CITY OF BEND, OREGON

2012-2013 ANNUAL REPORT
Stormwater NPDES Permit No. 102901
Stormwater UIC WPCF Permit No. 103052

Final Report
October 31, 2013

City of Bend
Public Works Department
Stormwater Utility

October 31, 2013

Mr. Eric Nigg
Water Quality Manager, Eastern Region
Oregon Department of Environmental Quality
475 NE Bellevue Dr., Suite 110
Bend, OR 97701

SUBJECT: City of Bend FY2012-13 Stormwater Annual Report

PUBLIC WORKS

Dear Mr. Nigg,

575 NE 15TH STREET
PO BOX 431
BEND, OR 97701
[541] 317-3000 TEL
[541] 389-2245 FAX
BENDOREGON.GOV

The City of Bend is pleased to submit two copies of the enclosed FY2012-13 annual report per the requirements of our NPDES Permit Number 102901 for Bend's Municipal Separate Storm Sewer System that was issued on February 26, 2007 and has been administratively extended. This annual report provides an update on the progress the City has made in meeting permit conditions between July 1, 2012 and June 30, 2013. As required, the annual report provides a compliance status update with regards to permit conditions and the City's efforts in implementing the statutory goal of reducing pollutant discharges to surface water to the maximum extent practicable, while meeting the measurable goals for each of the minimum control measures.

The City received its Stormwater WPCF-UIC permit No. 103052 on May 14, 2013, and this report also describes initial efforts in implementing that permit, including efforts to begin implementation of the *Integrated Stormwater Management Plan 2022* that was accepted by DEQ as part of the WPCF-UIC permit. The first WPCF-UIC permit-required annual report is due November 1, 2014. But given that this FY2012-13 report also covers the City' efforts with respect to protecting drinking water supplies from potential stormwater impacts due to the City's stormwater underground injection controls, I have also copied Greg Aitken, (WPCF-UIC permit writer, DEQ) with the report as well.

Should you have any questions or concerns regarding this annual report, or the City's stormwater quality program, please contact me at 317-3018.

Sincerely,
City of Bend

Wendy Edde, Stormwater Program Manager

Att: FY2012-13 NPDES and WPCF-UIC Stormwater Annual Report (2 hard copies)
CC: Greg Aitken, DEQ (1 electronic copy, 1 hard copy); Benjamin Benninghoff (1 electronic copy)

City of Bend

Certification Regarding the City of Bend NPDES Municipal Stormwater Annual Report

"I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Paul Rheault

Paul Rheault
Public Works Director
City of Bend
October 30, 2013

CITY OF BEND, OREGON

2012-2013 ANNUAL REPORT
Stormwater NPDES Permit No. 102901
Stormwater WPCF-UIC Permit No. 103052

FINAL REPORT
October 31, 2013

City of Bend
Public Works Department
Stormwater Utility

Prepared by:

City of Bend
Public Works Department
Stormwater Utility

575 NE 15th Street
Bend, OR 97701

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541-317-3000

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ACRONYMS AND ABBREVIATIONS

ACWA	Association of Clean Water Agencies
APWA	Association of Public Works Agencies
ASCE	American Society of Civil Engineers
BEDAB	Bend Economic Development Advisory Board
BMPs	Best Management Practices
BOPA	Batteries, Oil, latex Paint, and Antifreeze
City	City of Bend, Oregon
CMP	Congestion Management Plan
COBA	Central Oregon Builders Association
COIC	Central Oregon Intergovernmental Council
COSM	Central Oregon Stormwater Manual
CTF	Stormwater Utility Fee Citizen's Task Force
DEQ	Oregon Department of Environmental Quality
DHS	Oregon Department of Health Services
DWPA	Drinking Water Protection Areas
EPA or US EPA	United States Environmental Protection Agency
ERU	Equivalent Residential Unit
FOG	Fats, Oil, Grease
FTE	Full Time Equivalent
FY	Fiscal Year
GIS	Geographic Information System
GPS	Geographical Positioning System
HHW or HHHW	Household Hazardous Waste
IAC	Utility Infrastructure Advisory Committee
IECA	International Erosion Control Association
IPM	Integrated Pest Management
ISWMP	Integrated Stormwater Management Plan
LID	Low Impact Development
MEP	Maximum Extent Practicable
Monitoring Plan	*City of Bend Water Quality Monitoring Plan*
MS4	Municipal Separate Storm Sewer System
NHD	High-Resolution National Hydrography Data Set
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
O & M	Operation & Maintenance
OEC	Oregon Environmental Council
OLCA	Oregon Landscape Contractors Association
PAG	Stormwater Quality Public Advisory Group
PCBs	Polychlorinated Biphenyls
PCOs	Pest Control Operators
PEO	Professional Engineers of Oregon
PIP	Public Involvement and Participation
POCs	Pollutants of Concern
QAPP	City of Bend Ambient Water Quality Monitoring Project

	Quality Assurance Project Plan
SWAT	Stormwater Action Team
SWMP	Storm Water Management Plan or Program
SWPPP	Storm Water Pollution Prevention Plan
TDM	Transportation Demand Management
TMDL	Total Maximum Daily Load
UDWC	Upper Deschutes Watershed Council
UGB	Urban Growth Boundary
UIC	Underground Injection Control; drywell or drill hole
USGS	United States Geologic Survey
WHPA	Wellhead Protection Area
WPCF	Water Pollution Control Facility

1.0 INTRODUCTION

Background

The City of Bend is both a National Pollutant Discharge Elimination System (NPDES) designated small Municipal Separate Storm Sewer System (MS4) owner and operator, and a stormwater underground injection control (UIC) owner and operator. As such, the City is required to meet the requirements of NPDES Permit No. 102901 (DEQ File No. 113602) that it received on February 26, 2007 from the Oregon Department of Environmental Quality and of Water Pollution Control Facility-Underground Injection Controls (WPCF-UIC) Permit No. 103052 (DEQ File No. 112361) that it received on May 14, 2013.

The NPDES permit requirements are based on the federal Clean Water Act (33.U.S.C. ∫1342(p)), as amended, along with federal Environmental Protection Agency (EPA) regulations for MS4 discharges. The permit authorizes the discharge of stormwater from all municipal separate storm sewer system outfalls owned and operated by the City. The City has nearly 30 outfalls to the river that serve a portion of the City along the Deschutes River and West Hills. Privately owned and maintained entities, such as the Old Mill District and specific subdivisions in town that do not discharge to the City's MS4 system, are outside of the City's direct jurisdiction with respect to the NPDES permit. The City has applied for renewal of its NPDES permit and is working with DEQ to negotiate the terms for the next five year permit. In the meantime, the City's permit coverage is extended through the negotiation period under the existing permit, and so the City must continue to implement the Integrated Stormwater Management Plan (2006).

Per item 1 of the NPDES permit's Schedule C, Compliance Conditions and Schedules, initial implementation of the approved stormwater management plan (the City's *Integrated Stormwater Management Plan* (ISWMP)), was required to begin by July 31, 2007. The ISWMP describes the activities the Program will implement during the City's first 5-year NPDES permit period. These activities are divided among the following major components of the Program:

- Overall Program Administration, Planning and Financing;
- Public Education and Outreach;
- Public Involvement and Participation;
- Illicit Discharge Detection and Elimination;
- Construction Site Stormwater Management;

- Post-Construction Stormwater Management in New and Redevelopments;
- Municipal Operations and Maintenance—Pollution Prevention and Good Housekeeping;
- Monitoring;
- Drinking Water Protection Areas: Investigation, Re-Delineation and Management.

On May 14, 2013 The City received its first Water Pollution Control Facility Permit (WPCF) for Underground Injection Controls (UIC) under the federal Safe Drinking Water Act and Oregon Administrative Rules. This permit covers the City's drywells and drill holes that inject stormwater into the ground. The WPCF permit allows the City to operate Underground Injection Control systems to manage stormwater. Starting in FY2013-14, the City must meet the tasks under the Integrated Stormwater Management Plan 2022 (2012) that were accepted under the City's WPCF-UIC permit and is being considered for the NPDES permit negotiation. Although not required for this annual report, the City is including reporting of initial progress in implementing the ISWMP 2022 in addition to reporting on ISWMP (2006) implementation.

Contents of the Annual Report

This represents the seventh Annual Report submitted to the DEQ describing stormwater quality and pollution prevention activities implemented by the City during Fiscal Year 2012-2013 (July 2012 through June 2013). As quoted from item 2 of the NPDES permit's Schedule B, Monitoring and Reporting Requirements, the annual report must contain the following:

> a) The status of compliance with permit conditions, an assessment of the appropriateness of the identified BMPs, progress towards achieving the statutory goal of reducing the discharge of pollutants to the MEP (maximum extent practicable), and the measurable goals for each of the minimum control measures;
>
> b) Results of information collected and analyzed, if any, during the reporting period, including evaluation criteria used to assess the success of the program at reducing the discharge of pollutants to MEP;
>
> c) A summary of the stormwater activities the permittee plans to undertake during the next reporting cycle, including a schedule for implementation;
>
> d) A description of changes made to the SWMP, including changes to BMPs or measurable goals identified in the SWMP;

e) Information on all new additions or removals of annexed areas that result in an expansion or contraction of the MS4's boundaries;

f) Notice that the permittee is relying on another government entity to satisfy some of the permittee's permit obligations (if applicable); and,

g) Number and nature of enforcement actions taken.

Per the WPCF-UIC permit, the first annual report is not due until November 1, 2014 but the City is taking this opportunity to report on initial startup activities that occurred in FY2012-13. Per subsection 4., the annual Underground Injection Control System Report must:

a. Include stormwater monitoring reports conducted in accordance with their Stormwater Monitoring Plan, including a spreadsheet of all data from sampled UICs provided in the analytical laboratory reports;
b. Discuss any action level exceedances (outlined in Permit Table 1) and actions taken to address the exceedances;
c. Describe any actions taken to implement the Underground Injection Control System Management Plan required in Schedule D, condition 5, any proposed modifications to the Underground Injection Control System Management Plan, and any additional actions taken to manage the City's injection systems to ensure groundwater protection;
d. Describe any actions described in your Underground Injection Control System Management Plan that you were not able to complete and why;
e. Identify any injection systems that you closed, retrofitted, or installed during the year;
f. Describe your future (in the next year) known plans to install, modify, convert, or close any underground injection systems; and
g. Provide one hard copy and one electronic copy of the annual Underground Injection Control System Report to DEQ.

The Annual Report contains detailed information on each component, including the purpose and general strategy of the component; the tasks completed; an assessment of the effectiveness of activities conducted in reducing or preventing stormwater pollution; and a summary, by individual component, of modifications proposed to the ISWMP per the review conducted this fiscal year. Tables or documents produced under each task are presented in an appendix at the end of each component section. At the end of each task header throughout the report,

a notation is included as to whether the task applies to the City's Municipal Separate Storm Sewer System (MS4), which is the piped system that drains to the Deschutes River or other surface waterbody, or to Underground Injection Controls (UIC) or both. The stormwater quality regulatory requirements are different depending on whether the stormwater discharges through an MS4 or UIC system.

2.0 OVERALL PROGRAM MANAGEMENT AND LEGAL AUTHORITY

Introduction

This section describes the overall administrative and management support functions that the City provides to operate and manage the stormwater quality program. This section also describes activities to ensure adequate legal authority and facilitate enforcement of the City's environmental codes related to water quality. In general, the City's stormwater staff are responsible for the overall coordination of the Integrated Stormwater Management Plan (ISWMP) (2006) and ISWMP 2022. However, several City departments assist the stormwater utility staff with the coordination and implementation of the tasks, taking direct responsibility for some tasks.

Tasks Completed (ISWMP (2006))

The following ISWMP standard and steady improvement tasks have been completed or are ongoing:

Task II.1 Administration and Coordination (MS4/UIC)

Stormwater Coordinators. Stormwater Coordinators consist of multiple intra-agency groups that focus on coordinating on stormwater issues. The first is a main Stormwater Liaisons Oversight Coordination Group that consists of representatives from multiple departments that focus on stormwater issues, similar to the now-defunct Stormwater Action Team (SWAT) that was active in the initial years of the utility. Subgroups of this Liaisons group focused on specific issues also meet frequently. And stormwater items that require coordination at the highest department-head level are handled through the standing "Economic Development & Infrastructure Strategic Management" (EDISM) committee, a City management and department head level coordination committee. The Stormwater Coordinators continued to meet in FY2012-13.

Stormwater Liaisons. The Stormwater Liaisons team and subsets of this team met several times through the year in an effort to coordinate the implementation of the new stormwater ordinance - Bend Code Title 16 and general coordination of the stormwater program. The Stormwater Liaisons and subgroups meeting summaries and agendas are included in Appendix A.

Economic Development and Infrastructure Strategic Management. In addition the "Economic Development & Infrastructure Strategic Management" (EDISM) also met weekly during FY2012-13 and discussed stormwater related topics related to the public facilities plan and/or the Third Street Underpass

infrastructure improvement project at five of its meetings. EDISM members consist of the City Manager, Assistant City Manager, Community Development Director, Public Works Director, Engineering and Infrastructure Planning Director, Finance Director, Business Advocate, City Attorney, Planning Manager, Communications Manager, Transportation Manager, Long Range Planning Manager, and City Engineer. Meeting agendas/summaries are included in Appendix A.

Ad-Hoc Work Groups. Several smaller task group meetings were held as necessary. For example, City technical services staff met periodically with City lab staff regarding stormwater monitoring efforts. City technical services staff continued to meet as needed with field staff supervisors. An internal Water Pollution Control Facility-UIC permit review group, a fire department coordination meeting, and utility billing coordination team also met. An organization chart of stormwater utility staff is included in Appendix A. City staff also participated in Engineering Infrastructure & Planning Department (EIPD) meetings and specific project meetings for the Third Street Underpass Project, Riverside Project, Potential Contaminant Source Risk Evaluation Project and other projects.

City Council. As in past years, City staff notified City Council of the availability of the stormwater quality annual report through a written message in the weekly City Manager memorandum to Council. (See Appendix A). City staff also provided a presentation to the Council giving an overview of the stormwater program and the Third Street project in April 2013 at a worksession (See Appendix A).

Other. Coordination also occurred external to City staff. This included coordination of the Stormwater Quality Public Advisory Group and participation in regional and statewide groups.

Public Advisory Groups. The City's Stormwater Quality Public Advisory Group (PAG) provided input to staff on stormwater quality issues and projects during the year; see Task IV-1 for more details. In addition the Infrastructure Advisory Committee (IAC), a committee of public volunteers appointed by the City Council to provide input on utility infrastructure projects, discussed the Stormwater Master Plan finalization project and the Third Street infrastructure project during FY2012-13 (see Appendix C).

Regional and Statewide Groups. City staff served as co-chair of the Oregon Association of Clean Water Agencies (ACWA) Groundwater Committee, continued to participate on the Stormwater Committee, and also tracked the public education committee. Staff are also participating on four subgroups—the Underground Injection Control (UIC) Water Pollution Control Facility (WPCF) permit negotiation subcommittee; UIC Rules Revision; UIC outreach brochures; and Construction Site Stormwater Field Guide workgroups.

Effectiveness. As described above, there was a large amount of coordination in FY2012-13. Together the Stormwater Coordinators exceeded the measurable goals for FY2012-13.

The City will work to further incorporate ad hoc task groups to improve effectiveness with key staff people on smaller implementation projects. Through efforts to date, the City has been able to:

- Facilitate communication regarding the WPCF UIC Permit, TMDL, and Phase II negotiation process.
- Improve coordination with the monitoring team and maintain coordination among stormwater crews throughout the year;
- Coordinate implementation efforts.

