CITY OF BEND, OREGON

2013-2014 ANNUAL REPORT
Stormwater NPDES Permit No. 102901
Stormwater UIC WPCF Permit No. 103052

National Pollutant Discharge Elimination System
Municipal Separate Storm Sewer Annual Report

Underground Injection Control System Report

October 28, 2014

City of Bend
Utility Department

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."

Jon Skidmore
Assistant City Manager, Operations
City of Bend
October 29, 2014

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FINAL REPORT
October 28, 2014

City of Bend
Utility Department
Stormwater Utility

Prepared by:

City of Bend
Utility Department
Stormwater Utility

62975 Boyd Acres Road
Bend, OR 97701

http://bendoregon.gov/stormwater
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 28 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) during this time.

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(2006) described the activities the Program would 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 reissuance negotiation.

Contents of the Annual Report

This represents the eighth Annual Report submitted to the DEQ and describes stormwater quality and pollution prevention activities implemented by the City during Fiscal Year 2013-2014 (July 2013 through June 2014). 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 subsection 4. of the City WPCF-UIC permit, 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 required by both permits, 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. The City exceeded the requirement of having interdepartmental stormwater coordination meetings at least four times per year in FY2013-14. Stormwater Coordinators consist of multiple intra-agency groups that focus on coordinating on stormwater issues, taking the duties of the now-defunct Stormwater Action Team (SWAT) that was active in the initial years of the utility. The first is a Stormwater Liaisons Oversight Coordination Group that consists of representatives from multiple departments that focus on stormwater issues. To increase efficiency, the City targeted meetings with subgroups of this Liaisons group and other ad hoc task group members on specific issues. 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. This committee discussed the Stormwater Master Plan, Stormwater Public Facilities Plan and utility rates in FY2013-14. The Stormwater Coordinators continued to work together to integrate stormwater pollution prevention across departments in FY2013-14 (meeting agendas and sign-in sheets are included in Appendix A).

City stormwater staff also participated in Central Area Plan District Multi-modal Planning Efforts and the Galveston Improvement project planning efforts.

Organization charts of stormwater utility staff are included in Appendix A.

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 in the November 1, 2013 memorandum, and another item about the watershed model in the December 13, 2013 weekly Council memorandum (see Appendix A). City staff also provided a presentation to the Council regarding the Stormwater Master Plan project on May 7, 2014 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 other local, 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 Third Street Project, the Stormwater Master Plan finalization project and the Public Facilities Plan during FY2013-14 (see Chapter 4). Stormwater Program staff also provided stormwater quality input on the Central Area District Multi-Modal Plan, and the Galveston street improvements technical advisory group, a grassroots stakeholder effort to improve the Galveston business district.

Regional and Statewide Groups. City staff served on the Board of the Oregon Association of Clean Water Agencies (ACWA), and participated on the Groundwater Committee, Stormwater Committee, and Public Education committees. Staff also participated on the UIC outreach brochures subgroup that resulted in the release of two revised statewide UIC pollution prevention brochures; and the initiation of the Illicit Discharge fact sheet work group. The City's Communication Director participated in a panel at ACWA's "Communicating the Value of Water Workshop" held on February 26, 2014 in Salem.

The City's Stormwater Program Manager presented a stormwater quality presentation at the Oregon Association of Water Utilities Sunriver conference in early 2014.

The City of Bend is an Accredited Public Works Agency, which it earned through the American Public Works Association. The accreditation process includes review of the City of Bend's stormwater activities and processes. Additionally, the City's Stormwater Program Manager earned the APWA's Certified Stormwater Manager certification in May 2014.

Effectiveness. As described above, there was a large amount of coordination in FY2013-14, but with a greater emphasis on more focused meetings to increase efficiency as workload pressures increased with an improving economy. Together the Stormwater Coordinators (which have taken the place of the former Stormwater Action Team) exceeded the measurable goals for FY2013-14. The City has effectively worked to further incorporate ad hoc task groups to improve effectiveness with key staff people on smaller implementation projects.

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 Bend Code Title 16 a comprehensive management stormwater ordinance covering clearing, grading and erosion control on construction sites; stormwater management design standards and maintenance controls; illicit discharge controls; well drilling; and stormwater drainage utility. (See Appendix A of the FY2011-12 Annual Report for the full title).

In FY2013-14, the City focused on the finalization and adoption of the City's first formal Stormwater Master Plan. The Stormwater Master Plan will form a basis for and will be referred to by the City's first Stormwater Public Facilities Plan, a document being developed by the City to meet State land use OARs Goal 11. Once completed, the Public Facilities Plan will be incorporated into the Bend Comprehensive Plan, anticipated in FY2014-15. The City's focus on the finalization of the Stormwater Master Plan was determined to be effective as it resulted in Council adoption on August 6, 2014 by unanimous decision.

Effectiveness. The City met its measurable goals for all subtasks. Over the initial NPDES MS4 permit term, the City has successfully passed resolutions and an ordinance to set up the stormwater utility, adopted the improved standards and specifications, and adopted the new stormwater ordinance, Bend Code Title 16. The City continues to work in a thorough, planned approach to address stormwater improvement opportunities as they arise.

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 FY2013-14 remained at $4 per equivalent residential unit (ERU).

With the regulatory clarity provided by the City's first WPCF-UIC permit received in May 2013, in FY2013-14, the City actively worked to finalize the City's first formal Stormwater Master Plan that addresses both stormwater quantity and quality issues and needs. The project started in late 2006 and was expected to be complete in 2008; in fact, 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 completed an initial public draft for this long-standing project in December 2008, held two related informational workshops in February 2009 and received comments on the draft. Based on the comments received, and the makeup of the City's stormwater infrastructure, the City decided to place the project completion on hold until regulatory clarity with regards to UICs was obtained. In the meantime, the City worked to obtain the information needs suggested in the 2008 draft and the City worked to refine cost estimates for master planning strategies to better inform the final approach. With issuance of the WPCF-UIC permit, the City completed an internal rate study in FY2013-14 analyzing the increases needed to implement the draft Stormwater Master Plan for three different infrastructure improvement approach levels being considered. The City obtained public input on the Master Plan infrastructure improvement approaches and took them to City Council on May 7, 2014 for a preferred approach selection (see Appendix A). The final public draft Master Plan with the preferred approach was released for review in May 2014 and comments were taken through June 30, 2014. (See www.bendoregon.gov/stormwatermp for more details.

The City operates on a biennial budget. The FY2013-14 budget report related to stormwater was included in the FY2012-13 Annual Report in Appendix A.

Additionally staff has been reviewing additional innovative funding strategies, especially public/private partnerships. In FY2013-14, staff attended a series of webinars offered by the USEPA:

- Building Green Infrastructure Jobs and Health: The Prince George's County, Maryland Urban Stormwater Runoff Public Private Partnership (P3) model (January 13, 2014)
- Stormwater Management Incentives and Public Private Partnership in Philadelphia: Driving Affordable Green Stormwater infrastructure Retrofits on Private Properties (February 25, 2014) (See Appendix A).

Finally, staff kept abreast of federal and state rule changes that could impact or influence legal authority and requirements including pertinent Endangered Species Act proposed listing, and the EPAs proposed Waters of the U.S. Rule, the latter for which staff attended a USEPA webinar (see Appendix A).

Effectiveness. The City has successfully established a stormwater utility service charge, and began collecting fees in July 2007. The City collected $2.5 million in service charge fees in FY2013-14, and completed an internal rate study examining the needs for the next twenty years for consideration for the Stormwater Master Plan project. The City sought public input based on the results and conducted a full public review of the revised draft Stormwater Master Plan in FY2013-14 (see Appendix A). These efforts were effective given that in July 2014 the Stormwater Master Plan was revised based on the comments received, and the Plan was unanimously approved by the City Council on August 6, 2014. City leaders are planning to build on this information in FY2014-15 to pursue a rate increase approach sufficient to cost-effectively implement the Stormwater Master Plan and operate the utility. The City did explore a pilot public-private partnership project in the first half of 2014, but prevailing wage requirements made it less desirable on the small scale explored.

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. The City released the draft in October 2011 for full public review through 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 December 2012. 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 reissuance. Therefore this annual report summarizes efforts to implement both ISWMPs.

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. One full chapter in the APWA Manual focuses on stormwater and includes several water quality-related sections. The City successfully gained recertification in the spring 2011.

Annexations. In FY2013-14, there was one 34 acre parcel annexed into the City's UGB for the construction of a new middle school off of Skyliners Road on the westside of the City, approximate to Miller Elementary and Summit High Schools (see map in Appendix A).

Urban Growth Boundary. 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, which is continuing. 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 FY2013-14, is the eighth 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 which has been approved by DEQ as the management document for the WPCF-UIC permit. This is the first annual report submitted to DEQ for activities required by the WPCF-UIC permit. Descriptions of effectiveness are included under each task. Per the City's stormwater permits, the annual reports are due by November 1 of each year. 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. The review of the draft by the Stormwater Quality Public Advisory Group and internal departments helped improve the quality of the final document.

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. A copy of the most recent (October 2014) UIC registration list is included in Appendix I. This provides information on new UICs, as well as UICs that have been closed or retrofitted. The City's UIC facilities and wellhead protection areas are included on the City's mapping services website, using Geoblade, located at: http://www.bendoregon.gov/index.aspx?page=463. Additionally the City has street level imagery that staff can use for internal research purposes.

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 (See Chapter 10 for additional details).

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 4,755 dry wells; 967 active drill holes, and 9,749 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 permit under one facility, which has been helpful for maintaining the accuracy of the City's UIC database. With the receipt of the permit, some procedures have been modified to reflect the permit registration requirements.

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).

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

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 and stormwater quality staff participate on other city planning task groups as invited. 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. Efficiency could increase if the City could operate under just one Integrated Stormwater Management Plan 2022 rather than the dual plans given the permit reissuance timing, but the City anticipates a new Phase II permit in FY2014-15.

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 in December 2012. 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 City began implementing the ISWMP 2022 in FY2013-14 under the WPCF-UIC Permit that was issued in May 2014, 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. City staff are effectively meeting the initial performance standards based on the timeline adjustments noted in the ISWMP 2022 given the date of acceptance and permit issuance (please see Appendix A for an implementation status summary of performance standards within ISWMP 2022).

