CITY OF BEND

2016-2017 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 Annual Report

November 1, 2017

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FY 2016-2017 NPDES Annual Report

CITY OF BEND

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Jon Skidmore
Assistant City Manager, Operations
City of Bend
October 26, 2017

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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
AWWA	American Water Works Association
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
CPESCL	Certified Professional in Erosion and Sediment Control Lead
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
PNCWA	Pacific Northwest Clean Water Agencies
POCs	Pollutants of Concern
	City of Bend Ambient Water Quality Monitoring Project
QAPP	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 (DEQ) 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.

NPDES Permit. 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 30 outfalls to the river that serve a portion of the City along the Deschutes River and West Hills. Privately owned and maintained entities, such as the Old Mill District and specific subdivisions in town that do not discharge to the City's MS4 system, are outside of the City's direct jurisdiction with respect to the NPDES permit. The City has applied for renewal of its NPDES permit and is working with DEQ to negotiate the terms for the next five-year permit, which is expected to be a statewide general permit. In the meantime, DEQ has administratively extended the City's NPDES permit coverage, 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.

WPCF UIC Permit. 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 began implementing the Integrated Stormwater Management Plan 2022 (2012) that was 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 eleventh Annual Report submitted to the DEQ and describes stormwater quality and pollution prevention activities implemented by the City during Fiscal Year (FY) 2016-2017 (July 2016 through June 2017). 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. Supporting 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 (2012). 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 met the requirement of having interdepartmental stormwater coordination meetings at least four times per year in FY2016-17. Stormwater Coordinators consist of multiple interdepartment groups within the City 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. Stormwater Coordinators are comprised of:

(a) Stormwater Liaisons consisting of representatives from multiple departments that focus on stormwater issues,

(b) separately those department heads and in higher management attending a direct reports meeting to the assistant City Manager, Jon Skidmore, discussing topics including stormwater as related to utility budgeting and rates, UGB expansion, and Mirror Pond that would previously be covered by the now-defunct Economic Development and Infrastructure Strategic Management (EDISM) team, and,

(c) subgroups of these.

Stormwater Coordinators meetings included:

- Stormwater Liaisons Meetings (08/02/16, 10/19/17; 11/28/2017; 6/29/17)
- Stormwater Coordinators Subgroups—Legal/CDD (10/26/17); Regulatory/Street/Storm Ops (12/01/16, 5/22/17)

Meeting agendas and sign-in sheets for Stormwater Liaisons meetings are included in Appendix A.

City staff also continued to participate in the:

- 14th Street (http://www.bendoregon.gov/city-projects/city-infrastructure-projects/transportation-go-bond), and
- South Awbrey Butte (http://www.bendoregon.gov/city-projects/city-infrastructure-projects/s-awbrey-butte-drainage-study) stormwater planning efforts.

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

City Council. In FY2016-17, the City Council:

- Considered stormwater management in addressing UGB expansion (February 10, 2017 Memorandum from Assistance City Manager and Direct reports to the Bend City Council)
- Received information on the City Edition Video related to sediment reduction (March 3, 2017 Weekly Memo)
- Partook in the Good of the Order Clean Water Works Student Video and Poetry Awards (June 21, 2017 Session). (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.

Regional and Statewide Groups. City staff served on the Board of the Oregon Association of Clean Water Agencies (ACWA) as the Groundwater Committee co-chair, and staff participated on the Groundwater Committee, Stormwater Committee, and Public Education committees. Staff also continued to lead the illicit discharge detection and elimination outreach subgroup that is working to revise and develop multiple best management practices fact sheets and booklets to aid in minimizing illicit discharges. Work in FY2016-17 focused on graphic outlay preparation.

Additionally, City managerial staff actively participated in the Pacific Northwest

Clean Water Association (PNCWA) with the City's Utilities Operations and Maintenance Manager Shannon Ostendorff serving as PNCWA president through the hosting of the fall conference that included a pre-conference workshop focused on creating a rain garden on City property; and a during conference tour of stormwater better site design facilities. City staff also participated in a DEQ advisory process for the Phase II NPDES MS4 permit development.

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.

Effectiveness. As described above, there continued a large amount of coordination in FY2016-17. A combination of the larger coordination meetings together with a continued emphasis on more focused meetings for efficiency appears to work well. Together the Stormwater Coordinators (which have taken the place of the former Stormwater Action Team) well exceeded the measurable goals for FY2016-17.

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).

The City finalized the City's first formal Stormwater Master Plan on August 6, 2014 by unanimous decision. The Stormwater Master Plan formed the basis for the City's first Stormwater Public Facilities Plan, developed by the City to meet State land use OARs Goal 11. The City adopted its first Stormwater Public Facilities Plan (PFP) and Findings at the December 17, 2014 City Council meeting and has been acknowledged by the Oregon Department of Land Conservation and Development (DLCD). These documents have both helped the

City meet State Goal 11 requirements. On August 14, 2015, a Bend Code 11.16.120 provision became effective related to requiring secure, lockable, leak-proof oil and /or grease containers to prevent spillage and dumping.

In spring 2017, the City of Bend Engineering and Infrastructure Planning Department hired a professional landscape architect to conduct a review of the City's existing landscape and design maintenance practices for improvement recommendations for future standards and specifications updates. A technical memorandum will be completed in FY2017-18.

Effectiveness. The City has 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 towards continual improvement with review and update of its rules and policies.

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 FY2016-17 was increased to $5.15/ equivalent residential unit (ERU), and the City Council passed a rate of $5.30/ ERU for FY2017-18 in June 2017. The increases are in line with the funding needed for the projects outlined in the City's Stormwater Master Plan, adopted by City Council on August 6, 2014. The fee is designed to cover quantity and quality issues.

The City operates on a biennial budget. The FY2017-19 budget report related to stormwater is included in Appendix A. The City also continues to address changes caught in audits

Effectiveness. The City has successfully established a stormwater utility service charge, and began collecting fees of $4/ERU in July 2007. Fees were effectively raised for the first time to $5/ERU starting in July 2015 to meet the needs of the adopted Stormwater Master Plan, and yearly since to $5.15/ERU in July 2016 and to $5.30/ERU starting in July 2017. The FY2016-17 anticipated revenue was $3.4 Million, and actual stormwater fees brought in $3.47M. The City Budget Committee and City Council supported the budget and rate increases for the FY2017-19 biennium. The fees cover stormwater quality and regulatory compliance activities, stormwater facility operation and maintenance, half the City's street sweeping program due to the stormwater quality benefits of street sweeping, as well as capital improvement projects and maintenance projects.

The City continues making updates as part of its periodic audit of its billing using

the last aerial photograph for quality assurance. As of September 2017, 1,040 audit-related changes to the billing system have been made as a result to ensure accuracy. In late spring 2017, the City paid for another aerial, which will be used in part to conduct an additional audit to continue to ensure implementation equity.

Task II.4 Planning (MS4/UIC)

In July 2016, DEQ posed the public draft MS4 Phase II General Permit. City stormwater staff distributed the draft to Stormwater Coordinators and consolidated comments, which the City submitted on time. DEQ began redrafting the permit to address the comments it received and the City participated in the subsequent listening session that DEQ held on April 27, 2017. The DEQ tentatively plans to release a revised public draft general permit on September 30, 29017. Although given budgetary and staffing constraints, tis anticipate that DEQ will not release the draft until after that date.. The City will continue to track and [participate as per DEQ's schedule.

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 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. A review of the ISWMP this year resulted in no recommended changes.

The City continues to prepare for future regulations by participating on pertinent DEQ NPDES Phase II MS4 advisory committees and groups, and by staying appraised of TMDL regulatory issues.

Since July 2007, the City of Bend voluntarily retains American Public Works Association (APWA) Accreditation, a certification that the City complies with the recommended practices in the APWA Public Works Management Practices Manual. One full chapter in the APWA Manual focuses on stormwater and includes several water

quality-related sections.

Annexations. In FY2016-17, there were no annexations. As a UGB expansion did occur, annexations may be expected to occur in the future.

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. In FY2016-17, both the City Council and the Deschutes County Board of Commissioners adopted a final UGB amendment in FY2016-17. On December 6, 2016 the Bend UGB Expansion was acknowledged by the DLCD, with the expansion adding 2,380 acres of land for housing and employment around the edges of the existing City. On June 7, 2017, the City and County adopted a Joint Management Agreement to establish clear responsibilities; and the City has adopted an ordinance for the Urbanizable Area District (see: http://www.bend.or.us/index.aspx?page=1290 for UGB maps and documents; and City Edition article https://www.youtube.com/watch?v=FU9xSIyrnXY for an overview.). Along with the UGB adoption is a requirement to increase density within the City by over 60%--the City began working with the Stormwater Quality Public Advisory Group in Spring 2017 to review and provide input on how to address and plan for the effects of increasing density on the stormwater system.

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 underground injection controls on May 14, 2013. The NPDES permit reissuance is still actively being developed as a statewide general permit with initial public review taking place in July-August 2017 and finalization now planned in FY2017-18.

Task II.5 Annual Reporting (MS4/UIC)

This annual report, covering FY2017-18, is the eleventh 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 MS4 permit and ISWMP 2022, which has been approved by DEQ as the management document for the WPCF-UIC permit. This is the fourth 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). All annual reports are posted on the City's website (www.bendoregon.gov/stormannualreport), and City staff are open to comments and suggestions for improvements.

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 (September 2017) 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, BOOM, 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.

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 5,112 drywells (with 67 installed and 10 decommissioned in FY2016-17; 1,027 active drill holes, 4 drain fields, 193 swales 8,700 catch basins, 6 lynch catch basins, 1,580 curb inlets (17 of which were installed in FY2016-17); 72 up basins, and 42 inlets.. 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).

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

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

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

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

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

Summary Assessment of Effectiveness

Since adoption of the ISWMP (2006), the City has (a) formed a stormwater utility, (b) obtained reliable funding for that utility, (c) staffed the utility, currently with a program manager, a program analyst, 4 dedicated stormwater field staff, 3 FTE sweeper staff, 1/2 FTE management/administration staff, support to Engineering and Infrastructure Planning Department for stormwater capital projects, 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 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), Pacific Northwest Clean Water Association (PNCWA), and Association of Public Works Agencies (APWA), 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 appreciates the efficiencies of being able to submit one annual report for both permits, given that the systems are interrelated.

ISWMP Revisions/Future Improvement Tasks

The City has reviewed the ISWMP 2022 tasks and has the following updates to the ISWMP 2022 itself at this time. As the EDISM group has morphed into the Assistant City Manager's direct reports meetings, the ISWMP 2022 description should be modified eventually to reflect this; however the tasks themselves are broad enough where they can be met need for permit change.

With regards to responsible personnel (Table II-1 in ISWMP 2022), the following changes have occurred since 2012:

- Public Works has been split into three different departments: Streets, Utilities, and Engineering and Infrastructure Planning Department (EIPD). The Directors of each of these departments report to Assistant City Manager Jon Skidmore.
- Paul Rheault is the Utilities Director rather than the Public Works Director.
- David Abbas is the Streets Department Director.
- Tom Hickmann is the Engineering and Infrastructure Planning Department Director.
- Ryan Oster is the City Engineer.
- Russell Grayson is the City's Community Development Director.
- Sharon Wojda is the Finance Director.
- Anne Aurand is the Communication Director.
- Charles Swann oversees Street supervision.
- In Spring 2017, Reese Moody, Collection Systems Supervisor, and Shannon Ostendorff, Utility Operations Manager left the City. While Orrin Libolt has filled the Collection Systems Supervisor that oversees the stormwater operations crews, the Utility Operations Manager position has not yet been filled and is undergoing review.
- The Utilities Manager role has disappeared, but the duties were handled in FY2016-17 by then-Interim Assistant Utility Director/Support Service Manager Teresa Ristoff. Currently these duties are split between Paul Rheault, Teresa Ristoff, and Steve Prazak.
- In Summer 2017, Jeff England (EIPD) retired from the City. His role is being absorbed by three principal engineers: Eric Forster, George Franklet, and Joshua Robertson.
- Within the Utility Department, Nick McAteer oversees small engineering projects.

In Fall 2016, the City proposed modifications to the UIC Stormwater Monitoring Plan for consideration due to different methodologies needed given a new contract lab, removal of extra analytes not required in the permit, and a proposed change in sampling location within the same corporation yard site due to installation of a new treatment device. These proposals were accepted by DEQ.

The City continues to seek 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 2013, 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 of the UIC permit (by FY2018-19) as well as when the NPDES Phase II General Permit, designed to take the place of the existing individual NPDES Phase II MS4 permits, is released. While DEQ staff continue to develop the NPDES MS4 permit the City must by NPDES permit regulations also continue to implement the original ISWMP (2006). 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 (see Appendix A for an implementation status summary of performance standards within ISWMP 2022).

3.0 PUBLIC EDUCATION AND OUTREACH ON STORMWATER IMPACTS

Introduction

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

Tasks Completed (ISWMP (2006))

The following tasks have begun or continued implementation in FY2016-17.

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

Utility Bill Inserts. The Our City newsletter, entitled "A Newsletter for Bend Citizens," is included with utility bills. The following contained articles either specifically related to stormwater pollution prevention or that incorporated stories that promoted activities having a direct or indirect benefit to water pollution prevention, such as reducing automotive trips traveled or reducing dry weather flows.

- July 2016. The July 2016 newsletter included information on utility rate increases, an announcement promoting the Deschutes River Cleanup, and an announcement of the Annual Water Quality Report that includes information on stormwater pollution prevention efforts especially related to UICs.
- August 2016. The August 2016 newsletter provides information on water leak detection, that can help reduce dry weather flows, and again announced the annual water quality report.
- November 2016. The November 2016 newsletter provides an article on "Urban Drool" Prevention that promoted the City's annual stormwater report, along with general information on Winter Road Maintenance.
- January 2017. The January 2017 newsletter provided information on how the City Budget Works that included mention of stormwater funding; together with information on Bend being a bicycle friendly community.
- March 2017. The March 2017 newsletter provided an article on the Clean

Water Works Film Contest for Kids, and promoted the Earth Day Fair where the City kicked off this year's Clean Water Works campaign.

- April 2017. The April 2017 newsletter included an article entitled "Protect the Deschutes River" that introduced the stormwater utilities new compliance specialist. It also included an article on the Water Wise Program's irrigation overspray inspection program.
- June 2017. The June 2017 newsletter included a story on the Clean Water Works partnership program (see Appendix B).

City staff also worked preparing copy of a stormwater article for the July 2017 newsletter, which would be the final hard-copy version to be sent to customers as the City Communications Department switches to an online electronic only version.

Clean Water Works Campaign. In January 2017, the City reinvigorated its Clean Water Works campaign, which it promoted in the spring 2017 with a new Clean Water Works partnership program through December 2017. As part of the Clean Water Works campaign, the City incorporated the identifier and several new outreach pieces including fact sheets for RVs, Landscape Maintenance Services, Choosing a Landscaper, and Pressure Washing fact sheet and equipment tag along with draft work on a pressure washing pamphlet (see Appendix B). Additionally the City distributed earlier developed campaign materials such as illicit discharge fact sheets for residents and businesses, lead reduction fact sheet, sediment reduction fact sheets, food service outreach update, business inspection checklist, a commercial vehicle wash fact sheet, and the Kids Activity Guide. Several of the new outreach sheets were based on the Oregon Association of Clean Water Agency drafts that have been reviewed statewide.

In April/May, the City staff provided Clean Water Works Partner materials to its partners with an official kick-off at the Earth Day parade and festival. These included point of purchase displays, discount cards, and partner water bottles and bags together with the illicit discharge outreach fact sheet, pad of paper with easy reminders and pen to both owners and staff of the participating businesses.

The City continued to post a call for entries for the City of Bend, Zolo Media and BendFilm Clean Water Works video contest for students from Fall 2016 – Spring 2017. In fall 2016, the City worked with BendFilm to distribute the 2017 contest flyer electronically to area schools with students in the age range of the contest (5^{th}-12^{th} grade) as part of BendFilm's Future Filmmakers outreach. This year the City expanded to also include a poetry category open to ages K-12.

The City also posted at Quest at the Fest one 3'x10' and two 3'X 8' banners that included the Clean Water Works logo and pollution prevention messages. Additionally, the sound bites from the 30-second public service announcements

that are included on the City's You Tube and web page (http://www.bendoregon.gov/index.aspx?page=290) are played on the City's public works telephone "hold" music.

Targeted Mailouts. In early 2017, the City conducted targeted mailouts to car washes, all developers, food service/restaurants, pressure washers, RV rentals and sales, and carpet cleaner facilities with a Bend Business License and clean water volunteers (known to have spent 3+ hours) to invite them to join the Clean Water Works Partner program. As part of this effort, the City sent a mailing with an introductory letter, specific fact sheet or booklet, and partnership form inviting them to participate (see Appendix D). The targeted mailings were sent to businesses that were selected based on the campaign pollutants of focus (illicit discharges in general, lead, and sediments).

Other Outreach/ Distribution. The City also distributed training opportunity and other announcements by email using the City's Stormwater Stakeholder email list; and made announcements on the City's website and social media including Facebook and Twitter.

City stormwater staff stocked information holders at public areas throughout the City (Boyd Acres, City Hall) as appropriate with one or more of the following:

- Kids Activity Guide
- 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)
- 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
- Oregon State University's Waterwise Gardening in Central Oregon

City staff continued to provide outreach that discussed the importance of not discharging Fats, Oil, and Grease (FOG) into sewer or storm drains (see webpage at http://www.bend.or.us/index.aspx?page=190).

Effectiveness. The City exceeded its Bend ISWMP (2006) requirements to develop at least 2 information piece utility bill inserts, brochures or posters and distribute at least 4 this year. The City distributes the bulk of its public outreach

on its website (see www.bendoregon.gov/cleanwaterworks), through social media, by video, and via direct mail of targeted audiences.

The City of Bend conducted a pre-Clean Water Works campaign survey in spring 2015 and a post campaign survey conducted in October 2016 with the report completed in April 2016 (see FY2015-16 Annual Report, Appendix A, specifically appendix to City Manager Memorandum to City Council). Statistically significant findings occurred between the baseline and final survey. See summary assessment at the end of the chapter for a summary.

The City chooses long-standing guides like the Bend Park and Recreation District's Recreation Guides and this year, the Smart Shopper, to display its educational outreach 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.

City staff used additional resources to spread the stormwater pollution prevention message this year, including the Upper Deschutes Watershed Council, Environmental Center, and several volunteers participating in the Clean Water Works Partnership Program. This helped reach the word beyond typical channels.