Task II.2 Legal Authority (MS4/UIC)

The goal of this task is to ensure that the City has the legal authority to implement the various elements of the ISWMP. Securing adequate legal authority has been a top priority in developing the stormwater quality program. On December 6, 2006, the Bend City Council adopted the Integrated Stormwater Management Plan. Since the adoption of the ISWMP, the Bend City Council has passed several resolutions establishing the stormwater utility and ensuring adequate funding will be available to the stormwater utility.

In 2011, the City adopted an updated Standards and Specifications that strengthened and clarified stormwater requirements and adopted the Central Oregon Stormwater Manual (August 2010).

On January 4, 2012 the City Council adopted Title 16 a comprehensive stormwater ordinance. This new ordinance is organized into six Chapters:

- Chapter 16.05 “General Provisions” provides general standards applicable to the entire title.

- Chapter 16.10 “Clearing, Grading and Erosion Control on Construction Sites” contains a requirement to obtain a permit for certain clearing and grading activities, describes the exemptions from the permit requirements, and establishes standards for clearing, grading, and erosion and sediment control.

- Chapter 16.15 “Stormwater Management Design Standards and Maintenance Controls” provides standards for stormwater management systems on private property and requirements for ongoing maintenance.

- Chapter 16.20 “Illicit Discharge Controls” prohibits certain discharges to

stormwater systems and groundwater.

- Chapter 16.25 "Well Drilling" imposes mitigation responsibility on those responsible for new wells that impact existing stormwater facilities.

- Chapter 16.30 "Stormwater Drainage Utility" contains standards and procedures and imposes charges for the City's Stormwater Drainage Utility.

The complete text of Bend Code Title 16 is attached in Appendix A of the FY2011-12 Annual Report.

Effectiveness. The City met its measurable goals for all subtasks. Over the permit term, the City has successfully passed resolutions and an ordinance to set up the stormwater utility, adopt the improved standards and specifications, and adopted the new stormwater ordinance, Bend Code Title 16. Obtaining internal buy-in and public input regarding Title 16 through the PAG, public meetings, the Infrastructure Advisory Committee, and the City Council meetings was critical for the success of the project. The City continues to work in a thorough, planned approach to address stormwater improvement opportunities as they arise. This coordination will continue.

Task II.3 Financing (MS4/UIC)

Over the course of the Integrated Stormwater Management Plan (2006) planning period, the City has adopted several resolutions and Title 16 that established a stormwater utility with enterprise funding through monthly service charges based on impervious surface coverage. The rate in FY2012-13 remained at $4 per equivalent residential unit (ERU).

The City released the public draft of its first formal Stormwater Master Plan that addresses both stormwater quantity and quality issues and needs in December 2008, held two related informational workshops in February 2009 and received comments on the draft. The City is developing and working to refine cost estimates for master planning strategies to better inform the final recommended approach. The Master Plan project is undergoing a final round of review and changes based on the newly-issued City WPCF UIC permit. However, the portion of the Stormwater Master Plan project that is applicable to this BMP task—namely, the establishment of a utility service charge—has been completed successfully since 2007.

The City operates on a biennial budget. The FY2011-13 budget report related to stormwater was included in the FY2010-11 Annual Report. The FY2013-14 through FY2014-15 budget report is included in Appendix A.

Effectiveness. The City has successfully established a stormwater utility service charge, and began collecting fees in July 2007. The City collected $2.51 million in service charge fees in FY2012-13, and is using the funds in excess of the budgeted amounts to establish necessary contingency reserves, and accelerate capital improvement projects (CIP) as originally directed by the Council. The City has been able to accelerate projects. In the first six years of the Utility, $4.6 million was spent on capital improvement projects, which is $1.6 million more than budgeted and was collected as directed through savings and not debt issuance.

The City worked with DEQ to finalize the City's first Water Pollution Control Facility permit for the City's Underground Injection Controls (WPCF-UIC), one of the first such permits to be issued for stormwater UICs in the nation. The final permit was issued by DEQ on May 24, 2013 and will remain in effect until April 30, 2023. Now that the City has the final permit the Master Plan costs and projected revenues are being updated. The completion of the master plan and associated public facilities plan is scheduled for FY2013-14.

Task II.4 Planning (MS4/UIC)

In the fall of FY 2006-07, the City underwent a thorough review and rewrite of its original stormwater management plan. City Council adopted the revised Integrated Stormwater Management Plan on December 6, 2007. Per the NPDES permit requirements, implementation of the Integrated Stormwater Management Plan had to begin by July 31, 2007. In FY2009-10 the City designated ISWMP tasks by their applicability to the City's stormwater permit regulations ("MS4" for the City's NPDES permit and "UIC" for the City's anticipated WPCF permit).

In July 2011, the City submitted a draft Integrated Stormwater Management Plan 2022 as part of its NPDES permit reissuance renewal application for DEQ review. Whereas the draft had undergone internal and PAG review, it had not undergone full public review. The City released the draft in October 2011 for full public review. The City held an open house in October 2011 that covered not only the draft stormwater ordinance but also the draft ISWMP 2022, and closed the ISWMP 2022 comment period at the end of January 2012. The City incorporated those comments along with modifications based on changes to the WPCF-UIC permit template. The City resubmitted the revised draft ISWMP 2022 to DEQ for consideration as the management plan for both its piped system to the river (NPDES permit SWMP) and for drainage to dry wells and drill holes (UIC management plan) in FY2012-13. DEQ accepted the ISWMP 2022 for the WPCF-UIC permit after holding its own public review period, and is still reviewing it for the City's NPDES Phase II permit.

The City of Bend voluntarily retains Association of Public Works Agencies (APWA) Accreditation, a certification that the City complies with the

recommended practices in the APWA Public Works Management Practices Manual that it first received in July 2007. Chapter 26 in the APWA Manual focuses on stormwater and includes several water quality-related sections. The City successfully gained recertification in the spring 2011.

In FY2012-13, there were no annexations to the City's UGB. The City's boundaries remained unchanged. In 2009, the City of Bend submitted a proposal to expand the City's urban growth boundary (UGB) to the Oregon Department of Land Conservation and Development (DLCD) for approval. In 2010, the Oregon Land Conservation and Development Commission (LCDC) issued an order that partially acknowledged and remanded the proposal back to the City for further work. City stormwater staff continues to track the ongoing process.

Effectiveness. The City effectively met the August 2011 deadline for submittal of its NPDES Permit reissuance package for DEQ review. The City obtained its Water Pollution Control Facility Permit for stormwater drywells and drill holes on May 14, 2013. The NPDES permit reissuance is still under review by DEQ.

Task II.5 Annual Reporting (MS4/UIC)

This annual report, covering FY2012-13, is the seventh annual report prepared by the City and serves to cover ISWMP (2006), describing continuing activities and achievements made to meet the water quality requirements of the NPDES permit and ISWMP 2022, describininitial activities towards meeting the requirements of the newly-acquired WPCF-UIC permit. Descriptions of effectiveness are included under each task. Per the City's NPDES permit, the annual reports are due by November 1 of each year. The WPCF-UIC permit also requires an annual report starting November 1, 2014, but the City is reporting on initial efforts to implement the WPCF-UIC permit herein via descriptions of ISWMP 2022 implementation status as well. A summary of performance standard implementation status to date for all components is included in Appendix A. This annual report was created with input and review from Stormwater Liaisons members representing several municipal departments and Stormwater Quality Public Advisory Group (PAG) members representing various community interests (see Appendix C).

Effectiveness. The completed report signifies that this task has been met for the current fiscal year.

Task II.6 UIC Registration (UIC[1])

The City's GIS geodatabase includes all known City-owned stormwater facilities, an impervious surface area layer and drinking water protection area layers. In

[1] See BMP V-5 for MS4-related mapping.

FY2012-13 the City continued to submit quarterly updates to DEQ. A copy of the July 2013 UIC registration list is included in Appendix I.

The City continues to collect data on failed dry wells and drill holes as well as on drill hole features (e.g., depth), and completed the UIC Systemwide Assessment, submitting that to DEQ in December 2012.

Effectiveness. This is an ongoing task, but the City continues to update and improve its base map of existing structures and knowledge of its facilities. The City's database now includes 4,702 dry wells; 999 drill holes, and 9,452 catch basins and additional storm facilities. The database also includes the location of bioswales, the direction of pipe flows, and dry well test report data.

City staff have developed a standard operating procedure for registering and incorporating public UICs under the City's applied-for permit under one facility, which has been helpful for maintaining the accuracy of the City's UIC database.

Tasks Completed (ISWMP 2022)

The City's WPCF-UIC permit recognized the ISWMP 2022. Whereas several of the tasks mirror those in the original ISWMP (2006), some are different. For those that mirror, we direct you to the ISWMP (2006) task status update.

BMP II-1. Administration and Coordination (MS4 and UIC)
See ISWMP 2006 Task II.1 Administration and Coordination (MS4/UIC).

BMP II-2. Legal Authority (MS4 and UIC)
See ISWMP 2006 Task II.2 Legal Authority (MS4/UIC).

BMP II-3. Financing (MS4 and UIC)
See ISWMP 2006 Task II.3 Financing (MS4/UIC).

BMP II-4. Planning (MS4 and UIC)
See ISWMP 2006 Task II.4 Planning (MS4/UIC).

BMP II-5. Annual Reporting (MS4 and UIC)
See ISWMP 2006 Task II.5 Annual Reporting (MS4/UIC).

Summary Assessment of Effectiveness

Since adoption of the ISWMP (2006), the City has (a) formed a stormwater utility, (b) obtained reliable funding for that utility, (c) staffed the utility, currently with a program manager, a program analyst, 4 dedicated stormwater field staff, 2.8 FTE sweeper staff, 1/2 FTE management/administration staff, and additional temporary staff as needed. The City is actively coordinating internally, as well

as with the public through the Stormwater Quality Public Advisory Group and the Infrastructure Advisory Committee. Additionally, the City is also actively coordinating with other municipalities in the state (through the Oregon Association of Clean Water Agencies (ACWA)), to improve effectiveness, knowledge and efficiencies. The internal meeting summaries included in Appendix A are evidence of continued coordination among departments. The City was effective in improving its stormwater-related legal authority as per regulatory requirements including for construction site management, post-construction controls, utility and financial stability, and illicit discharge.

The City has also made a good-faith effort to begin implementing the ISWMP 2022 as part of the City's WPCF-UIC permit, which it received on May 14, 2013.

ISWMP Revisions/Future Improvement Tasks

The City seeks to have one stormwater quality management plan to address both its surface water and underground discharges, thus an integrated stormwater management plan. The City submitted to DEQ by the August 3, 2011 NPDES Permit reissuance submittal deadline, a fully updated draft Integrated Stormwater Management Plan 2022 for DEQ NPDES staff review. The draft ISWMP 2022 public review period ran from October 2011-late January 2012, and included a public meeting. The City revised the document (November 30, 2012) based on comments received and submitted it to DEQ as part of the WPCF-UIC permit issuance package. This revised copy was also provided for consideration by DEQ NPDES permit staff. As part of the WPCF-UIC permit issuance the draft ISWMP 2022 underwent a public review period conducted by DEQ and was accepted without change. The document is slated to begin implementation in FY2013-14 (under the WPCF-UIC Permit), and carries through a 10 year planning period to coincide with that permit. A major review will be conducted at the five year planning mark. While DEQ staff continue to consider the ISWMP 2022 for the NPDES permit the City must by NPDES permit regulations also continue to implement the original ISWMP (2006). Therefore, the City continues to implement the ongoing tasks in the City's original ISWMP (2006) that is incorporated into the City's existing NPDES permit. Implementation of the ISWMP 2022 is scheduled to officially start in FY2013-14 for the WPCF-UIC permit but initial implementation activities are reported herein as well. Please see Appendix A for an implementation status summary of performance standards within ISWMP 2022.

3.0 PUBLIC EDUCATION AND OUTREACH ON STORMWATER IMPACTS

Introduction

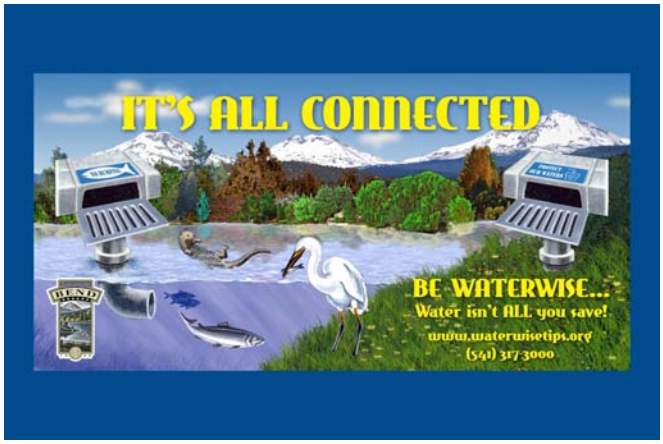
The purpose of this component is to implement a program to distribute educational materials to the community or conduct equivalent outreach activities about stormwater discharge impacts on water resources, including both surface waters and groundwater, and the steps that the public can take to reduce such pollutants in stormwater runoff. The City is committed to providing a strong public outreach component for this program to provide the public a basic understanding of what stormwater is and why using best management practices (BMPs) matter.

Tasks Completed (ISWMP (2006))

The following tasks have begun or continued implementation in FY2012-13.

Task III.1 Utility Bill Inserts, Brochures or Posters (MS4/UIC)

Utility Bill Inserts. The City included several stormwater updates in the City newsletter including an article on the Community Garden Demonstration Project and the 3rd Sheet Underpass Improvement project. The flyer goes out with all of the utility bills (see Appendix B).



Movie slide graphic.

"It's All Connected" Outreach. The City continued the "It's All Connected" campaign to illustrate to the public the connections between stormwater, drinking water and river water quality, and the importance of not polluting. The City distributed illicit discharge flyers, Illicit Discharge Minimization Manuals, and restaurant outreach with the "It's All Connected" graphic. Additionally, the sound bite from the 30-second public service announcement that is included on the City's You Tube and web page (http://www.bendoregon.gov/index.aspx?page=290) is played on the City's public works telephone "hold" music. The entire PSA was played at the

intermission of Munch n Movies that took place in Compass park on Fridays from mid-August to mid-September, and an "It's All Connected" movie slide advertisement was advertised at the popular Bend Film Festival.

The It's All Connected advertisement "Only Rain in the Storm Drain" was also included in the Central Oregon Builders Association (COBA) 2013 Directory and Preferred Contractors Buyer's Guide"; and the City included the It's All Connected "We Otter Help Keep Our Waters Clean" and "I Can See Why. Canoe?" advertisements in each issue of the Bend Park and Recreation guides (see Appendix B).

In addition, the City developed two new "It's All Connected" Outreach pieces that it will look to use in the coming fiscal year: "I'm Heron We Should Keep Our Waters Clean" and "Save the Fish So We Can Catch 'Em Later." (See above and Appendix B).

Targeted Mailouts. The City created a flyer called "Important Utility Information for New and Existing Property Owners." The flyer was mailed to local real estate brokers and made available online (see Appendix B). This flyer explains to the public how stormwater fees are collected and who need to apply for a stormwater utility service fee.

Additionally, the City developed and distributed 23 Carpet & Upholstery Cleaning Disposal Brochures along with an informational letter. This brochure contained BMPs on how to properly dispose of carpet cleaning waste. The brochure was mailed to all carpet cleaners in the City's business licenses database (see Appendix D).