The City would request that DEQ consider the ISWMP (2006) to be fully implemented and to relieve the City from having to report on the ISWMP (2006) activities in future annual reports. The City requests that DEQ instead have the ISWMP 2022 be recognized as the current and sole stormwater management plan for the City's NPDES MS4 permit as it is already recognized for the WPCF-UIC permit, because the ISWMP 2022 represents the proposed future improvement tasks for the MS4 area.

The City has reviewed the ISWMP 2022 tasks and has no proposed modifications to the ISWMP 2022 itself. We do propose modifications to the City's UIC Stormwater Monitoring Plan however to improve our ability to collect enough stormwater to take samples at two locations (for more information, see Task IX.3).

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 FY2013-14.

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 how to keep updated about City Construction Projects including the Third Street Underpass project (September 2013); an article soliciting public input on utility rates (April 2014), and an article on the Stormwater Master Plan (June 2014). The flyer goes out with all of the utility bills (see Appendix B).

"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 in fall 2013.

The It's All Connected advertisement "Only Rain in the Storm Drain" was also included in the Central Oregon Builders Association (COBA) 2014 Directory and Preferred Contractors Buyer's Guide"; and the City included the new It's All

Connected "Save the Fish So We Can Catch 'Em Later" and "I'm Heron We Should Keep Our Waters Clean" along with "I Can See Why. Canoe?" advertisements in the Bend Park and Recreation guides (see Appendix B).

Targeted Mailouts. City staff actively participated in a multi-year statewide project through the Association of Clean Water Agencies to update two underground injection control pollution prevention brochures:

- Clean Water Tips at Home
- Clean Water Tips for Business and Industry.

The brochures include pollution tips for prevention of groundwater pollution. The Home brochure includes tips for auto care, yard and home care, managing waste; and the Business and Industry brochure includes tips for outside activities, floors and plumbing, storage areas, and work areas. The City of Bend tailored the brochures by including local contact information, and distributed the brochures with utility bills to all stormwater customers in the City (see Appendix D). They were also distributed, along with "Bend's Better Site Design Walking Tour," which was graphically redesigned and printed in FY2013-14, to the information centers at Utilities, City Hall, and Finance departments.

Central Oregon Rain Garden Plant List Supplement to Oregon Rain Garden Guide. City staff included the updated Central Oregon Rain Garden Plant List Supplement (2013) as part of the continued distribution of the "Oregon Rain Garden Guide" and "Xeriscaping™ in The High Desert" guides at Stream Stewardship Day (held in July 2013) (see Appendix F of the FY2012-13 Annual Report for a copy of the plant list).

Other Outreach/ Distribution. In July 2013, City staff included poster series outlining City activities including one for the "Stormwater Utility Program" at Quest at the Fest (see Appendix B). City staff updated the "What Are Your Stormwater Fees Paying For" fact sheet with current funding levels (see Appendix B). City staff distributed a reference guide entitled "Stormwater Management Terminology" to assist the public to understand stormwater related acronyms and terms with clear descriptions and photographs on the City's website and made it available at public meetings to facilitate communication. City staff also distributed training opportunity announcements by email and on the City's website (see Appendix B).

Information holders at public areas throughout the City (Boyd Acres, 15th Street,

City Hall, Finance Department) are stocked with one or more of the following:

- ACWA "Protecting Your Watershed" (English and Spanish)
- Considering Stormwater—Time and Moneysaving Considerations at the Conceptual Planning Stage
- ACWA Construction Site Stormwater Guide—Illustrated Best Management Practices*
- ACWA UIC brochures (Clean Water Tips for the Home and Clean Water Tips for Business and Industry)*
- APWA "P.W. Paws Rain of Terror" comic book*
- Bend's Better Site Design Walking tour—Ideas for Keeping water Quality in Mind When Developing Sites*
- Training Webinar Announcements
- Illicit Discharge Manual
- Pressure Washing and Surface Cleaning Brochure
- Oregon Rain Garden Guide with revised Plant List*

The City helped sponsor and had a booth at the 2014 Earth Day Fair and Parade, held on April 29, 2014. Stormwater-related handouts made available at the booth included those in the list of above with an asterisk next to them, along with It's All Connected" magnets. In their 2014 sponsorship opportunity outreach, Earth Day organizers anticipated over 2,500 participants at the event.

Staff also gave a stormwater pollution prevention presentation at the March 2013 Oregon Association of Water Utilities Annual Technical and Management Conference held in Sunriver (see Appendix B). The conference was attended by drinking water utility personnel from across the state.

City staff 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 brochures entitled "Fat Free -- Sink to Sewer" and "Do you have FOG in your home?" that also discuss the importance of keeping FOG out of the storm drains (see Appendix B and webpage at http://www.bend.or.us/index.aspx?page=190). A public service announcement regarding the FOG campaign is also included on the City's public works telephone "hold" music. The City has been focusing on reducing Fats, Oil and Grease from restaurants and other food industries recently.

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.

The City choses 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 12 additional views this year, up to 239 views since December 2008. The Vactor Truck Stormwater Operations video has had 5,310 views in the four years it has been on the channel. The "3rd St. Stormwater Project" that was published on October 31, 2013 has received 217 views on the channel. The video includes information on drill hole spill control measures as well. To measure the effectiveness of the "It's All Connected" campaign, the City conducted a pre- and post-survey (see annual report FY2011-12), and the City began planning to implement the public education strategy adopted 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 announces new- and redevelopment-related stormwater webinar workshops through the City's stormwater webpage, as well as posting outreach materials (www.bendoregon.gov/stormwaterbmp) and Master Plan updates (www.bendoregon.gov/stormwatermp and Appendix A). There was also a site for the Third Street Underpass project (see http://www.bendoregon.gov/index.aspx?page=645). The City also continued to use other communication tools, such as Facebook, Twitter, and an internal City intranet site to distribute announcements.

Effectiveness. Use of the website has increased over the past year (see table on page 3-5). The exception to this is the Regulatory page, which makes sense given that the WPCF-UIC permit was issued in May 2013 (FY2012-13), one of the first in the nation to be issued, and citizens were becoming more accustomed to Bend Code Title 16. 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 from that link were received during FY2013-14. Over 190 people are on the City News email update list. The City has over 5,698 likes in FY2013-14, up from 5,402 Likes on its Facebook page last year and 2,921 followers in FY2013014, up from 1,177 followers the previous year on Twitter.

Web Page View Comparison (FY2012-13 to FY2013-14)

Date Range	Visits	Page Views	Avg Time	% Exit
City of Bend Stormwater : What's New?				
7/1/2012-6/30/2013	63	374	0:01:50	15.51%
7/1/2013-6/30/2014	45	248	0:01:33	18.15%
% Change	↓ -28.57%	↓ -33.69%	↓ -15.87%	↑ 17.02%
City of Bend Stormwater : Business and Home Resources				
7/1/2012-6/30/2013	75	289	0:01:08	25.26%
7/1/2013-6/30/2014	261	601	0:01:42	40.27%
% Change	↑ 248.00%	↑ 107.96%	↑ 50.52%	↑ 59.42%
City of Bend Stormwater : Get Involved!				
7/1/2012-6/30/2013	18	102	0:00:53	16.67%
7/1/2013-6/30/2014	12	69	0:01:20	17.39%
% Change	↓ -33.33%	↓ -32.35%	↑ 52.63%	↑ 4.32%
City of Bend Stormwater : Regulations				
7/1/2012-6/30/2013	56	191	0:04:18	27.75%
7/1/2013-6/30/2014	52	179	0:01:21	26.26%
% Change	↓ -7.14%	↓ -6.28%	↓ -68.39%	↓ -5.37%

A portion of the Bend Community Survey (DHM, January 2013) focused on modes that people used to obtain information. 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 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 continued to perform outreach on the stormwater utility's major capital improvement project, the Third Street Underpass project on October 31, 2013. The segment was shown on City Edition on cable television COTV Channel 11 on Bend Broadband at 6:30 p.m. on Monday, Wednesday and Friday and on closed circuit TV in City Hall both during the month of November 2013 along with being made available on YouTube (http://www.youtube.com/watch?v=ULPcVNJAqg4).

Effectiveness: The City's You Tube News channel has 331 subscribers, and the

City Edition broadcast has been viewed 219 times on You Tube, along with the broadcasts on cable television and within City hall for the month of November 2013. COTV is shown on BendBroadband in Bend, Redmond, Sisters, Black Butte Ranch, Tumalo, Suniriver, and Powell Butte. The Bend DMA rank which covers this area and beyond is 193 with a cable penetration of 60% (Zolo Media, 2014).

The Stream Stewardship Day event held in July 11, 2013 this year to take advantage of better weather received coverage on KTVZ 21 television and by the *Bend Bulletin*. (See Chapter 4.0 for more details).

The public, including school children, were able to view stormwater equipment and the watershed diorama along with other public works equipment during Quest at the Fest , which was located in the City Hall parking lot area adjacent to the Bend Summer Fest on July 13, 2013. Volunteers worked the watershed diorama.

The City released several stormwater quality related news releases/articles in FY2013-14. *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 unless otherwise noted):

- Keep Track of City Construction Projects (September 2013);
- Help Us Modernize Our Utility Rates (April 2014);
- Finalizing the City's Formal Stormwater Master Plan (June 2014).

Newsletters in the second-half of 2013 also included announcements of the availability of the Drinking Water Quality Report (July 2013), Bend Central District Multi-modal, Mixed Use Area (October 2013), and Snow Removal (December 2013).