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

The City continued to update the stormwater website www.bendoregon.gov/stormwater focusing on an update of the Clean Water Works campaign at www.bendoregon.gov/cleanwaterworks. The Clean Water Works website includes buttons for home and garden resources; kid's page; businesses; and discounts and partners. The website includes general stormwater quality information as well as topics of interest to the general public. The rest of the stormwater site remains organized into interest areas, including: What's New?, About Stormwater, Business Resource, Home Resources, Regulations, Stormwater Master Plan, Get Involved, and Frequently Asked Questions. 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 South Awbrey Butte Drainage Study (http://www.bendoregon.gov/index.aspx?page=1351) and existing long term plans such as the Stormwater Master Plan (www.bendoregon.gov/stormwatermp). There continues to be 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 (see Figure 3-1).



Figure 3-1. Social Media Outreach Example

Effectiveness. Overall, the use of the website has again increased over the past year (see Table 3.1). Keeping the stormwater website updated is a continual process. The City has included a link on the website to comment on the stormwater pages. No comments were received during FY2016-17.

Table 3.1 Web Page View Comparison (FY2015-16 to FY2016-17)

Page Title	Date Range	Visits	% Exit
City of Bend : Clean Water Works			
	7/1/2015-6/30/2016	205	16.45%
	7/1/2016-6/30/2017	616	16.56%
	% Change	↑ 200%	↑ 1%
City of Bend : Stormwater			
	7/1/2015-6/30/2016	231	14.30%
	7/1/2016-	856	12.62%

Page Title	Date Range	Visits	% Exit
	6/30/2017		
	% Change	↑ 271%	↓ -12%
City of Bend : Stormwater Utility Fee			
	7/1/2015-6/30/2016	171	41.54%
	7/1/2016-6/30/2017	125	51.20%
	% Change	↓ -27%	↑ 23%
City of Bend : Stormwater Master Plan			
	7/1/2015-6/30/2016	163	40.35%
	7/1/2016-6/30/2017	217	29.03%
	% Change	↑ 33%	↓ -28%
City of Bend : About Stormwater			
	7/1/2015-6/30/2016	73	22.52%
	7/1/2016-6/30/2017	540	27.04%
	% Change	↑ 640%	↑ 20%

Although still relatively small in relation to population size, the City's Facebook presence continues to grow. The City has over 11,622 at present (September 11, 2017), up from 9,577 likes in FY2015-16. Currently there are 10,900 followers and over 4,000 total site visits. Twitter following continues to trend upward as well. The City currently has 6,754 followers on Twitter, up from 5,502 in FY2015-16 and 1,177 followers in FY2012-13 (see Figure 3-2).

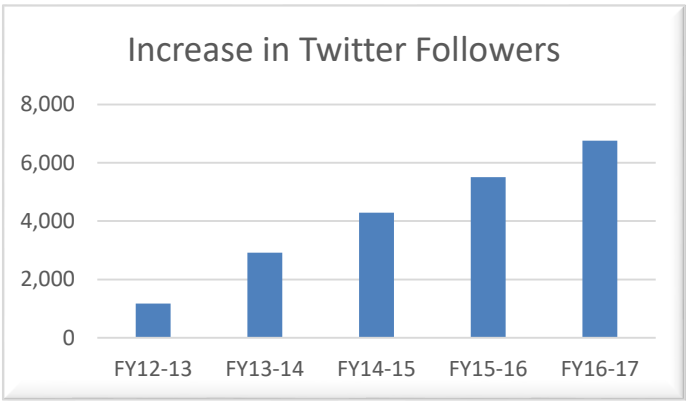
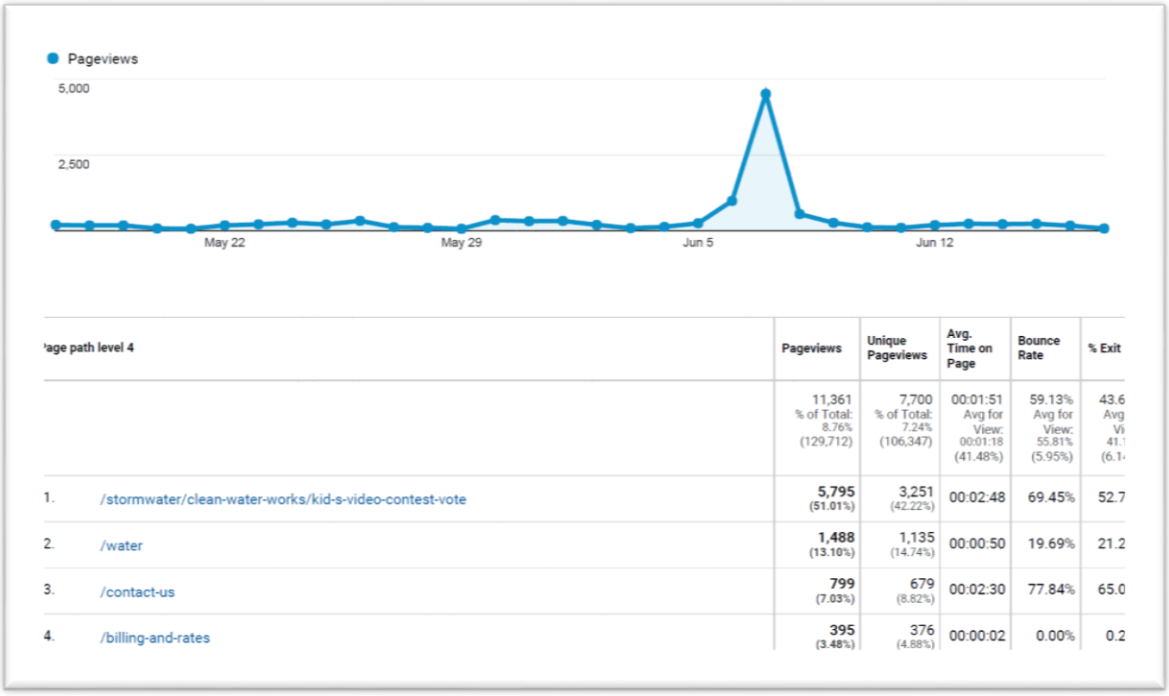


Figure 3-2. Number Following City of Bend Twitter Account

Although numbers are still relatively low in comparison to the population, increasing trends means social media is becoming an increasingly useful media to incorporate into campaigns. As Table 3.1 illustrates, the Clean Water Works partnership efforts were useful in increasing the number of hits to the Clean Water Works page showing a year to year increase in visits of 200%. The largest increase was the success of the People's Choice Award vote for the film contest, which earned over 5,000 hits in one day (see Figure 3-3). That is more than all the hits to the site the past year.



'age path level 4		Pageviews	Unique Pageviews	Avg. Time on Page	Bounce Rate	% Exit
		11,361 % of Total: 8.76% (129,712)	7,700 % of Total: 7.24% (106,347)	00:01:51 Avg for View: 00:01:18 (41.48%)	59.13% Avg for View: 55.81% (5.95%)	43.6 Avg Vi 41.1 (6.1
1.	/stormwater/clean-water-works/kid-s-video-contest-vote	5,795 (51.01%)	3,251 (42.22%)	00:02:48	69.45%	52.7
2.	/water	1,488 (13.10%)	1,135 (14.74%)	00:00:50	19.69%	21.2
3.	/contact-us	799 (7.03%)	679 (8.82%)	00:02:30	77.84%	65.0
4.	/billing-and-rates	395 (3.48%)	376 (4.88%)	00:00:02	0.00%	0.2

Figure 3-3. Website Analytics of Video Contest People's Choice Vote

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

Commercial PSAs. As part of the Clean Water Works campaign the City again aired the 30-second TV commercials developed in spring 2015 entitled "Clean Water Works,""Dirty Water," and the Clean Water Works partnership commercial. Screenings "Clean Water Works" and "Dirty Water" occurred at Munch 'n' Movies in August and September 2016 and on television. The commercials are also posted on the City web site. The City displayed the "Clean Water Works" movie slide prior to several films at the Bend Film Festival, held in October, 2016 and at other BendFilm events throughout the year.

The City continued to post on the City's website and played the radio public service announcements (PSAs)—one focusing on illicit discharge reduction; one



Freeze frame from Clean Water Works Partners television commercial that aired in May-June.

focusing on what our stormwater utility service charge covers; and one focusing on sediment reduction together with those additional radio advertisements promoting Clean Water Works partners during the spring 2017. The radio PSAs are posted on the City web site www.bendoregon.gov/cleanwaterworks at the bottom of the home and garden page under "Audio;" and on the "Discounts and Partners" page.

The City also refined a commercial promoting Clean Water Works partners efforts with the addition of the new partners, which aired on television during the first half of 2017.

In 2017, the City purchased 883 spots and negotiated bonus spots for a total of 1,961 advertising spots across formats and genres, including 15 TV stations and 6 radio stations.

City Edition and Other Video Outreach. The City continues to use City Edition to provide updates on the stormwater utility and its programs. In FY2016-17, the City created the following segment:

- Reducing Sediment in the Deschutes River (March 2017, 111 views online), a still of which is shown in the picture below.



The City's Stream Stewardship partner, Upper Deschutes Watershed Council, created a video for the 2016 event that took place in August: https://www.youtube.com/watch?v=ugu5MkK7Tmc. KTVZ also included a segment on it

as well: https://www.youtube.com/watch?v=0-Xdy_Q95xU.

Press Releases. The public, including school children, were able to view stormwater equipment, the watershed diorama and other public works equipment during Quest at the Fest event, which was located downtown adjacent to the Bend Summer Fest on July 9, 2016. Volunteers worked the watershed diorama and provided outreach materials. The City took out a full-page advertisement in the Source Weekly to promote the event.

The City released several stormwater quality related news releases/articles in FY2016-17. Many were focused on the City newsletter *Our City: A Newsletter for Bend Citizens*, distributed with monthly utility bills and posted on the website in Bend (see Task 3.1 for a description). The Source Weekly included City Quest at the Fest information in July 2016. This year, the City again released for distribution a press release announcing those earning their Certified Erosion and Sediment Control Lead but it was not picked up.

The City continued to purchase advertising space in the Bend Park and Recreation Guides, the advertisements include a stormwater pollution prevention "Clean Water Works" 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.

This year, the City added an advertisement in the Smart Shopper guide, another guide that people tend to keep and refer—the advertisement promoted clean water and our partners (see Appendix B). The City also purchased advertising in the Earth Day section and the Summer Events issues of *the Source Weekly*, advertising the Clean Water Works Partners together with a clean water message. The City also purchased advertisements in the *Bend Bulletin's* Go! Magazine, and online webpage (Appendix B).

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 City's You Tube News channel now has 575 subscribers (as of October 4, 2017), up from 401 subscribers last year. COTV is shown on BendBroadband in Bend, Redmond, Sisters, Black Butte Ranch, Tumalo, Sunriver, and Powell Butte. The Bend DMA rank which covers this area and beyond is 193 with a cable penetration of 60% according to Zolo Media quoting a 2013 PSU study (Zolo Media, 2014). Several videos remain up on the City's youtube channel, where they continue to add some views each year.

The *Bend Bulletin* has a daily circulation of 26,986 Monday through Friday, down from 27,547 Monday through Friday, in 2012. The last known circulation data for weekend delivery is as follows: 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 15,500 weekly (2017) up from 15,000 and a total readership remaining at 37,500 weekly (Source Weekly, 2017 and 2013 Distribution and Circulation). It is distributed in Bend, Redmond, Prineville, Madras, Terrebonne, Sisters, Sunriver, and LaPine.

The City's 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. Hardcopy mailouts will end after July 2017 for cost and sustainability reasons. Electronic mailing lists will be used instead.

According to its 2016 sponsorship packet, the Bend Film Festival routinely brings in 8,000+ attendees, 73% of whom are from the Bend Area and 8% from other parts of Oregon for approximately 80+ screenings of movies over four days at 6 venues. The gender breakdown is 67% female, and the age of attendees includes 9% in the 22-34 year age range; 13% in the 35-44 year age range, 49% in the 45-64 year age range and 27% who are 65 years or older. Per 2014 data, 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. Although the costs have been rising and the percentage of Bendites has fallen 7% since 2014, the total number of attendees has increased by 3,000 in that same time period and the slides are shown multiple times.

City increased to two the number of educational videos screened at Munch n' Movies showings this year, deemed effective as it is a local family-friendly event.



UIC model.

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

The City again made its watershed and UIC dioramas available to lend to local school teachers for use in their classrooms, and it received use from The Environmental Center and Upper Deschutes Watershed Council together with the High Desert Museum and interested parties. The stormwater/watershed 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. The UIC model depicts a city street that drains into four catch basins cut-aways. Two of the basins are connected to a drywell and the other connect to a drill hole. In FY 2016-17, the dioramas were used at several events as well including Quest at the Fest (July 2016) and Earth Day (April 2017). At the Teacher Appreciation Day event in September 2016 at the High Desert Museum, the City released its "Teacher's Resources" fact sheet together with a setup of the diorama, videos available to lend, classroom monitoring kits, the BendFilm video contest announcement to help get the word out about the resources the Stormwater Program have available to lend.

Effectiveness. Both dioramas have been well received as interactive, visual, three-dimensional learning tools. Using the unit at Quest at the Fest and other events is especially effective as it draws families in to learn about pollution prevention in an enjoyable manner. The models were also loaned out for events that staff could not attend, such as at the High Desert Museum's Water Festival in October 2016 (UIC model), and the Environmental Center's use of the watershed diorama at the Day of Nature festival at Riverbend Park in September 2016. The face-to-face contact with teacher at the Teacher Appreciation event was very useful for making contact with educators. The Environmental Center was also there promoting the City's schools program, which gather a lot of interest resulting in a full program for the year.

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 ISWMP (2006) goal of completing the performance standards task for inclusion in the ISWMP 2022 draft that was accepted by DEQ for the WPCF-UIC permit in FY2012-13, and continues implementing the new performance standards as part of the ISWMP 2022. 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 and finalize the strategic outreach plan in November 2013, and began implementation thereafter (see Annual Report FY2013-14 Appendix B).

Substantial progress continued to be made on all implementation goals noted in the strategic outrace plan for FY2016-17 mainly incorporated into the Clean Water Works partnership program:

- Distribution of fact sheets to support tail-gate meeting training (5-15 minutes) for City Staff, and initial distribution that was upgraded as a continual improvement project to being conducted online via the City's COMPLI to improve training reach and recordkeeping continued into FY2016-17 (Message I) (see Table 8.3). In the second half of the fiscal year, the COMPLI program was phased out for another similar program, Target Solutions, with broader reach throughout the City. Staff are working with the implementers of this transition to ensure the stormwater training modules are included in the new system. See Table 8.3 for the topics covered and number of staff trained. In addition, supervisors were provided copies of the fact sheets when first developed for their use in informal training.
- Acronyms and Abbreviations distributed at front counters, on the website under "What's New," and upon request (Message II)
- Development and use of the UIC diorama model together with the watershed model (Message II)
- Advertising at BendFilm Festival and Munch 'n' Movies (see Appendix B), and worked with BendFilm and Zolo Media to jointly host a Clean Water Works student film contest together with BendFilm's Future Filmmakers. Conducted advertising to schools with contest-aged children (5th to 12th grade in school year 2017 for the video contest, and to children Kindergarten – 12th for a poetry contest over the same time period) (Message II)
- Banner messages were developed in past years and three banners with the Clean Water Works message are used at outreach events (Message II)
- Single-family Residential Site Plan and ACWA Erosion and Sediment Control guide, and regulatory flow charges included on City's website (www.bendoregon.gov/stormwaterbmp) and distributed by private engineering and this year through the Clean Water Works Partership Program invites (Messages II and III)
- Print advertising continued in Parks and Recreation Guide, and extended to Smart Shopper in 2017 (Message II)

- Stormwater considerations and sizing incorporated into both the CCity of Bend Waterwise Landscape brochure completed in FY2016-17, together with update of the Waterwise Gardening in Central Oregon guide with OSU (formerly the Xeriscape™ Guide) (Message III).
- Business related section including type of business specific and general illicit discharge fact sheets for both residents and businesses are posted on the Clean Water Works website (Message I and III)
- Storm drain marking occurred in FY2016-17 as part of an Earth Day volunteer effort with OSU graduate students. Permanent messaging of manhole covers continued in FY2016-17(Message III)
- City staff provided training on post construction controls (see Chapter 7, Task VII-4). (Messages III (infiltration) and V)
- Continued with a new 2017 incentive program with a discount card for various businesses similar to the one conducted in summer-winter 2015, with car washes, construction industry contractors, food service establishments, pressure washers, and carpet cleaners the business groups targeted with an offer. This wasn't scheduled until later years, but we flipped the schedule with the pilot incentive program entitled "Stormwater Facility Maintenance Assistance Program." The paperwork for that effort was developed in late FY2013-14 and released to purchasing for review and distribution in July 2014 but that approval was delayed due to purchasing division staffing shortages and legal counsel's concerns. City stormwater staff awaited review and approval until mid-May 2017, which was too late for this fiscal year given the separate Clean Water Works incentive program with discount cards that is occurring in 2017 (Message IV) With the several years of delay, program staff did not budget for the Stormwater Facility Maintenance Assistance Program in the upcoming biennial budget and instead started considering how to incorporate something similar into the Clean Water Works program through a discount.
- Include drinking water protection areas on City mapping web site (Message IV)
- City staff offered IECA webinars and an onsite CESCL training in February 2017 to improve knowledge of effective erosion and sediment control; continued to distribute ACWA Construction Site Guide and distributed a sediment fact sheet for both residents and businesses. This year, the City distributed the ACWA Construction Site Guide with the invite for participation in the Clean Water Works Partner program (Message IV)
- Clean Water Works Partnership Program outreach focused on and included new and existing targeted fact sheets with BMPs specifically related to reducing pollutants of concern (Message V).
- Work to improve illicit discharge coordination and reporting internally began in FY2013-14 and continued with development and deployment of the fact sheets with input from operation staff. Illicit discharge

minimization ongoing training using Compli software was setup and began taking place in late FY2014-15 continuing into FY2016-17. Staff are now moving the same training to a new program. Staff also purchased new spill kits for utility vehicles. A new IDDE doorhanger was created in FY2016-17 (Message V).

- In past years, City staff contracted with a consulting firm to assist with TMDL preparedness including providing a review of best management practices and structural controls specific to local stormwater pollution concerns that was completed in FY2015-16 (Message V).

The Clean Water Works campaign that originally launched in April 2015 was reinvigorated in January 2017 was developed keeping the following objectives noted in the public outreach strategic plan in mind:

- Use positive messages throughout the campaign.
- Continue watershed/stormwater awareness, but move more towards actions
- Conduct evaluation surveys to research the levels of awareness in the city and effectiveness of the programs
- Increase awareness of sediment impacts to storm drainage facilities and the Deschutes River/Tumalo Creek
- Through a media campaign, educated residents and businesses about the link between lands use activities and water quality/flooding as well as about the City's role in protecting water resources and managing stormwater.
- Increase awareness of potential pollutants from automotive vehicles and options to minimize these pollutants
- Increase awareness of what constitutes an illicit discharge and how to prevent spills and encourage behaviors to reduce illicit discharges.