Central Oregon Rain Garden Plant List Supplement to Oregon Rain Garden Guide. City staff updated the Central Oregon Rain Garden Plant List Supplement based on comments from native plant specialists in time for inclusion in the continued distribution of the Oregon Rain Garden Guide and Xeriscape™ Guides at spring/summer outreach events including the Public Works Day, and Stream Stewardship Day (held in July 2013 this year) (see Appendix F). The Xeriscape™ Guide also has color photographs of the plants, so staff cross referenced it in its Rain Garden plant list supplement.

School Outreach. Approximately 270 water wise bags were distributed to Bear Creek and Jewel Elementary School students and other members of the public as part of the City's annual Public Works Day in May of 2013. The bags all contained the Oregon Rain Garden Guide with updated Central Oregon plant list supplemental, and an "APWA PW Paws Comic Book" (see Appendix B), "Central Oregon Xeriscape™ Guide" and other goodies.

On March 8, 2013, a City stormwater quality staff person met with a local cub scout den and gave them an interactive presentation on where stormwater goes, how to prevent pollutants from getting into the stormwater, and how the river water quality is monitored by City and state DEQ staff. The den, comprised of 4th graders, were able to collect river water and perform water quality sampling using the Water Environment Federation "World Water Monitoring Day" sampling kits.

Other Outreach/Distribution. City staff created, in conjunction with the Stormwater Quality Public Advisory Group, a reference guide entitled "Stormwater Management Terminology" to assist the public to understand stormwater related acronyms and terms with clear descriptions and photographs (See Appendix B). The document was placed on the City's website and can be used at public meetins to facilitate communication.

Staff also gave a panel presentation on May 16, 2013 to the Central Oregon Regional Council (CORC) of Community Association Institute's Oregon Chapter breakfast on UIC management together with DEQ's David Cole and a local maintenance disposal spokesperson (see Appendix B).

City staff also continued to provide outreach that discussed the importance of not discharging Fats, Oil, and Grease (FOG) into sewer or storm drains. The City's FOG program includes a brochure entitled "Do you have FOG in your home?" that also discusses the importance of keeping FOG out of the storm drains. A public service announcement regarding the FOG campaign is also included on the City's public works telephone "hold" music.

Staff also participated in managing an Oregon Association of Clean Water Agencies (ACWA) workgroup and finalized an outreach guide for construction

site activities including commonly used erosion and sediment controls. In addition to the statewide guide, the City created a stormwater facility sizing example site plan for residential construction sites that encourages the use of low impact development practices (For more information see Chapter 6- Construction Site Activities).

In addition, the City is a member of ACWA and its dues helped support ACWA's sponsorship of the Oregon Environmental Council's "Love Your River" Campaign. The campaign allows users to find their watershed and sign on-line pledge sheets and earn chances to win prizes from such companies as REI. While the timing of the statewide program outreach is sometimes not suitable for Central Oregon (i.e., suggesting planting trees in January), when the message lined up well, the City did promote the campaign on its website. For example, the City promoted the 'Only Rain in the Storm Drain" month, and the site included a link directly to Bend's volunteer coordinator for promoting storm drain marking (see http://www.oeconline.org/our-work/water/love-your-river/past-monthly-challenges/only-rain-in-storm-drains.) The home page of the "Love Your River" website is located here: http://www.oeconline.org/our-work/water/love-your-river.

Effectiveness. The Central Oregon plant guide is very useful for improving the Central Oregon Rain Garden Guide and assisting Bend citizens to find plants that will be successful in bioretention basins here. Because the comments of one expert arrived too late to be incorporated into the spring 2012 original release of the list, these comments were incorporated into the 2013 update of the list to increase effectiveness.

The City chose guides like Central Oregon Builder's Association (COBA's) Directory and Bend Park and Recreation District's Recreation Guides to display its "It's All Connected" messages because these are more likely to be kept around for a while before being discarded, lending to additional chances to be viewed multiple times by the target audience.

The "It's All Connected" video on the City's YouTube channel has had 227 views since December 2008. To measure the effectiveness of the "It's All Connected" campaign, the City conducted a pre- and post-survey see annual report FY2011-12.

The City uses the City's business license database to send outreach to certain businesses, such as carpet cleaners this year. Given a recent downswing in renewals, the City is working to ensure that all businesses required to obtain a business license do so. This should continue to maintain or improve effectiveness.

The outreach to real estate brokers was developed as a direct result of questions received from the real estate community and a request for such information, and will help ensure utility customers properly sign-up.

A summary evaluation report of the "Love Your River" campaign is included in Appendix B. The City actively used the campaign when it was appropriate for conditions in Central Oregon. The OEC is not going to continue the campaign in FY2013-14.

Task III.2 Stormwater Pollution Prevention Web Site (MS4/UIC)

The City continued to update the stormwater website www.bendoregon.gov/stormwater. The website includes general stormwater quality information as well as topics of interest to the general public. The City has organized the site into interest areas, including: What's New?, About Stormwater, Business & Home Resources, Regulations, Stormwater Master Plan, Get Involved, Frequently Asked Questions and Waterwise. The "Get Involved" section includes several outreach resources for interested consumers. The City announced new- and redevelopment-related stormwater webinar workshops through the City's stormwater webpage, as well as posting the stormwater ordinance, construction-related best management practices, and Illicit Discharge Minimization Manual. The City also continued to use other communication tools, such as Facebook, Twitter, and an internal City intranet site to distribute announcements.

Effectiveness. Keeping the stormwater website updated is a continual process. The City has included a link on the website to comment on the stormwater pages and no comments were received during FY2012-13. Over 190 people are on the City News email update list. The City has over 5,402 Likes on its Facebook page and 1,177 followers on Twitter. A portion of the Bend Community Survey (DHM, January 2013) focused on modes that people used to obtain information (see figure). Whereas 28% of respondents indicated that they get information about City issues in Bend from the website, the top responses were for newspaper and television. When asked have you ever used any of the following to receive information from

Communications

29. Where do you get information about City issues in Bend? **(DO NOT READ LIST)**

Response Category	N=400
Newspaper	60%
TV	53%
Friends/family	28%
Website	28%
Radio	17%
City Newsletter	15%
City council	4%
All other responses	1% or less
(DON'T ASK) Don't know	3%

30. Have you ever used any of the following to receive information from the City? **(Read list; accept multiple responses)**

Response Category	N=400
The newsletter inside your City utility bill	53%
City website	38%
Informational videos produced by the City that air on cable channel 11 or that are available online	28%
City Facebook page	7%
City Twitter feed	1%
(DON'T ASK) Don't know	26%

DHM Research | Bend Community Survey | January 2013

the City, the newsletter received 53% positive responses, with the City website and City Edition videos following with 38% and 28%.

Task III.3 City News Broadcast Stormwater Quality Messages and Press Releases (MS4/UIC)

The City performed outreach on the stormwater utility's major capital improvement project, the Third Street Underpass project on April 29, 2013. The segment was shown on City Edition and during the month of May in City Hall, along with being made available on YouTube. http://www.youtube.com/watch?v=YR-gv8prKhk

Example of City's Facebook posts regarding Public Works Day and the Third Street project.

The public, including school children, were able to view stormwater equipment and the watershed diorama along with other public works equipment during Public Works Day on May 23, 2013, which was captured on this City Edition segment: http://www.youtube.com/watch?v=TmnIksPHtRM. It was also advertised on a local radio station POWER 94, which had a remote broadcast at the Public Works Day event.

The City also put effort in FY2012-13 towards supporting focus of media attention on this year's Stream Stewardship Day activities. The event received coverage on KTVZ 21 television and by the Bend *Bulletin*. However, although planning

occurred in FY2012-13, the event this year was held in July rather than June to try to take advantage of better weather. (See Chapter 4.0 for more details).

The City released several stormwater quality related news releases/articles in FY2012-13. *Our City: A Newsletter for Bend Citizens*, distributed with monthly utility bills and posted on the website, included the following articles (See Appendix B for copies):

- How Are We Doing? (July 2012)
- Bend Partners For Community Garden Grant (March 2013);
- Learn More at Bend 101 Class (April 2013);
- 3Rd Street Underpass Project (May 2013);
- Bend Silver Bike Friendly Community (June 2013).

Newsletters in the second-half of 2012 included information on utility rate assistance, and links to GO Bond projects for transportation improvements that included roadside swales and improved stormwater drainage.

The following media releases related to stormwater were released:

- Announcement of the IECA Erosion and Sediment Control workshop in May 2013 in the *Source Weekly* (see Appendix B).
- Announcement of the Stream Stewardship Day in the *Source Weekly* by way of sponsorship of the Upper Deschutes Watershed Council event, held in early July 2013 this year (see Appendix B).
- Updates about capital improvement projects that incorporate stormwater features including two press releases regarding the Third Street Underpass project that incorporated the removal of deep drill holes to help protect groundwater quality (see Appendix B).

Other stormwater-related media articles included:

- Bend *Bulletin* News Article, “Keeping Safe Water Flowing” (June 9, 2013) (see Appendix B).
- *Source Weekly* News Article, “Dive In---The top 10 water-logged controversies in The High Desert,” Erin Foote Marlowe, April 18, 2013.

Electronic copies of *Our City* are available on the City’s website at: www.bendoregon.gov/index.aspx?page=649&parent=3243.

As mentioned above, the City continued to purchase advertising space in the Bend Park and Recreation Guides, the advertisements include a stormwater pollution prevention "It's All Connected" message in each guide (See Appendix B). The guides were chosen as a useful outreach tool as people tend to keep them to refer to for recreational activities throughout the quarter rather than recycling them immediately as with a newspaper. Two different messages were used, playing on the same theme. The City also put an "It's All Connected" advertisement in the Central Oregon Home Builders Directory for the year.

The City displayed the "It's All Connected" movie graphic prior to several films at the Bend Film Festival, held October 11-14, 2012 (see graphic on page 3-1). The City also advertised the "It's All Connected" 30-second public service announcement at Munch 'n' Movies as well (see http://www.youtube.com/watch?v=fMMDbsMJ3Zg).

Effectiveness. The City exceeded the measurable goals for this task, which was to post at least one stormwater quality-related message per year during each permit year, and to submit either locally or as part of a regional effort at least three news releases regarding stormwater issues to media outlets per year.

The Third Street Underpass Project City Edition segment has received 213 views on You Tube as of October 3, 2013, as well as additional views in City Hall and cable television. The author of the Source article regarding the top 10 list that incorporated stormwater and alluded to the Third Street underpass project did not contact the stormwater division directly, but instead relied on website information, according to the article.

The Bend *Bulletin* has a daily circulation of 27,547 Monday through Friday, 28,924 on Saturday and 29,997 on Sundays according to the Oregon Newspaper Publisher's Association (August 2012). In addition to Bend, the *Bulletin* is delivered to Gilchrist, LaPine, Sunriver, Sisters, Redmond, Terrebonne, Prineville, Madras, and Warm Springs, so the City's efforts may have benefits beyond the City limits.

The Source Weekly has a net weekly circulation of 15,000 and a total readership of 37,500 weekly (Source Weekly, 2013 Distribution and Circulation). It is distributed in Bend, Redmond, Prineville, Madras, Sisters, Sunriver, and LaPine. The newsletter is distributed monthly with the approximately 35,000 utility bills, is made available on the City's website and is emailed out to email subscribers. The City's Facebook page has just under 5,402 Likes and 1,177 followers on Facebook. The City's You Tube page has 210 subscribers and has over 200,031 total uploaded views since March 2008.

According to its sponsorship packet, the Bend Film Festival routinely brings in 5,000 attendees, mostly from Central Oregon for approximately 80 screenings of movies. The slide is shown multiple times prior to a screening, and thus is an

effective tool for getting our pollution prevention message to people in a cost-effective manner. City continued with "It's All Connected" video shown before Munch n' Movies showings this year, deemed effective as it is a local family-friendly event.

Task III.4 Stormwater/Watershed Diorama (MS4/UIC)

The City again made its watershed diorama available to lend to local school teachers for use in their classrooms. The diorama includes both surface water and groundwater components. City staff continued to use additional setup pieces that included a gas station, apartment building to promote additional urban setting pollution prevention discussions.

In FY 2012-13, the diorama was used at Public Works Day and it was a big draw for several classes from Bear Creek and Jewel Elementary school. The City also had a model diorama of a drywell, which it gratefully borrowed from the City of Redmond, on display at Public Works Day and the presentation to the community association organization CORC.

Effectiveness. As in past years, the diorama has been well received as a terrific visual, three-dimensional learning tool. Using the unit at Public Works Day was especially effective. The dry well model was also very effective. The diorama did not see much traffic at Stream Stewardship Day 2013 as volunteers were focused on clean-up and it received only minimal general foot traffic.

Task III. 5 Performance Standards (MS4/UIC)

Performance standards have been completed and incorporated into the ISWMP 2022. The new ISWMP 2022 was approved by DEQ as part of the WPCF permit issuance. Performance Standards and implementation status is available in Appendix A.

Effectiveness. The City met its goal of completing the performance standards task for inclusion in the ISWMP 2022 draft that was accepted by DEQ for the WPCF-UIC permit in FY2012-13. The City has started implementing the new performance standards as part of the ISWMP 2022, which are scheduled to start in FY2013-14. A summary of initial implementation status efforts is included in Appendix A. The City is ahead of schedule with implementation considering the

City received its WPCF-UIC permit in May 2013.

Tasks Completed (ISWMP 2022)

BMP III-1. Develop and Implement Strategic Outreach Plan Targeting Pollutants of Focus for the Public and City Employees (MS4 and UIC)

City staff worked with the PAG to develop program outreach goals and objectives for a new outreach plan. Staff will continue to develop and finalize the strategic outreach plan in FY2013-14. See Appendix C for PAG meeting agendas and summaries. City staff also committed to continuing education targeting improving outreach campaigns. On May 1, 2013, a City staff attended the US EPA Watershed Academy webcast "Using Social Indicators in Watershed Management Projects" (see Appendix B).

BMP III-2 Stormwater Pollution Prevention Web Site (MS4 and UIC)

See ISWMP (2006) Task III.2 Stormwater Pollution Prevention Web Site (MS4/UIC).

BMP III-3. Media Relations: City News Broadcast Stormwater Quality Messages and Press Releases (MS4 and UIC)

See ISWMP 2006 Task III.1 Utility Bill Inserts, Brochures or Posters (MS4/UIC).

BMP III-4. School/Enrichment Activity Outreach: Stormwater/Watershed Diorama (MS4 and UIC)

See ISWMP 2006 Task III.4 Stormwater/Watershed Diorama (MS4/UIC).

BMP III-5. Implement Performance Standards (MS4 and UIC)

See ISWMP 2006 Task III. 5 Performance Standards (MS4/UIC).

Summary Assessment of Effectiveness

The City met or exceeded the measurable goals for implementation of required permit activities. Because City staff understand the importance of effective outreach and education for stormwater quality, stormwater education and outreach will continue to be a priority in the upcoming years.

4.0 PUBLIC INVOLVEMENT AND PARTICIPATION

Introduction

The goal of the public involvement and participation (PIP) component is to work with City residents, public employees, businesses, and government officials concerning the importance of and methods for controlling pollutants in urban runoff. Ultimately, community involvement in implementing pollution prevention practices and in evaluating and documenting conditions within the watershed is the only hope of achieving meaningful change in the quality of urban runoff.

Tasks Completed (ISWMP (2006))

The following tasks are completed or ongoing routine tasks conducted during FY 2012-2013:

Task IV.1 Public Advisory Group (MS4/UIC)

During FY2012-13 the Stormwater Quality Public Advisory Group (PAG) met 4 times providing input on the annual report, Illicit Discharge Minimization Manual, public outreach strategic planning initial input and upcoming stormwater trainings (See Appendix C for a list of PAG members, and meeting agendas/summaries).