The following City media releases related to stormwater were released (see Appendix B:

- Annual Water Quality Report (7/1/2013)
- Announcements of the Stream Stewardship Day in the *Source Weekly* by way of sponsorship of the Upper Deschutes Watershed Council event, held Thursday, July 11, 2013 (see Appendix C).
- 3rd St. Underpass Project Officially Underway (7/11/2013)
- Announcement of Stormwater Master Plan public open houses in *Source Weekly* (April 2014) (see Appendix A)
- Reed Market Road Phase 2 Construction Begins in June (5/6/2014)
- Annual Water Quality Report (6/30/2014)

Other stormwater-related media articles included:

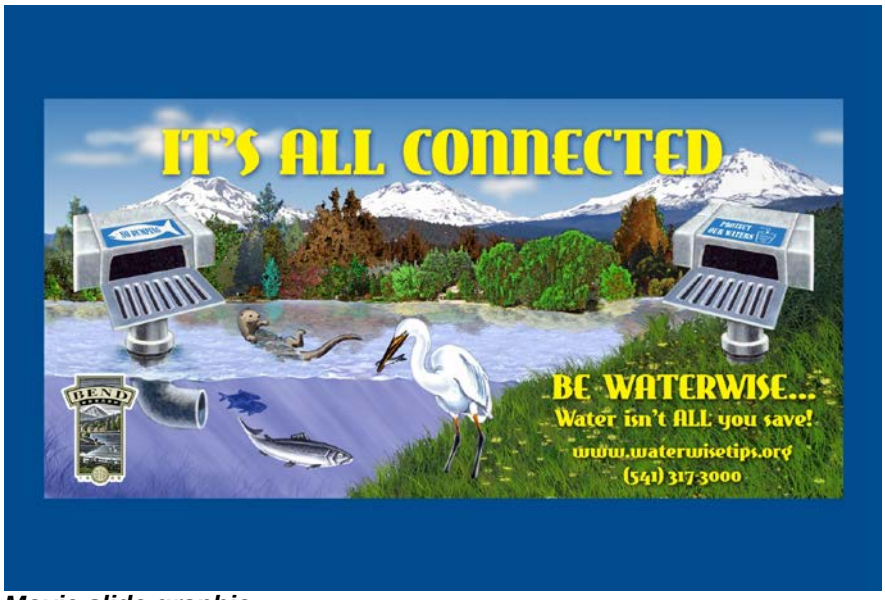
- Bend *Bulletin* News Article, "Deschutes water tests OK, but not so

good for aquatic life," Dylan J. Darling, (August 25, 2013) (see Appendix B).

- Bend *Bulletin* News Article, "Third Street Underpass Detour" (September 12, 2013) (see Appendix B).
- Bend *Bulletin* News Article, "Reed Market Road Construction—Next Phase Begins in June," Monica Warner, (May 9, 2014) (see Appendix F).
- Bend *Bulletin* News Article, "Third Street Underpass Staying Dry" (June 3, 2014) (see Appendix F).

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.



Movie slide graphic.

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). 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.

Bend Film Festival
AGE OF ATTENDEES

0-29:	14%
30-44:	32%
45-64:	43%
65+:	11%

(Source: Bend Film Festival, 2014.)

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 2014 sponsorship packet, the Bend Film Festival routinely brings in 5,000+ attendees, 80% of whom are from the Bend Area for approximately 80+ screenings of movies over four days at 6 venues. The gender breakdown is 68% female, and the age of attendees is broken out below. Education levels of attendees indicate that 38% hold post-graduate degrees and 96% attended college. 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 2013-14, the diorama was used at Stream Stewardship Day and Quest at the Fest both held in July. The diorama was also lent to the Upper Deschutes Watershed Council for their school outreach and to individual teachers, including one from High Lakes that used it for two classes in Spring 2014.

Effectiveness. As in past years, the diorama has been well received as an interactive, visual, three-dimensional learning tool. Using the unit at Quest at the Fest, which is a city-wide event taking the place of Public Works Day, was especially effective as it draws families in to learn about pollution prevention in an enjoyable manner. The City is looking 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)

The new ISWMP 2022, containing the completed performance standards, was approved by DEQ as part of the WPCF-UIC permit issuance. Baseline implementation status is being met in full. A summary of 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

DIORAMA AND COMMUNITY ORGANIZATION PARTNERSHIP EFFECTIVENESS

Thank you again for the use of the City of Bend Watershed Model. It is such a useful hands-on tool. We were able to use it with 6 different classes this year for our watershed curriculum. With each class having about 30 students, the model was used by about 180 kids this fall! It is a great way to help them understand how our watershed functions and how our streams are impacted by our actions.

Kelly Beck *| Education Assistant*
Upper Deschutes Watershed Council
(Email, Friday December 13, 2013)

for the WPCF-UIC permit in FY2012-13, and has begun implementing the new performance standards as part of the ISWMP 2022. A summary of initial implementation status efforts is included in Appendix A. The City is on 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 Stormwater Quality Public Advisory Group (PAG) to develop program outreach goals and objectives for a new outreach plan. Staff worked with the PAG to finalize the strategic outreach plan in November 2013, and began implementation thereafter (see Appendix B). City Stormwater Program staff are also working with the other utilities to coordinate City utility messages.

All implementation goals noted in the strategic outreach plan for FY2013-14 were met:

- Development of at least half the fact sheets to support tail-gate meeting training for City Staff, and initial distribution (Message I) (see Appendix G)
- Distribution of Acronyms and Abbreviations at trainings and open houses (Message II)
- Research of new/additional dioramas (Message II)
- Advertising at Bend Film Festival and Munch n Movies (Message II)
- It's all Connected banner message outreach opportunities researched with baseball league, circus center , and indoor sports center (Message II)
- Single-family Residential Site Plan and ACWA Erosion and Sediment Control guide included on City's website (www.bendoregon.gov/stormwaterbmp) and distributed by private engineering (Message II)
- Development of a commercial example site plan began with a draft undergoing review and comment (Message II)
- A pilot incentive program entitled "Stormwater Facility Maintenance Assistance Program" was developed in late FY2013-14 and sent downtown to purchasing for review and release in July 2014 (Message IV)
- Work to improve illicit discharge coordination and reporting internally began in FY2013-14 with development of the fact sheets with input from operation staff. Additionally work was completed to get scheduled for a public works wide safety meeting (scheduled for September 2014 (Message V)

- City staff contracted with a consulting firm to assist with TMDL preparedness and modified the scope of work in early 2014 to include a review of best management practices and structural controls specific to local stormwater pollution concerns (Message V).

Effectiveness. The City met its goal of completing and began implementing the Strategic Outreach Plan for stormwater education. An effectiveness evaluation for previous campaigns was analyzed as part of the strategic outreach plan development, and the City was effective in participating in a statewide effort to analyze outreach campaign effectiveness through the development of the DHM report for ACWA. The coordination of messaging among utilities is taking more time up front, but with the promise of improved efficiency and clear messaging over the long-term.

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) and ISWMP 2006 Task III.3. City News Broadcast Stormwater Quality Messages and Press Releases (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) and Appendix A.

Summary Assessment of Effectiveness

The City participated in a statewide research project about stormwater behavior prepared for the Oregon Association of Clean Water Agencies by DHM research, entitled, “Research Summary About Stormwater Behavior,” (DHM Research, February 2014), using research sources in including two from Bend, Oregon. The review covered values, behaviors, barriers and motivations, media review, and gaps in research (see Appendix B). The results find that:

- Protecting water is consistently a high priority for Oregonians, and protecting *drinking water* is the most paramount water issue.
- Oregonians have limited understanding and awareness of stormwater, but "their individual perceptions and behaviors related to stormwater are specific to the source," (DHM, February 2014).
- To be effective, connecting stormwater behavior changes to other important values such as drinking water, children and pets; saving money and discounts, and outdoor recreation can be useful.
- Targeting mothers, having community partners be spokespeople, using a positive tone, and the Keep It Simple (Kiss principle) by listing easy, specific steps to behavior change improves effectiveness. (See Appendix B for full report).

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. The tools provided by the DHM report will help the City improve targeting of its messages as it continues to implement the Strategic Outreach Plan.

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 2013-2014:

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

During FY2013-14 the Stormwater Quality Public Advisory Group (PAG) met 6 times providing input on the annual report, Public Education Strategic Plan, public outreach strategic planning initial input and stormwater master plan (See Appendix C for a list of PAG members, and meeting agendas/summaries).

In addition to the PAG, the City brought the Stormwater Master Plan before the Council-appointed Infrastructure Advisory Committee (IAC). The IAC is convened to provide recommendations to City Council on infrastructure related issues. City staff sought recommendations from the IAC on the Infrastructure Improvement Approach on March 24, 2014 and on the Stormwater Master Plan at the meeting on June 23, 2014 (see Appendix C).

Effectiveness. The City exceeded 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 FY2013-14 the City held two public open houses for the Stormwater Master Plan project (see Appendix A and B). City staff provided a brief introductory presentation, answered questions and took comments especially with regard to

the infrastructure improvement approaches. The City then took the comments to the City Council work session on May 7 and received input from Council on the preferred approach. The Stormwater Master Plan revised draft incorporated the preferred infrastructure improvement approach and was released in late May through June for public comment.

Effectiveness. Although no public meeting element was required in FY2013-14, the opportunity to meet with the public on the Stormwater Master Plan project helped improve the project and improve its chance of success. Comments received by the public were incorporated and responded to in a revised July 2014 version for Council consideration.

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

The City's Volunteer Coordinator is working with several members of the community including high school students, landscape architects, 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 to address a stormwater localized flooding problem. In a project that started in FY 2012-13, work continued in FY2013-14 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. Project progress is also captured through City Edition videos, including this one from November 2, 2013: http://www.youtube.com/watch?v= JvOr1R5-DNE&list=UUMC_SVKeVflHjVdbfQEl0eg as well as media coverage (see Appendix C). The project is expected to be completed in FY2014-15.

City Materials for the Volunteer Fair

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. Additional information about the Bend Beautification Program is included here: http://www.bend.or.us/index.aspx?page=139. The volunteer, James Newkirk, who was recognized by the City Council in December 2012 for putting in over 100 hours of volunteer service marking storm drains that resulted in a front page newspaper article continued marking drains this year. His recognition last year inspired the consideration by a local Boy Scout to explore coordinating a large storm drain marking effort as an Eagle Scout Project. City staff met with the scout and reviewed his proposed plan in FY2013-14.

Collection of trash brought to shore by local divers and volunteers during Stream Stewardship Day, July 2013.

Watershed diorama at July 2013 Stream Stewardship Day.

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 (UDWC), and was held on July 11, 2013. The event included REI and the Old Mill District as sponsors as well, among others who helped advertise the event (see Appendix C). 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.