Effectiveness. The City is effectively implementing the Strategic Outreach Plan for stormwater education.

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)

Effectiveness. The City has exceeded an average of one stormwater quality message posted per year.

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

The City actively assists with the Upper Deschutes Watershed Council's outreach to school children by (a) making the watershed diorama available; (b) providing copies of the Kid's Activity Guides and highlighters/pens available for distribution to appropriate grade levels; (c) making Worldwide Monitoring Day sampling kits available, notifying of available grants and helping sponsor Stream Stewardship Day. In return UDWC assists by distributing City materials such as the video contest flyers (see Task IV.3). City staff also provided the UIC model to High Desert Museum Staff at the Water Festival held October 6 -9, 2016, and City stormwater staff participated in the Teacher's Night event at the High Desert Museum in September 2016 to share our lending library and available materials with teachers.

In FY2016-17, the City again entered into a contract with the Environmental Center developing a school outreach program entitled "A Journey Through Bend Youth Education Partnership" with regards to the Utility Department focus on wastewater, drinking water, and conservation, and stormwater pollution prevention. Staff shared the availability of a PNCWA school outreach grant availability and one school was able to obtain that to help them participate in the program. The event included a Stormwater Quest field trip along with distribution of materials and outreach to elementary and middle school aged children. See program annual report in Appendix B.

See also ISWMP 2006 Task III.4 Stormwater/Watershed Diorama (MS4/UIC) and Task IV.3.

Effectiveness. The stormwater education program has increased effectiveness over the last few years since the City Utility Department as a whole has made it a priority to develop a One-Water type program covering all aspects of the water cycle with which the City is involved, and hiring a consultant to conduct that work. Being able to directly meet with area wide teachers at the High Desert Museum's Teacher's Night Out is an effective way to share our offerings in a face-to-face manner. The school outreach program with the Environmental Center reached 1,961 students this year, up from 1,490 Bend students the first year.

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



Pacific Northwest American Water Works Association Award for "Dirty Water" TV Commercial.

The City exceeded the measurable goals for implementation of required permit activities. The main focus this year was continuation of the Clean Water Works Partnership program to determine if such level of effort could be effectively performed at a single mid-size city given that the other locations it has been tried have been major metropolitan areas with several municipalities participating. The goal in 2017 is to determine if conducting an established program is sustainable given the resources of a mid-size City. See the FY2015-16 Annual Report for a summary focusing on the overview and effectiveness of this effort.

Evaluation results suggest that citizens tend to remember more often messages that have been used over time (several years). Public Advisory Group members felt the program should be continued, but for a year in length before making long-term decisions. Thus the City is following that guidance with the 2017 effort. The initial effort took a substantial amount of staff time, and much was incorporated in house due to the fact that the Utility Department fortunately happens to have a communication technician who once owned her own marketing firm in town. This greatly saved on costs, although the program cost levels did face scrutiny and cutbacks at the highest management levels given overall City priorities, needs, and perceptions. Long-term viability at these levels are unclear, although with several outreach materials already developed. the 2017 level of effort needed has been reduced. While partners seemed willing to participate again based on survey results, very few repeats occurred, but more partners did sign up including from the newly targeted landscape community. None from the newly targeted pressure washer community or car washes accepted the invite in 2017. Giving car wash discounts is challenging though because many are self-serve using tokens, and not easily set up for offering a discount.

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. But these will be weighed against capital funding needs as well.

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 2016-17:

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

During FY2016-17, the Stormwater Quality Public Advisory Group (PAG) took on the special role of examine possible approaches to handling stormwater in Bend as the City continues to densify. The City agreed to increase density by 66% in the 20 year UGB planning period. As such, the PAG agreed midyear to meet bimonthly as they focus on this issue. Thus, whereas the permit requirement is to meet at least semi-annually, the PAG has met 5 times including an optional field trip during the fiscal year. (See Appendix C for a list of PAG members, and meeting agendas/summaries). The group worked on developing a problem statement and examining regional/neighborhood scale and street scale controls to start.

Effectiveness. The City exceeded its goal of convening the Public Advisory Group at least semiannually. City staff worked to fill vacancies this year prior to embarking on the special sessions focusing on post-construction controls with increasing density. City staff continues to find the Public Advisory Group very helpful in providing input and new perspectives on various stormwater issues, and thereby directly helps improve the effectiveness of the stormwater program. Long-standing PAG members have commented that they enjoy providing input on the problem definition and Strengths-Weaknesses-Opportunities-Threats (SWOT) analyses related to the density topic.

Task IV.2 Public Meeting (MS4/UIC)

This task refers to holding public meetings when updating the ISWMP. However, the City is not currently in the process of updating the ISWMP—the ISWMP 2022 did go through a public review process and was accepted by DEQ for the UIC

permit. Similarly a public meeting was held for the original ISWMP adopted in 2006 as necessary for the City's NPDES Phase II MS4 permit. DEQ has recently released a public draft NPDES Phase II MS4 general permit designed to replace the individual existing permits for stormwater drainage to surface water. Once that is completed, the City will begin a process to refine the ISWMP and incorporate a public meeting at that time.

In FY2016-17, public input was solicited for the South Awbrey-Butte Drainage Study in February and March of 2017 as to drainage issues on the South side of Awbrey Butte.

Effectiveness. Past public meetings have proven successful in obtaining input to improve the City's integrated stormwater management plans and master plan. The public input received in 2017 gave the engineering team better insight into drainage issues on the south side of Awbrey Butte and feedback from the meeting is being incorporated into the final report.

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

In addition to the standing volunteer efforts such as the work of the City's Volunteer Coordinator on storm drain marking and landscape maintenance and modifications over time, the City Stormwater Program again implemented an innovative social marketing campaign to increase volunteer participation for clean water. The Stormwater Program wanted to see if, as an established program, the amount of effort became more sustainable for a mid-size City.

Clean Water Works Partnership Program. The City sought to include more behavior change buy-in by promoting a multiple incentive partnership program. Those businesses or groups that met specific criteria (e.g., had a Bend Business License, were willing to run through a short fact sheet of best management practices training, mark their storm drains (as applicable) or, in some cases, had volunteered at least three hours for clean water, etc.) were invited to participate in the voluntary program. Those participating were rewarded with radio and television advertising, website acknowledgement, received point of purchase advertising (with the number or displays this year targeted to the type of business and request of the partner), and a thank you bag of goodies. The goodies incorporated an educational component this year and were extended to all employees; they included water bottles, lunch bags with an informational fact sheet for each of the employees, and window decals to note their participation. The efforts this year were modified to increase engagement from their employees. The partners were also able to specify a discount of their choice to be included on the Clean Water Works Partner Discount Card. Citizens can then visit the Clean Water Works webpage and download the discount card for free, or pick one up through various means such as at events or City offices.

This partnership program is running from April 2017 through December 2017

and has benefits to City (best management practices outreach had an improved chance of being read and disseminated, this year to all participating employees as well; business owners were pledging to care for our clean waters); has benefits to the business owners (advertising, discount card to attract more business, giveaways for their employees, positive connotations); and the public benefited by being able to more easily recognize those who pledged to be a good player and discounts at local businesses. This is not a certification program, but a voluntary pledge incentive program. In 2017, we have 14 partners actively providing discounts. This brings up the number of past and present participants, including those providing and not providing discounts, to 39 since the program started in 2015.

Storm Drain Marking. The City of Bend coordinated with Oregon State University students after the Earth Day Fair in April 2017 to mark storm drains. For more information, see Task V.3. Additionally, this year the City had a limited number of storm drain markers available on a first come first service basis to encourage marking of private drains as well.

OSU Graduate students helped mark storm drains for Earth Day 2017.



Deschutes River Cleanup. The City both actively participated in and helped to sponsor the Deschutes River Cleanup, formerly known as Stream Stewardship Day (see Appendix C). This annual event was coordinated by the Upper Deschutes Watershed Council (UDWC), and was held on August 6, 2016. The event included several sponsors including REI, whose employees perform monthly clean-ups on their own as well, and the Bend Park and Recreation District. The City announced the event via its Facebook site and posted event posters. To encourage City staff support, the stormwater division had 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. The Upper Deschutes Watershed Council reported the following results:

- About 25 garbage bags of instream debris
- Roughly 67 bags of litter and weeds from riparian areas
- 1,400 pounds of total debris removed by about 200 volunteers.

School Outreach. The City Utility Department hosts an intensive school outreach program for the three water utilities—drinking water, water reclamation, and stormwater. In FY2016-17 the City of Bend Utility Department again partnered with the Environmental Center who worked with local school teachers to refine and implement the “Our Water Program, a Journey Through Bend” (see Appendix B for the summary report). The overall program includes five lesson plans related to all aspects of water, one of which is the Stormwater Quest. The

Quest took place at Riverbend Park along the Deschutes River with teachers, parents, and Environmental Center staff helping to lead the efforts. Students worked to solve puzzles as they visited stormwater facilities located in the park. The City Edition video that captured the event remains available on the City's YouTube channel (see www.youtube.com/watch?v=pOXo5ZOrlUc).

In spring 2016 and throughout the summer, the City invited students to participate in the Clean Water Works Video contest. Unfortunately no entrants were received by the August deadline. The City ran the 2015 student winning psa at Munch n Movies in August/September 2016. And the City decided to try the contest one more time, but this time lined up with student's school use of their IPads and schedules and adding a poetry contest, placing the due date at the end of April. We received a much better response rate with the FY2016-17 entries, with 14 entries for the video contest and one entry for the poetry contest. The winners included the following in video (links are hosted by the contestant and some may no longer be available):

- Tyler Bodi Sweet, Most Creative, "East Bend Boys and Girls Club for Clean Water"
- Sequoyah Walther-Gingold, People's Choice Award, "Clean Water"
- Joe Sortor, 5th-8th Grade Division Winner, "Don't Take Our Water for Granted"
- Akira Talaba, Grand Prize Winner: Video, "Clean Water Works"

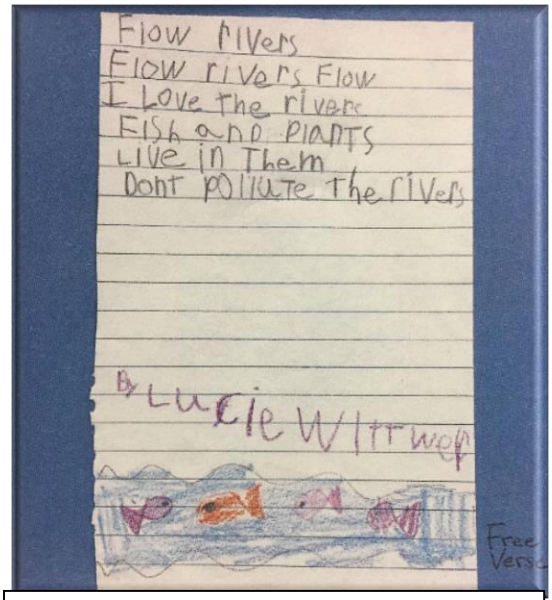


Figure 4-1. Grand Prize Winning Poem

Lucie Wittwer was the Grand Prize Winner for Poetry, with her poem "Flow Rivers." See Section III.2 and Appendix C for more details.

Additionally, our video contest partner BendFilm would show our Clean Water Works advertising slides at their BendFilm events throughout the year for added reach.

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. Additionally, the City continued its popular diorama lending program to area teachers and others interested. The City also provide copies of its new Kid's Activity Guide and giveaways for Upper Deschutes Watershed Council to use in

their teachings.

Effectiveness. The Clean Water Works partnership programs proved challenging, rewarding, and successful. An online survey of Clean Water Works Partners was taken after the initial effort using Survey Monkey and 14 responded. Whereas 21% of respondents felt the Partnership effort was a good value for them, 100% of respondents indicated they would participate again in the coming year. Ten (71%) indicated that this partnership program make them and their employees think of ways to protect water quality or the importance of protecting it, with the remaining four answering "maybe/unsure". A majority (57%) felt that the effort helps make a positive difference for water quality, with the remaining 29% indicating it has the potential to do so. The City has worked to increase effectiveness this year by (a) expanding the number of potential partners to include landscapers and pressure washers; (b) increase the hurdle to participate to include ensuring their personal storm drains are marked (City has some first come first served markers to assist); and (c) provide outreach goodies for all employees, with the goodies including an applicable fact sheet to help reinforce best management practices.

Given Bend's hard winters, the storm drain art paint did not have the longevity that would be help to make a continuing program be sustainable; thus the City decided not to continue with the efforts even though the payback in media coverage the first year was very much worthwhile. Reaching out to the art community was an added bonus, so the City worked to build on that by offering a student poetry contest this year instead.

The school video contest was another terrific partnership between a non-profit (BendFilm), government institution (the City), for profit business (Zolo Media) all working together to help school children interested in the field of film and acting get firsthand experience while providing an important community service message. Staff were successful this year to obtain multiple entries for a public people`s choice selection award that would helped drive people to the City's Clean Water Works website. With the addition of a last day promotion by Zolo Media on their CBS and ABC syndicates with interviews of students and program staff, the number of people accessing the City's Clean Water Works site to vote increased to over 4,000 hits, more in one day than the entire year previously. In short, it went viral in Bend terms. Improving the connection so post votes would send folks to a more educational page will be worked on to further increase effectiveness in future years.

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. In FY2013-14 the City began implementing the new performance standards as part of the ISWMP 2022 for the WPCF-UIC permit, and the City

continued to implement these and additional performance standards this year per the schedule. Performance Standards implementation status is available in Appendix A.

Effectiveness. The City met its original ISWMP 2006 goal of completing the performance standards for inclusion in the draft ISWMP 2022 and is on task meeting them.

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 exceeded its goals for public participation this year, and as can be seen in reading the individual tasks and effectiveness evaluations, the City is actively improving its programs to become increasingly more efficient and effective. The new People's Choice Award contest was especially effective at leading people to the Clean water Works website. The partnership with Zolo Media and BendFilm was excellent in helping to get the word out about both clean water and the contest to both students and the public. Zolo aired a cover story about the People's Choice contest that aired on both its prime time ABC and CBS stations right before the end of the contest, including interviews with City staff and the students of Seven Peaks Elementary. Their teacher had based curriculum around the contest as a learning opportunity for the students, and he had learned of the contest through the City's Our City outreach newsletter. This year with the focus on density pressures, the Stormwater Public Advisory Group is playing a key role for the community, just as it was designed to do.

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 FY2016-17 to address illicit discharges.

Tasks Completed (ISWMP (2006)

The following are conducted during FY2016-17.

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

In April 2015, the City kicked off an outreach and social marketing campaign based off of a strategic education strategy, called Clean Water Works. This campaigns purpose is to build awareness and change behavior through targeted topics and clear messages about stormwater pollution prevention information together with an incentive program. The campaign focuses on three main issues specific to the concerns in Bend: general illicit discharge information, lead reduction, and sediment reduction.



Figure 5-1. Clean Water Works Partner Logo

The initial campaign included development of print, TV and radio advertisements, and four illicit discharge prevention banners that include the City's phone number. Fact sheets on illicit discharges were distributed for both home (www.bendoregon.gov/government/departments/utilities/stormwater/clean-water-works) and commercial/ industrial uses. This year the City reinvigorated the campaign with a new partnership program and materials. In FY2016-17, the City developed several new outreach pieces including *Proper RV Waste Disposal fact sheet*, *Pressure Washing fact sheet*, *Landscape Maintenance for Healthy Water fact sheet*, *Hiring a Landscaper fact sheet*, and an *Illicit Discharge Door Hanger*.

The goal of the Clean Water Works program is to increase engagement in protecting water quality. The City accomplishes this by providing best management practices and information in a manner that engages the interest of the targeted business/nonprofits by offering incentives to businesses and non-profits such as free TV and radio spots and marketing discounts on a discount card. In return, participating businesses agree to train staff on stormwater BMPs, many aimed to reduce illicit discharges, or to volunteer for clean water. The idea is a triple-win social marketing campaign based on concepts from EPA's *Getting In Step* guidance.

In April 2016, the City mailed out partnership invitations and application packets to all businesses in the following classifications; (13) Auto shop, (18) Carpet Cleaners, (134) Contractors, (173) Restaurants, (9) Car Washes, (69) Landscapers and (10) Pressure Washers within Bend. The City used the Bend business license database for contact information. The application packet included a letter outlining the incentive program, an applicable fact sheet or guide, and partnership participation form for those interested in becoming a partner (see Appendices C, D, and E). By offering the incentive program, we would have a higher chance of the recipient reading the best management practices whether or not they decided to participate. In FY2016-17, the City had 14 participants in the discount card program and distributed 185 gift bags to their employees. The City extended the gift bag program to all employees this year and included an extra educational fact sheet to extend the reach of the program.

In FY2016-17, the City in conjunction with Bend Film and Zolo Media hosted the second Clean Water Works student video contest. This year the City received 14 video submissions and had over 4,000 votes for the Viewer's Choice Award. This year's winner was Akira T. His video focused on the importance of not polluting the river. The City also held a poetry contest. Lucy W. won the contest with Her *Flow Rivers* poem. The effort gained a cover story new coverage on our local ABC and CBS networks. The City aims to develop these into PSAs for outreach, such as at Munch 'n' Movies and on television.



Figure 5-2. Clean Water Works Video Contest Grand Prize Winner
Still from FY2016-17 Clean Water Works student film contest winner public service announcement.

The City continued to distribute the *Illicit Discharge Minimization BMP Manua*l and the *Illicit Discharge flye*r as educational outreach as part of illicit discharge follow-up procedures (see Appendix D of the FY2012-13 Annual Report) and regularly followed up on Illicit Discharge reports. Towards the end of the year the City sought to update the Illicit Discharge flyer to a door hanger. See Task V.7 and Appendix D for a summary of illicit discharge response actions addressed in FY2016-17.

Effectiveness. The City exceeded its goal of conducting outreach to 50% of businesses within a specific segment by distributing the Clean Water Works partnership program invites to all known Auto shop, Carpet Cleaners, Contractors, Restaurants, Car Washes, Landscapers and Pressures Washers within Bend.

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

The City maintains an automated non-emergency Code Enforcement phone tree. The City designates one of the options in this phone tree for reporting Illicit Discharges.

Callers who select that option are transferred directly to stormwater staff for follow-up. Another option is for construction site erosion and sediment control or drainage issues, which is directed to the construction manager in the Community Development Department for routing. Additionally, the City advertises the general number, (541-317-3000) for reporting illicit discharges and general information about the stormwater utility. The City's "Clean Water Works" campaigns include the public works main phone number and website information that can be used for reporting illicit discharges.