In addition to the PAG, the City has convened a Council-appointed Infrastructure Advisory Committee (IAC) to provide recommendations to City Council on infrastructure related issues. City staff provided an overview presentation of the Stormwater Master Plan update at the August 13, 2012 meeting, and the IAC discussed the Third Street project, Illicit Discharge Manual and the Stormwater Master Plan at its April 8, 2013 meeting (see Appendix C).

Effectiveness. The City met its goal of convening the Public Advisory Group at least semiannually. City staff continues to find both the Public Advisory Group and the Infrastructure Advisory Committee very helpful in providing input and new perspectives to new materials and concepts including the completion of the Illicit Discharge manual and/or the development of the strategic education plan. Both groups have proven effective with the PAG focused on providing input to stormwater staff and the IAC focused on providing input and recommendations to the City Council.

Task IV.2 Public Meeting (MS4/UIC)

In FY2012-13 the City held public meetings for capital improvement projects involving stormwater drainage upgrades, including the stormwater-specific Third Street Underpass project. City staff provided an overview of the Third Street

Underpass project at a City Council worksession on April 3, 2013. The City held a public open house for the project on April 22, 2013 at Bend Senior High School. In addition, information via fliers were sent to area businesses and residents to inform them of the open house, and in October 20, 2012 to inform them of delays as additional information was reviewed. At the April 22 public meeting, 12 attendees participated (see Appendix A).

Effectiveness. Although no public meeting element was required in FY2012-13, the opportunity to meet with the public on the Third Street Underpass project helped improve the project and improve its chance of success.

Task IV.3 Stormwater Quality Volunteer Opportunities (MS4/UIC)

Franklin's Corner community garden design

The City's Volunteer Coordinator is working with several members of the community including high school students, landscape architects and contractors and nursery experts to modernize landscaping and public facilities to be water and maintenance friendly, and incorporating designs that use and demonstrate stormwater features. In FY 2012-13 work began on the community garden project at 9th Street and Franklin, entitled Franklin's Corner, incorporating a stormwater demonstration projects with planter boxes, bioretention and permeable walks. The project has a website (http://www.franklinscorner.org/community-garden.html) and Facebook page (https://www.facebook.com/Franklinscornercommunitygarden) and is supported in part by a grant.

The City continued to work with the Bend Beautification Program to coordinate volunteers from service clubs, private individuals, church groups, Neighborhood Associations and other groups for litter pickup, vegetation management, and storm drain marking (see Appendix C and also Task III.3). Staff made maps, kept bags stocked and tracked and ensured directions were followed. Staff are monitoring the marker installations by date installed to track their longevity. Addition information about the Bend Beautification Program is included here: http://www.bend.or.us/index.aspx?page=139. One volunteer, James Newkirk, was recognized by the City Council in December 2012 for putting in over 100 hours of volunteer service marking storm drains. The recognition resulted in a front page newspaper article on this very special volunteer and the storm drain marking program (see Appendix C.)

The City both actively participated in and helped to sponsor the Stream Stewardship Day (see also Appendix C). This annual event was coordinated by the Upper Deschutes Watershed Council, held on July 11, 2013 and included REI and the Old Mill District as sponsors as well, among others. The City announced the event via its Facebook site. To encourage City staff support, the stormwater division coordinated with streets division to have staff available to help collect and dispose of bags of litter collected by local dive teams and riparian area collection efforts. Announcements of the event were also made on local radio stations, and included in the Source Weekly.

Collection of trash brought to shore by local divers during Stream Stewardship Day 2013.

Effectiveness Evaluation. The Public Advisory Group, comprised of volunteers representing various interests within the City, has continued to provide invaluable insight to City staff to improve the City's stormwater program. The City filled all vacancies on the PAG and reenergized the group with standard meeting days. Meanwhile, City staff worked effectively through the PAG, IAC, and BEDAB along with conducting outreach to outside groups such as Central Oregon Builders Association and via public meetings to get citizen participation and input.

In FY2012-13, 1,414 drains were marked; additionally several volunteers cleared weeds and litter from City medians and right-of-ways, helping to keep them from clogging or polluting storm drains. The outstanding efforts of storm drain marking volunteer James Newkirk earned both Council recognition and a front page news story in the Bend Bulletin, which helped spread the pollution prevention message. Staff received at least one illicit discharge call wherein the caller said she knew what she was reporting was wrong because she had seen the little circular markers on the storm drains downtown.

With regards to school outreach, the use of the diorama continues to be successful; and the field trip for Bear Creek and Jewel Elementary School and other students to Public Works Day that included the watershed diorama, the TV truck, the lab display and the spill truck along with vactors and street sweepers, and other public works related equipment and demonstrations was determined a big hit by the students. Effectiveness was improved with radio coverage as well.

The City chose not participate in the Salmon Run this year. In years past the City has participated by setting the watershed diorama and handing out informational flyers such as Rain Garden and Xeriscaping guides. The City has found that the weather in early May is generally too cold and/or windy and participants tend to not linger before or after the event near the tables, and in

some years materials were provided on a voluntary basis rather than included in a standard packet. The benefits of the race were no longer directly supporting river health anymore as they had in the past. This limits the City's ability to effectively distribute information and materials. The City has found that Public Works Day was a more suitable event in FY2013-14.

Much of the work that went into promoting Stream Stewardship Day in FY2012-13 resulting in positive results during the event held this year in early July 2013. Holding the event during the work week in the summer resulted in fewer student participants than the previous year, but the in-river volunteers came out in force and about 75 people volunteered in all. Together with increased television media coverage as a result of fewer competing events during the week rather than on busy summer weekends make this year's event effective (see http://www.ktvz.com/news/volunteers-clean-up-deschutes-river-in-bend/-/413192/20945930/-/c2gwxcz/-/index.html).

Task IV.4 Performance Standards (MS4/UIC)

Performance standards have been completed and incorporated into the ISWMP 2022. The new ISWMP 2022 was approved by DEQ as part of the WPCF permit issuance. Performance Standards implementation status is available in Appendix A.

Effectiveness. The City has begun implementing the new performance standards as part of the ISWMP 2022 for the WPCF-UIC permit and is ahead of schedule. Effectiveness for this task is too early to determine as implementation is not scheduled to begin until FY2013-14. The City met its original ISWMP 2006 goal of completing the performance for inclusion in the draft ISWMP 2022.

Tasks Completed (ISWMP 2022)

BMP IV-1. Public Advisory Group (PAG) (MS4)
See ISWMP 2006 Task IV.1 Public Advisory Group (MS4/UIC).

BMP IV-2. Public Meetings (MS4)
See ISWMP 2006 Task IV.1Public Advisory Group (MS4/UIC).

BMP IV-3. Stormwater Quality Volunteer Opportunities (MS4)
See ISWMP 2006 Task IV.3 Stormwater Quality Volunteer Opportunities (MS4/UIC).

BMP IV-4. Performance Standards (MS4)
See ISWMP 2006 Task IV.4 Performance Standards (MS4/UIC).

Summary Assessment of Effectiveness

The City met or exceeded its goals for public participation this year, and continues to look for new ways to partner and involve the public in pollution prevention events. According to the community survey (DHM, January 2013), over a majority (68%) felt "protecting drinking water sources" was an "urgent" or "high priority" area for the City. Public participation was very strong this year, not only on committees but for design and in-field activities as well, and that is helped by having a dedicated Volunteer Coordinator at the City.

5.0 ILLICIT DISCHARGE CONTROLS

Introduction

The purpose of this component is to eliminate discharges of pollutants from illicit connections and illegal dumping to the storm drainage system. This chapter describes the activities conducted during FY 2012-13 to address illicit discharges.

Tasks Completed (ISWMP (2006))

The following tasks are tasks conducted during FY 2012-2013:

Task V.1 Public Education on Illegal Discharges and Improper Disposal (MS4/UIC)

In May of 2013, staff developed a Carpet Cleaning Waste Disposal best management practice brochure and mailed it to all 23 carpet cleaning businesses listed in the City's Business License database. The brochure contained information on the City's stormwater regulations and provided recommendations on how to properly dispose of carpet cleaning waste (see Appendix D).

Additionally, the City completed the Illicit Discharge Minimization BMP Manual (see Appendix D). The City mailed a letter and an Illicit Discharge Minimization BMP Manual to 19 commercial businesses identified in the UIC System Wide Assessment as having a high risk of impacting a City UIC (see Appendix I for a copy of the letter introducing it), distributed it at a public presentation to the Central Oregon Regional Council (CORC) of Community Association Institute's Oregon Chapter, included it in the workshop materials for the May Erosion and Sediment Control Best Management Practices workshops and placed it on the City's website. The manuals are also handed out when problems are noticed in the field during stormwater inspections.

The City continued to use a notice of illicit discharge flyer where reports of illicit discharges have been received (see Appendix D for a copy of the violation handout and a summary of illicit discharge response actions addressed in FY2012-13).

The City continued to distribute the Pressure Washing and Surface Cleaning brochure and other outreach as appropriate (see FY2009-10 Annual Report, Appendix B).

In FY2012-13, the City provided an *"It's All Connected"* movie slide to be shown prior to the start of multiple movies at the Bend Film Festival, and the 30 second public service announcement at intermission at Munch 'n' Movies in August-September 2012. The "It's All Connected" movie slide and video, and other outreach all include the phone number to call in to report illicit discharges.

Effectiveness. The City exceeded its goal of conducting outreach to 50% of businesses within a specific segment by distributing the Carpet Cleaning flyer to all known Carpet Cleaner businesses.

The City continued to use its tracking system, maintaining a spreadsheet of stormwater-specific follow-up actions (see Appendix D), tracking 19 events in FY2012-13. Staff coordinated well with various DEQ staff in addressing the issues that arose. Reports came from the public as well as from other City staff noticing problems in the field; suggesting that the staff training and public reach have continued to be useful.

Task V.3 Post Warnings About Illicit and Illegal Discharges (MS4/UIC)

Per the Standards and Specifications revisions that took effect on July 1, 2011, new and replaced City of Bend stormwater manhole covers now include an imprinted, lifelong "Only Rain in the Storm Drain" stamp. City design standards now require a permanent stamp on all new storm drain covers to delineate stormwater facilities in an educational manner. (See photo to the right.)

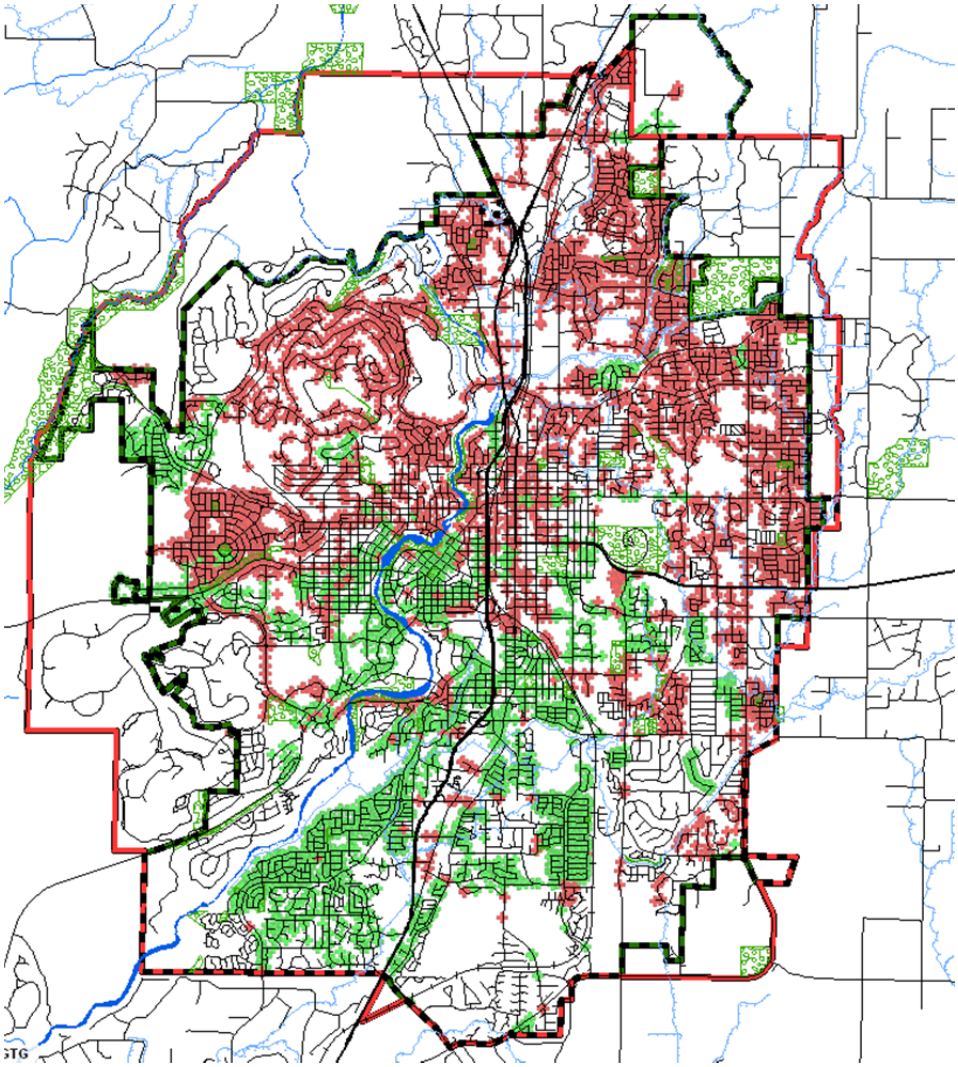
For existing facilities, the City's stormwater staff work closely with the City's volunteer coordinator and the Bend Beautification volunteer group to install epoxy-applied storm drain markers. The City and its volunteers applied over 1,414 markers in FY2012-13 (see map on next page). The City GIS staff are continuing to track marker locations through its geodatabase by date installed to help evaluate longevity.

Effectiveness. The City has effectively chosen a long-lasting but volunteer-friendly retrofit marker; and was successful in requiring stamped manhole covers as part of new installations, given their longevity. The manhole covers do not have a cost difference from previous covers, so this is a cost-effective educational tool.

Task V.4 Post Illicit Discharge Prevention Information on Web Site (MS4/UIC)

In FY2011-12 the City launched a new web site: www.bendoregon.gov. The content is better organized and visually appealing. All stormwater related material is now located in one central location at: www.bendoregon.gov/stormwater.

Additionally, the City continues to post



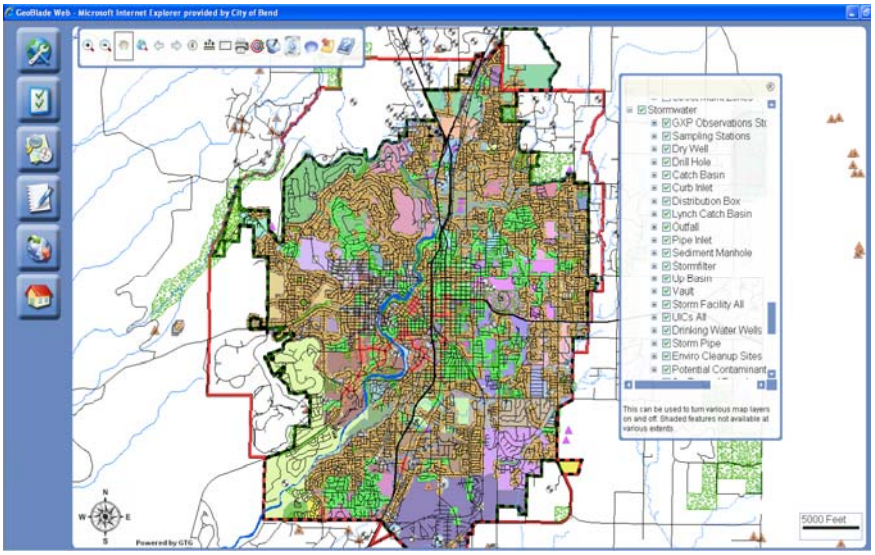
Green dots illustrate marked storm drains. Red dots illustrate unmarked drains. (2013).

contact information for people to report illicit discharges on the City's website; Stormwater Steward pledge sheets to help prevent illicit discharges and stormwater pollution in general; and the It's All Connected Campaign materials. See: www.bendoregon.gov/stormwater and click "Get Involved," and see www.bendoregon.gov/.