The City also worked in late spring 2014 to help promote the 2014 Stream Stewardship Day, scheduled for late summer 2014. With the City helping to sponsor the 2014 event early, the UDWC was able to increase its resources as a result of a matching grant from the musician

Jack Johnson to promote the event. The 2014 event was delayed to August to coordinate with the Jack Johnson concert to increase the reach of the effort.

Other volunteer efforts unrelated to City efforts occur as well. For instance, REI workers adopt a stretch of the river to keep clean. Additionally, of their own volition, the Bend Paddle Trail Alliance conducted a cleanup of Mirror Pond on March 8, 2014 as well.

Effectiveness Evaluation. The Public Advisory Group (PAG), 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 is working to fill vacancies on the PAG for the energetic group. Meanwhile, City staff worked effectively through the PAG, Infrastructure Advisory Committee (IAC), and Bend Economic Development Advisory Board (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 FY2013-14, the 296 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 in 2012 earned both Council recognition and a front page news story in the Bend Bulletin, which helped spread the pollution prevention message and the development of a storm drain marking Boy Scout Eagle Project. The City staff met with the Eagle candidate during F2013-14 and helped him develop his project, which is currently under development and anticipated to take place in late summer/fall 2014.

School Outreach. The City worked through the Upper Deschutes Watershed Council to help outreach to schools by restocking and repeatedly lending out the City's watershed diorama for their watershed education efforts, which culminate in a watershed summit for students (see http://www.nuggetnews.com/main.asp?SectionID=8&SubSectionID=8&ArticleID=22358). Additionally, the City also lent out the diorama and provided worldwide monitoring day kits to individual teacher's and schools upon request, including Highland School in FY2013-14 that was used by two classes.

City staff also participated in interviews by the classes of Rimrock Expeditionary Alternative Learning Middle School (REALMS) that culminated in a documentary prepared by the students on the Deschutes River and Tumalo Creek. The documentary was aired at the Telluride Film Festival hosted by the Environmental Center on February 21-22, 2014. (http://www.youtube.com/watch?v=bwB44tC71Ds&feature=youtu.be)

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 continuing to have 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 2013-14 to address illicit discharges.

Tasks Completed (ISWMP (2006)

The following tasks are tasks conducted during FY 2013-2014:

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

In winter 2014, targeting business that have UICs, City staff coordinated the printing and mailing the APWA Clean Water Tips for Business and Industry Brochure to all commercial businesses within the City. The brochure contained information on UIC regulations and provided BMP recommendations to help keep stormwater clean on commercial sites (see Appendix D).
Staff also helped develop and mail an APWA Clean Water Tips at Home Brochure to all single family residential stormwater customers within Bend. The brochures were included in the January/February stormwater utility bills (see Appendix D.) Over the past couple of years, City staff had actively participated on the subcommittee to develop the brochures, which involved refining and updating older versions, as part of a statewide effort. Both brochures were adapted to include local contact information.

The City continued to distribute the Illicit Discharge Minimization BMP Manual (see Appendix D of the FY12-13 Annual Report) and the illicit discharge flyer as educational outreach as part of illicit discharge follow-up procedures. See Appendix D for a copy of the violation handout and a summary of illicit discharge response actions addressed in FY2013-14.

In FY2013-14, the City provided an *"It's All Connected"* movie slide to be shown prior to the start of multiple movies at the October 2013 Bend Film Festival, and the 30 second public service announcement at intermission at Munch 'n' Movies in August-September 2013. The "It's All Connected" movie slide and video, and other outreach all include the phone number to call in to report illicit discharges (see Chapter 3).

In June 2013, staff purchased additional educational outreach tools, including funnels that target home and automotive business customers with the message: "Keep Our Waters Clean! Properly recycle used motor

oil." And provided the www.waterwisetips.org website along with the City's main number for reporting illicit discharges. The City also purchased a stress ball water droplet that states: "Only Rain in the Storm Drain!," gave the City best management practices website (www.bendoregon.gov/stormwaterbmp) and stated "See an illicit discharge? Call: 541-317-3000." These arrived in time for distribution at early FY2014-15 events.

Effectiveness. The City exceeded its goal of conducting outreach to 50% of businesses within a specific segment by distributing the APWA Clean Water Tips for Business and Industry Brochure to all known businesses within Bend. A significant number of businesses in bend use UICs onsite to control stormwater runoff, to the brochures had wide applicability. The best management practices themselves included in the brochures are also protective of surface water quality when implemented.

The City continued to use its tracking system, maintaining a spreadsheet of stormwater-specific follow-up actions (see Appendix D), tracking 38 events in FY2013-14. 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.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 (see picture in FY2012-13 Annual Report Task V.3). City design standards now require a permanent stamp on all new storm drain covers to delineate stormwater facilities in an educational manner.

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 296 markers in FY2013-14 (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)

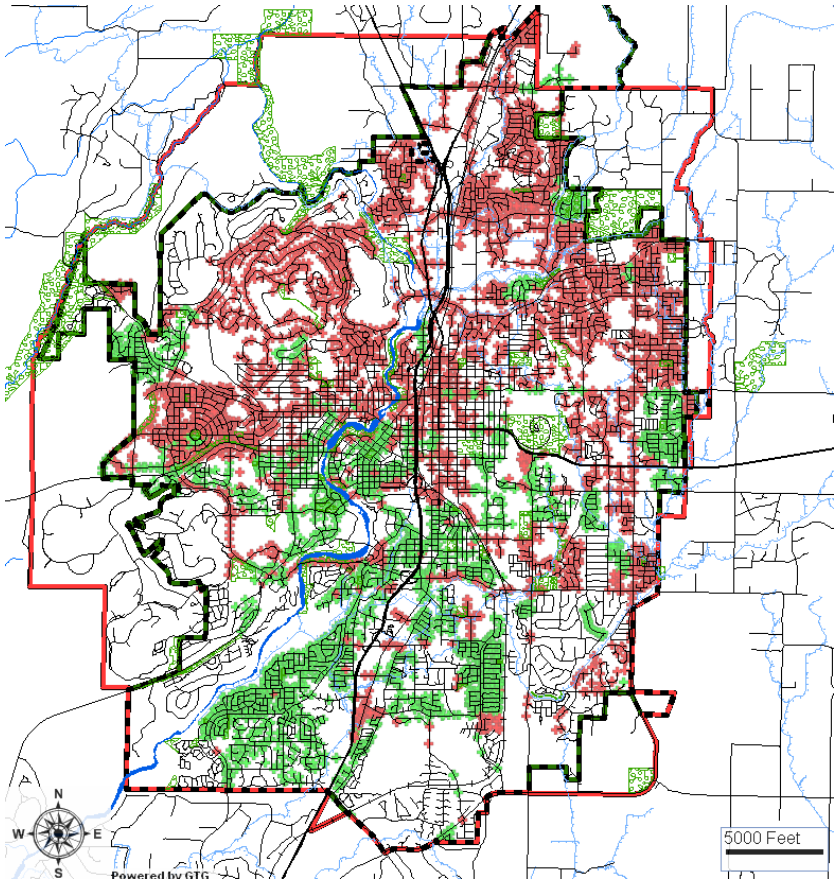
Stormwater related material is located in a central location at: www.bendoregon.gov/stormwater. In FY12-13 the City added a line specific to stormwater on its online Citizen Service Request Form (CSR), that lets the public electronically submit Illicit Discharge complaints along with several other commonly reported issues. The

checkbox reads: Report Pollutants in Stormdrain/Illicit Discharge (email photos to: dbuchanan@bendoregon.gov) (see figure on page 5-5).

Additionally, the City continues to post on the website contact information to report illicit discharges; 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/stormwaterbmp.

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 areas (shown in green) of markers installed during initial NPDES permit period. 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 but also per volunteer request (see map at left).

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



Storm Drain Marking Status (July 2014).
(Installations shown in green).

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 that includes the piped system, using Geoblade, located at: http://www.bendoregon.gov/index.aspx?page=463. Additionally the City has street level imagery that staff can use for internal research purposes. In

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

FY13-14 City staff collected and updated drywell depth measurements for 4,570 drywell facilities and incorporated the information into the City's INFOR electronic tracking 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. The inclusion of best known locations of public and private wells along with time of travel and buffer overlays also helps citizens with UICs better understand their locations to assist them in their own regulatory compliance and water quality protection efforts.

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 ordinance. In FY2012-13 the City finalized and began distributing the Illicit Discharge Best Management Practices Minimization Manual. A copy of the manual is available in Appendix D of the FY2012-13 Annual Report. Additionally as part of the ordinance effort, interdepartmental staff worked through implementation roles and responsibilities in early to mid-2012. The Stormwater utility takes primary responsibility of illicit discharge inspection response and follow-up.

Effectiveness. The City has successfully developed the Illicit Discharge Manual that is referenced in the stormwater ordinance, Bend Code Title 16, and has continued the implementation and education process. Reports of illicit discharges are continuing to increase, 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 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.

On April 29, 2014 City of Bend public works staff received training on hazardous waste spills and proper disposal. The presentation included mention of stormwater illicit discharges. A copy of the meeting agenda, presentation and sign-in sheets are available in Appendix D. Staff also schedule an additional specific training for recognizing and reporting illicit discharges and spill control to occur in September 2014. In addition to the safety meeting all new public works staff are trained through watching the video "*Storm Watch, Municipal Storm Water Pollution Prevention"* and they take a test/certification on Compli that they have completed the effort. The video covers the following segments:

- Good Housekeeping & Spill Prevention
- Vehicle & Equipment Washing
- Vehicle & Equipment Maintenance
- Spill Reporting & Response
- Street Maintenance
- Outdoor Storage of Materials & Wastes
- Landscaping & Lawn Care.

