keep it looking great throughout the year, as you are available. We supply all tools, gloves and bags.
- Sustainable Environment Demonstration Sites: We have many pocket parks, a community garden, and other locations which feature sustainable native landscapes, utilize minimal irrigation, stormwater management, and are maintained entirely though our volunteer program.
- Streams and Rivers- Storm Drain Marking: A great project for families or individuals, marking stormwater drains in neighborhoods. Visible storm drain markers increase public awareness about stormwater and its connection to waterways and discourage dumping in storm drains.

Target Audience: General public
Pollutants of Concern: trash, litter, and illicit discharges
Schedule: Ongoing, storm drain marking kits and cleanup supplies available year-round

Activity: One Water Student Video Contest	MS4 & UIC

Description: The One Water Student Video Contest (formerly known as the Clean Water Works Video Contest) began in 2015 as an effort by the City of Bend Utility Department to educate students and the public about stormwater pollution prevention and how to keep water in Bend clean. Starting in 2023, the contest was expanded to include both stormwater and water conservation themes for the City of Bend Utility Department. Students create and submit a video message associated with an annual theme that relates to stormwater and water conservation. The winning students receive a cash prize, plus the grand prize winner has their video professionally reproduced into a public service announcement to air on television. The video contest continues to be operated as a collaborative partnership between the City of Bend Utility Department, nonprofit BendFilm, and Central Oregon Daily News (Zolo Broadcasting LLC).
Target Audience: 4^{th}-12^{th} grade students
Pollutants of Concern: all
Schedule: Annual contest in spring

Activity: Utilities Public Advisory Committee	MS4 & UIC

Description: The Utilities Public Advisory Group (UPAG) is a group of community stakeholders invited by the City of Bend Utility Department to provide input to department staff on programs and policies for stormwater management, water conservation, and other City water system topics.
Target Audience: General public, stormwater stakeholders, developers, nonprofits
Pollutants of Concern: all
Schedule: Ongoing, monthly meetings

Activity: Stormwater Education Dioramas	MS4 & UIC
Description: The City's Utility Department offers a variety of free educational resources including kid-friendly dioramas and hands-on models. The City has one full size UIC model to show how stormwater is injected underground and one tabletop watershed diorama to show stormwater movement through a watershed. These resources can be checked out by the public and used for educational purposes. Stormwater, Water Quality, and Water Conservation Program staff are also available to visit classrooms to give demonstrations or presentations. Target Audience: Children, school students Pollutants of Concern: trash, sediment, illicit discharges Schedule: Ongoing, rentals available year-round	

Activity: Earth Day Fair	MS4 & UIC
Description: The City coordinates with the Environmental Center to have a booth at the Earth Day fair each year. At the booth, City staff provide stormwater outreach materials, conduct watershed or UIC demonstrations using dioramas, and answer questions from the public. Target Audience: General public, children Pollutants of Concern: all Schedule: Annual participation on Earth Day (April)	

Summary Schedule: Stormwater Program Opportunities for Public Involvement

Activity	Audience(s)	Schedule	Link
River Cleanup Stewardship Opportunity	General public, children	Annual (summer)	https://www.upperdeschuteswatershedcouncil.org/events/deschutes-river-cleanup/
Bend Beautification Program	General public, children	Year-round	https://www.bendoregon.gov/community/volunteer-program/bend-beautification-program
Student Video Contest	4th-12th grade students in Bend	Annual (spring)	https://www.bendoregon.gov/government/departments/utilities/stormwater/clean-water-works/kid-s-page
Utilities Public Advisory Committee	General public, subject matter experts, stakeholders	Monthly meetings (September through June)	https://www.bendoregon.gov/government/departments/utilities/utilities-public-advisory-group
Stormwater Education Dioramas	Children, schools, students	Year-round	https://www.bendoregon.gov/government/departments/utilities/educational-resources
Earth Day Fair	General public, children	Annual (spring)	https://envirocenter.org/tec-events/earth-day-fair/

Stormwater Website Resource List: Public Education

Topic	Audience(s)	Link
What is stormwater? and why is it important?	General public, children	https://www.bendoregon.gov/government/departments/utilities/stormwater/about-stormwater
Student Video Contest Past Winner Library	General public, students	https://www.bendoregon.gov/government/departments/utilities/stormwater/clean-water-works/kid-s-page
Business Resources	Commercial businesses, contractors, developers	https://www.bendoregon.gov/government/departments/utilities/stormwater/clean-water-works/business-resources
Home and Garden	General Public, landscapers, developers	https://www.bendoregon.gov/government/departments/utilities/stormwater/clean-water-works/home-and-garden-resources
Stormwater Annual Reports	General Public	https://www.bendoregon.gov/government/departments/utilities/stormwater/about-stormwater/annual-reports
Stormwater Digital Maps-Bend Data Viewer	General Public	https://data.bendoregon.gov/