Effectiveness. Well more than 50 markers per year are being posted. The storm drain marking continues to be a popular volunteer activity. (See map for number of markers installed during initial NPDES permit period). At least one illicit discharge report caller indicated she was aware of the program from the storm drain marking. The City has been successful on focusing volunteers to focus the marking storm drains within wellhead protection areas 10 year time of travel areas, and then also in areas immediately adjacent to river drainage areas, as you can see by the following map.

Task V.5 Stormwater System Map (MS4[1])

The City developed a geodatabase map in FY2008-09 including GPS coordinates for known City stormwater facilities, and the City has been updating the geodatabase as appropriate since. City Information Technology GIS staff regularly updates the mapping interface, Geoblade, which has greatly improved staff response times and information. A version is also available online for the public to use.



Example of the type of stormwater information readily available to City staff on the Geoblade mapping system.

Effectiveness. The City has successfully conducted an overall in-field inventory and ongoing maintenance to keep the data in the base map updated. The geodatabase includes directions of pipe flows as well as swales, UICs, and other features.

Task V.6 Illicit Discharge Ordinance (MS4/UIC)

On January 4, 2012 the Council adopted a stormwater ordinance adopting Bend Code Title 16 (see Appendix A of the FY2011-12 annual report). Chapter 16.20 of the ordinance covers Illicit Discharge Controls. In conjunction with and as called out in the new ordinance, this year the City finalized an illicit discharge minimization manual. A copy of the manual is available in Appendix D.

Effectiveness. The City has successfully developed the Illicit Discharge Minimization Manual that is referenced in the recent stormwater ordinance, Bend Code Title 16, and has continued the implementation and education process. Reports of illicit discharges are up, suggesting that education efforts are helping citizens to understand what illicit discharges are and when and to whom to report them.

Task V.7 Program to Detect and Address Illicit Discharges (MS4/UIC)

The City is working with Public Works and Building Inspectors, along with additional Public Works staff including Industrial Pretreatment Program staff to coordinate efforts. The City met with Fire Department staff to provide education and improve coordination as well (see Appendix D). The City has a Stormwater Analyst who is responsible for following up on illicit discharge notifications and complaints. Through its educational materials, the City encourages both public and staff reporting of illicit discharges.

[1] See Task II-6a for related UIC mapping.

On November 28, 2012 City of Bend public works staff received training on hazardous waste spills and proper disposal. A copy of the meeting agenda and sign-in sheets are available in Appendix D. Over 16 public works employees also received advanced training, up to and including an 8-hour HAZWOPER refresher course that was provided to select crews after the staff meeting. In addition to the safety meeting all new public works staff are trained through watching the video "*Storm Watch, Municipal Storm Water Pollution Prevention."*

City staff also targeted outreach to City airport leases when evidence of an illicit discharge was noted (see Appendix D).

Effectiveness. The City continued to use its tracking system, maintaining a spreadsheet of stormwater-specific follow-up actions, tracking 19 events in FY2012-13 (see Appendix D). Staff coordinated well with various DEQ staff in addressing the issues that arose. Reports came from the public as well as from other City staff noticing problems in the field, suggesting that the staff training and public outreach have continued to be useful.

Task V.2 Illicit Discharge Reporting Mechanism (MS4/UIC)

To ensure consistency, the City finalized an illicit discharge reporting standard operating procedure in FY2009-10 (see FY09-10 annual report for additional information). The City is using this and will continue to provide additional clarifications as needed.

Front desk staff are trained on where to send illicit discharge inquiries for proper response, and they are using an automated call center program for directing calls and response. Additionally, the City posted contact information for people to report illicit discharges on the City's website. (See the City's website at: www.bendoregon.gov/stormwater). The City's "It's All Connected" campaign includes the public works main phone number and website information that can be used for reporting illicit discharges. Stormwater staff is using the Infor system to issue and track work orders. City staff has implemented a preventive maintenance schedule and zones to efficiently clean and maintain the stormwater system.

Effectiveness. Whereas, the City continues to educate staff and the public to be aware of and report illicit discharges, the focus in FY 2012-13 was to begin implementation of the new regulations related to illicit discharges.

Task V.8 Minimize Landscape Irrigation Runoff (MS4/UIC)

The City includes landscape irrigation runoff minimization measures in its standards and specifications. City stormwater staff continue to work with water conservation staff to help minimize dry weather flows from irrigation runoff. For instance, the website promoted by stormwater (www.waterwisetips.org) also promotes water conservation activities. The City also developed a new waterwise gardening tool that includes information on how to properly design a landscape and prevent irrigation runoff (see

http://www.bend.watersmartgardening.com/ and http://www.bend.watersmartgardening.com/Garden-Resources/Runoff.php). The City included a representative from the landscape irrigation industry on its Stormwater Quality Public Advisory Group. The City's "Signs You May Be Overwatering" audio public service announcements are played on the Public Works Department hold music line together with the "It's All Connected" audio. Additionally, the City budgeted for a water conservation program manager to be hired in FY2013-14, and the position will focus on revitalizing the waterwise outreach and education program including focusing on outdoor irrigation and landscape water efficiency.

Effectiveness. The City has established some contacts with OLCA members that are helpful for both in refining outreach to landscape contractors. The City is also working to improve its demand side management program.

Tasks Completed (ISWMP 2022)

BMP V-1. Public Education on Illegal Discharges and Improper Disposal (MS4 & UIC)

See ISWMP (2006) Task V.1 Public Education on Illegal Discharges and Improper Disposal (MS4/UIC).

BMP V-2. Illicit Discharge Reporting Mechanism (MS4 & UIC)

See ISWMP (2006) Task V.2 Illicit Discharge Reporting Mechanism (MS4/UIC).

BMP V-3. Post Warnings about Illicit and Illegal Discharges (MS4 & UIC)

See ISWMP (2006) Task V.3 Post Warnings about Illicit and Illegal Discharges (MS4/UIC).

BMP V-4. Post Illicit Discharge Prevention Information on Web Site (MS4 & UIC)

See ISWMP (2006) Task V.3 Post Warnings about Illicit and Illegal Discharges (MS4/UIC).

BMP V-5. Implement Illicit Discharge Regulations (MS4 & UIC)

See ISWMP (2006) Task V.6 Illicit Discharge Ordinance (MS4/UIC).

BMP V-6. Implement Performance Standards (MS4 & UIC)
Performance standards have been completed and incorporated into the ISWMP 2022. The new ISWMP 2022 was approved by DEQ as part of the WPCF-UIC permit issuance and implementation is scheduled to begin in FY2013-14. Performance Standards and implementation status is available in Appendix A.

Effectiveness. The City has started implementing the new performance standards as

part of the ISWMP 2022 ahead of schedule. The City met its ISWMP (2006) goal of completing the performance standards for inclusion for consideration in the draft ISWMP 2022.

Enforcement Actions

In FY2012-13, the City provided education and verbal warnings as noted but did not need to provide more stringent enforcement actions for illicit discharge or for cases of excessive irrigation runoff. In general, the City starts with education and a problem-solving approach. Violators are provided educational materials and a form noting the violation is distributed around the neighborhood. Cost for cleanup can also be charged to the violator. More serious violations on private property are referred directly to the DEQ for follow-up and enforcement. See Appendix D for a summary of illicit discharges and follow-up activity. Since FY10-11 the City has been using its new customer service data base program (INFOR). This program assists in tracking stormwater illicit discharge reports and helps verify that the proper staff are notified of the incident.

Summary Assessment of Effectiveness

The City has made significant progress including improved legal authority and clarifications through the illicit discharge ordinance section and associated Illicit Discharge Manual that now provides for additional education and enforcement in an effort to reduce illicit discharges (see Appendices A and D). The City is focused on distributing and implementing the Illicit Discharge Manual in FY2013-14.

6.0 CONSTRUCTION SITE STORMWATER ACTIVITIES

Introduction

The purpose of this component is to control pollutants discharged to municipal storm drains from new and redevelopment construction activities to the maximum extent practicable. Several of the pollutants of concern within the Deschutes River are related to sediment loads. Although the main source of sediments in the Deschutes River are related to upstream river management activities, the City sees it as a priority to reduce the stormwater-related sediment contributions to the problem. Sediments are a main pollutant coming off of uncontrolled construction sites and can clog stormwater facilities including drywells and drill holes as well as negatively impact the Deschutes River, which is listed for sediment and turbidity within Bend.

Construction sites that disturb one or more acres and discharge stormwater through a man-made conveyance or directly to a surface water are already regulated through the state-administered NPDES 1200-C permit program. Many construction sites within the City limits are either smaller than one acre or the stormwater discharges do not drain to a surface water. Per the City's recently passed new Grading/Clearing regulations as part of the Bend Code Title 16 stormwater ordinance, grading permits are now required on all commercial developments that are adding 5,000 square feet or more of impervious surface or adding one or more UICs, and erosion must be prevented from reaching the storm drain system from all sites.

Tasks Completed (ISWMP (2006))

The following tasks are either completed yearly or are continuing:

Task VI. 1 Evaluate and Update Regulatory Authority and Procedures (MS4/UIC)

In FY 2010-11, the City updated the Design Standards, Construction Specifications and the Development Codes. City's standards and specifications only apply to City-owned property and rights-of-way, not to private lands. The revised standards include new erosion control details and incorporates the COSM erosion requirements. The standards and specifications are available online at: http://www.bendoregon.gov/index.aspx?page=161. The revisions adopted the Central Oregon Stormwater Manual (2010) and took effect July 1, 2011.

On January 4, 2012, the City Council voted to approve the new comprehensive stormwater ordinance adopting Bend Code Title 16 (see Annual Report FY11-12 Appendix A). Bend Code Title 16 adopts the Central Oregon Stormwater Manual (2010). Staff are continuing to working with city inspectors, contractors and developers on the education and implementation of this relatively new ordinance. Development and construction site plans for City review are routed through E-Plans, an electronic review software.

Effectiveness. The City has successfully completed improving design standards and specifications including adoption and beginning implementation of Bend Code Title 16 and the revised Standards and Specifications. The City has made major progress in regulating construction site erosion and has completed the tasks outlined for this BMP.

Task VI.2 Construction Site Educational Materials (MS4/UIC)

During FY2012-13, the City developed a "Single Family Example Drainage Plan" that can be used to help calculate stormwater flows and encourages the use of Low Impact Development, along with a "Suggested BMPs for Single Family Construction Sites—Example Erosion and Sediment Control Plan" to help with implementation of Bend Code Title 16 (see Appendix E).

City staff worked with the Oregon Association of Clean Water Agencies (ACWA) by managing a statewide project to create an Erosion and Sediment Control inspection field guide entitled "Construction Site Stormwater Guide." The field guide is glove-box-sized and includes example pictures and information on proper installation and maintenance of common erosion and sediment controls. The final guide was completed in March 2012 and is included in Appendix E.

City staff have placed several construction site references on its website: http://www.bendoregon.gov/index.aspx?page=298. The references include, in addition to the three named above:

- Central Oregon Stormwater Manual
- Construction Site BMP Maintenance Poster
- Erosion and Sediment Control Fact Sheet
- Grading, Clearing & Erosion Permit Flow Chart
- Drainage Submittal Flow Chart
- Stormwater Maintenance Agreement.

Links to erosion and sediment control certification programs are also included.

Effectiveness. The City has met the schedules for this task and have provided for additional materials as well. The City continues to look for opportunities to partner with groups like ACWA to produce cost effective high quality outreach materials.

Task VI.3 Construction Site Inspections and Violation Hotline (MS4/UIC)

In FY2012-13 grading and drainage ordinance compliance and questions were routed to Russell Grayson of the Community Development Department—Private Engineering division, to coordinate compliance, investigation and follow-up. When an erosion and sediment, or poor housekeeping or spill problem is discovered on site, City inspectors provide verbal education and warnings. If the erosion and sediment problems are not addressed by the time the inspector returns for the next inspection, the inspector can withhold additional inspections until the problem is remedied. This proved to be an effective way to encourage contractors to repair erosion control deficiencies. Building inspectors help with compliance as part of their standard inspections as well.

In FY2012-13, over 900 sites were inspected. Approximately 820 residential home site inspections were conducted by building division inspectors, with approximately 15 verbal warnings and fewer than 5 written warnings provided. Engineering inspectors provided another 85 inspections with 8-9 verbal and no written warnings to sites they inspect (commercial/industrial and public right-of-way).

Effectiveness. Construction activity showed signs of improvement and single family home starts continue to increase. Inspectors are providing verbal education and warnings construction site stormwater management. This has been enough to result in compliance. No formal enforcement proceedings were necessary.

Task VI.4 Construction Site Education (MS4/UIC)

With the startup of the implementation of Bend Code Title 16, the City focused on providing education. Over the summer of 2012, the City hosted a series of short webinars focused on Erosion and Sediment control. These were held in the early morning on the last Tuesday of the month in an attempt to encourage participation by the local development community. They included:

- Types of Erosion Processes (June 26, 2012—see FY2012-13 annual report)
- Top Ten Misunderstood Elements in Construction Stormwater Compliance (Tuesday, July 31, 2012) (see Appendix E)

The City then worked with the International Erosion Control Association (IECA) to give two trainings of an erosion and sediment control and good housekeeping class on best management practices entitled “Complying with Construction Site Erosion and Sediment Control Requirements” on May 14, May 2013. One class was hosted by the City of Bend and was open to the public. This class offered a field demonstration as well that allowed attendees to see BMPs in a real world environment. A copy of the presentation, handout summary and the evaluation

summary are available in Appendix E. The City also sponsored a second identical presentation, without the field portion, as part of an all-day Central Oregon Builder's Association training. Attendees could attend the whole day or attend for select sessions (see Appendix E).

Effectiveness. Over the summer of 2012, four IECA erosion and sediment control webinars were originally offered but only the first two were held due to the low turnout by the public. Whereas the July webinar had 11 attendees, all but 1 were from the City. Based on low public attendance and the effectiveness evaluation survey results from the webinars, the City decided to hold off on the last two webinars in the series and reorganize to bring in a live training to increase effectiveness, which worked. City staff hosted a pair of very successful erosion control training courses presented by IECA in May 2013. The City coordinated the afternoon training with COBA to encourage local residential contractors to attend and receive continuing education credits. By holding the same training at two different times of the day, more attendees had the opportunity to participate while balancing workloads and the City had a better reach attracting the local development community. City staff also videotaped the morning training for later use. The trainings were effective for both City staff and the public on the use of proper erosion and sediment control best management practices and proper housekeeping practices. Spot checks of construction sites by stormwater division employees have shown that best management practices are being used. Please see Appendix E for a summary of the evaluation forms from the workshop and webinar.