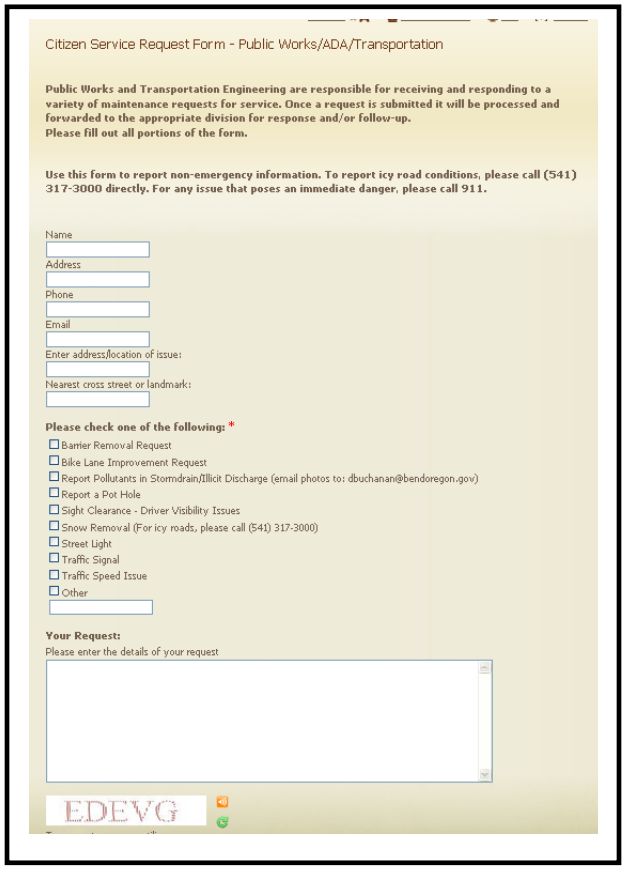
Staff also conducted dry and wet weather inspections of the City's 15th Street and Bod Acres corporation yards (see Appendix G).

Effectiveness. The City continued to use its tracking system, maintaining a spreadsheet of stormwater-specific follow-up actions, tracking 38 events in FY2013-14 (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. Most times initial outreach and education resolve the issue. In FY2013-14, one formal Notice of Violation was provided to a business whose product was blowing off site into the City storm drains (May 2014), and one additional notification letters were sent.

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.

The City continued to utilize the Citizen Service Request (CSR) from to the City's webpage (www.bend.or.us/index.aspx?recordid=133&page=26) but modified it slightly to improve clarity for use for reporting illicit discharges (see figure at right). This form allows the public to electronically report Illicit Discharges directly. The completed form is automatically emailed to stormwater program staff for follow-up.


Citizen Service Request Form - Public Works/ADA/Transportation

Public Works and Transportation Engineering are responsible for receiving and responding to a variety of maintenance requests for service. Once a request is submitted it will be processed and forwarded to the appropriate division for response and/or follow-up.
Please fill out all portions of the form.

Use this form to report non-emergency information. To report icy road conditions, please call (541) 317-3000 directly. For any issue that poses an immediate danger, please call 911.

Name
Address
Phone
Email
Enter address/location of issue:
Nearest cross street or landmark:

Please check one of the following: *
- Barrier Removal Request
- Bike Lane Improvement Request
- Report Pollutants in Stormdrain/Illicit Discharge (email photos to: dbuchanan@bendoregon.gov)
- Report a Pot Hole
- Sight Clearance - Driver Visibility Issues
- Snow Removal (For icy roads, please call (541) 317-3000)
- Street Light
- Traffic Signal
- Traffic Speed Issue
- Other

Your Request:
Please enter the details of your request

EDEVG

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: http://www.bendoregon.gov/index.aspx?page=198). 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. The City improved its reporting mechanisms in FY2013-14 with improvements to the CSR forms. As part of that effort, City staff looked into smart phone apps to enhance reporting of illicit discharges both on a statewide basis and on a local only basis, and decided that upgrading the existing CSR form was the best approach. Part of the reason for this decision is that the City also has a BendVoice.org website for the whole City wherein we ask for ideas and input on how we can be "the best managed City in the country." Feedback is channeled to the communications department and the seek input from individual staff as warranted. Whereas, the City continues to educate staff and the public to be aware of and report illicit discharges, the focus in FY 2013-14 was 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 continues 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 continued use of its 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 but he had to leave in FY2013-14 due to a promotion involving extensive travel. 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 hired a water conservation program manager in FY2013-14, and the position focuses on revitalizing the waterwise outreach and education program including focusing on outdoor irrigation and landscape water efficiency. These efforts included educational outreach on City Edition regarding efficient watering systems (see http://www.youtube.com/watch?v=-sukKxVuRZk), which helps reduce dry weather flows.

Effectiveness. The City has established some contacts with OLCA members that are helpful for both in refining outreach to landscape contractors, and the outdoor water conservation information works to help minimize dry weather flows.

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 but not yet accepted as part of the City's NPDES permit reissuance that remains in negotiation. Performance standards implementation began in FY2013-14 based on the timing of the WPCF-UIC permit issuance. A summary of Performance Standards implementation status is available in Appendix A.

Effectiveness. The City has started implementing the new performance standards as part of the ISWMP 2022 and is fully compliant with the scheduled implementation 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 FY2013-14, the City provided education and verbal warnings along with one formal written notices of violation 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 focused on improving documentation and enforcement procedures for Illicit Discharges. The City drafted an enforcement plan and is working with key stakeholder to finalize this plan now that with implementation experience staff has recognized the need for refinements. This effort is scheduled to be addressed in FY2014-15. The City did effectively make improvements to the online citizen service request form and has improved pathways in FY2013-14 for stormwater program staff and operations staff to be properly notified. Stormwater staff are also seeing improvements in spill response notification from fire and water/wastewater utilities.

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 to refine the education and implementation of the 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. As the City moves into a period of growth, staffing pressures increase. As a result, department heads have asked for a review of roles and responsibilities for implementing portions of Bend Code Title 16, especially with respect to constructions issues. This is occurring and will continue into FY2014-15.

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

In FY2013-14, the City provided the "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 project proponents to help with implementation of Bend Code Title 16 (see FY2012-13 Annual Report, Appendix E for copies).

City staff also provided copies of the Oregon Association of Clean Water Agencies (ACWA) "Construction Site Stormwater Guide," an inspection field 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.

City staff have placed several construction site references on its website: www.bendoregon.gov/stormwaterbmp. The references include, in addition to the three named above, the following links:

- Example Drainage Plan - Single Family Residential
- Central Oregon Stormwater Manual
- Maintain Construction Site BMPs Poster
- Erosion and Sediment Control Fact Sheet
- Grading Clearing & Erosion Permit Flow Chart
- Drainage Submittal Flow Chart
- Sample Site Plan - Single Family Residential
- Stormwater Maintenance Agreement
- Construction Site Stormwater Guide - Illustrated BMPs (ACWA)

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 and IECA to produce cost effective high quality outreach materials.

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

In FY2013-14 grading and drainage ordinance compliance and questions were routed to Russell Grayson, City Engineer, 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, which can have the effect of stopping a project from progressing.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 FY2013-14, over 900 sites were inspected. The Community Development Department recorded 90 single family residential starts and conducted approximately 980 final inspections. Engineering inspectors provided another 120 inspections with 35 verbal warnings and no written warnings in FY2013-14 (up from 85 inspections and 8-9 verbal warnings in FY2012-13) to sites they inspect (commercial/industrial and public right-of-way). Six illicit discharge complaints addressed were related to construction or erosion control activities (see Appendix D)

Effectiveness. Both commercial construction activity and single family home starts increased significantly in FY13-14. Inspectors are providing verbal education and warnings construction site stormwater management. City staff will be reviewing and potentially revising roles and responsibilities to increase effectiveness in FY2014-15 given the increased work load is straining existing resources in the community development and engineering departments.

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

The City hosted webinars by the Center for Watershed Protection in FY2013-14. One of these focused on construction site education, entitled “Design and Construction of BMPs” that was held on Wednesday, April 19, 2014. This was advertised on the City’s stakeholder email list, to Stormwater Quality coordinators and PAG, as well as placed on the City’s website and front desk. A copy of the presentation and sign-in sheet are available in Appendix E.

Effectiveness. Between the webinars and on-site training on erosion and sediment control held last year, and the webinar held this year, the City has exceeded it biennial training requirements for this task. Of the four effectiveness evaluation surveys received after the webinar, the presentation was ranked 3.5 on a scale of 1-5 (with 5 being outstanding); the facility was ranked a 4.5 and the refreshments a 4. Staff have found that working with COBA increases participation by the development community. Staff will continue to look for opportunities to work with COBA to improve effectiveness in the future.

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 COSM (2010) is now part of the City's development rules, referred to in both the Standards and Specifications and Bend Code Title 16.

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 and is in full compliance with the first year standards 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 FY2013-14, no formal violations were given, but roughly 50 verbal warnings, no written violations and no future inspection delays for single-family residential sites were given. Of the six illicit discharge complaints related to construction or erosion control, educational materials were provided, a verbal warning for one was given, and cleanup activities were taken.

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. The adoption of Bend Code Title 16 provides adequate enforcement authority. Feedback from trainings is used to refine effectiveness of future trainings. The City develops and distributes new education materials as the needs presented themselves. The City is working to refine its draft enforcement plan, to improve it based on recent workload and experience and record-keeping needs.

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 2013-14:

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 at www.bendoregon.gov/stormwaterbmp.

Effectiveness. Obtaining DEQ review of the revised COSM (2010) and adopting the manual as part of the City's Standards and Specifications and Bend Code Title 16 has helped encourage its widespread use and provided the City enforcement authority to require its use. Other municipalities that have adopted the manual include Deschutes County and the City of Redmond so it is serving as a regional guide.

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. In FY2013-14 the City received 4 private development maintenance agreements. The agreements are recorded on the properties' title. (See Appendix F for an example).

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 continues 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.

The City laid the groundwork in FY2013-14 to provide a maintenance presentation to the Green Industry Conference, and is examining incentive programs for encouraging proper maintenance. The City also worked towards developing a program to encourage maintenance of private stormwater facilities through an incentive-based program.