The City continues to use the illicit discharge reporting standard operating procedure (see FY2009-10 annual report for additional information). The City also uses an online Citizen Service Request (CSR) form available on the City's webpage (www.bendoregon.gov/services/online-services/citizen-service-request-form-public-works). This form allows the public to electronically report Illicit Discharges. The completed form is automatically emailed to stormwater program staff for follow-up.

Front desk staff are trained on where to send illicit discharge reports 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. Stormwater staff use 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 and staff keep an eye out for evidence of illicit discharges as they do so.

Effectiveness. The City continues improve its reporting mechanisms and educate the public on how to prevent illicit discharges. City staff work with the Public Advisory Group to get input on pollution prevention messages.

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 a permanent imprinted, "Only Rain in the Storm Drain". In FY2016-17 the City installed 19 new curb inlets with this permanent imprint.



OSU graduate students who volunteered to apply storm drain markers with our pollution prevention message on Earth Day

Additionally, the City has an ongoing volunteer storm drain marking program, with the installation of round, plastic semi-permanent markers (10-12 years longevity expected) affixed to existing catch basins. The marker includes a general "Don't Pollute" message along with pictures of swimmers, fish, ducks, and drinking water. For this reason, we use it both in areas that drain to the river and areas that flow underground toward our drinking

water aquifer. The program has seen strong success over time (see Storm Drain Marking Map in appendix D). This year the as part of Earth Day celebration, the City coordinated a storm drain marking event with OSU graduate students. The group marked 195 catch basins in 4 hours. Each volunteer received a fanny pack with a discount card and other Clean Water Works goodies to remember their effort.

Effectiveness. The City has successfully integrated a method of providing a permanent stormwater quality message on all new manhole lids.

The Storm Drain Marking Map in appendix D shows the effectiveness of the volunteer storm drain marker program, which has focused on areas draining to the river and within drinking water protection areas. Due to the volunteer effort by the OSU graduate students, the City installed 195 markers, exceeding the City's goal of installing 50 markers per year.

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). The page has five main categories, including "Get Involved" which links to a location to report illicit discharges (see picture on right).



Figure 5-3. Clean Water Works Website Welcome Page

In FY2015-16 the City added a Clean Water Works webpage that includes four main sections: Home and Garden, Kid's Page, Business Resources and Discount and Partnerships (see www.bendoregon.gov/cleanwaterworks). City staff post new *illicit discharge fact shee*t for both business and homeowners and radio advertisements (www.bend.or.us/modules/showdocument.aspx?documentid=22502) on the City's web site.

In FY2016-17, City of Bend worked with a graphic designer to develop and posted several new fact sheets on the website, including a *Pressure Washing Fact Sheet*, *Tips for Looking to Hire a Landscaper* and *RV Waste Disposal* (www.bendoregon.gov/home/showdocument?id=30490) (See Appendix B).

Effectiveness. The City has provided information on its website to report spills. Additionally, the Home and Garden and Business sections of the Clean Water Works campaign pages have several outreach pieces targeting illicit discharge minimization, both in general, and for specific pollutants. City staff have received several calls this year from concerned citizens noting illicit discharges, which suggests that the contact information on the website and other methods is reaching the public who care enough to let the City know of potential spills and problem areas, allowing a more efficient

response and better water quality protection. The Clean Water Works page showed a 200% increase in visits this fiscal year over last (see chapter 3.0).

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

The City developed a geodatabase map in FY2008-09 including GPS coordinates for all known City stormwater facilities, and has continued to update the geodatabase as appropriate since. In FY2016-17, City Information Technology GIS staff updated the mapping interface from geoblade to BOOM, the new interface that utilizes Geocortex software. A limited version is available online for the public to use that includes catch basins, storm drain pipes and UICs. The online map viewer is located at: (www.bendoregon.gov/index.aspx?page=463). Additionally, the City has street level imagery that staff can use for internal research purposes.

This year, the City began researching and collecting private stormwater facility location data. A temporary employee is reviewing private drainage plans, assigning facility ID numbers for each private drainage facility and recording location data. When completed the City will convert the data into a geo-database and uploaded into the City GIS 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. In FY2016-17 the City upgraded the map viewing interface.

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 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 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 (www.bendoregon.gov/index.aspx?vurl=idmanual) that is referenced in the stormwater ordinance, Bend Code Title 16, and has continued the implementation and education process.

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

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

The Utility Department continues to work closely with Operation Maintenance staff, Building Inspectors, Engineering Inspectors and Industrial Pretreatment Program staff to coordinate IDDE efforts. The City has a Stormwater Analyst who is trained on, and responsible for, following up on illicit discharge notifications and complaints. When a spill or illicit discharge is noted, this staff person investigates to attempt to find and properly address the source. The stormwater utility added a new staff member in FY2016-17 to oversee erosion and sediment control enforcement and post construction site inspections.

To ensure stormwater performance standard trainings are occurring, the City uses an online program called Compli to track staff trainings. In FY2016-17, public works staff were trained in Concrete Use and Disposal; Winter Road Care; Leaky Equipment and Fueling; Spill Prevention, Control and Cleanup; Utility/Road Repair & Maintenance; Pressure Washing and Surface Cleaning; Vehicle and Equipment Washing; and Paint Use and Disposal (see Appendix D). The staff are required to take a short quiz after each training. These trainings are provided as a series of stormwater-performance standard specific trainings are implemented throughout the year to appropriate staff (see Chapter 3 for a summary). Trainings are automatically emailed out to applicable public works employees and reminders are provided. Staff are required to review a fact sheet or review a presentation and complete a short quiz. In FY2016-17 Staff began migrating the trainings to a new software, Target Solutions. The new software should be fully operational in FY2017-18 and will function similar to the Compli System.

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 Target Solutions 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.



Field Component of CESCL Training, February 27, 2017.

Staff continue to conduct inspections of the City’s 15th Street and Boyd Acres Corporation Yards in conjunction with quarterly Safety Inspections (see Appendix G).

In February 2017, the City of Bend hosted an Erosion and Sediment Control Lead training course and invited local contractors and City inspection staff (see Chapter 6 for more details on this training).

Effectiveness. The City continued to use its tracking system, maintaining a spreadsheet of stormwater-specific follow-up actions, tracking 32 events in FY2016-17 (see Appendix D). This number is slightly lower than years past, but this is due to the hiring of a new compliance specialist. Previously all construction site erosion complaints were tracked in a single IDDE database, but now construction site/ erosion control complaints are tracked separately (See Chapter 6).

Staff continued to coordinate 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. Initial outreach and education has been successful in resolving most of the issues. In FY2016-17, City of Bend staff issued one formal violation, to an apartment complex that had multiple pump station overflows into an onsite drainage swale. In order to avoid a fine, the apartment complex is working with the City to develop a consent agreement, which requires the property manager to increase the maintenance frequency for the pump station, until the pump station can be upgraded/replaced. Additionally the City continued to track the compliance orders for the FY 2015-16 infractions by a carpet cleaner to successful completion also the City referred one claim to DEQ and DEQ conducted the enforcement.

City staff incorporate several additional trainings including; Illicit Discharge Recognition and Reporting, Vehicle and Equipment Washing; Street Sweeping; and Concrete Use and Disposal into Compli system. Work has begun to migrate all the existing trainings into Target Solutions, which provides opportunity for additional trainings.

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

City stormwater staff work closely with water conservation staff to help minimize dry weather flows from irrigation runoff. The City's water conservation group continued its sprinkler inspection program, offering free sprinkler inspections for City of Bend utility customers. In FY2016-17, Staff performed over 200 inspections, reducing water use and adjusting sprinkler heads to eliminate overspray onto city streets and sidewalks. The sprinkler inspection program is a free service in which participants receive a site visit analysis and a customized watering schedule for their landscape as well as education on how to maximize the performance of their underground irrigation system. The program includes a visual inspection to pinpoint any problems in the sprinkler system, including runoff, tests to determine how evenly the water is covering intended areas, and a soil sample to determine root depth and soil type. The staff conducted extensive advertising including the Smart Irrigation and Water Wise City Edition (www.youtube.com/watch?v=k0aMFj-jK1E).

City staff worked with the OSU extension program to update the *Water-wise Gardening in Central Oregon guide* (formally called *Xeriscape in the High Desert*). The revised Water-wise Gardening guide was published in February of 2017. A copy of the guide is available online at (https://catalog.extension.oregonstate.edu/em9136/viewfile). The Water

Conservation group also developed a new Water-wise landscape guide with input from stormwater staff. This new guide includes a section on stormwater facility planning and sizing, and shows several low impact development examples; a copy of the guide is also available online at (www.bendoregon.gov/home/showdocument?id=29569).
The City continues to include landscape irrigation runoff minimization measures in its standards and specifications.

Effectiveness. The work of the Water Conservation program team have resulted in increased efforts towards improving landscape irrigation efficiency and reducing landscape irrigation runoff.

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

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

See ISWMP (2006) Task V.6 Illicit Discharge Ordinance (MS4/UIC) and ISWMP (2006 Task V.7 Program to Detect and Address Illicit Discharges (MS4/UIC).

BMP V-6. Implement Performance Standards (MS4 & UIC)

Performance standards have been completed and incorporated into the ISWMP 2022. The ISWMP 2022 was approved by DEQ as part of the WPCF-UIC permit issuance but has not yet been 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 is implementing the performance standards as part of the

ISWMP 2022 and is fully compliant with the implementation schedule. The use of the Compli system for performance standards trainings has improved staff ability to track training related performance standards (see Appendix D for a list completed trainings). In FY2016-17 the City began smoothly migrating the for performance standards trainings to a new software, Target Solutions. The New software is anticipated to be fully implemented in FY2017-18. The City met its ISWMP (2006) goal of completing the performance standards for inclusion for consideration in the draft ISWMP 2022.

Enforcement Actions

In FY2016-17, the City provided education and verbal warnings along with one formal violation and one referral to DEQ. In general, the City starts with data collection, 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. 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.

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. Since FY2010-11, the City has been using its customer service database program (INFOR). This program effectively assists in tracking initial stormwater illicit discharge reports and helps verify that the proper staff are notified of the incident. The City also continues to effectively use the online citizen service request to respond to illicit discharge reports. Stormwater staff are also seeing improvements in spill response notification from fire and water/wastewater utilities.

The City has effectively improved its staff training approach that will help reduce illicit discharges, and improve notification of spills. Illicit discharge detection and elimination efforts naturally appear to focus on sanitary sewer/septic system cross connections. The City of Bend currently works to address a large number of pollutants with its IDDE program; however, the City has been working diligently to increase and improve its separate sanitary sewer system by the installation of new interceptor lines (SE Interceptor: (www.bendoregon.gov/index.aspx?page=149); North Area Sewer Improvement: (www.bendoregon.gov/index.aspx?page=1245); Plant Interceptor Sewer Line Rehab: (www.bendoregon.gov/index.aspx?page=1344), a new pump station upgrade adjacent to the Deschutes River (Colorado Lift Station: (www.bendoregon.gov/city-projects/city-infrastructure-projects/colorado-lift-station), and an expansion of the water reclamation facility (www.bendoregon.gov/index.aspx?page=664). These efforts represent a substantial commitment to improving wastewater infrastructure, with the bonus of reducing concerns of wastewater leaks and problems entering the stormwater system.

6.0 CONSTRUCTION SITE STORMWATER ACTIVITIES

Introduction

The objective 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 directly attributed to sediment loading; with the majority of sediments sourced from upstream activities. The City sees it as a priority to reduce stormwater related sediment contributions into the river within its jurisdiction. Sediments are a major pollutant that can come off uncontrolled construction sites and have the potential to clog stormwater facilities (e.g. drywells, drill holes, and swales) and negatively impact the Deschutes River, which is listed for sediment and turbidity within the city of Bend.

Construction sites that disturb one or more acres and discharge stormwater directly to a surface water body 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. As part of the Bend Code Title 16 Stormwater Ordinance, grading permits are required on all commercial developments that are adding 5,000 square feet or more of impervious surface or adding one or more UICs, and sediment 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 FY2016-17, the City began a partial review and update of the Design Standards, Construction Specifications and the Development Codes. City's Standards and Specifications only apply to City-owned property and right-of-ways, not to private lands unless referred to in the development code. The revised standards will include additional erosion control details while continuing to include the COSM erosion requirements. The current standards and specifications are available online at http://www.bendoregon.gov/index.aspx?page=161.

The City's stormwater staff continues to work with city inspectors, engineers, contractors and developers to implement Bend Code Title 16. Part of the implementation process is the review of development and construction site plans

through E-Plans, an electronic review software. In August 2015, the City adopted new standards related to inspections, including shifting some responsibilities to the engineer of record. (see http://www.bend.or.us/modules/showdocument.aspx?documentid=23509 for the standards and http://bend.granicus.com/MetaViewer.php?view_id=5&clip_id=351&meta_id=12606 for the City Council issue summary for more information.) The engineer of record is responsible for certifying that the designs are installed per the site plan. The Stormwater Compliance Specialist works closely with the Construction and Right-of-Way Manager and his team in Private Engineering along with the Building Inspectors to ensure efforts are coordinated and messages are consistent.

In FY2016-17, the City hired a Stormwater Compliance Specialist in the Utility Department. The Stormwater Compliance Specialist is responsible for educating, inspecting, regulating and enforcing construction site stormwater ESC compliance.

Effectiveness. The City has successfully completed improving design standards and specifications including the adoption and implementation of Bend Code Title 16, Standards and Specifications, and the COSM. The City has made major progress in regulating construction site erosion and sediment and has completed the tasks outlined for this BMP. In FY2016-17 the Stormwater Utility hired a Stormwater Compliance Specialist. Since January 2017, he has taken the lead on revising inspection forms, attending pre-construction meetings to provide education and communicate expectations, conducting ESC verification inspections, and enforcing when needed. An ESC Inspection form is attached in Appendix E.



Examples of ESC BMPs

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

The City sent a Clean Water Works Partnership invite to 134 construction contractors and company owners. The packet sent in March 2017 included an invite cover letter, a partnership participation pledge sheet, a Clean Water Works sticker, the 20-page illustrated ACWA Construction Site Stormwater Guide, and a fact sheet entitled “Sediment Prevention for Businesses” that includes information on both post-construction as well as construction sediment. The second page included a segment entitled, “What Can You Do as a Builder/Contractor” with five BMPs and a list of resources for more information. (See Appendix E).

The City continued to provide on our website the "Single Family Example Drainage Plan" to project proponents to help with implementation of Bend Code Title 16 (see FY2012-13 Annual Report, Appendix E for copies). This 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".

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

- Sediment Fact Sheet for Businesses
- Maintain Construction Site BMPs Poster
- Erosion and Sediment Control Fact Sheet
- Grading Clearing & Erosion Permit Flow Chart
- Drainage Submittal Flow Chart
- Sample Erosion and Sediment Control Plan - Single Family Residential
- Stormwater Maintenance Agreement
- Central Oregon Stormwater Manual
- Construction Stormwater Pollution Prevention (NPDES Webcasts)
- Construction Stormwater Pollution Prevention Plan Development

Effectiveness. The City has met the schedules for this task and have provided for additional materials and incentive programs as well. Some construction companies and homebuilders have participated in the Clean Water Works Partnership program. 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 FY2016-17, grading and ESC questions were routed to the City's Stormwater Compliance Specialist to coordinate compliance, investigate and follow-up. When an ESC or poor housekeeping issue is discovered on site, the Stormwater Compliance Specialist, in coordination with City inspectors, provides verbal education and warnings. If the erosion and sediment problems are not addressed by the time the Stormwater Compliance Specialist returns for the next inspection, a formal Stormwater Violation Letter outlining the compliance deficiency, inspection history, required actions, and potential enforcement procedures may be issued. In coordination with CDD, the Stormwater Compliance Specialist can withhold additional inspections or issue a Stop Work Order until the problem is remedied, which can have the effect of stopping a project from progressing. This procedure proved to be an effective way to encourage contractors to repair erosion control deficiencies in a timely manner. An example Stormwater Violation Letter is attached in Appendix E.

Over 53,688 total inspections were requested in FY2016-17 of the Community Development Department. The Community Development Department recorded 831 single-family residential starts and 332 approved commercial final inspections. Engineering inspectors require erosion and sediment controls unless the site is in a depression and stormwater would stay on site. Erosion and sediment controls have been required on grading/drainage permits, all work in right-of-way, and on commercial properties. In FY2016-17 there were 896 grading/drainage reviews. Engineering inspectors inspected for erosion and sediment controls on these, providing verbal warnings as needed. No stop-work orders for drainage were needed. The Stormwater Compliance Specialist along with other Utility staff made 106 construction site visits, attended 20 preconstruction meetings, and issued 1 stormwater violation letter; these events were recorded in the Inspection Tracking Log Book (see Appendix E).

Effectiveness. Both commercial construction activity and single-family home starts stayed elevated in FY2016-17 compared to prior years. To meet compliance goals, the Stormwater Compliance Specialist and Engineering/Building Inspectors provided verbal education, warnings, and delayed inspections to meet construction-site stormwater management goals. City staff reviewed roles and responsibilities to increase effectiveness but the work load is straining existing resources in both the Community Development and Engineering departments. In response, the newly hired Stormwater Compliance Specialist devoted a focus on construction site ESC inspections and post construction drainage inspections. The Stormwater Compliance Specialist has increased compliance effectiveness and helped Engineering and Building Inspectors with complaint response.

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







2017 CESCL Field Training.

In March 2017 the City of Bend hosted a two-day Certified Erosion Sediment Control Lead (CESCL) training course. An announcement flyer was emailed out to local contractors and engineers. The City had 29 sign-up for the class and 22 attendees. Roughly, half of the attendees were City employees and the other half were local engineers and contractors. The City contracted with Nathan Hardebeck, with Clean Water Technologies to provide the training and organize a hands-on erosion control BMP demonstration in the field. In order to make the class more applicable to our region, several local presentations were included with this training. Kyle Thomas,the City of Bend Construction and Right-of-Way Manager, gave a presentation on common erosion control issues that inspection staff are finding in the field. Wendy Edde, City of Bend Stormwater Program Manager, gave an overview on the City's regulations and erosion control requirements. Krista Ratliff with Oregon DEQ provided an update on the state 1200c permit. A copy of the presentations, sign-in sheets and a course evaluation summary have been included in Appendix E. Those completing the test at the end of the course earned a Certified Erosion and Sediment Control Lead designation, valid in Washington State and recognized in Oregon by the DEQ.

The City of Bend also hosted several Construction ESC related webinars in FY2016-17 (see Table 6-1 below). Copies of the webinar announcements, sign-in sheets and evaluations are available in Appendix E.