Task VI.5 Participate in Regional Coordination Activities: Regional Stormwater Control Manual (MS4/UIC)

Developed regionally and refined in 2010, the Central Oregon Stormwater Manual (2010) has been incorporated into both the City's Design Standards and Construction Specifications and Bend Code Title 16.

Effectiveness. The IECA trainings held in May 2013 (see Task VI.4) were effective in communicating the use of the COSM and standards and specification as guides for construction site best management practices.

Task VI.6 Performance Standards (MS4/UIC)

Performance standards have been completed and incorporated into the ISWMP 2022. The ISWMP 2022 (November 2012) was approved by DEQ as part of the WPCF-UIC permit issuance to begin in FY2013-14 and is being considered by the DEQ as part of the NPDES permit reissuance. A summary of initial implementation status of the Performance Standards is available in Appendix A.

Effectiveness. The City has started implementing the new performance

standards as part of the ISWMP 2022 ahead of schedule and will track effectiveness in FY2013-14.

Tasks Completed (ISWMP 2022)

BMP VI-1. Implement the Stormwater Regulations (MS4 and UIC)

See ISWMP (2006) Task VI. 1 Evaluate and Update Regulatory Authority and Procedures (MS4/UIC).

BMP VI-2. Implement Performance Standards Related to Construction Site Controls (MS4 and UIC)

See ISWMP (2006) Task VI.6 Performance Standards (MS4/UIC).

Enforcement Actions

The City has the ability to provide education, warnings, delayed inspection and red tags (stop work orders) to violators. In FY2012-13, no formal violations were given, but roughly 23-24 verbal warnings, 4 written violations and no future inspection delays were given. Informal spot checks by stormwater staff showed improvements in construction site management, and areas where additional educational materials were needed. The City developed and distributed new education materials as the needs presented themselves. The City is working to refine its draft enforcement plan, to improve it based on real-world experience and record-keeping needs.

Summary Assessment of Effectiveness

The City has successfully implemented the tasks in this component. Staff have been and are continuing to focus on education and refining coordination efforts both internally and with external groups to ensure effective and smooth implementation of Bend Code Title 16, the Standards and Specifications and, through these, the Central Oregon Stormwater Manual. Feedback from trainings is used to refine effectiveness of future trainings.

7.0 POST-CONSTRUCTION STORMWATER MANAGEMENT IN NEW AND REDEVELOPMENT

Introduction

The objective of the Post-construction Stormwater Management in New Development and Redevelopment chapter is to minimize the discharge of pollutants in stormwater from new developments and redevelopments within the City.

Tasks Completed (ISWMP (2006))

The following describes yearly tasks that have been completed, or are ongoing that were performed during FY 2012-13:

Task VII.1 Participate in Regional Stormwater Control Manual and Tailor to Bend (MS4/UIC)

The Central Oregon Stormwater Manual (2010) has been adopted as part of Bend Code Title 16 and the City's Standards and Specifications. Links to the COSM are available on the City's website and it is currently actively in use on such projects as the Bear Creek improvement project and GO-Bond projects (see figure), as well as on private projects.

Effectiveness. Obtaining DEQ review and the support letter of the revised COSM (2010) has helped encourage its widespread use. City staff was effective in adopting the manual as part of the City's Standards and Specifications and Bend Code Title 16. The City has adopted the COSM as a standard design manual as part of the stormwater ordinance (Bend Code Title 16).

Task VII.2 Operation and Maintenance (MS4/UIC)

As noted in the FY2007-08 Annual Report, City staff have determined that, in general, private development will be required to maintain private stormwater facilities and the City will maintain City stormwater infrastructure. Maintenance responsibility for regional controls will be considered on a case-by-case basis.

City staff has incorporated long-term operation and maintenance considerations within the new Bend Code Title 16 (See Annual Report FY11-12 Appendix A), Bend Code Title 16: section 16.15.040). The new code requires all new

commercial development to submit a signed maintenance agreement that will be recorded on the title of the property.

For City-owned facilities, City staff continues to use the INFOR asset management software to assist with maintenance tracking and facilities assets management. In January of 2012 field crews officially began using the system to issue work orders, and track assets maintenance costs.

Field staff also continue to conduct a review of public stormwater facilities to determine which need to be improved/replaced as part of their everyday maintenance activities. On the private side, the City continues to use E-Plans for review and electronic record keeping.

Effectiveness. The City has incorporated an operation and maintenance section to Bend Code Title 16 and is requiring that a maintenance agreement be recorded on the title for new commercial developments. With regards to the public system, the City is continues using INFOR as a tracking program. Preventative maintenance routes have been established in the INFOR system, and are being used to schedule and track routine maintenance operations.

Task VII.3 Evaluate and Update Plan Review and Inspection Programs (MS4/UIC)

In FY2012-13, the City Stormwater Division staff, Community Development and Private Engineering staff continued to work through refining how Bend Code Title 16 is being implemented. In this fiscal year, the City Engineer (private engineering) took over responsibility for overseeing inspectors from the new Engineering and Infrastructure Planning Department, which split off from the Public Works Department this fiscal year as well. With new housing starts, inspection workload has seen a significant increase over previous years. As a result, refinement of the standard review program and understanding on which divisions are responsible for inspections and updating the processes are important for successful implementation of the new Code language. The City therefore is refining its draft enforcement plan based on these changes.

Effectiveness. Although initial effectiveness of changes occurring as a result of passage of Bend Code Title 16 appear promising, the City is continuing to work through implementation of Bend Code Title 16 with respect to finalizing inspection and enforcement pathways given the significant reorganizations internally and will be monitoring efforts closely and continuing work to refine and improve them as feedback dictates.

Task VII.4 Post-construction Control Education (MS4/UIC)

The City provided several training opportunities on post-construction stormwater

controls to internal staff and/or the public. The following is a listing of other trainings related to post-construction controls that the City either hosted or helped to sponsor and invited the public, via notifications to the City's Stormwater Liaisons, PAG and Stormwater Stakeholder email lists, to attend (see Appendix F unless otherwise noted):

- Soil's Role in Processing Pollutants: Case Studies of Green Infrastructure and Carbon Sequestration (Watershed Management Group's "Soil is Life" Webinar Series, January 24, 2013)
- Lose 10 Pounds of Pollution Without Structural BMPs (Center For Watershed Protection, February 15, 2013)
- Smart Stormwater Retrofitting In The Urban Environment (Center For Watershed Protection, March 13, 2013)
- Watershed Arithmetic & Counting Your Watershed Practices Toward TMDL Goals (Center For Watershed Protection, April 17, 2013).

Staff participated in a panel presentation regarding stormwater management requiremetns to the Central Oregon Regional Council of Community Associations Institute's Oregon chaper breakfast on May 16, 2013 (see Appendix B).

Additionally, City Stormwater Liaisons, Public Advisory Group members, and Stormwater Stakeholders have been kept informed of various post-construction control outreach opportunities—from webcasts to local trainings. Two City staff members attended ACWA's Stormwater Summit held at Lane County Community College in June 2013.

Staff continues to make available the following outreach guides on its website at bendoregon.gov/stormwaterbmp, and several are available through the Permit Center:

- Better Site Design Walking Tour Booklet (2013 update) and Points to Ponder
- Considering Stormwater at the Conceptual Planning Stage Brochure
- Example Drainage Plan—Single Family Residential (2013)
- Central Oregon Stormwater Manual (2010)
- One Backyard at a Time Video (Bend area examples excerpt)
- Oregon Rain Garden Guide
- Central Oregon Plants for Stormwater Facilities (May 2013 update)
- Stormwater Maintenance Agreement
- Links to EPA website low impact development materials

The City refined two outreach pieces this year—the first being the "Central Oregon Plants for Stormwater Facilities," a companion document to the Oregon Rain Garden Guide and the Central Oregon Stormwater Manual, and the second

being the "Better Site Design Walking Tour" (see Appendix F). The list of plants suitable for infiltration facilities within Central Oregon now incorporates comments from a local native plan expert to improve the native plant suggestions. Secondly, the "Better Site Design Walking Tour" booklet was revised to include better directions to each site, and with respect to graphical layout. In addition, a companion piece providing additional input on the Points to Ponder questions was incorporated. Distribution began, including placement on the City's website in Summer 2013.

The City helped distribute "The Oregon Rain Garden Guide" by providing copies at outreach events (i.e., Public Works Day). The full color guide includes information specific to Central Oregon. The City staff with the assistance of a local nursery expert and PAG member created a supplemental plant list for Central Oregon including plant establishment watering requirements and ongoing watering requirements (see Appendix F). The water conservation landscape design website discussed under Task V-8 will also be helpful in preventing dry weather flows.

To address the needs of project review staff, stormwater staff worked closely with private engineering to develop the Single Family Residential Example Drainage Plan fact sheet this fiscal year.

Effectiveness. City staff successfully met the requirements of this task, and received positive feedback on evaluation forms for the educational webinars, as well as input on how to improve offerings in the future (see Appendix F for the results).

Task VII.5 Performance Standards (MS4/UIC)

Performance standards have been completed and incorporated into the ISWMP 2022. The new ISWMP 2022 was approved by DEQ as part of the WPCF-UIC permit issuance with implementation scheduled to begin in FY2013-14. Initial implementation efforts is included in the Performance Standards implementation status, available in Appendix A.

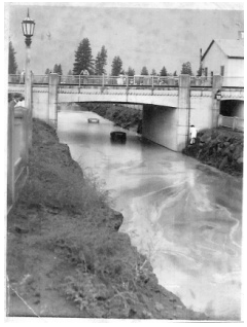
Effectiveness. The City is ahead of schedule in starting to implement the performance standards. DEQ is still reviewing the ISWMP 2022 with respect to the issuance of the City's NPDES permit reissuance for drainage to the river, but has accepted them for its UIC program.

Tasks Completed (ISWMP 2022)

BMP VII-1. Implement the Stormwater Regulations (MS4 and UIC)

The City has focused its efforts this year on the implementation of both the Standards and Specifications and Bend Code Title 16. For example, stormwater staff worked with the transportation department to incorporate low impact development into the Riverside Reconstruction project. The project includes a sediment manhole and permeable pavers with a rock storage gallery. City stormwater staff participated on the design team to address the stormwater runoff.

Additionally, FY2012-13 saw the completion of roadside swales along Bear Creek Road (see http://bendoregon.gov/index.aspx?recordid=795&page=29) and the new roundabouts at Simpson and Mt. Washington, Brookswood and Powers, and Empire and 18th. In addition construction of similar low impact development drainage features started on Reed Market Road, and construction on the Third Street underpass project improvements started to improve water quality and long-standing drainage concerns at the major north-south transportation corridor through the use of upstream drainage detention basins, swales and planter boxes, and use of a retention basin rather than drillholes in a subdrainage basin that lies mostly within a wellhead protection zone. Stormwater staff together with engineering staff explained the Third Street project both on a City Edition broadcast as well as at a Council worksession presentation (see Appendix A for a copy of the Council presentation and Appendix F for more information on the Third Street project such as news articles and website announcements).



Third Street flooding (circa 1938), courtesy Deschutes Historical Society

BMP VII-2. Implement Performance Standards Related to New Development and Redevelopment Site Controls (MS4 and UIC)

See ISWMP (2006) Task VII.5 Performance Standards (MS4/UIC).

Summary Assessment of Effectiveness

The City is on schedule in implementing the tasks in this section. Overall, City staff participated in both attending and providing multiple workshop presentations related to post-construction controls in FY2012-13. The City has updated and actively implement the development rules and legal authority to require and maintain adequate post-construction controls. The City is ahead of schedule in starting implementation of the performance standards.

8.0 *MUNICIPAL OPERATIONS AND MAINTENANCE ACTIVITIES*

Introduction

The objective of this component is to work with maintenance staff to maximize the removal of pollutants during routine maintenance activities and to minimize discharges of pollutants to watercourses and injection systems. Routine maintenance activities include: street sweeping, maintenance of storm drainage facilities and watercourses, and litter control. This component also includes reviewing corporation yard practices and making recommendations to improve the quality of stormwater runoff from these facilities.

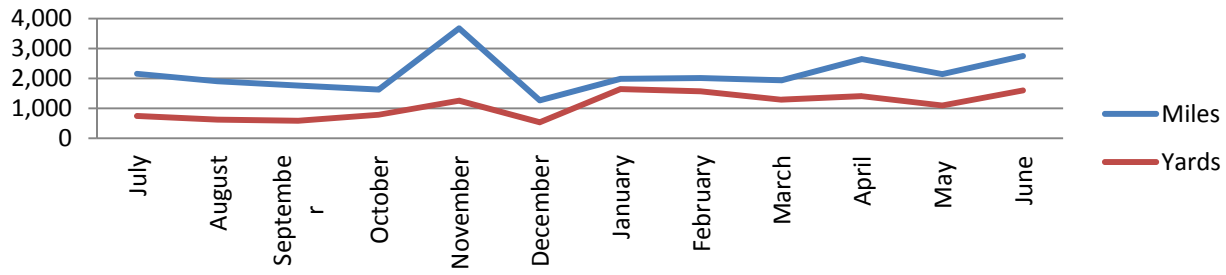
Tasks Completed (ISWMP (2006))

The following describes ongoing tasks or tasks completed during FY 2012-13:

Task VIII.1 Street Sweeping (MS4/UIC)

The City continues its ongoing street sweeping program per its Sweeping Operations Plan (see FY2007-08 Annual Report). The City regularly has five to seven sweepers running when the pavement is dry. In FY2012-13 they traveled 25,861 miles, directly removing 13,126 yards of material from the streets.

FY2012-13 Municipal Maintenance Sweeping



The City staff began collecting additional data to help determine where build-up of sediment and litter is increased. That information will be used to optimize maintenance activities and to identify areas for targeted outreach and enforcement.

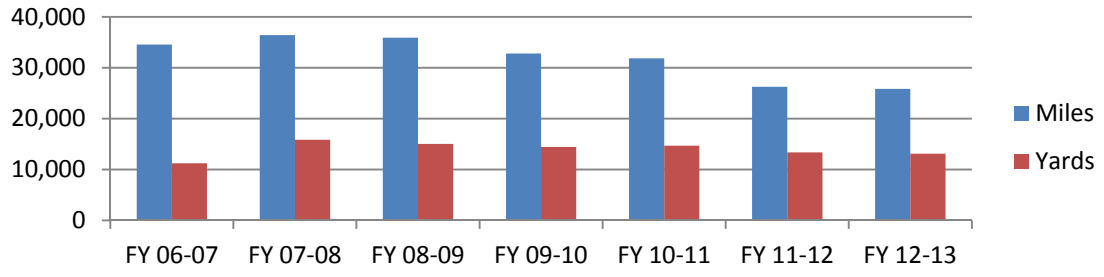
FY2012-2013 Municipal Maintenance Sweeping

Date	Miles	Yards
July	2,155	741
August	1,905	622
September	1,759	584
October	1,627	788
November	3,628	1,256
December	1,267	536
January	1,983	1,640
February	2,012	1,567
March	1,936	1,289
April	2,647	1,408
May	2,144	1,094
June	2,750	1,601

In FY2012-13, the Stormwater Utility funded 2.8 FTE of 7 FTE sweeper positions due to the stormwater benefits of street sweeping. The Streets fund supports the other 4.2 FTE. This year, the City purchased two regenerative air sweepers to replace failing machines.

Effectiveness. The 13,126 yards of material collected in FY2012-13 was kept out of the City's drainage system. This helps to reduce clogging of stormwater facilities, and helps to keep pollutants out of the Deschutes River. Although the miles swept have been a bit lower the past couple of years, the yards of material collected has remained fairly stable. Staff have worked to increase efficiency, and the amounts also are related to the type of winter weather and the amounts of cinders/basalt that have been applied.