Effectiveness. Having maintenance agreements will be useful for implementing Bend Code Title 16. Additional guidance on proper maintenance, perhaps adding visuals to the maintenance descriptions in the COSM or other guidance, may help improve understanding of proper maintenance. 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 FY2013-14, City staff reviewed current workloads and came to the realization that a review and reworking of roles and responsibilities for construction site inspections and other aspects of plan review are needed, given the workloads on the Community Development Department building inspectors and private engineers, and given additional reorganizations. The workload concerns were discussed at an EDISM meeting. With regards to reorganizations, in October 2013, stormwater quality program staff were transferred to utilities division. At the end of the fiscal year, stormwater operations staff were also transferred to utilities. A Growth Management Department was created downtown that includes transportation and long-range planners, and Public Works was planning for dissolution into two separate departments—the Utility Department and the Right of Way Operations and Maintenance Department. Given the workload analysis, requests, and reorganizations, the City plans a thorough review and update process in FY2014-2015. As part of this effort the City will review the

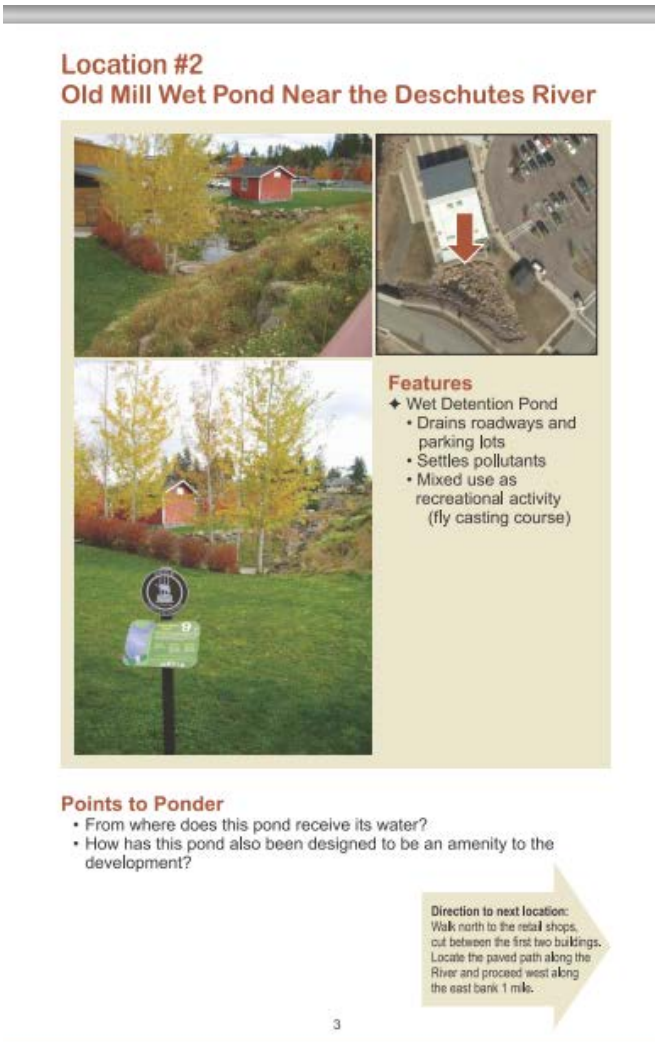
current implementation and enforcement plan, and may request additional staffing.

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 fine-tuning inspection and enforcement pathways given the significant reorganizations internally that continue. The City has been monitoring efforts closely and has widespread support to work to refine and improve the processes given the changes occurring at the City. The CDD incorporation of electronic plan review through E-Plans has increased plan review efficiency in the Planning Division by 69% from 2010 to 2013, per the Community Development Department July 1, 2012 to June 31, 2013 annual report, the most recent available. Planning applications have increased from under 200 in FY2010-11 to over 450 in FY2012-13.

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

The City updated the graphics on printed copies for distribution of Bend's Better Site Design Walking Tour, which provides an approximately 3-mile walking tour in the Old Mill and Farewell Bend and Riverbend Park areas of better site design features that help improve water quality by means of low impact development techniques. Nineteen sites are noted on the tour including bioretention swales, reduced parking footprints, pervious asphalt, green roofs, and riparian buffers.

The City provided several training opportunities on post-construction stormwater controls to



Example page from the Bend's Better Site Design Walking Tour.

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 for sign-in sheets and presentation notes). These were hosted by either the United States Environmental Protection Agency (USEPA) or the Center for Watershed Protection (CWP)).

- USEPA, "Building Green Infrastructure Jobs and Wealth" (January 13, 2014)
- CWP, "Reimaging the Parking Lot and Roadway as a Stormwater Practice" (February 12, 2014)
- USEPA, "Stormwater Maintenance Incentive's and Public Private Partnerships," (February 25, 2014)
- CWP, "The Role of Local Codes" (March 12, 2014)
- CWP, "The Life of a Stormwater BMP Practice/ BMP Maintenance" (May 21, 2014)
- CWP, "How to Pick the Right Vegetation for Bioretention" (June 111, 2014).

Additionally, City Stormwater Liaisons, Public Advisory Group members, and Stormwater Stakeholders have been kept informed of other 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 on May 15, 2014.

Staff updated with improved graphics and printed the Better Site Design Walking Tour Booklet to promote and educate about low impact development examples within Bend. 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

City staff actively participated in the development of two ACWA outreach pieces that were completed this year—the first being the "Clean Water Tips for Business and Industry," a document to help commercial business owner protect the groundwater supplies from stormwater pollution, and the second being the "Clean Water Tips at Home" (see Appendix F). Staff distributed these by type to all stormwater customers in Bend, including them in the utility bills in January/February 2014.

The City helped distribute "The Oregon Rain Garden Guide" and supplemental plant list for Central Oregon by providing copies at outreach events (i.e., Stream Stewardship Day and Earth Day). The full color guide includes information specific to Central Oregon. The water conservation landscape design website discussed under Task V-8 is also of assistance in preventing dry weather flows.

The City also used the Third Street Underpass Stormwater project to educate the public about low impact development, through outreach on City Edition, and in the Bend Bulletin (June 2014) (see Chapter 3 and Appendix F).

Effectiveness. City staff successfully met the requirements of this task. Having continuing education credits available helps draw the engineering community to the webinar trainings that provide access to national expertise.

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. Implementation efforts are included in the Performance Standards implementation status, available in Appendix A.

Effectiveness. The City is on schedule with implementing the baseline 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 transportation engineers to incorporate low impact development into the Riverside Reconstruction project, which was completed in FY2013-14 (see Appendix F). The project includes a sediment manhole upgrade to an existing outfall, and permeable pavers with a rock storage gallery along a roadway edge. City stormwater staff participated on the design team to address the stormwater runoff.

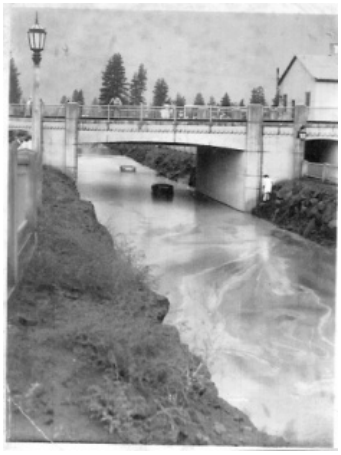
The City's first permeable pavers used in a roadway on the Riverside Project.

Additionally, FY2013-14 saw the construction of roadside swales along parts of Reed Market Road (see Appendix F). It also saw the completion of major construction on the Third Street underpass project improvements designed 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 on a City Edition broadcast, described under BMPVII-2, and with updates on the project website (see Appendix F).

Franklin's Corner community garden design

Significant progress was made on the Franklin Crossing Community Garden, which converts an unused grassy area with stormwater issues into a stormwater basin, and ADA compliant community garden, developed through community volunteer work. (See http://www.youtube.com/watch?v=JvOr1R5-DNE) It's completion is expected in FY2013-14.

Staff and a Stormwater Quality Public Advisory group member also participated on the Galveston Technical Advisory Committee and Galveston Task Frorce, respectively. The designs being developed as part of this grass roots effort supported by transportation engineering incoprorate stormwater improvement low impact development/green infrastructure concepts.



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)

A summary of the implementation status for the Performance Standards incorporated into ISWMP 2022 and accepted by DEQ under the City's WPCF-UIC permit is included in Appendix A. The City is currently on schedule with implementation.

The City met retrofit performance standards with the construction of the Franklin Community Garden, the Reed Market Project work that is underway, and particularly the Third Street Underpass Project and UIC Upgrades that included several low impact development features including planter boxes and bioretention swales in the upper watershed near the source of runoff, and a retention basin in the Colorado Interchange to help reduce long-time flooding issues (see pictures). The project resulted in the removal of four deep drill holes in an area determined to be a high-risk for spills. For more information on this project, see City Edition (October 31, 2013) http://www.youtube.com/watch?v=ULPcVNJAgg4&list=UUMC_SVKeVflHjVdbfQEl0eg.

Third Street Underpass Project upper watershed bioretention facility.

Third Street Underpass Project: construction on the regional retention basin occurring in

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 FY2013-14. The City has updated and actively implemented the development rules and legal authority to require and maintain adequate post-construction controls. The

City has begun implementing the performance standards and is meeting or exceeding the approved schedule.

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.

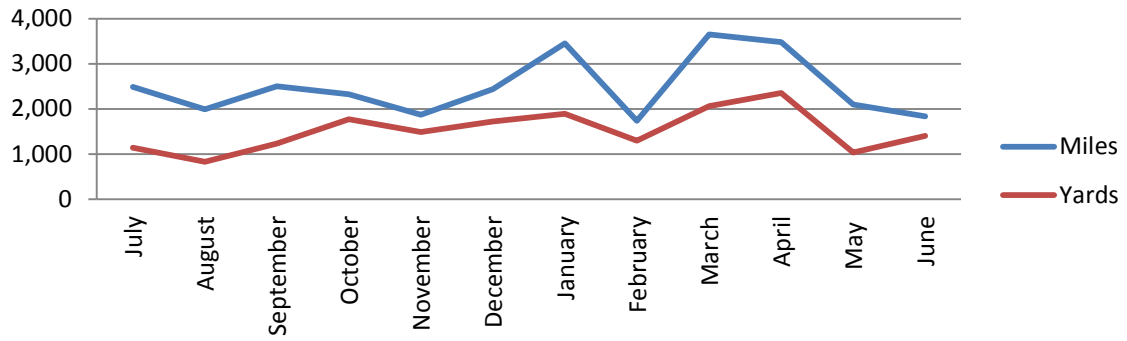
Tasks Completed (ISWMP (2006))

The following describes ongoing tasks or tasks completed during FY2013-14:

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 FY2013-14 they traveled 29,813 miles, directly removing 18,187 yards of material from the streets.