Table 6.1 Construction Site Training Summary

Spring Webinar Series		
Presenter	Webinar Training	Date
ASCE	Construction Stormwater Best Management Practices (BMPs)	December 20, 2016
ASCE	A New Approach to Application of Sediment Transport for Jurisdictional Assessment in the Arid Southwest	December 20, 2016

On a broader scale, the City prepared a City edition cable news segment on the Sediment Reduction program entitled "Reducing Sediment in the Deschutes River,

" that first aired in March 217 on cable TV, in City Hall, and is still available on the City's YouTube channel (see https://www.youtube.com/watch?v=r8r0LydZH_s). The City Edition segment on sediment has been viewed 112 times since posted in Spring 2017.

Effectiveness. Between the webinars and on-site Certified Erosion Control Lead (CESCL) training, the City exceeded its biennial training requirements for this task. The City will consider using a larger venue for future CESCL classes to accommodate more people. Some feedback was that some people wanted to see a shorter one-day class and that the field component was very useful.

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, expected to be a statewide general permit. A summary of initial implementation status of the Performance Standards is available in Appendix A.

Effectiveness. The City's implementing the new performance standards as part of the ISWMP 2022 and is in full compliance with the standards in FY2016-17. The City will review the ISWMP 2022 once NPDES permit conditions are known.

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. Most often, the Stormwater Compliance Specialist and Building/Engineering inspectors work to educate as part of standard operating procedure and this approach quickly resolves any potential issues. In FY2016-17, one formal violation letter was issued and multiple verbal warnings resulted in compliance without the need for escalation. These events were recorded in the Inspection Tracking Log Book (see Appendix E).

Summary Assessment of Effectiveness

The City has successfully implemented the tasks in this component. Staff has continued to focus on education and coordination efforts, both internally and externally to ensure effective and smooth implementation of Bend Code Title 16, the Standards and Specifications, and the Central Oregon Stormwater Manual. The City has improved the program this year with the integration of the newly hired Stormwater Compliance Specialist to handle ESC compliance tasks along with inspection needs. The adoption of Bend Code Title 16 provides adequate enforcement authority. Feedback from trainings is used to refine effectiveness and selection of future trainings. The City develops and distributes new education materials as the needs present themselves, and is working towards improving enforcement staffing. In FY2016-17, Utility staff made 106 construction site visits, attended 20 preconstruction meetings, and issued 1 Stormwater Violation Letter. The City is continuing to refine its enforcement plan as roles and responsibilities change due to workload, experience, record-keeping needs, and technological capabilities. Across departments, staff are noticing that uncovered loads appear to be contributing to the sediment problem, and this may be an important area to focus future efforts.



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 limits.

Tasks Completed (ISWMP (2006))

The following describes yearly tasks that have been completed, or are ongoing that were performed during FY 2016-17:

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.

Effectiveness. Obtaining a 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 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. The COSM may need to be reviewed to consider DEQ's current risk-evaluation on stormwater underground injection controls and new post-construction control requirements coming out of the anticipated NPDES Phase II MS4 general permit once finalized. Team members briefly discussed this in FY2016-17 but decided an update at this time is premature especially given the status with the phase II permit.

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

As noted in the FY2007-08 Annual Report, City staff have determined that, in general, private developments are required to maintain private stormwater facilities and the City maintains 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 Bend Code Title 16 (See Annual Report FY2011-12 Appendix A), Bend Code Title 16: section 16.15.040). The code requires all new commercial development to submit a signed private maintenance agreement that will be recorded on the title of the property (see FY2013-14, Appendix F for an example).

For City-owned facilities, City field staff continue to use the INFOR asset management software to assist with maintenance tracking and facilities assets management. 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. With the hire of the Stormwater Compliance Specialist in January 2017, the City has improved it's an intensive O&M verification program to identify existing deficiencies in public stormwater facilities. This effort included updating inspection sheets (see Task VII.3). The more intensive O&M verification program is tracked on Sharepoint.

On the private side, the City continues to use E-Plans for project review and electronic record keeping but inspects only on compliant. The city continued an intensive effort in FY2016-17 to better capture private stormwater facilities into their own database for easier retrieval and data analysis. Over 6,300 facilities have been entered into the database by the end of June 2017. The Stormwater Program has copies of both private stormwater plans and private maintenance agreements (37 to date) saved on Sharepoint by tax lot number.

Effectiveness. Having maintenance agreements are useful for implementing Bend Code Title 16. In the future 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. With the addition of the Stormwater Compliance Specialist, in FY2016-17 24 public stormwater facilities have been inspected and outstanding maintenance and installation deficiencies have been identified. This shows a marked increase in number of inspections. The finding will help improve future maintenance on installation as program staff share findings with operations and engineering staff.

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

In FY2016-17, the City hired a Stormwater Compliance Specialist to improve inspection documentation of post-construction controls and lead the inspection program. Staff attendance at the Vegetated Private Water Quality Management Training hosted by Clean Water Services and Portland Community College in

June 2017 has helped provide guidance in program development. The Stormwater Compliance Specialist has trained and coordinated closely with building and private engineering inspectors.

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 as growth increases. The City has been monitoring efforts closely and has widespread support to work to refine and improve the processes given the changes occurring in the City. With the hire of the Stormwater Compliance Specialist, the City has developed more effective stormwater facility inspection forms along with an inspection tracking spreadsheet. Copies of inspection forms and an abbreviated copy of the tracking spreadsheet are available in Appendix F. These refinements to the inspection program are increasing effectiveness.

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

Multiple City of Bend staff assisted with the planning of and provided the venue for the PNCWA 2016 pre-conference workshop "Build a Rain Garden". On October 18th, the City hosted a City of Bend Stormwater tour for participants of the PNCWA 2016 conference held in Bend. The tour included visits to Franklin's Corner, the Third Street underpass projects, and the Bend Park and Recreation Administration Building Stormwater Facilities. In FY2016-17, City staff provided input on the internal Waterwise Landscape Guide (http://www.bendoregon.gov/home/showdocument?id=29569), and the OSU Waterwise Gardening in Central Oregon guide (https://catalog.extension.oregonstate.edu/em9136/viewfile). This feedback resulted in the incorporation of the Stormwater Management Section of the OSU Waterwise Gardening Guide and the City Infiltration Plant-List developed by PAG members and local experts. For the City of Bend Waterwise landscape Guide, the feedback included the additions of rain gardens and permeable pavement in the infiltration planting plan figure and a two-page spread on stormwater management (see Appendix F).

The City continues to distribute 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's Stormwater Compliance Specialist earned fifteen continuing education hours for attending the Vegetated Private Water Quality Management Training on June 21 and 22, 2017 (see Appendix F). Four City staff members attended ACWA's Stormwater

Summit held at Lane County Community College on May 10, 2017.

The City provided several training opportunities associated with post-construction stormwater controls to internal staff and the public. Program Manager Wendy Edde attended NRPA Webinar *Green Infrastructure in Parks: Collaboration, Funding, and Community Engagement* on March 9th 2017. Several other City staff attended the CWP Webinar Training *Making Urban Trees Count* on June 21st 2017. Table 7.1 provides 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).

Table 7.1 Post-Construction Control Trainings

Winter Webinar Series		
Presenter	Webinar Training	Date
ASCE	Permeable Pavement: Design Considerations and Tips for Avoiding Failures	December 20, 2016
Spring Webinar Series		
Presenter	Webinar Training	Date
CWP	Stormwater Contaminants of Emerging Concern	March 24, 2017

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

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

The City helped distribute "The Oregon Rain Garden Guide" and supplemental plant list for Central Oregon by providing copies at outreach events (i.e., Deschutes River Cleanup and Earth Day). The full color guide includes information specific to Central Oregon. Starting in February 2017, the Stormwater Public Advirsory Group began a special meeting series focusing on post-construction control options with increased density within the City. The first meetup included education presentations and tours related to green infrastructure and low impact development. See chapter 4.0 for more details.

Effectiveness. City staff successfully met the requirements of this task. Due to staffing shortages the City's Program Manager could not commit to speaking at the "Build a Rain Garden" workshop for PNCWA. The City was able to draw from the expertise of a PAG member to substitute, providing attendees hands-on experience, and an understanding of the importance of PAG support. Incorporating stormwater design considerations into the Water-wise Gardening in Central Oregon Guide (February 2017) and City of Bend Waterwise Landscape Guide helps users consider stormwater drainage and design earlier in the planning process, allowing for more opportunities to affectively address the issues in a sustainable manner. Coordinationg with water conservation efforts has proven useful and has increased effectiveness. Having continuing education credits available helps draw the engineering community to the webinar trainings that provide access to national expertise. The ASCE webinar on permeable pavements gave permeable pavers a 4/5 on a scale of 1-5 with 5 being excellent (see Appendix 6).

Task VII.5 Performance Standards (MS4/UIC)

Performance standards have been completed and incorporated into the ISWMP 2022. The 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 performance standards.

Tasks Completed (ISWMP 2022)

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

The City continues to focus its efforts this year on the implementation of both the Standards and Specifications and Bend Code Title 16. For example, stormwater engineering staff worked with a landscape architect to ensure success of low impact development into the Reed Market Improvement project given landscape establishment issues that have been occurring at the site that includes bio-swales and planter boxes along a Reed Market Rd. City stormwater staff continue to participate on the design team to address the stormwater runoff for the 14th Street project and the South Awbrey Butte Drainage Study. Staff continued to provide input on other CIP and internal maintneance projects as well.

The City is working to tailor its preferred post-construction facilities by area for inclusion in the next Standards and Specifications update.

Effectiveness: The City continues to implement post construction controls as part of retrofit projects, and was effective in securing budget increases to continue implementing the capital improvement projects outlined in the Stormwater Master Plan, adopted in August 2014. Delays in implementation area result of competing demands.

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.

In FY2016-17, the City hired a Temporary Stormwater Database Technician to continue collecting information on the location of UICs and other stormwater facilities distributed within city limits on private industrial and commercial property. GPS coordinates and attribute data were entered into a spreadsheet to provide quick and easy access to stormwater facility location information in the case of an illicit discharge or emergency spill as well as to assist City field staff performing private stormwater facility inspections. Attribute information for these facilities includes a unique ID for each facility, a facility type, a site address, the source from which the facility location was derived, the date the information was entered into the database, who created that data, and property owner and contact information. While over 7,000 facilities have been entered into the system, the database is still in the process of being constructed and is estimated to be sustainably completed by August 2018.

Effectiveness: The City is currently on schedule with implementation of performance standards. The City met retrofit performance standards with the construction of Reed Market Project (phase two) work that is underway.

The City has successfully ramped up the process of conducting an overall inventory check for private stormwater facilities for non-single family residential properties. The inclusion of this information into the City's current datasets will provide City Staff and Emergency Spill Responders a better understanding of UIC and other onsite drainage facility locations, therefore improving water quality protection efforts.

The City also tried out a deepened >18inch catch basin in an area of town not draining to the river, for a sidewalk improvement project where stormwater grates were being changed out for improved bicycle safety. The City may consider maintaining these sites as a experimental project to see if the deepened catch basins are more effective than the regular catch basins.

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. The City has updated and actively implemented the development rules and legal authority to require and maintain adequate post-construction controls. In FY2016-17, the City hired a Stormwater Compliance Specialist to perform maintenance verification inspections of post-construction stormwater facilities. The City is implementing the performance standards and is meeting or exceeding the approved schedule. The City has been successful in securing additional funding to help fund the capital improvement projects described in the Stormwater Master Plan. In FY2016-17, the City hired a Temporary Stormwater Database Technician to collect information on the location of stormwater facilities distributed throughout city limits on private industrial and commercial properties. While it has been five years since the City has submitted the ISWMP 2022 the City is hesitant to update the plan until reviewing the next draft of the Phase II General Permit that DEQ expects to have out in FY2017-18.

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 and minimize the discharges of pollutants to watercourses and injection systems. Routine maintenance activities include: street sweeping, inspections and cleaning of storm drainage facilities and watercourses, and litter control. As of this writing the City stormwater system has 5,112 drywells, 976 drill holes, 4 drain fields, 194 swales, and 10,400 catch basins in addition to the over 40 miles of storm drain pipe, 14 miles of which drain to the Deschutes River. 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 FY2016-17:

Task VIII.1 Street Sweeping (MS4/UIC)


City Sweeper Downtown Bend.

The City continues to implement its Sweeping Operations Plan (see Appendix G for a copy of the most recent plan). The City is broken down into eight geographical sweeping areas, each area has four zones. Each zone requires approximately four days for a sweeper to complete. Routes are designed based on the street classification and community needs. Each Sweeper contains a map of the zone with the identified route boundaries. Sweeper operators are assigned zones on a daily/weekly basis and routes are assessed for accuracy and updated as needed.

In FY2016-17, the Stormwater Utility continued to fund three FTEs of seven FTEs sweeper positions due to the stormwater benefits of street sweeping. The three stormwater utility funded personnel focused on sweeping year around. Due to budget restrictions, the four Street funded FTEs are re-positioned during the

summer to assist with paving and ADA projects. During winter operations when the sweepers can access the streets, the four FTE street sweeper crew operate the sweepers as they are able given weather conditions (November to March) (see Figure 8-1).

The City continues to improve sweeping efficiency. In FY2016-17 the City used electronic reader boards to inform neighborhoods of the sweeping schedule and to help reduce the number of cars parked along the curb line. The City also developed new door hanger to inform homeowners on what they can do to keep the curb line clear for maintenance crews and street sweepers (see Appendix G for a copy of the door hanger). In FY2016-17 the sweepers traveled 18,239 miles and removed 16,108 cubic yards of material from the streets.

Figure 8-1. FY2016-17 Municipal Maintenance Sweeping

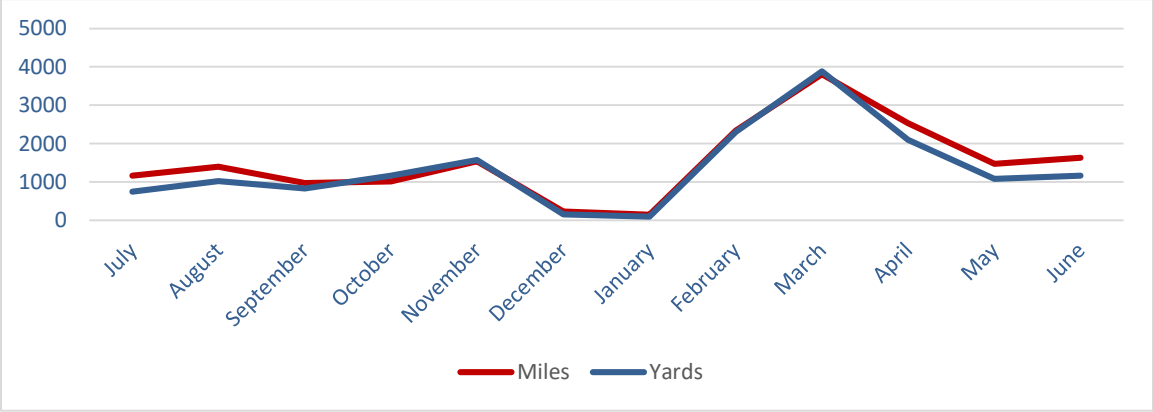
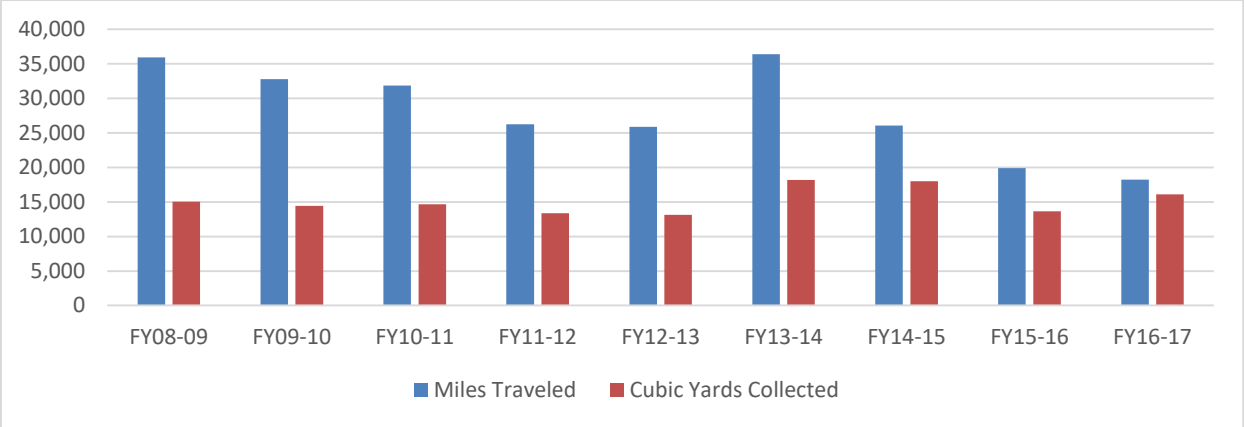


Table 8-1 FY2016-17 Municipal Maintenance Sweeping

Date	Miles	Cubic Yards
July	1160	748
August	1400	1024
September	974	828
October	1011	1160
November	1536	1572
December	233	156
January	150	100
February	2340	2303
March	3805	3881
April	2529	2098
May	1471	1078
June	1630	1160

Effectiveness. The City sweeping program collected 16,108 cubic yards of material in FY2016-17. The removal of this material reduces clogging of stormwater facilities and keeps pollutants out of the Deschutes River. The City is continuing to look for ways to improve sweeping efficiency such as reader boards, door hangers, and the consideration of callout system. The sweeper zones need to be smaller in size, to facilitate this new grid system the Street Supervisor is working towards developing new routes for the program. The amount of material removed is also related to the type of winter weather received and the quantity of traction material (cinders/basalt) that have been applied. This winter was exceptionally severe and broke several snow fall accumulation records. While sweeping is important throughout the City, sweeping in areas that drain to the river is the highest importance from a stormwater quality perspective because the river is listed for sediment/turbidity. Staff have asked that the level of service be increased in the river drainage with the new routes. Staff are also looking to measure effectiveness for both the proposed route changes and the purchase of a new sweeper, scheduled for FY2017-18.

Figure 8-2. Sweeping Summary from FY2008-09 through FY2016-17



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. The Street department is responsible for sweeping public roads and both corporation yards. Facilities is responsible for sweeping parking lots and the parking structure. In the early years of the stormwater program, the City formed a Clean Streets and Parking Lots/Litter Task Group within Public Works. This group worked to determine monitoring protocols and examine ways to improve effectiveness of the entire sweeping program. The City Stormwater Program Manager and the Sweeping Supervisor continue to meet and coordinate on sweeping efficiency. Parking lot sweeping was not an issue this year. The City has been able to improve its

proportion of yards of material collected per road mile traveled (see Figure 8-2). See also Task VIII.1.