Sweeping Summary for FY2006-2007 through FY2012-2013



Task VIII.2 Parking Lot Sweeping (MS4/UIC)

The City owns and is responsible for sweeping five parking lots throughout the

City—the downtown parking structure, the Mirror Pond parking lots, the Brandis lot at Greenwood and Bond, and the Troy Field parking lot across Louisiana from McMenamins. For efficiency, the City formed a combined Clean Streets and Parking Lots/Litter Task Group within Public Works to determine monitoring protocols and examine ways to improve the effectiveness of the entire sweeping program by first monitoring the build-up of sediment and litter and identifying where improved cleaning is needed most. They have been incorporated as part of the regular stormwater coordination meetings between stormwater technical services and field services. The City does not track sweeping materials from parking lots separately from streets but has been able to improve its proportion of yards of material collected per road mile traveled. See also Task VIII.1.

Effectiveness: The amount of materials removed from parking lots is currently not tracked separately from that removed from streets, but crews have not noticed excessive litter or sediments within the parking lots. See Task VIII.1 for more on effectiveness. The City has improved efficiency over time.

Task VIII.3 Litter Collection and Material Disposal (MS4/UIC)

Figure 8-1 Litter Collection after 2013 Stream Stewardship Day event.

The City continues to provide street-side litter receptacles in the downtown core area that are emptied by a local garbage/recycling company three times per week in the winter and four times per week in the summer. Street Division staff maintain these receptacles on an as-needed basis, and also check daily and empty as needed two additional trash receptacles located at the Troy Field parking lot.

The City also helped out the annual Stream Stewardship event by collecting the bags of materials brought up by volunteers.

Effectiveness. The inclusion of green waste barrels by local garbage companies appears to keep down leaf litter, anecdotally.

Task VIII.4 Landscape Maintenance Practices

The City continued to implement improved landscape practices and make adjustments to improve efficiencies. For example, the City has been switching out high water use plants in its medians and right-of-way landscapes for ones more suited for the local climate. The City updated its plant list for Central Oregon plants that are suitable for both the climate and the inundation

requirements needed to survive in infiltration areas—improved information for native plants was incorporated.

Furthermore, the City is working with its Volunteer Coordinator to use volunteers to help maintain the landscapes and medians. The Volunteer Coordinator is also coordinating projects such as the Community Garden at Franklin and 9th street project. This project is replacing an underutilized landscapes—in this case a grass section—and converting it to a community garden that includes stormwater facilities including rain gardens, and improved irrigation as demonstration projects. Interpretive signage is planned to be incorporated. Work began in FY2011-12 and should be completed in FY2013-14 (see Chapter 4). Furthermore, the City has planned a similar project to improve landscaping at City Hall and other City facilities to be more maintenance and water user friendly, incorporating stormwater quality demonstration features. The project is currently on hold while the City continues to look for grant funding.


Empire and 18th Roundabout—drainage swale on far side.

The City continues to implement the Standards and Specifications related to landscaping. Additionally, the City has installed the following stormwater surface controls in the right of way in FY2012-13 and has started to maintain them:

- Bear Creek—installation of two stormwater retention basins designed to handle to 100 year storm as part of a safe sidewalk/school access improvement project in an area with failing UICs.
- Simpson and Mt. Washington Roundabout infiltration swales
- Brookswood and Powers Roundabout infiltration swales and
- Empire and 18th Roundabout infiltration swales.

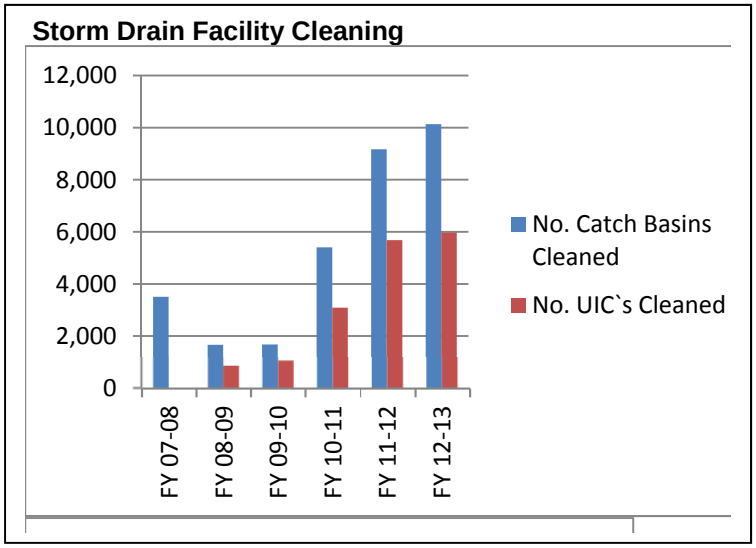

Simpson and Mt. Washinton detention swale with maintenance access road.

Effectiveness: The City is effectively installing new stormwater surface controls in right-of-way areas, handling stormwater via low impact development standard measures incorporated in the Standards and Specifications. The City also continues implementing improved practices such as plant selection and considering concave medians and bioretention that incorporate stormwater as a design element. Volunteer projects such as described above are useful for educational and public participation purposes, although they do tend to take longer to complete and effective coordination is needed to ensure ongoing success.

Task VIII.5 Improved Catch Basin/Storm Drain Facilities Cleaning (MS4/UIC)

Staff continued work to identify opportunities to improve maintenance practices. Staff now uses the Infor system to manage swales, catch basin and UIC maintenance records.

In FY2012-13, the four dedicated stormwater operations staff along with seasonal temporary staff maintained 10,132 catch basins, and 5,976 UICs (dry wells and drill holes) removing 158 yards of material. In addition to routine cleaning and inspection, staff completed 599 maintenance repairs, including catch basin replacements, and unplugging drill holes.



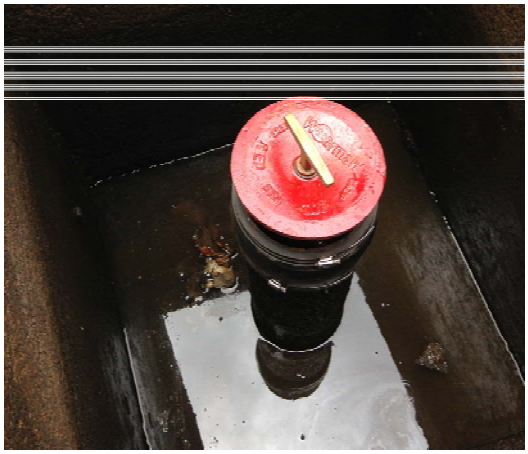
The City continues to maintain two different types of manufactured stormwater pretreatment devices. One of the devices is a Contech Stormfilter that is installed in Newport Avenue at the west end of the Newport Bridge. The other device is a Royal Environmental EchoStorm filter that is installed in Neff Avenue near the Pilot Butte Middle School. A sediment manhole was placed in front of the Echo storm filter to help reduce clogging issues, and it continues to be incorporated in regular maintenance schedules. In addition, staff have installed gross pollutant traps around drill holes to help prevent clogging within the hole. These are proving effective at reducing clogging and preventing large size pollutants from entering the drill hole.

Staff has put aside a specific budget line-item to fund work on pipe replacement projects to repair deficiencies identified during the CCTV inspection project. See Annual Report FY09-10 for additional information on the CCTV project.

Effectiveness. The additional staff, along with the INFOR software continues to increase efficiency and effectiveness of the City's stormwater program to clean

the catch basins, drill holes and dry wells, removing more than 158 yards of material. The maintenance levels this year continue to increase over past years (see graphic on previous page). This is in part due to the increase in dedicated staff and fewer special projects related to increasing the City's system understanding that were crucial to obtain in past years to be able to run the system more efficiently. Additionally, installation of gross pollutant screens on existing drill holes has helped prevent clogging and increased the efficiency in cleaning these types of UICs.

Task VIII.6 Spill Prevention, Response Materials, and Training (MS4/UIC)


Drill Hole Shut off valve

Stormwater crews began to implement a new drill hole valve program. Shut-off valves will allow stormwater crew to safely block the flow during a spill to a drill hole. In FY2012-13 staff installed nineteen 6" drill hole shut-off valves at high risk locations identified in the UIC Systemwide assessment. The City plans to expand this program and install an additional 90 valves in FY13-14.

Staff continued to maintain simple spill kits in each of the street and stormwater vehicles. Streets and stormwater field crews are periodically trained in spill prevention and response at their monthly staff meetings, and all of Public Works was provided a Hazardous Material overview training on November 28, 2012 (see Appendix D). In addition, all new public works personnel are required to watch spill prevention and control training movie as part of their training.

The City keeps one sander loaded year round to serve for spills, as the sand can be used to make a temporary berm to help contain the spilled materials. The City also maintains a spill containment trailer that is stocked with absorbents, booms, pipe plugs and other related items in order to respond to larger spills. Spill containers are also present in the Public Works garage area.

The City continues to use integrated pest management (IPM) techniques for weed control but does track its weed control program pesticide use; the reporting information that is provided yearly to the State is available upon request. Stormwater crews carry storm drain plugs and absorbents for spill response.

Streets and stormwater management staff attended a Winter Road Care Pollution Prevention webinar held by US EPA on January 31, 2013. Copies of

sign-in sheets and meeting materials are included in Appendix G.

Effectiveness. Installing valves on high risk drill holes helps reduce response times to closed off drill holes during a spill incident. The spill trailer allows for staff to contain and clean up larger spills. Training helps staff understand how to reduce situations where spills may occur and when to report spills; along with the needs and expectations for protecting water quality through storm drain maintenance. The webinar helped spur discussions and understanding regarding winter road care and stormwater quality.

Task VIII.7 Illicit Dumping (MS4/UIC)

Areas with high pedestrian traffic tend to have higher levels of gross pollutants (trash). As a result, stormwater crews sweep the downtown corridor where there is high pedestrian traffic at a higher rate than other areas of town. City staff who see an illicit discharge or illegal dumping are trained to contact stormwater personnel for educational follow-up (see also Task V-2). Fifteen of the nineteen reports of illicit discharges reported in FY2012-13 were by City staff. Additionally, the City has focused outreach efforts, such as its successful "It's All Connected" campaign and storm drain marking program, on reducing non-stormwater discharges (see the Public Education and Public Participation chapters of the annual report for more information)

Effectiveness. City staff are implementing educational and inspection best management practices to help reduce the number and severity of illicit dumping incidences. The increased storm drain facility cleaning means every catch basin was examined during FY2012-13 for both illicit discharges and the need for cleaning.

Task VIII.8 City-owned Corporation Yards, Industrial and Commercial Facilities (MS4/UIC)

City staff conducted Municipal Self Audits to assist in conducting an internal corporation yard audit that can be used to determine ways to improve water quality on site. Staff began to conduct these audits in FY2010-11. Staff have identified City owned and operated facilities, and have performed inspections of both the Boyd Acres facility and 15th Street facility, completing self-inspection checklists. Stormwater staff have attended safety program inspection walkthroughs of city-owned corporation yards as well.

The City continues to embark on an Integrated Pest Management (IPM) approach to addressing landscape maintenance, which involves minimizing the use of pesticides by choosing native and pest-resistant plants and using mechanical and less-toxic controls as much as practical.

Effectiveness. The City has been effective in conducting corporation yards audits this year and starting discussions to work with appropriate staff to improve practices as needed.

Task VIII.9 Detect and Correct Cross-connections and Leaks (MS4/UIC)

In late May 2013, City staff found a coffee stand with an illicit wastewater connection to a private UIC in town as part of an Industrial Pretreatment Program Fats Oil and Grease (FOG) program inspection. The connection has been removed and a gray water tank has been installed to handle the bar sink. City utility staff continue to work to locate cross connections between sanitary sewer and stormwater. Areas are selected in part on whether storm surges are noted at sanitary sewer pump stations. The most recent area reviewed was River Rim subdivision, with work completed in early October 2013. No significant cross connections were found. The equipment and techniques can be used in instances where a sanitary sewer to storm line connection is suspected. The CCTV pipe review of the stormwater system to the river in FY2009-10 did not find any such connections however. City staff post resource links including septic system information on its website, directing people to County and State materials.

Effectiveness. The television inspection was very effective in detecting cross connections and deficiencies in the 14 miles of storm drainage pipes that are connected to river outfalls. The City continues to work on projects to replace the pipe sections in need of repair. These projects will also include the abandonment of illicit connections (e.g., roof downspouts).

Task VIII.10 Promote Commute Alternatives for Municipal Employees and the Public (MS4/UIC)

The City of Bend continued to be a year-round supporter of Commute Options. Commute Options decided not to hold Commute Options Week in June as it typically had in the past, instead working to promote the statewide effort of during a similar week in October. For more information, see their website, http://www.commuteoptions.org/index.php?m=5&s=172&id=268.

The City also continued its transportation demand management program (TDM) to encourage alternative modes of transportation and to reduce single occupancy vehicle trips. City staff are offered $60 or the equivalent in time off for every 20 trips using alternative transportation. A summary of TDM participation is included in Appendix G.

In addition, the City transportation engineering department embarked on a project to improve pedestrian and bicycle commute safety along Riverside Drive. The project underwent design and approval in FY2012-13 and is undergoing

construction to be completed by October 2013. The project includes stormwater quality improvements including the addition of a sediment manhole prior to an existing drainage inlet, and the incorporation of porous pavers along shoulder parking areas. More information on the project is available through the City Edition segment (March 28, 2013) : http://www.youtube.com/watch?v=4Bjg5dKk_qE&list=TLL5SxUBtri67NrMi4ZrDNm1Cxpp-jfH-I

Additionally, the City completed the Safe Passages to School project at Bear Creek that improved sidewalk access to schools, and incorporated improved drainage retention swales as part of the project.

Effectiveness. Commute Options worked to coordinate better with statewide programs to improve efficiency by way of introducing Drive Less Connect in fall 2011 and continuing to move towards statewide collection of data online. The City continued to promote the TDM program, and will move towards combining reporting for that program through the Drive Less Connect reporting starting in FY2013-14. By doing this, participants have more opportunities to obtain rewards for alternative commute options.

Task VIII.11 Performance Standards (MS4/UIC)
Performance standards have been completed and incorporated into the ISWMP 2022. The new ISWMP 2022 was approved by DEQ as part of the WPCF-UIC permit issuance and is scheduled to begin in FY2013-14. A summary of performance standards and initial implementation status is available in Appendix A.

Effectiveness. The City has started implementing the new performance standards as part of the ISWMP 2022; initial standards are scheduled to be met during F2013-14. The City met its goal of completing the performance standards for inclusion in the draft ISWMP 2022.

Tasks Completed (ISWMP 2022)

BMP VIII-1. Street Sweeping (MS4 and UIC)

See ISWMP (2006) Task VIII.1 Street Sweeping (MS4/UIC).

BMP VIII-2. Implement Performance Standards (MS4 and UIC)

See ISWMP (2006) Task VIII.11 Performance Standards (MS4/UIC).

BMP VIII-3. Landscape Maintenance Practices (MS4 and UIC)

See ISWMP (2006) Task VIII.4 Landscape Maintenance Practices.

BMP VIII-4. Improved Storm Drain Facilities Cleaning (MS4 and UIC)

See ISWMP (2006) Task VIII.5 Improved Catch Basin/Storm Drain Facilities Cleaning (MS4/UIC).