FY2013-14 Municipal Maintenance Sweeping



The City staff continues collecting additional data to help determine where build-up of sediment and litter is increased. The initial data elected has been used to optimize maintenance activities by means of creating maintenance

zones. The arterials and collectors tend to collect more winter traction debris and are therefore placed in zones for maintenance twice yearly (see Appendix G).

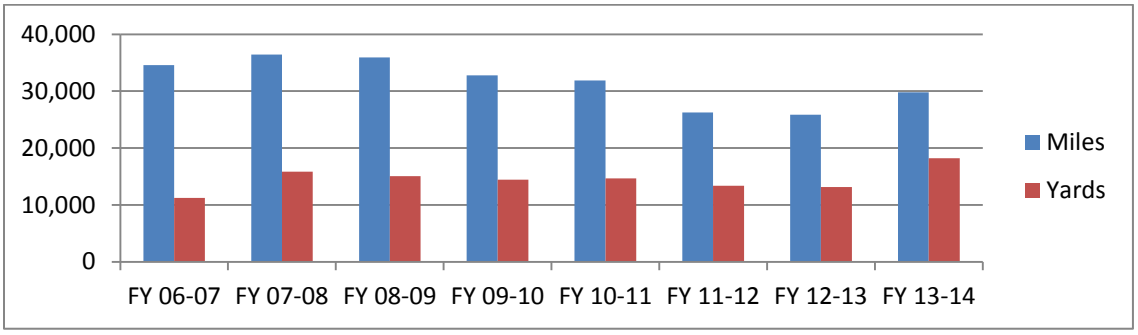
FY2013-2014 Municipal Maintenance Sweeping

Date	Miles	Yards
July	2,489	1,137
August	1,988	830
September	2,500	1,232
October	2,324	1,768
November	1,868	1,486
December	2,434	1,722
January	3,449	1,892
February	1,737	1,298
March	3,652	2,058
April	3,477	2,351
May	2,096	1,034
June	1,835	1,399

In FY2013-14, 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.

Effectiveness. The 18,187 yards of material collected in FY2013-14 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. For the second year in a row sweeper miles have increased along with yards removed. In fact the 18,000+ yards removed is the most removed in one year since the data has been reviewed (see table) showing increased efficiency. 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 FY2013-2014

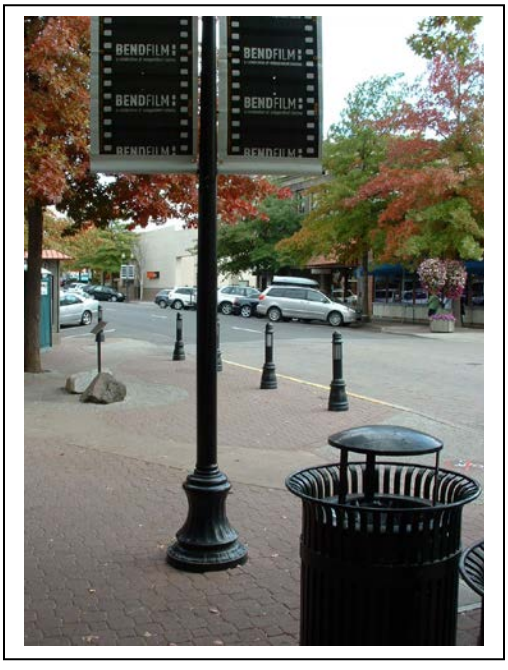


Task VIII.2 Parking Lot Sweeping (MS4/UIC)

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, in the early years of the stormwater program, 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 because they are completed together and collected in the same truck, 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)



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, such as using the updated plant list for Central Oregon plants that are suitable for both the climate and the inundation requirements needed to survive in infiltration areas.

Furthermore, the City continues to work with its Volunteer Coordinator to use volunteers to help maintain the landscape and medians. In the past this has included pruning and adding drain rock to the 27th street concave median between Highway 20 and Neff. The Volunteer Coordinator is also coordinating projects such as the Community Garden at Franklin and 9th street project. This project is replacing an underutilized landscape—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 being incorporated. Work began in FY2011-12 and continued in FY2013-14 with completion anticipated in FY2014-15.

Bear Creek Swale Maintenance

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. This project remains on hold while the City continues to looks for funding opportunities.

The City continues to implement the Standards and Specifications related to landscaping and low impact development landscape controls. See Chapter 7.0 for information on recent CIP projects.

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 and the COSM. 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.

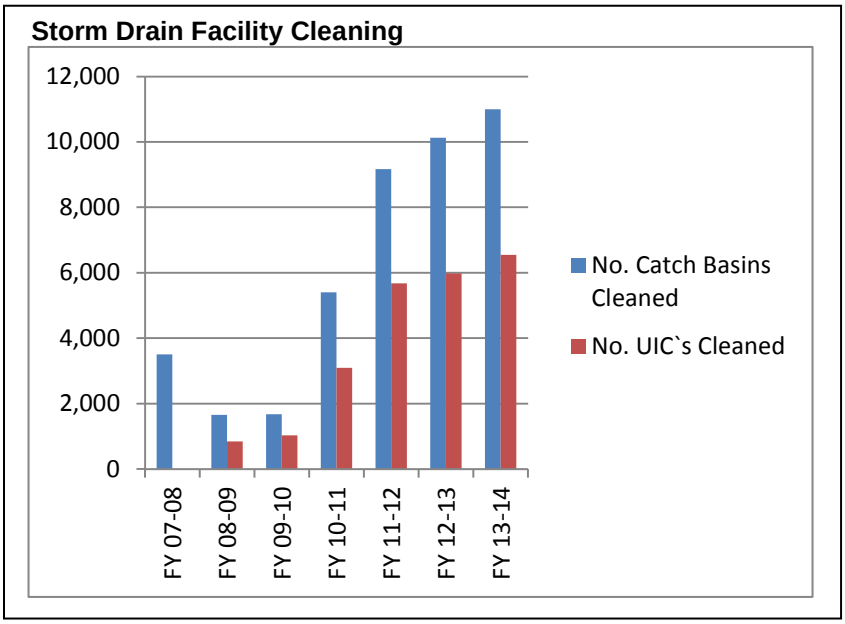
Task VIII.5 Improved Catch Basin/Storm Drain Facilities Cleaning (MS4/UIC)

Staff continued work to identify opportunities and improve maintenance practices.

Staff uses the Infor system to manage swales, catch basin and UIC maintenance records.

In FY2013-14, the four dedicated stormwater operations staff along with 2 seasonal temporary staff maintained 10,996 catch basins, and 6,547 UICs (dry wells and drill holes) removing 138 yards of material. In addition to routine cleaning and inspection, staff completed 506 maintenance repairs, including catch basin replacements, and unplugging clogged 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 install 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. (See City Edition (October 31, 2013) http://www.youtube.com/watch?v=ULPcVNJAqg4&list=UUMC_SVKeVflHjVdbfQEl0eg. at two minute mark or a visual overview of the recent spill control efforts.



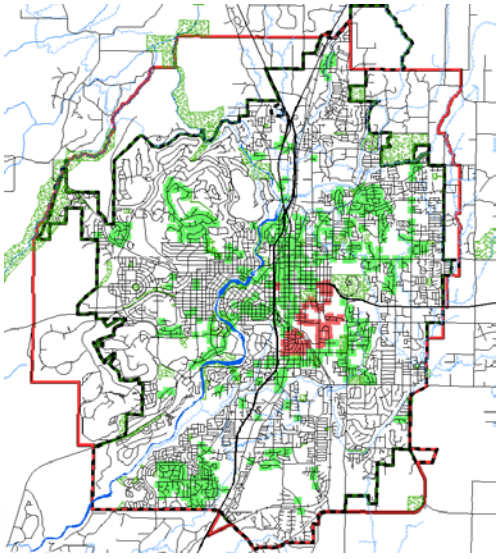
Staff have put aside a specific budget line-item to fund work on pipe replacement projects to repair deficiencies identified during the CCTV inspection project. This project got delayed a year in FY2013-14 due to the impending move of stormwater operations personnel to Utilities. The Utilities Department has a construction services (now repair and replacement) division and it was determined it would be best to start the program in that division rather than divide it after one year. Progress was made in refining which CIP-level project would be

competed in house in addition to the smaller project fixes that the operations and maintenance personnel were already doing.

Six City stormwater staff, including all dedicated operations crewmembers, participating in a webinar training by the USEPA on January 7, 2014 entitled "Best Practices for Green Infrastructure Operations and Maintenance (see Appendix G.)

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 138 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. The Green Infrastructure O&M webinar was well received. A formal evaluation survey was not conducted, but attendees were informally surveyed and their comments were recorded after the meeting. Comments included: "Good webinar." "One of the best we have had." And "Bill Hunt's section was especially useful."

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



Drill Hole Shut off Map
(areas in red have a valve installed)

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 FY2013-14 staff installed 94 6"-drill hole shut-off valves at high risk locations identified in the well head protection areas. The City plans to continue this program and install an additional 25 valves in FY2014-15.

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 April 30, 2014 (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 at both Corporation Yards (15th and Boyd Acres).

The City developed a series of 13 tailgate training; each training packet includes a sign-in sheet and informational fact sheet/ handout. The training is intended to be given by the supervisors and utility leads to their staff. The City worked with operations staff in FY2013-14 to refine these and will begin implement the new trainings in FY2014-15.

The City continues to require all new employees to complete the training entitled "Municipal Storm Water Pollution Prevention—Storm Watch." This consists of reviewing online videos and completing a short quiz covering best management practices for: good housekeeping & spill prevention, vehicle and equipment washing; vehicle and equipment maintenance; spill reporting and response; street maintenance; outdoor storage of materials and wastes; and landscaping and lawn care. In FY13-14 twelve new employees completed the training.

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.

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.

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). City staff reported 22 of the 38 reports of illicit discharges reported in FY2013-14. 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)

The City ordered and received funnels and water droplets for the July 2014 Quest at the Fest event. The water droplets contain a pollution prevention message "Only Rain in the Storm Drain" and a phone number to report illicit dumping. The message on the funnels was targeted at proper disposal of used motor oil.

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 FY2013-14 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 (see Appendix G). 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 quarterly. Stormwater staff have attended safety program inspection walkthroughs of city-owned corporation yards as well.