Effectiveness: Crews have not noticed excessive litter or sediments within the parking lots. See Task VIII.1 for more on effectiveness. The City continues to improve sweeping 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. The Downtown Bend Business Association (DBBA) maintains these receptacles with routine cleaning and repair on an as-needed basis per an MOU with the DBBA and the City. For more information on the City's relationship with DBBA to protect stormwater quality in the downtown area, see the City Edition "Bend Downtown Stormwater" that ran during February 2015 and remains available on the City YouTube channel:www.youtube.com/watch?v=3eE6d2eH3Y&index=23&list=PLufJOv4LpbfAT2WkINy89WDCrQ9YdFBkE. City staff prepared a newsletter release in FY2016-17 encouraging residents to properly tree limbs for improved street sweeper access and was also included in the July-2017 Our City Newsletter available on the Citys website at: www.bendoregon.gov/Home/ShowDocument?id=31258 (or see Appendix G).

The Street Division right-of-way and landscape maintenance crews collect litter as a part of their routine maintenance. Work orders are tracked using Infor EAM asset management system. The Street Division also administers an Adopt-A-Road program and a Volunteer program whereby citizens help with weed abatement and collect litter. The City has participated in developing a volunteer program called Bend Beautification. Street sweepers are used to pick up litter on paved surfaces. Large amounts of debris, deposited on streets, alleys, or other City properties are removed by personnel using the necessary equipment needed. Maintenance supervisors do not have authority to enforce compliance, but can notify code enforcement personnel with all pertinent information.

Stormwater crews continued to help at the annual "*Deschutes River Cleanup"* Stream Stewardship event held in August 2016. Crews collected trash bags that were filled by the volunteers and transported them to dump trucks parked in the staging area. This year the event had approximately 200 volunteers, removing a total of 67 garbage bags of weeds, trash and debris from alongside the river and 25 bags of in stream debris for a total of 1,400 lbs. as reported by the Upper Deschutes Watershed Council.

In the past several years, City staff had responded to several grease storage container spills in the downtown areas. In response to these spills, the City

adopted Bend Code 11.16.120 in FY2015-16. The new Code requires that all grease collection and recycling companies use secure, lockable and leak proof containers. As a result of the code change, In FY2016-17 the City did not receive a single grease spill report. With the heavy winter snow, the Citys street cleaning efforts were highlights on KTVZ`s "C.O. streets see trash uncovered by melting snow" February 13, 2017 http://www.ktvz.com/news/co-streets-see-trash-uncovered-by-melting-snow/332441755

Effectiveness. The City effectively assists in the collection and disposal of litter in the Downtown area and throughout the City by picking up trash from landscaping and stormwater facilities. The City also participates in and sponsors The Upper Deschutes Watershed Council, Deschutes River cleanup event that focuses on trash removal. The adoption of Bend Code 11.16.120 significantly reduced the number grease spills.

Task VIII.4 Landscape Maintenance Practices

City landscape crew do not use restricted use herbicides. Training is important and City landscape head Jimmy Hall attended the 2016 Oregon Department Agriculture weed symposium. City staff worked with the OSU extension program to update the water wise landscape guide that was published in February of 2017. A copy of the guide is available online at https://catalog.extension.oregonstate.edu/em9136/viewfile.
This guide includes a section on stormwater facility planning and sizing, shows several low impact development examples and incorporates the Citys approved plants suitable for bio-retention/infiltration basins. This plant list was created taking into account maintenance consideration as well.

The City's water conservation group continued its sprinkler inspection program, offering free sprinkler inspections for City of Bend utility customers. In FY2016-17 Staff performed over 200 inspections, reducing water use and adjusting sprinkler heads to eliminate overspray onto city streets and sidewalks. In addition to conserving water, this program has also helped reduce dry weather irrigation flows into the City streets. They also put on a workshop on February 21, 2017entitled, "Curb the Flow – Streetscaping in Bend" to keep water off the street (see appendix G).

The City of Bend Stormwater Compliance Specialist attended a Vegetated Water Quality Management Certification Course hosted by Portland Community College and Clean Water Services. Copy of the certification is provided in Appendix F. This is the second staff member in the stormwater section that has received this training.

City capital improvement projects have incorporated stormwater surface controls, including Reed Market, Murphy Road Improvements, and the G.O. Bond

roundabouts. See the City of Bend completed infrastructure projects for more information on recently completed projects (http://www.bendoregon.gov/city-projects/city-infrastructure-projects/recently-completed-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. At present the City has 193 swales. The City has implemented improved practices such as plant species selection and concave medians and bioretention that incorporate stormwater as a design element. The City is working to ensure proper maintenance during warranty in a standard manner, and necessary communication upon change of responsibility to the stormwater utility for ongoing maintenance. In FY2016-17 the City Stormwater Compliance Specialist inspected 24 swales and has identified several needed maintenance repairs. Once all of the inspections are completed the repairs will be prioritized and corrected as budget allows.

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

Staff continued work to identify opportunities and improve maintenance practices. Stormwater field crews use the Infor system to manage swales, catch basin and UIC maintenance records. In FY2016-17, the four dedicated stormwater operations staff along with two seasonal temporary staff maintained 12,203 catch basins, 7,039 UICs (dry wells and drill holes) and removed 502 yards of material for these stormwater facilities. In addition to routine cleaning and inspection, staff completed 32,554 work orders, including tasks such as catch basin cleaning, catch basin replacements and unplugging clogged drill holes. Stormwater Crews also maintained City swales/detention basins/bioretention quarterly, performing over 760 maintenance inspections.

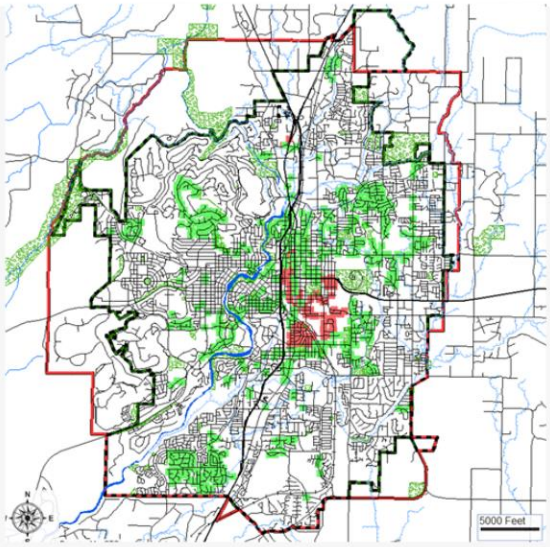
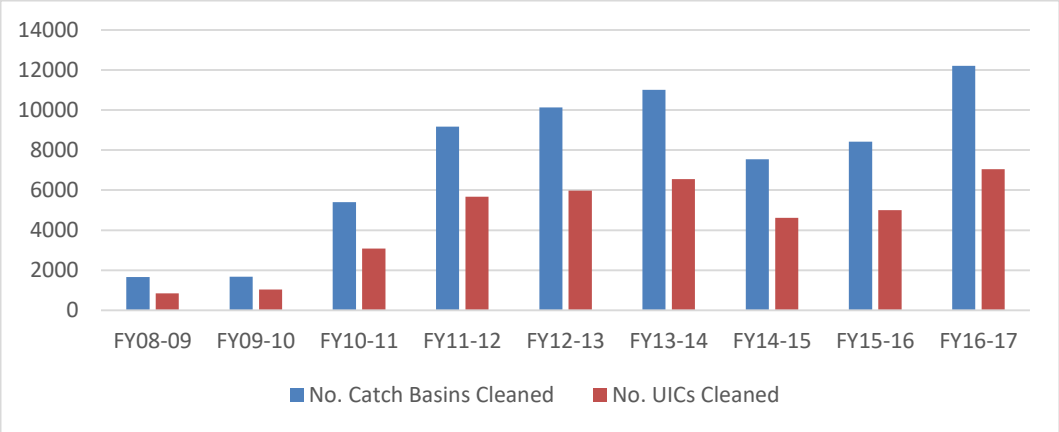


Figure 8-3. Drill Hole Shut-off Map
(Areas in red have a valve installed)

Figure 8-4. Storm Facility Cleaning from FY2008-09 through FY2016-17



As the number of landscaped stormwater facilities increase, stormwater crews are having to spend more time on landscape maintenance. This year in an effort to keep current stormwater maintenance schedules, staff contracted with a local landscape business to maintain several vegetated stormwater facilities. That allowed crews focus on catch basin and UIC cleaning (see Figure 8-3)

The City continues to maintain a Contech Stormfilter that is installed in Newport Avenue at the west end of the Newport Bridge, replacing the filters as needed. In FY2016-17 staff temporally held off on the installation new gross pollutant traps on drill holes and focus maintenance effort on retrofitting open-top drywells. Work on the drill hole retrofits will continue in FY2017-18. The drill hole retrofits have proving to be effective at reducing clogging and preventing large size pollutants from entering the drill hole.

In FY2015-16 City staff began work on the Awbrey Butte Drainage study. The City hired a consultant to model the drainage flows for this area. In conjunction with this project City crews cleaned and CCTV inspected all of the piped system within the drainage basin. Crews also collected other data, including curb height and infiltration rates for existing UICs within the drainage basin.

Effectiveness. The additional staff, along with the INFOR software and the use of private contractors has continued to increase efficiency and effectiveness of the City's stormwater program to clean the catch basins, drill holes and dry wells, removing more than 502 yards of material. The maintenance levels have continued to increase (see Figure 8-3) making this year one of the most effective cleaning years to date. Additionally, installation of gross pollutant screens on existing drill holes and the installation of open topped drywell inserts has helped

prevent clogging and increased the efficiency in cleaning these types of UICs.

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

Stormwater crews began implementing a drill hole valve installation program in FY2013-14. The shut-off valves allow stormwater crews to safely block the flow during a spill to a drill hole. In FY2016-17 staff temporally held off on the installation new gross pollutant traps on drill holes and focus maintenance effort on installing Drywell-Catch Basin Inserts on direct injection drywells. Staff installed 20 Drywell-Catch Basin Inserts at high risk locations within the right-of-way and at City cooperation yards. The City plans to continue both the drill hole and drywell retrofit programs in FY2017-18.

Staff continued to maintain simple spill kits in each of the street and stormwater vehicles. Streets and stormwater field crews are trained annually in spill prevention and response and in illicit discharge prevention (see Appendix D). In FY2016-17 City expanded the spill kit program and purchased spill kits for all utility vehicles. Distribution will take place in FY2017-18. Spill containers are also present at both Corporation Yards (15th and Boyd Acres).

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 two spill containment trailers that are stocked with absorbents, booms, pipe plugs and other related items in order to respond to larger spills. They are located at each corporation yard for easier access throughout town.

In FY2013-14 the City developed a series of 13 tailgate trainings; each training packet includes an informational fact sheet/ handout. The tailgate trainings were upload into the City COMPLI program. City staff are required to review the fact sheets annually online and complete a short quiz for each. Staff can work the completion of these into their schedule, given ample time before deadlines, and this improves tracking and accountability. In FY2016-17 the City began phasing out the use of COMPLI and began migrating these trainings over to a new training software platform Target Solutions.

The City continues to require all new Utility, Streets, and EIPD 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.

The City uses 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 drill hole valves and Drywell-Catch Basin Inserts on high risk UICs helps reduce spill impacts and risk because staff are given the ability either contain the material in a sump or close off the 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 respond to spill situations, when to report a spill and the importance of protecting storm drain from spilled material. With the break-up of Public Works into three individual departments, additional coordination work remains necessary to ensure that training across the departments is maintained.

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 are trained to report illicit discharges to the appropriate stormwater personnel (see also Task V-2). Staff reported 17 of the 32 reports of illicit discharges reported in FY2016-17. The City continues to focus outreach efforts on its "Clean Water Works" campaign and storm drain marking program (see the Public Education and Public Participation chapters of the annual report for more information).

The City distributed kids activity guides, highlighters and crayons for the July 2016 Quest at the Fest event. The materials include a link to the city website where they can report illicit dumping.

Effectiveness. City staff have implemented educational and inspection best management practices to help reduce the number and severity of illicit dumping incidences. Every storm drain facility is inspected annually (see Task VIII.5) by stormwater crews and examined for evidence of illicit discharges. Increased education on illicit discharges has led to increased calls from both citizens as well as City staff, which get investigated and addressed (see Chapter 5).

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

City staff continued to conduct municipal self-audits to improve water quality on corporation yard sites, performing quarterly inspections at both the Boyd Acres and 15th Street. Staff complete an inspection checklists during the regularly-scheduled safety inspection (see Appendix G for an example inspection). Staff began to conduct these inspections in FY2010-


Installed Drywell Catch Basin Insert at The Boyd Acres Yard.

11.

In September 2016 the underground fuel tanks and above ground pumps at the Pilot Butte Campus (On the east side of the building) were removed. The fueling pad was previously uncovered, posing a risk to stormwater run-on and spills. In FY2016-17 stormwater crews installed three Drywell-Catch Basin Inserts in all of the open toped drywells at the Boyd Acres Corporation Yard. The insert settles out the heavy solids and contain floatables oils.

Effectiveness. The City has been effective in conducting corporation yards quarterly inspections and initiating discussions with appropriate staff to improve practices as needed. The City has also take steps provide basic pre-treatment on open grate UICs at the Boyd Acres facility.

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

Beginning in FY2013-14, City crews collect CCTV inspections data on all new stormwater pipes both when installed and at the end of the warranty period. The crews verify that storm pipes are installed per the approved plans. This initial pipe survey data help provide base line information and will allow for quicker identification of illicit connections in the future. In FY2015-16, the City completed a comprehensive CCTV pipe inspection for the Awbrey Butte Drainage study, and no sewer illicit connections were found. 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 FY2016-17.

In a separate project that will reduce the potential for drinking water pollution and septic cross connections, the City is installing a South East Sewer Interceptor. The project has the potential to eliminate 1,000 septic systems of the estimated 2,800 spices systems in operating within City limits. Properties within 300 feet of a sewer line are required to connect when there onsite septic system fails.

Effectiveness. Implementing CCTV inspections for stormwater together with smoke test inspections in the sanitary sewer have been effective for ensuring and cross-connections are addressed.

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 coordinated through Commute Options (see Appendix G). The City has a page setup for staff with

information on different type of travel—guidance on setting up carpools, bicycle riding, etc, and information on how to sign up for the TDM program. In FY2016-17 this effort included the Bike More Challenge, a state wide program held in June by the Street Trust. Also noted in the January 2017 City Newsletter, the League of American Bicyclist named the City as a "Bicycle Friendly Community" www.bendoregon.gov/Home/ShowDocument?id=29192 (or see appendix G)

Effectiveness. In FY2016-17 the City continued to promote the TDM program, and electronic reporting through the Oregon Drive Less Connect website. City staff efforts saved 2,892 gallons of gas. The Oregon Drive Less Connect website tracker states that the statewide program has saved $43,965 gallons of gas, 173,149 trips, 1.4 million miles not driven alone and 888,348 lbs. of carbon dioxide saved presumably across the state. (see http://www.commuteoptions.org/your-options/drive-less-connect/). Table 8-2 provides City of Bend employee statistics.

Table 8.2
FY2016-17 City of Bend TDM Summary

User Travel Data	Jul-Sept 2016	Oct-Dec 2016	Jan-Mar 2017	Apr-June 2017	Fiscal Year 2016-17 Totals
Number of Users Joined Network	8	2	6	11	27
Total Number of Users	226	230	237	247	N/A
Total Active Users	130	113	107	118	N/A
Total Inactive Users	96	117	130	129	N/A
Non SOV Miles Logged	29,985	7,921	30739	30,004	98,649
Total Trips	4,342	1,122	3771	4,830	14,065
Bike trips	2,555	135	504	1,984	5,178
Bus trips	38	23	83	53	197
Carpool trips	1,061	516	1681	1,160	4,418
Compressed Work Week trips	98	26	80	91	295
Other trips	0	4	2	8	14
Telework trips	56	30	87	66	239
Vanpool trips	0	-	0	-	0
Walk trips	534	388	1334	1,468	3724
Savings					
Carbon Dioxide (lbs)	18,979	4,279	16907	18,604	58,769
Gasoline (gal)	935	210	829	918	2892
Monetary savings ($)	$7,153	$1,614	6376	$ 7,014	$22,157
Ridematch Statistics					
Ridematch search performed	97	100	104	104	104
Ridematch search with no result	71	74	78	78	78
Ridematch requests sent	13	13	13	13	13

Task VIII.11 Performance Standards (MS4/UIC)

Performance standards have been completed and incorporated into the ISWMP 2022. The 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. City staff have developed and distributed training fact sheets to help explain performance standards and best management practices in a manner. In FY2015-16 the Performance Standard Trainings were uploaded into the Compli system, allowing the City to better track what staff have been trained. See Table 8.3 for the total number of utility staff trained by performance standards section in FY2016-17. The City is in the process of migrating performance standard trainings to a new software platform called Target solutions. The City anticipates completing this migration in FY2017-18.

Table 8.3
FY2016-17 Compli Performance Standard Trainings

Performance Standard Training Section	# of Staff Completed
Utility / Road Repair and Maintenance	113
Concrete Use and Disposal	116
Vehicle and Equipment Washing	144
Winter Road Care	32
Leaky Equipment and Fueling Training	145
Paint Use and Disposal	145
Pressure Washing Surface Cleaning Fact Sheet	116
Spill Prevention Control and Cleanup	144
Stormwater Pollution Prevention	146

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 and implementation efforts are progressing effectively.

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 continues and the City is working to be more effective with its staff trainings by incorporating Compli. The TDM program continues to be a success as well.

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 FY2009-10 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 FY2016-17. The City annually provides the raw ambient water quality monitoring data to the local DEQ office for their use and consideration.

Effectiveness. The completion of the multi-year monitoring report in FY2009-10 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. Once analyzed the data 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 www.bend.or.us/index.aspx?page=205, which includes mention of stormwater pollution prevention efforts as well.

The City stormwater and water quality laboratory staff are all under that Water Quality Manager, and staff coordinate as needed to address 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 baseline river monitoring analysis and continues to collect data to help determine water quality changes over time.

Task IX.3 Stormwater Monitoring for UICs (UIC)

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

implementing a stormwater monitoring plan, last updated in October 2016 as part of the WPCF-UIC permit issuance.

In FY2016-17, the City continued the use of the Nalgene stormwater sample system at six UIC locations throughout the City. Stormwater staff closely monitors potential precipitation events to target efforts to ensure enough precipitation is present to collect a sample. A summary of the City's stormwater monitoring data collected in FY2016-17 is included in Appendix H.

The City met its goal of collecting two stormwater samples at each of the six sample locations identified the monitoring plan. The City deployed samplers for two rain events and three additional deployments at the Ladera site. Staff had a difficult time collecting enough runoff from the Ladera site to fill the sample container.