BMP VIII-5. Promote Commute Alternatives for Municipal Employees (MS4 and UIC)

See ISWMP (2006) Task VIII.10 Promote Commute Alternatives for Municipal Employees and the Public (MS4/UIC).

Summary Assessment of Effectiveness

As demonstrated herein, the City has been able to refine its collection and cleaning programs to be more efficient. The City has also been effective in installing several new landscaped drainage controls in the right-of-way. Crews are effectively maintaining the system, and are making improvements to existing drill holes to prevent both large scale pollutants from entering the hole as well as to include emergency shut-off devices in the most high-risk areas to help facilitate quick and safe closure in the case of an emergency spill. Outreach and coordination to ensure pollution prevention at corporation yards is improving with coordinating inspections with the safety manager inspections. The TDM program continues to be a success and two transportation projects that are designed to improve alternative transportation safety are finishing up construction.

9.0 MONITORING

Introduction

Early in 2004, the City and the Upper Deschutes Watershed Council (UDWC) began a multi-year monitoring program to gather data on the presence or absence of pollutants of concern in the Deschutes River within the Bend Urban Growth Boundary (Deschutes River Miles 172, and 159). This baseline report was completed in FY2009-10. As a Phase II NPDES permitted community, the City of Bend is not required to monitor stormwater discharges that drain to the river, but is required to monitor stormwater drainages to UICs as part of its WPCF-UIC permit, received in May 2013. The baseline data of the Deschutes River monitoring study will be useful to compare results of overall river health over time to help illustrate overarching effectiveness of pollution prevention efforts.

Task Completed (ISWMP (2006))

Task IX.1 Monitor Stormwater Discharges to the Deschutes River (MS4)

In FY2009-10, through a combined effort with the Upper Deschutes Watershed Council, the City completed the City of Bend Ambient Water Quality Monitoring project. This project focused on studying the diurnal, seasonal and annual variations of pollutants of concern in the river and Tumalo Creek. As part of the multi-year study, City staff conducted monitoring on the Deschutes River and Tumalo Creek just upstream, within and downstream of the City's UGB using grab sampling and continuous temperature monitoring at 16 stations, and continuous multi-parameter monitoring at up to 3 stations. (See Annual Report FY09-10 for additional information).

In addition, the City of Bend Laboratory collects samples for and performs analysis of both routine river samples and stormwater samples over 8 months of the year for the following constituents:

Temperature
pH
Dissolved Oxygen
Conductivity
Turbidity
Total Dissolved Solids
Total Nitrogen
Total Phosphorus

Nutrients
Escherichia Coli and Total Coliforms

Since September of 2005, the City has deployed multi-parameter submersible sondes at locations upstream and downstream of the City's stormwater outfalls. The purpose for these sondes is to detect changes in river water quality resulting from storm events. The sondes have been in place for significant storm events. The parameters monitored were pH, temperature, conductivity, turbidity and dissolved oxygen. More data and a more intensive data analysis will be necessary to determine if there are any significant stormwater impacts on river water quality, especially with respect to the nitrogen regime. Sondes are deployed during the winter rainy season as well as during the summer. The City will continue to monitor in FY2013-14 and currently remains in a data collection mode.

Effectiveness. The completion of the multi-year monitoring report in FY09-10 provides the City a useful document for understanding baseline conditions from which the City can compare with future studies to determine ultimate effectiveness of its MS4 stormwater quality programs. The additional data that the City is collecting will be able to be compiled and analyzed to help distinguish trends over time to the ambient water quality.

Task IX.2 Enhanced Drinking Water Well Monitoring (UIC)

The City continues to monitor drinking water quality weekly and continues to meet drinking water requirements under the Safe Drinking Water Act through regular well monitoring. The results of this monitoring are summarized in the City's separate yearly drinking water quality annual report, available at www.bend.or.us/index.aspx?page=205 .

The City stormwater and water quality laboratory staff continued meeting as needed and these meetings serve as the enhanced monitoring task group, as well as addressing other monitoring issues.

Effectiveness. The City is meeting the Safe Drinking Water Act requirements through its regular well monitoring. The City has completed the Water Master Plan, and having completed a baseline river monitoring analysis, continues to collect data to help determine changes over time.

Task IX.3 Stormwater Monitoring for UICs (UIC)

The City stormwater and water quality laboratory staff continued meeting as needed and these meetings serve as the enhanced monitoring task group, as well as addressing other monitoring issues. The City developed a stormwater monitoring plan as part of the WPCF-UIC permit issuance and submitted it to

DEQ in spring 2013. DEQ has accepted the plan. A copy of the approved plan can found online or is available upon request. Full implementation of the monitoring plan will begin in FY2013-14.

In FY2012-13, the City used automatic sampling collectors with Nalgene bottles at five UIC locations throughout the City. The City closely monitors potential precipitation events to target efforts to ensure enough precipitation is present to collect a sample. Several attempts resulted in too little runoff to obtain a full set of samples at all five locations. A summary of the City's stormwater monitoring data collected in FY2012-13 is included in Appendix H. For readability, this table does not include all analytes from past years.

In an effort to improve stormwater monitoring City staff purchased 2 additional ISCO flow monitors to allow for sampling 6 locations across the City. The monitors are equipped to measure and log pipe flow rate (in GPM), and water temperature and can be set to call or page out at a specified flow rate. The goal is to use the flow monitors for the FY2013-14 monitoring season.

Effectiveness. This program is continuing to provide the data needed to tailor an appropriate stormwater quality management program for both the river and UIC disposal. The main focus in FY2012-13 was developing a UIC monitoring plan that was implementable given Bend's climate and challenges. Given a higher-than-expected reading of zinc at the airport UIC in May 2013, the City will monitor closely this analyte in future samples.

Task IX.4 Performance Standards (MS4/UIC)

Performance standards have been completed and incorporated into the ISWMP 2022. The new ISWMP 2022 was submitted in December 2012 and approved by DEQ as part of the WPCF-UIC permit issuance. Performance Standards and implementation status is available in Appendix A.

Effectiveness. The City has started implementing the new performance standards as part of the ISWMP 2022 and are scheduled to formally begin implementation in FY2013-14. A summary of initial implementation status efforts is included in Appendix A. The City is ahead of schedule in implementing performance standards. The City met its goal of completing the performance standards for inclusion in the ISWMP 2022.

Tasks Completed (ISWMP 2022)

BMP IX-1. Monitoring of the Deschutes River (MS4)

See ISWMP (2006) Task IX.1 Monitor Stormwater Discharges to the Deschutes River (MS4).

BMP IX-2. Stormwater Monitoring for UICs (UIC)

See ISWMP (2006) Task IX.3 Stormwater Monitoring for UICs (UIC).

BMP IX-3. Implement Performance Standards

See ISWMP (2006) Task IX.4 Performance Standards (MS4/UIC).

Summary Assessment of Effectiveness

The City has successfully developed a UIC monitoring plan tailored to the Central Oregon climate and challenges. The City has increased the effectiveness of its stormwater monitoring efforts through the use of automatic grab samplers in conjunction with grab samples, and is now working to incorporate flow monitors.

Additionally, the final analysis of ambient surface water quality data provides good baseline data from which to tailor future pollution prevention and monitoring efforts. The City used this data in developing its draft ISWMP 2022 as the City is required to assess effectiveness of its water quality programs and this study provides a baseline for comparison while helping to inform the Total Maximum Daily Load (TMDL) process as it develops. Continued collection of ambient water quality data will help provide a measurement over time of effectiveness as that gets analyzed. The City has focused efforts to collect stormwater samples in recent years to better understand the quality of stormwater here in Bend. The City is using this data to target education and improve management efforts.

♦ 10.0 *DRINKING WATER PROTECTION AREA INVESTIGATION, DELIENATION AND MANAGEMENT* AND *UNDERGROUND INJECTION CONTROLS*

Introduction

One of the highest priorities for the City is protecting its drinking water wells from contamination. In order to do this, the City needs to know where and how it should focus its protection efforts and to meet Underground Injection Control (UIC) requirements that are protective of groundwater. The purpose of this section is to provide the information the City needs in order to do this, especially with respect to the City's stormwater underground injection controls (UICs). For this reason, the title of this chapter changes between the Integrated Stormwater Management Plan (2006) and the ISWMP 2022, from "Drinking Water Protection Area Investigation, Delineation and Management," to "Underground Injection Controls," respectively. This chapter of the annual report covers both the ISWMP (2006) and ISWMP 2022 respective chapters.

Tasks Completed (ISWMP (2006))

The following describes yearly tasks that have been completed, or are ongoing that were performed during FY2012-2013:

Task 10.1 Drinking Water Protection Area Delineation (UIC)

In FY2008-09, the City secured a $20,000 grant to refine its drinking water protection area delineations. In FY2010-11 the City completed the refinement of the drinking water protection zones for the City's groundwater wells. The results of the delineation project involved significant changes in both the direction and length of the Drinking Water Protection Areas (now known as Wellhead Protection Areas (WHPA) or Source Water Protection Area (SWPA)). As part of the refinement process the City worked with the State of Oregon, Department of Human Services (now named Oregon Health Authority (OHA)) to obtain final approval of the revised delineations (See FY2010-11 Annual Report Appendix I).

Effectiveness. The City successfully completed the development of new/refined well head protection area delineations for use in its required Source Water Assessment, and is actively working towards updating its potential contaminant source database.

Task 10.2 Drinking Water Protection Plan (UIC)
The focus of this task is to identify real and potential contaminant sources within the refined Drinking Water Protection Areas (DWPAs), designate which are private and public sources of potential pollutants, and develop and provide targeted educational materials minimizing potential contaminant sources for those agencies, businesses and residences within the revised DWPAs. This task became even more important after the DWPA project significantly changed the DWPAs. In FY10-11 through FY11-12, the City applied for and received a $30,000 grant to update the potential contaminant source inventory and to perform a susceptibility analysis to prioritize protective measures that might be taken to minimize the risk to groundwater. The City contracted with a consultant and began work on this project in FY2012-13. The inventory and windshield survey have been completed and the susceptibility analysis and final report is expected to be completed by FY2013-14.

Effectiveness: The City is successfully working to improve its understanding of its groundwater and stormwater systems to best be able to target efforts to protect drinking water. In the meantime, City staff continue to provide education on the importance and methods to protect water quality (see the education–related and illicit discharge chapters of this annual report for more details).

Task 10.3 Groundwater Vulnerability Study (UIC)

The City submitted and DEQ reviewed and accepted the study entitled "Pollutant Fate and Transport Model Results in Support of the City of Bend UIC WPCF Permit – Groundwater Protectiveness Demonstration and Proposed EDLs" in FY2011-12 (see http://www.deq.state.or.us/wq/uic/docs/template/BendReport.pdf or Appendix I of the FY2011-12 annual report for a copy of the report).

Effectiveness: The City has completed the groundwater vulnerability study and received a letter of acceptance from DEQ on February 13, 2012.

Tasks Completed (ISWMP 2022)

The following describes yearly tasks that have been completed, or are ongoing that were performed during FY 2012-2013:

BMP X-1. Complete Systemwide Assessment (UIC)
The City completed the System Wide Assessment (SWA) and submitted the documents to DEQ as part of the WPCF-UIC permit issuance package that ultimately resulted in the City receiving its first WPCF-UIC permit in December 2012. A copy of the UIC Systemwide Assessment is available upon request.

System Wide Assessment - Follow-up Tasks
The Systemwide Assessment suggested the following additional tasks be conducted and reported on in the first annual report of the WPCF-UIC permit (due November 1, 2014). The City has either completed or made substantial initial progress on the tasks, as described below.

- *Address accessibility issues, clean and provide measurements for remaining 42 of 976 drill holes. (Systemwide Assessment, Section 3.4)*

The City has completed obtaining measurements for the 42 drill holes for which access was problematic. The information is included in Appendix I.

- *Work to complete measurements for 1,776 drywells for which the City does not have specific depth information. (Systemwide Assessment, Section 3.4). Analyze specific depths to ensure adequate separation distance from regional seasonal high groundwater (Systemwide Assessment, Section 5.5).*

The City attempted to collect drywell data as part of routine maintenance, but that proved to be inefficient. The City has developed a revised plan to collect drywell measurements as a stand-alone project during Fall/Winter 2013-14 as a stand-alone project. Three of sixty-three maintenance zones have been completed to date with results included in Appendix I.

- *Clean and CCTV inspect two potentially misidentified drill holes in the Old Mill potentially perched water area. (Systemwide Assessment, Section 5.5).*

The City inspected the two sites on the Colorado street bridge over the river and confirmed that they were misidentified as drill holes. Both go down a shaft and then discharge into the Deschutes River. The City is in the process of updating our GIS database to be reflective of the addition of these outfalls and the withdrawal of these as drill holes.

- *The City will periodically review the State's database or capture new wells during local development actions for improved well location or installation information and include the information in future updates of the Systemwide Assessment submitted per permit requirements. (Systemwide Assessment, Section 6.6).*

The City the City has tracked two private wells installed just outside of City limits as well as some initial proposals for two wells within the City limits that have not been installed. The City will periodically update its Geoblade mapping to keep it current.

- *Update the Potential Contaminant Source (PCS) databases (Systemwide Assessment, Section 8.5).*

This project was contracted and commenced in FY2012-13. The inventory and windshield survey have been completed and the susceptibility analysis and final report is expected to be completed by FY2013-14. Please see Section 10.2 of this annual report for more details.

- *Provide educational outreach to all 19 identified businesses that could potentially impact a City UIC. (Systemwide Assessment, Section 8.5).*

The City mailed a letter and an Illicit Discharge Minimization BMP Manual to 19 commercial businesses identified in the UIC System Wide Assessment as having a high risk of impacting a City UIC (see Appendix I for a copy of the letter and Appendix D for a copy of the Illicit Discharge Minimization Manual). In addition the City has installed spill closure valves in these 19 drill holes to facilitate more timely and safe closure in the event of a spill (see also Task VIII-6).

BMP X-2. UIC Registration (UIC)

See Chapter 2.0 (ISWMP 2006) Task II.6 UIC Registration (UIC), and Appendix I for a summary of new public UICs installed in 2012 and 2013. The City submitted the UIC registration database quarterly through DEQ's electronic submittal pilot program. A copy of the registration database submitted electronically to DEQ in July 2013 is available upon request.

BMP X-3. UIC Retrofits, Upgrades or Decommissioning (UIC)

As part of the City's Go Bond project the City closed several UICs:

- Mt. Washington roundabout project closed one UIC
- Brookswood and Powers Rd roundabout project closed two UICs
- Empire Ave. and 18th roundabout project closed two UICs.

These were properly decommissioned (see Appendix I).

In FY2012-13 the stormwater division began work on the 3rd Street underpass project. As a result of this project the City scheduled to decommission four drill holes (decommissioning occurred July 1, 2013) and install a new piped stormwater system, pump station and a large regional bio-retention swale along with smaller planter boxes installed in the upper portion of the drainage basin. The planter boxes and upstream swales reduce flow to the underpass and

provide pretreatment to the existing UICs in the area. The project is scheduled to be completed in FY2013-14.

Summary Assessment of Effectiveness

The City has significantly increased scientific understanding of its system and groundwater aquifer through drinking water protection area delineation and vadose zone analysis, along with refining knowledge of the locations and status of its UIC system. The City continues to increase its knowledge through implementation of the potential contaminant source identification project and Systemwide Assessment follow-up actions. The City is refining its drainage system as it redevelops to include pretreatment and is actively conducting selective outreach and field modifications to be more protective within wellhead protection areas. The City successfully submitted and received DEQ approval of its Systemwide Assessment, and has completed a significant portion of the related follow-up actions.