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 FY2009-10, the City completed a comprehensive CCTV pipe inspection project for areas that drain to the river and found no sewer illicit connections but some connections that need further review. In FY2013-14 City crews began collecting CCTV inspections data on all new stormwater pipes. The crews verify that storm pipes are installed per the approved plans. This initial pipe survey data will help provided base line information and will allow for quicker identification of illicit connections in the future. In addition to the CCTV pipe inspections, stormwater staff are trained to look for illicit connections as part of routine zone maintenance. The City found no illicit connections in FY2013-14.

Effectiveness. The FY2009-10 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 finalizing the first stormwater master plan that includes several projects to replace 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 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. The program is now coordinated through Commute Options (see Appendix G). In October 2013, the held the first Drive Less Challenge for 12 days.

In addition, the City Transportation Engineers embarked on a project to improve pedestrian and bicycle commute safety along Riverside Drive. The project underwent design and approval in FY2012-13 and construction was completed in October of 2013 (see Appendix F). 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, the first public installation of roadway porous pavement in Bend.

Effectiveness. Commute Options worked to coordinate better with statewide programs to improve efficiency by way of introducing Drive Less Connect in fall 2011. In FY2013-14 the City continued to promote the TDM program, and electronic reporting through the Drive Less Connect website. The 2013 Drive Less Connect event resulted in 152,814 driving miles and 5,607 gallons of gas saved in Central Oregon, according to Commute Options (see Appendix G). The bicycle improvement at Riverside were designed to strategically increase mobility options through the downtown corridor to the west of the river.

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 was scheduled to begin in FY2013-14. The City is meeting the baseline requirements on schedule. A summary of performance standards and initial implementation status is available in Appendix A. Copies of dry and wet weather observation forms for the 15th Street and Boyd Acres Corporation yards are included in Appendix G. City staff have developed and begun distributing training fact sheets to help explain performance standards and best management practices in a manner suitable to tailgate meeting trainings (see Appendix G).

Effectiveness. The City is effectively implementing the new performance

standards as part of the ISWMP 2022, having met the initial standards 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

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. 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.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 has continued to monitor in FY2013-14 and is working with a consultant to analyze the data collected since the UDWC report, and to prepare a template for annual reporting. This work is expected to be completed in F2014-15.

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 is now being be compiled and analyzed which should 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 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 http://www.bend.or.us/modules/showdocument.aspx?documentid=17014, which includes mention of stormwater pollution prevention efforts as well.

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 groundwater 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. The City is improving its efforts by working to analyze the data collected since the 2009 UDWC report.

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. A copy of the approved plan can found in Appendix H of the FY2012-13 Annual Report.

In FY2013-14, the City continued the use of 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 six locations. A summary of the City's stormwater monitoring data collected in and the Sample Condition Weather Data Summary table for FY2013-14 are included in Appendix H. For readability, this table does not include all analytes from past years.

Despite being in a severe drought the City exceeded its goal of collecting two stormwater samples at 5 of the 6 sample locations. The only exception was at the Ladera low volume residential monitoring site. City staff deployed a sampler at this site during 5 storm events in FY2013-14. Only one of those events generated enough runoff to collect a sample. The other four events did not fill up the sample bottles. Due to the lack of runoff from this site the City is formally requesting DEQ approval to relocate the Ladera monitoring site. The proposed replacement site is also located on Ladera Rd. north of Ferguson Rd. (see the maps in Appendix H). The proposed replacement monitoring site is equivalent to the existing site in both land use and traffic volumes.

The City made a minor adjustment to the sampling point at the Boyd Acres monitoring site. The catch basin identified in the monitoring plan has two pipe outlets, one pipe drains to the east drywell and one drains to the west drywell. During the first storm event staff noticed that majority of the flow from this catch basin was draining to the East drywell. The west drywell acts as an overflow to the east drywell, so City crews relocated the sampler to the east drywell to better collect first-flush events (see the Boyd Acres Sample map in Appendix H). The new sample location receives runoff from the same catch basin identified in the monitoring plan.

The City previously purchased six ISCO monitors to measure and log pipe flow rate (in gallons per minute (GPM)), and water temperature and can be set to call or page out at a specified flow rate. City staff deployed the ISCO samplers but experienced several issues with the flow monitors, including multiple false reading and page out during dry weather. Due to these reliability issues the ISCO were removed from the drywells and staff began working with the manufacturer

to identify and correct the programming issues. Stormwater staff are optimistic that they can resolve the issues and re-deploy the flow monitors in FY14-15.

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 FY2013-14 was conducting UIC monitoring per the approved monitoring plan. The City is continuing to see higher-than-expected readings of zinc at the Bend Airport UIC, but they are still below compliance levels. The City will continue to monitor this analyte closely 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. A summary of initial implementation status efforts is included in Appendix A. The City is on schedule in implementing the 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 is working to improve the plan based on year-one in-field experience to ensure an adequate number of samples can

be collected and is formally asking for regulatory approval of the proposed monitoring plan updates, to be submitted separately.

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 and is working to analyze this data.

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

Introduction

This chapter covers reporting of activities listed under Chapter 10 of the Integrated Stormwater Management Plan 2022 entitled "Underground Injection Controls," and Chapter 10 of the original ISWMP (2006) entitled "Drinking Water Protection Area Investigation, Delineation and Management." 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 FY2013-2014:

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 has completed the Source Water Assessment including updating the 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 FY2010-11 through FY2011-12, 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 PCS inventory and susceptibility analysis was completed in October of 2013 The City set up the final report as a lunch and learn presentation "PCS Update Presentation" for citywide staff to attend that was held on November 12, 2103 (See Appendix I for the presentation, attendance sheet, and complete report.) The report was reviewed and accepted by Oregon Health Authority Drinking Water Program.

Effectiveness: The City is continuing to improve its understanding of its groundwater and stormwater systems to best be able to target efforts to protect drinking water. The City continues to provide education on the importance and methods to protect water quality (see ISWMP 2022 UIC tasks, described below, and 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 2013-2014:

BMP X-1. Complete Systemwide Assessment (UIC)

The City completed the Systemwide Assessment (SWA) and submitted the documents to DEQ in December 2012 as part of the WPCF-UIC permit issuance package that ultimately resulted in the City receiving its first WPCF-UIC permit. 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).

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

In FY2012-13 the City completed measurements for the 42 drill holes for which access was problematic. That information was included in the FY2012-13 Annual Report, 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).*

For efficiency the City decided to field verify the depths of all dry wells by zone. Therefore, in FY2013-14 City staff collected drywell depth measurements from all zones of the City. That effort resulted in field verification of 1,491 drywells. Upon a quality assurance review, it has been determined that staff will continue to work on collecting measurements for or address the remaining drywells. Others were found to be owned by ODOT, so the databases are being updated. The City now has measurements for a total of 4,552 of currently 4,755 total active drywells. See Appendix I for a list of most recent drywell depths.

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

In FY2012-13 the City inspected the two sites on the Colorado Street Bridge and confirmed that they were misidentified as drill holes. Both go down a shaft and then discharge into the Deschutes River. The City updated the 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 has continued to track new private wells installations within the City limits or close enough to impact City UIC setbacks. One private well was repurposed in NW Crossing to supply irrigation water to a new park. No City drywells were affected. The City will continue to periodically update its Geoblade well layer to keep it current.

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

The inventory and susceptibility analysis and final report was completed in October 2013. Please see Section 10.2 of this annual report and Appendix I for more details.

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

In FY2012-13 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 FY12-13 Annual Report, Appendix I for a copy of the letter and Appendix D for a copy of the Illicit Discharge Minimization Manual). In addition the City 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). The City continues to install additional spill closure valves in other high risk areas.

Effectiveness: The City has completed the systemwide assessment that has been accepted by DEQ who issued the City's WPCF UIC permit in May 2013. The City is using the systemwide assessment to help focus efforts for UIC upgrades.

<u>BMP X-2. UIC Registration (UIC)</u>

See Chapter 2.0 (ISWMP 2006) Task II.6 UIC Registration (UIC), and Appendix I for a summary of new public UICs installed in 2013 and 2014.

In FY2013-14, four drill holes were decommissioned as part of the Third Street Underpass Project.

The registration database in Appendix I includes information on spill and gross pollutant control best management practices installed.

Effectiveness: The City is submitting the registration database in an excel formal once per year as part of the annual report, as directed in the City's WPCF-UIC permit. The City is willing to work with DEQ should a different format or manner of submittal (e.g., electronic) is requested to improve database management.

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

As part of the City's capital improvement projects the City retrofitted or closed several UICs:

3rd Street Underpass. In FY2013-14 the stormwater division completed the 3rd Street underpass project. As a result of the project the City decommissioned four drill holes on July 1, 2013 and installed 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. For more information on the 3rd Street project, see the City Edition segment: http://www.youtube.com/watch?v=ULPcVNJAqg4&list=UUMC_SVKeVflHjVdbfQEl0eg.

Riverside/Franklin Bike and Pedestrian Corridor Improvement Project. A sediment manhole was installed upstream of the drill hole overflow that also drained to the Deschutes River. Additionally permeable pavement was laid along Riverside Drive edge as a demonstration and pretreatment project.

Upgrades. Additionally, the City is working to upgrade UICs, focusing first on drill holes given that they are deeper than the City's dry wells. Since the start of installation efforts after the completion of the Systemwide Assessment, 98 drill holes have been retrofitted with a valve that can be manually closed using a valve key in the event of a spill. This decreases spill risk and increases worker safety precautions. Similarly 98 drill holes have been retrofitted to date with a gross contaminant screen, designed to keep larger sized materials (litter, vegetation, etc.) from entering and clogging the drill hole. This serves to keep larger sized plastics and other pollutants from entering the drill hole. At 2 minutes into the YouTube segment about the Third Street Project that is linked above, a discussion of the City's efforts at spill control upgrades for drill holes is included in addition to the spill control benefits of the Third Street project.

In FY2014-15, it is anticipated that two drill holes on Reed Market Road near 16th Street intersection will be decommissioned.

Effectiveness: The City has closed four deep drill holes as part of the Third Street Underpass project in favor of low impact development and surface drainage controls. This project will serve to be more protective of the groundwater aquifer given the location of the drill holes. The City is effectively working to upgrade drill holes to reduce spill risk and clogging issues.

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 and groundwater protection efforts 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 of the related follow-up actions.