City staff deployed two flow monitors during the sampling season, one at Empire and the other at Simpson. The flow monitors send out a text message to monitoring staff when flow is detected or when the unit needs new batteries. The flow data is uploaded to a web based viewer, FlowLink Global. While the data is useful, the upkeep on the batteries and sensors calibration is time consuming given the amount of flow the City receives. The City revised its UIC monitoring plan in October 2016, making flow monitoring an optional task as staff time allows.


Staff deploying a Nalgene Sampler at the Bend Airport.

Effectiveness. This program is continuing to provide the required data needed for the stormwater quality management program for both the river and UIC disposal. All analytes monitored were within compliance levels.

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 continues to effectively implement the performance standards for monitoring as part of the ISWMP 2022 (see Appendix A).

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 (MS4/UIC)

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

Summary Assessment of Effectiveness

The City has successfully developed and currently implements a UIC monitoring plan tailored to Central Oregon climate and challenges. The City has increased the effectiveness of its stormwater monitoring efforts through the use of automatic grab samplers in conjunction with grab samples.

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

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. 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 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 FY2016-2017:

Task X.1 Drinking Water Protection Area Delineation (UIC)

The City completed its Drinking Water Protection Area Delineation for City wells in FY2010-11 (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 X.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 report was reviewed and accepted by the Oregon Health Authority Drinking Water Program. This year the City's focus was updating the Source Water Assessment for the City's drinking water watershed west of the City. This surface watershed is protected from urban land uses.

The City distributes and makes available on its website two ACWA brochures focusing on UIC pollution prevention—one for residential and one for commercial/industrial users.

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 X.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).

As part of the City's WPCF-UIC permit, the City is required in the 5th year (FY2017-18) to examine emerging pollutants. In anticipation of this, as co-chair of the ACWA Groundwater Committee, the City's Stormwater Program Manager helped set up a meeting of statewide agencies to examine the issue, focusing on pesticides (November 2017). City staff also attended a Center for Watershed Protection webinar, "Pollutants of Concern," on March 24, 2017 to check for overlap with surface water pollutant concerns. (See Appendix I)

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 FY2016-17:

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 follow-up tasks that have mostly been completed related to (a) finalizing drywell depth measurements; and (b) periodically reviewing the State's database or otherwise capturing new drinking water or irrigation water well data (see FY2013-14 and FY2014-15 annual reports for more information). The current drywell database captures depth measurements and is included in Appendix I. The City has continued to track new private wells installations within the City limits or close enough to impact City UIC setbacks. About eight wells were found but know within the City limits. The closest was about 500'-600' East of Shirley Ct, Near Hwy 20 on the east side of town. The 500' buffer therefore would be outside City limits.

In FY2016-17, the City began working with other statewide municipalities and agencies to begin to address the emerging pollutant analysis portion of the UIC permits. The City received direction from DEQ that the focus should be on pesticides, and City staff took an active role in coordinating other municipalities to prepare a cost-effective pollutant fate and transport model analysis for emerging pesticides that began in the spring 2017. The work is expected to be completed in September 2015 for submittal in the 5th year of the permit.

Effectiveness: The City successfully completed the systemwide assessment that was 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. The City is experiencing significant cost savings and anticipates an improved work product by teaming with other municipalities to conduct a substantial fate and transport model for emerging pollutants. The City continues to have a program to install additional spill closure valves in additional high risk areas at an average rate of 15 per year (see BMP X-3) but this fiscal year the team put its focus on installing catch basin inserts for open grate drywells instead. Additionally, the City is yearly tracking installation of new wells.

BMP X-2. UIC Registration (UIC)

A copy of the City's UIC database is submitted with the annual report (see Appendix I). See also Chapter 2.0 (ISWMP 2006) Task II.6 UIC Registration (UIC), Table 10.1 and Appendix I for a summary of new public UICs installed in FY2016-17. The Install Date is the date on the final plans brought to the GIS mapping department. Table 10.2 provides a summary of UICs decommissioned

in FY2016-17 and Table 10.3 provides a summary of UICs expected to be registered in FY2017-18 or beyond and Table 10.4 provides a summary of UICs expected to be decommissioned in FY2017-18 or beyond. City staff discovered one existing drywell (DDW010559) that was previously unmapped.

Table 10.1 New City of Bend UIC Installation Summary (those recorded in FY2016-17)

Facility ID	Install Date	Location Description
DDW010437	5/26/2016	Eastridge Subdivision
DDW010438	5/26/2016	Eastridge Subdivision
DDW010439	5/26/2016	Eastridge Subdivision
DDW010443	5/26/2016	Eastridge Subdivision
DDW010441	5/26/2016	Eastridge Subdivision
DDW010440	5/26/2016	Eastridge Subdivision
DDW010442	5/26/2016	Eastridge Subdivision
DDW010480	3/18/2016	Tuscany Pines Ph 2
DDW010451	6/16/2016	Roosevelt Water Main Replacement Ph. 1
DDW010452	6/16/2016	Roosevelt Water Main Replacement Ph. 1
DDW010453	6/16/2016	Roosevelt Water Main Replacement Ph. 1
DDW010478	12/16/2016	Sunny Breeze Ph. 2
DDW010432	5/11/2016	Rosengarth Estates Ph. 1
DDW010429	5/11/2016	Rosengarth Estates Ph. 1
DDW010430	5/11/2016	Rosengarth Estates Ph. 1
DDW010431	5/11/2016	Rosengarth Estates Ph. 1
DDW010433	5/11/2016	Rosengarth Estates Ph. 1
DDW010434	5/11/2016	Rosengarth Estates Ph. 1
DDW010499	1/20/2016	Stone Creek Ph. A-2 & F-1
DDW010498	1/20/2016	Stone Creek Ph. A-2 & F-1
DDW010497	1/20/2016	Stone Creek Ph. A-2 & F-1
DDW010496	1/20/2016	Stone Creek Ph. A-2 & F-1
DDW010495	1/20/2016	Stone Creek Ph. A-2 & F-1
DDW010494	1/20/2016	Stone Creek Ph. A-2 & F-1
DDW010493	1/20/2016	Stone Creek Ph. A-2 & F-1
DDW010492	1/20/2016	Stone Creek Ph. A-2 & F-1
DDW010491	1/20/2016	Stone Creek Ph. A-2 & F-1
DDW010490	1/20/2016	Stone Creek Ph. A-2 & F-1
DDW010529	4/27/2015	NW Potts Ct
DDW010465	8/26/2016	NW Crossing Ph 23

Facility ID	Install Date	Location Description
DDW010464	8/26/2016	NW Crossing Ph 23
DDW010463	8/26/2016	NW Crossing Ph 23
DDW010476	10/20/2016	Cascade Heights Ph. 4 & 5
DDW010477	10/20/2016	Cascade Heights Ph. 4 & 5
DDW010471	10/20/2016	Cascade Heights Ph. 4 & 5
DDW010530	10/20/2016	Cascade Heights Ph. 4 & 5
DDW010472	10/20/2016	Cascade Heights Ph. 4 & 5
DDW010475	10/20/2016	Cascade Heights Ph. 4 & 5
DDW010473	10/20/2016	Cascade Heights Ph. 4 & 5
DDW010474	10/20/2016	Cascade Heights Ph. 4 & 5
DDW010466	8/26/2016	NW Crossing Ph 23
DDW010467	8/26/2016	NW Crossing at McNeal
DDW010468	8/26/2016	NW Crossing at McNeal
DDW010459	8/22/2016	Pettigrew Place Ph 3
DDW010460	8/22/2016	Pettigrew Place Ph 3
DDW010461	8/22/2016	Pettigrew Place Ph 3
DDW010462	8/22/2016	Pettigrew Place Ph 3
DDW010521	12/16/2016	Sunny Breeze Ph. 2
French Drain	09/2016	62975 Boyd Acres, perforated pipe in waterwise garden on front admin building.

The registration database in Appendix I includes the most complete information, including updates to UIC data, and information on spill and gross pollutant control best management practices installed.

Effectiveness: The City is submitting the registration database in an excel format 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 closed several UICs in FY2015-16 (see Table 10.2 and Appendix I). Table 10.4 includes a table of those UICs that the City anticipates will be closed/decommissioned in FY2016-17. As part of this, the City is working to relocate one drywell as part of a sewer line upgrade project, and is in the early stages of possibly considering decommissioning up to three drill holes in FY2017-18 or thereafter (DDH009923, DDH009922, DDH009921) as part of the SW Roosevelt Water Main Replacement.
+

Table 10.2 FY2016-17 Decommissioned City of Bend UICs Summary

UIC	Description
DDW003423	DDW003423, 588, NW MERCHANT WAY
DDW010018	DDW010018, 5594, COUNTRY CLUB DR
DDW010019	DDW010019, 5595, COUNTRY CLUB DR
DDW010020	DDW010020, 5596, COUNTRY CLUB DR
DDW010021	DDW010021, 5597, COUNTRY CLUB DR
DDW010022	DDW010022, 5598, COUNTRY CLUB DR

Table 10.3 Anticipated UIC Installation in FY2017-18 and Beyond

UIC Number	Originally Anticipated Install Date	Current Anticipated Timing	Location/Project
DDW010231	7/25/2014	PROPOSED	Woodhaven Ph. 1
DDW010232	7/25/2014	PROPOSED	Woodhaven Ph. 1
DDW010233	7/25/2014	PROPOSED	Woodhaven Ph. 1
DDW010234	7/25/2014	PROPOSED	Woodhaven Ph. 1
DDW010235	7/25/2014	PROPOSED	Woodhaven Ph. 1
DDW010236	7/25/2014	PROPOSED	Woodhaven Ph. 1
DDW010237	7/25/2014	PROPOSED	Woodhaven Ph. 1
DDW010238	7/25/2014	PROPOSED	Woodhaven Ph. 1
DDW010392	11/24/2014	PROPOSED	Stone Creek B-1
DDW010393	11/24/2014	PROPOSED	Stone Creek B-1
DDW010394	11/24/2014	PROPOSED	Stone Creek B-1
DDW010395	11/24/2014	PROPOSED	Stone Creek B-1
DDW010396	11/24/2014	PROPOSED	Stone Creek B-1
DDW010397	11/24/2014	PROPOSED	Stone Creek B-1
DDW010398	11/24/2014	PROPOSED	Stone Creek B-1
DDW010399	11/24/2014	PROPOSED	Stone Creek B-1
DDW010400	11/24/2014	PROPOSED	Stone Creek B-1
DDW010401	11/24/2014	PROPOSED	Stone Creek B-1
DDW010402	11/24/2014	PROPOSED	Stone Creek B-1
DDW010407	1/1/2015	PROPOSED; Under Construction	Colorado Lift Station Vol VI-A N383171.30 E 3289445.75
DDW010410	9/28/2015	PROPOSED	Mission Linen Supply
DDW010456	1/1/2016	PROPOSED; Under Construction	SEI 2S&3

UIC Number	Originally Anticipated Install Date	Current Anticipated Timing	Location/Project
DDW010457	8/16/2016	PROPOSED; Under Construction	Escena Apartment Homes
DDW010458	8/16/2016	PROPOSED; Under Construction	Escena Apartment Homes
DDW010481	2/2/2017	PROPOSED	Leehaven Subdivision
DDW010482	2/2/2017	PROPOSED	Leehaven Subdivision
DDW010483	2/2/2017	PROPOSED	Leehaven Subdivision
DDW010484	2/2/2017	PROPOSED	Leehaven Subdivision
DDW010485	2/2/2017	PROPOSED	Leehaven Subdivision
DDW010486	2/2/2017	PROPOSED	Leehaven Subdivision
DDW010487	2/2/2017	PROPOSED	Leehaven Subdivision
DDW010488	2/2/2017	PROPOSED	Leehaven Subdivision
DDW010489	2/2/2017	PROPOSED	Leehaven Subdivision
DDW010500	8/1/2016	PROPOSED	Stone Creek Ph. A-3 & F-2
DDW010501	8/1/2016	PROPOSED	Stone Creek Ph. A-3 & F-2
DDW010502	8/1/2016	PROPOSED	Stone Creek Ph. A-3 & F-2
DDW010503	8/1/2016	PROPOSED	Stone Creek Ph. A-3 & F-2
DDW010504	8/1/2016	PROPOSED	Stone Creek Ph. A-3 & F-2
DDW010505	8/1/2016	PROPOSED	Stone Creek Ph. A-3 & F-2
DDW010506	8/1/2016	PROPOSED	Stone Creek Ph. A-3 & F-2
DDW010507	8/1/2016	PROPOSED	Stone Creek Ph. A-3 & F-2
DDW010508	3/17/2017	PROPOSED	Northwest Crossing Ph. 27
DDW010509	3/17/2017	PROPOSED	Northwest Crossing Ph. 27
DDW010510	3/17/2017	PROPOSED	Northwest Crossing Ph. 27
DDW010511	6/9/2016	PROPOSED	Rockridge Park
DDW010512	6/9/2016	PROPOSED	Rockridge Park
DDW010513	6/9/2016	PROPOSED	Rockridge Park
DDW010514	6/9/2016	PROPOSED	Rockridge Park

UIC Number	Originally Anticipated Install Date	Current Anticipated Timing	Location/Project
DDW010515	6/9/2016	PROPOSED	Rockridge Park
DDW010522	4/17/2017	PROPOSED	Northwest Crossing District 2 Lot 2
DDW010523	4/28/2017	PROPOSED	Lava Ridges Ph. 6
DDW010524	4/28/2017	PROPOSED	Riverwalk Subdivision
DDW010525	4/28/2017	PROPOSED	Riverwalk Subdivision
DDW010526	4/28/2017	PROPOSED	Riverwalk Subdivision
DDW010527	4/17/2017	PROPOSED	OR6 Vail
DDW010528	4/17/2017	PROPOSED	OR6 Vail
DDW010535	6/29/2017	PROPOSED	Hidden Hills Ph. 3
DDW010536	6/29/2017	PROPOSED	Hidden Hills Ph. 3
DDW010537	7/5/2017	PROPOSED	Ogden Subdivision
DDW010538	6/20/2017	PROPOSED	Northwest Woodlands
DDW010539	6/20/2017	PROPOSED	Northwest Woodlands
DDW010540	6/20/2017	PROPOSED	Northwest Woodlands
DDW010541	7/24/2015	PROPOSED	Shevlin Bluffs Ph. 2
DDW010542	7/24/2015	PROPOSED	Shevlin Bluffs Ph. 2
DDW010543	7/24/2015	PROPOSED	Shevlin Bluffs Ph. 2
DDW010544	8/1/2017	PROPOSED	Shevlin Bluffs Ph. 3 & 4
DDW010545	8/1/2017	PROPOSED	Shevlin Bluffs Ph. 3 & 4
DDW010546	8/1/2017	PROPOSED	Shevlin Bluffs Ph. 3 & 4
DDW010547	8/1/2017	PROPOSED	Shevlin Bluffs Ph. 3 & 4
DDW010548	6/28/2017	PROPOSED	Marea Landing Ph. 1 & 2
DDW010549	6/28/2017	PROPOSED	Marea Landing Ph. 1 & 2
DDW010550	6/27/2017	PROPOSED	Boneyard Brewing Public House
DDW010551	7/19/2017	PROPOSED	Blakely Apartments
DDW010552	8/11/2017	PROPOSED	Lodges at Bachelor Village Ph. 1
DDW010553	8/11/2017	PROPOSED	Lodges at Bachelor Village Ph. 1
DDW010554	8/11/2017	PROPOSED	Lodges at Bachelor Village Ph. 1
DDW010555	8/11/2017	PROPOSED	Lodges at Bachelor Village Ph. 1
DDW010556	8/11/2017	PROPOSED	Lodges at Bachelor Village Ph. 1

UIC Number	Originally Anticipated Install Date	Current Anticipated Timing	Location/Project
DDW010557	8/11/2017	PROPOSED	Lodges at Bachelor Village Ph. 1
DDW010558	8/11/2017	PROPOSED	Lodges at Bachelor Village Ph. 1
Drillhole	Spring/Summer 2018	Spring/Summer 2018	Shevlin Park and Shevlin Meadows Intersection
Unnamed (DW1)	Project Construction Start Summer 2018	Project Construction Start Summer 2018	Station 52+41.87; 14th Street Reconstruction
Unnamed (DW2)	Project Construction Start Summer 2018	Project Construction Start Summer 2018	Station 55+08.70; 14th Street Reconstruction
Unnamed (DW3)	Project Construction Start Summer 2018	Project Construction Start Summer 2018	Station 56+02.35; 14th Street Reconstruction
Unnamed (DW4)	Project Construction Start Summer 2018	Project Construction Start Summer 2018	Station 60+63.67; 14th Street Reconstruction
Unnamed (DW5)	Project Construction Start Summer 2018	Project Construction Start Summer 2018	Station 62+39.95; 14th Street Reconstruction
Unnamed (DW6)	Project Construction Start Summer 2018	Project Construction Start Summer 2018	Station 63+73.05; 14th Street Reconstruction
Unnamed (DW7)	Project Construction Start Summer 2018	Project Construction Start Summer 2018	Station 66+21.87; 14th Street Reconstruction
Unnamed (DW8)	Project Construction Start Summer 2018	Project Construction Start Summer 2018	Station 67+31.25; 14th Street Reconstruction
Unnamed (DW14)	Project Construction Start Summer 2018	Project Construction Start Summer 2018	Station 87+59.25; 14th Street Reconstruction

UIC Number	Originally Anticipated Install Date	Current Anticipated Timing	Location/Project
Unnamed (DW15)	Project Construction Start Summer 2018	Project Construction Start Summer 2018	Station 89+70.80; 14th Street Reconstruction
Unnamed (DW17)	Project Construction Start Summer 2018	Project Construction Start Summer 2018	Station 92+82.20; 14th Street Reconstruction
Unnamed (with swale)	Project Construction Start Summer 2018	Project Construction Start Summer 2018	Station 94+19.30; 14th Street Reconstruction

Table 10.4 Anticipated Decommissioning in FY2017-18 and Beyond

UIC Number	Planned Activity	Project Timing	Project Name/ Comments
DDH009923	Potential decommissioning	FY2017-18 or beyond	SW Roosevelt Water Main Replacement; construction slated spring 2018
DDH009922	Potential decommissioning	FY2017-18 or beyond	SW Roosevelt Water Main Replacement construction slated spring 2018
DDH009921	Potential decommissioning	FY2017-18 or beyond	SW Roosevelt Water Main Replacement construction slated spring 2018
DDW001540 (demolition) DDW010456 (new replacement)	Decommissioning, removing and replacing across northbound lanes with DDW010456 Under construction	FY2016-17 to FY2017-18	SE Interceptor Under Construction
DDW010533	Potential decommissioning	FY2017-18 and beyond, Phase I Construction start	14th Street, Phase I Construction; Westside of

UIC Number	Planned Activity	Project Timing	Project Name/ Comments
		spring 2018	Century at Knoll Avenue
DDW001239	Potential decommissioning	FY2017-18 and beyond, Phase I Construction start spring 2018	14th Street, Phase I Construction ; Westside of Century at Knoll Avenue

Upgrades. Additionally, the City is working to upgrade UICs. The City continued implementing its open-grate drywell retrofit plan and is ahead of schedule (see annual report FY14-15, Appendix I). In FY2016-17, City staff purchased 20 UIC inserts with a 36" sump for Police Department, City right-of-ways and the Boyd Acres corporation yard (see installation photo below) at a cost of approximately $1,500 apiece (see Table 10.5). Stormwater staff consulted with Fire and Airport staff to assist them in securing budgets in time for the biennial budget review process for future years work as well. In Table 10.5 the blue text represents those inserts purchased in FY16-17 for installation.

Table 10.5 Open Top Drywell Retrofit Status

City Facility ID	DEQ UIC #	DEQ Well #	Department Owner	DWPA / Road Classification	Status
DDW003114	10025	1050	Airport		Scheduling for FY18-19-FY20-21
DDW009606	10025	2918	Airport		Scheduling for FY18-19-FY20-21
DDW009607	10025	2916	Airport		Scheduling for FY18-19-FY20-21
DDW009608	10025	2915	Airport		Scheduling for FY18-19-FY20-21
DDW009609	10025	2914	Airport		Scheduling for FY18-19-FY20-21
DDW009610	10025	2917	Airport		Scheduling for FY18-19-FY20-21
DDW009611	10025	1051	Airport		Scheduling for FY18-19-FY20-21
DDW009612	10025	2919	Airport		Scheduling for FY18-19-FY20-21
DDW009613	10025	2920	Airport		Scheduling for FY18-19-FY20-21
DDW009614	10025	2921	Airport		Scheduling for FY18-19-FY20-21
DDW009615	10025	2922	Airport		Scheduling for FY18-19-FY20-21
DDW009616	10025	2923	Airport		Scheduling for FY18-19-FY20-21
DDW009617	10025	2924	Airport		Scheduling for FY18-

City Facility ID	DEQ UIC #	DEQ Well #	Department Owner	DWPA / Road Classification	Status
					19-FY20-21
DDW009619	10025	1044	Airport		Scheduling for FY18-19-FY20-21
DDW009622	10025	1049	Airport		Scheduling for FY18-19-FY20-21
DDW009625	10025	1047	Airport		Scheduling for FY18-19-FY20-21
DDW009626	10025	1048	Airport		Scheduling for FY18-19-FY20-21
DDW010073	10025	5651	Airport		Scheduling for FY18-19-FY20-21
DDW007553	10025	5094	Brooks Alley Parking Lot		Installed
DDW007554	10025	5093	Brooks Alley Parking Lot		Installed
DDW007555	10025	5095	Brooks Alley Parking Lot		Installed
DDW007559	10025	5278	Brooks Alley Parking Lot		Installed
DDW007560	10025	5279	Brooks Alley Parking Lot		Installed
DDW007561	10025	5277	Brooks Alley Parking Lot		Installed
DDW001533	10025	437	COB ROW	10yr / Alley	Installed
DDW001534	10025	438	COB ROW	10yr / Alley	Installed
DDW001610	10025	514	COB ROW	Alley	Installed
DDW002053	10025	2461	COB ROW	Alley	Installed
DDW003091	10025	1517	COB ROW	Local	Installed
DDW003102	10025	1544	COB ROW	Alley	Installed
DDW003146	10025	1528	COB ROW	Local	Installed
DDW003179	10025	1577	COB ROW	5yr	Installed
DDW003239	10025	2014	COB ROW	TBD	Installed
DDW003276	10025	560	COB ROW	5yr / Alley	Installed
DDW003360	10025	458	COB ROW	Alley	Installed
DDW003386	10025	970	COB ROW	Alley	Installed
DDW003444	10025	2059	COB ROW	10yr / Local	Installed
DDW003489	10025	513	COB ROW	Alley	Installed
DDW003495	10025	656	COB ROW	Alley	Installed
DDW003496	10025	440	COB ROW	Alley	Installed
DDW003499	10025	88	COB ROW	Alley	Installed
DDW003500	10025	130	COB ROW	Alley	Installed
DDW003504	10025	517	COB ROW	Alley	Installed
DDW003514	10025	540	COB ROW	Alley	Installed
DDW003529	10025	5006	COB ROW	Local	Installed
DDW007207	10025	5023	COB ROW	Local	Installed

City Facility ID	DEQ UIC #	DEQ Well #	Department Owner	DWPA / Road Classification	Status
DDW007303	10025	5539	COB ROW	Local	Installed
DDW007304	10025	72	COB ROW	Alley	Installed
DDW007536	10025	5365	COB ROW	10yr	**Installed**
DDW007567	10025	552	COB ROW	Local	Installed
DDW007601	10025	5031	COB ROW	Alley	Installed
DDW008151	10025	5311	COB ROW	10yr	**Installed**
DDW008166	10025	5489	COB ROW	Minor Arterial	**Installed**
DDW008934	10025	5316	COB ROW	10yr	**Installed**
DDW009247	10025	657	COB ROW	Alley	Installed
DDW009523	10025	658	COB ROW	Alley	Installed
DDW003348	10025	185	Facilities (Boyd)		**Installed**
DDW003352	10025	190	Facilities (Boyd)		Installed
DDW003353	10025	189	Facilities (Boyd)		Installed
DDW003354	10025	188	Facilities (Boyd)		Installed
DDW003030	10025	538	Facilities (City Hall)		Removed after further inspection / cleaning revealed not a UIC.
DDW003032	10025	139	Facilities (City Hall)		Removed after further inspection / cleaning revealed not a UIC.
DDW010063	10025	5641	Fire	1yr	Scheduled FY2017-18
DDW010064	10025	5642	Fire		Scheduled FY2017-18
DDW010065	10025	5643	Fire		Scheduled FY2017-18
DDW010066	10025	5644	Fire		Scheduled FY2017-18
DDW010067	10025	5646	Fire		Scheduled FY2017-18
DDW010068	10025	5645	Fire		Scheduled FY2017-18
DDW010071	10025	5649	Fire		Scheduled FY2017-18
DDW010072	10025	5650	Fire	1yr	Scheduled FY2017-18
DDW003023	10025	631	Police		Installed
DDW003027	10025	629	Police		Installed
DDW003034	10025	630	Police		Installed
DDW003041	10025	627	Police		Installed

Effectiveness: The City installed drop-in retrofits with a three-foot sump into the open grated drywells. As this sump is larger than what the company has standardly constructed, the City monitored these installations for quality assurance/quality control through the winter months to see how they withstood freeze-thaw and weighted conditions prior to purchasing more. Operations staff found that welding the rings onto the drywells helps ensure the catch basin inserts do not fall into the drywell given the City's freeze-thaw winter cycles can otherwise result in loosening and slippage. Since given these additional steps, the units worked well, the City continued purchasing the inserts due to the cost-effectiveness given existing grading and drainage changes would not be needed. The initial installations within the right-of-way are focusing on high spill risk and time of travel areas first; individual departments are covering the cost of theirs and their timelines differ as budget has been set aside.



Installing open grate UIC retrofit at Boyd Acres corporation yard as an installation demonstration.

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, with refining knowledge of the locations and status of its UIC system, and completion of the potential contaminant source identification project and Systemwide Assessment. The City is actively implementing an open-grate drywell retrofit project and is refining its drainage system as it redevelops to include pretreatment while actively conducting selective outreach and field modifications to be more protective within wellhead protection areas. The inserts are working well at capturing contaminants.

Appendix A

Overall Program Management and Legal Authority

City of Bend
Stormwater Liaisons Meeting

Proposed Agenda
Tuesday, August 2, 2016, 9:00 AM to 9:30 PM
Board Room, City Hall

Purpose: Coordinate Stormwater Activities Among Affected Departments

I. Welcome and Introductions (2 minutes)

Objective: Welcoming remarks. Review and modify agenda as needed.

II. Review: Public Draft NPDES MS4 Phase II Stormwater Permit (28 minutes)

Objective: Understand status, key changes; discuss comments and next steps related to development of discussion draft General Permit, distributed 7/1.

UTILITY DEPARTMENT

City of Bend
Stormwater Liaisons
Meeting Attendance Sheet
August 2, 2016

	Name:	Department/Division:
1.	Joe McClay	CDD/Building Safety
2.	GARY FIRESTONE	ADMIN/LEGAL
3.	Craig Chenoweth	CDD
4.	David Buchum	Stormwater
5.	Chuck Swan	Street + Ops
6.	Kyle Thomas	COB/PDE
7.	Wendy Edde	CoB/SW
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City of Bend
Stormwater Liaisons Meeting

Summary
Tuesday, August 2, 2016, 9:00 AM to 9:30 PM
Board Room, City Hall

Purpose: Coordinate Stormwater Activities Among Affected Departments

Attending: Joe McClay (CDD/Building Safety; Gary Firestone (Admin/Legal); Craig Chenoweth (CDD); David Buchanan, Wendy Edde (Utility/Environmental Compliance-Stormwater); Chuck Swan (Streets and Operations); Kyle Thomas (Private Development Engineering)

Key Items Discussed

- ***NPDES Phase II MS4 permitting in Bend Overview***
- ***Public Draft MS4 NPDES Phase II Permit—Content***
    - ***Focusing on Reasonable Potential, Construction Site, Post-Construction***
        - Reasonable potential language is unnecessary as it would be examined retrospectively against water quality standards
        - Attendees expressed concerns over impact to building industry and affordable housing needs.
        - ESC reviews take 1 hour first review, with 1-2 additional review cycles thereafter. The permit requirements would likely affect every lot in town 5,000 sf or less. City's minim lot size is 3,000 sf.
- ***Public Hearing Approach***
    - *Wendy to speak; as will other ACWA members*
    - *Focus on largest concern at this time.*
- ***Comments/ Next Steps***

Key Decisions Made/ Key Action Items

- City cannot accept the reasonable potential language set up to exempt coverage under the permit.
- Wendy will testify at the public hearing focusing on reasonable potential analysis language.
- Attendees will provide additional comments to Wendy to compile.
- Wendy will circulate a draft comment letter for review prior to submittal to DEQ.
- Wendy will follow-up on request for time extension

City of Bend
Stormwater Liaisons Meeting

Proposed Agenda
Wednesday, October 19, 2016, 9:30 to 10:30 AM
Board Room, City Hall

Purpose: Coordinate Stormwater Activities Among Affected Departments

I. Welcome and Introductions (5 minutes)

Objective: Welcoming remarks. Review and accept minutes. Receive updates on previous action items. Review and modify agenda as needed.

II. Phase II MS4 NPDES Stormwater Permit Update, (10 minutes)

Objective: Receive status update with regards to the status of the permit since the public comment period.

III. Annual Report Draft Review, (15-20 minutes)

Objective: Provide initial comments on annual report; provide data gaps (inspections/enforcement); discuss results

IV. Stormwater Utility Program Compliance Specialist, (5-10 minutes)

Objective: Receive status update and discuss interdepartmental workflow.

V. Post-Construction Controls Updates (5-10 minutes)

Objective: Updates regarding UGB/Density needs; COBA concerns; maintenance; Gresham's experience; roundtable discussions; next steps.

VI. Roundtable Discussion/Updates (5-10 minutes)

Objective: Open discussion. Share stormwater-related issues/news/updates.

Stormwater Utility Program Compliance Specialist

Interdepartmental Coordination

Roles

I. **Construction Site Activities-Erosion and Sediment Control**
   - **a. SFR**
     - i. Provides pre-con ESC education at precon meetings
     - ii. Performs stormwater ESC roles previously performed by Building Inspectors by means of a verification program
     - iii. Coordinates Stormwater Quality ESC Recordkeeping
   - **b. Commercial/Industrial Assistance**
     - i. Engineering Inspectors =Point Person Lead—
       1. SUPCS may refer to Engineering Inspectors or be available to assist as resource specialist
       2. SUPCS conducts verification program
     - ii. Provides Education
     - iii. Coordinates Stormwater Quality ESC Recordkeeping

II. **Post-Construction Controls**
   - a. Verification Program that Controls Installed (SFR Needs)
   - b. Credit Program Audit/Verification: Onsite Inspections
   - c. City-owned Landscape Controls O&M Inspections
   - d. Private O&M Inspections
     - i. If problem areas / complaints
     - ii. Verification
   - e. Coordinates Stormwater Quality O&M Verification Recordkeeping
     - i. Coordinates with Private Stormwater Database

III. **Other**
   - a. **ROW & Easement Encroachment Issues**
   - b. **IDDE Assistance-Dry Weather Flows**

Coordination Considerations

I. Close team working relationships with Building and Engineering Inspectors
II. Coordination and assistance with recordkeeping (coordinate with Code Enforcement and inspectors)
III. Meeting involvement—improving ESC educational outreach
IV. Communication—needs to know what stages the projects are
V. Needs to be looped into Private Facility database development coordination
VI. Coordination with EIPD and O&M for City-owned O&M Inspections/Results
VII. Would MOU/SOP Be Appropriate

City of Bend
Stormwater Liaisons
Meeting Attendance Sheet
October 19, 2016

	Name:	Department/Division:
1.	Wendy Edde	Utility / Env. Comp/Storm
2.	STEVE BRZAK	Utility / Environmental Compliance
3.	Chris Henningsen	PDED
4.	GARY FIRESTONE	LEGAL
5.	Ian Leitheiser	" "
6.	KYLE THOMAS	PDE.
7.	James Goff	CDD
8.	Gillian Ockner	CMO
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City of Bend
Stormwater Liaisons Meeting Summary

Wednesday, October 19, 2016, 9:30 to 10:30 AM

Key Items Discussed:

- **Phase II MS4 NPDES Stormwater Permit Update.** The DEQ received 250 comments approximately and is working to address them. No date for a finalized general permit has been set.
- **Annual Report Draft Review.** Attendees discussed the draft annual report and provided minor comments.
- **Stormwater Utility Program Compliance Specialist.** The Utility Department is working to secure a Stormwater Utility Program Compliance Specialist to help with erosion and sediment control inspection, post construction O&M verification inspections, and some right-of-way compliance as has been discussed and worked towards over the past couple of years. Interviews will take place in November.
- **Post-Construction Controls Update.** Ryan prepared and is working with COBA on a new process to facilitate addressing as-built changes to plans for smaller lot single family homes since site plans do not include topography. COBA does not want an engineer necessary to self-certify single family residential. The results of the UGB approval process is that the current City limits will need to densify—this has the power to greatly affect stormwater drainage in the City. The Stormwater Public Advisory Group may be a good place to examine this issue. Wendy shared information on Gresham's experience analyzing on-site, neighborhood, and regional controls taken from a recent presentation.
- **Stormwater permanent controls on smaller lots.** Including initial review, onsite inspection and changes made after ownership. Discussed Gresham's experience.

Key Decisions Made/ Key Action Items

- Wendy to forward TMDL information to Ian, Kyle, and Gary.
- Attendees will provide any final comments on the annual report and Wendy will finalize and submit it to DEQ by the November 1 deadline.
- Wendy will research BMP practices for capturing inspection tracking as part of other inspections to inform the Plante Moran process.
- Community Development Department including Building and Private Engineering staff committed to assisting with the interviewing and working closely with the new Stormwater Utility Program Compliance Specialist to ensure training and coordination among the two departments.
- Wendy will share post-construction control notes from City of Gresham.
- Ryan to continue to keep the Stormwater Coordinators appraised of modifications to the process changes on single-family home as-built changes once COBA provides comments/comes into final agreement.
- City staff will work towards having the Stormwater Public Advisory Group examine how best to handle stormwater within the City with increasing densification.

Stormwater Coordination
Legal/CDD Meeting
10/26/16

Name	Dept./Division
1. Wendy Elle	Utility / Env. Reg. Stormwater
2. Colin Stephens	CDD
3. Jess Grayson	CDM
4.	CDD
5.	Legal

City of Bend
Stormwater Liaisons Meeting

Proposed Agenda
Monday, November 28, 2016, 11:00 to 12:00 Noon
Board Room, City Hall

Purpose: Coordinate Stormwater Activities Among Affected Departments

I. Welcome and Introductions (5 minutes)

Objective: Welcoming remarks. Review and accept minutes. Receive updates on previous action items. Review and modify agenda as needed.

II. Updates: Annual Report, Phase II MS4 NPDES Stormwater Permit Update and Stormwater Utility Program Compliance Specialist, (5-10 minutes)

Objective: Receive status update with regards to the status of the annual report and follow-up, next steps DEQ is taking with the draft permit, and Stormwater Utility Program Compliance Specialist position.

III. Discuss Updates/Public Input Approach/Next Steps for Short Term SFR and Long Term Density Increase, (20-30 minutes)

Objective: Understand latest updates/approaches. Discuss Public Advisory Group approach and interested participants.

IV. Discuss Construction Activities (5-10 minutes)

Objective: Confirm Inlet Protection Preference Modifications and updates to ACWA guide specific to Bend.

V. Training Opportunities/Needs (5-10 minutes)

Objective: Discuss next CESCL training scheduling and upcoming ASCE webinars. Discuss Compli trainings; opportunity for illicit discharge training across departments. Discuss any additional training desires/needs to be budgeted for future.

VI. Roundtable Discussion/Updates (5-10 minutes)

Objective: Open discussion. Share stormwater-related issues/news/updates.

Stormwater Liaisons
November 28, 2016

	Name	Dept.
1.	Wendy Edde	Utility - Storm
2.	Steve Pratak	Utility Dept.
3.	Dust Buchan	Utility - Storm
4.	Joe McCloy	Building Safety Division
5.	Chuck Swann	Streets
6.	Ryan Oster	Engineering
7.	Gillian Ockers	CMO
8.	Gary Firestone	LEGAL
9.	Shanna Osterdorff	Operations
10.	Russell Grayson	CDD

City of Bend
Stormwater Liaisons Meeting

Summary
Monday, November 28, 2016, 11:00 AM to 12:00 PM
Board Room, City Hall

Purpose: Coordinate Stormwater Activities Among Affected Departments

Attending: Joe McClay (CDD/Building Safety; Gary Firestone (Admin/Legal); Steve Prazak, David Buchanan, Wendy Edde (Utility/Environmental Compliance-Stormwater); Chuck Swan (Streets and Operations); Russel Grayson (Community Development)*; Shannon Ostendorff (Utilities/Oppressions); Ryan Oster (*Community Development/Engineering).

Key Items Discussed

- ***Status update***
  - *Annual report and follow-up, DEQ is currently reviewing the document*
  - *Stormwater Utility Program Compliance Specialist position is scheduled to begin in late January, pending background and reference checks.*
  - *UGB expansion and PFP update*

- ***Public Input Approach/Next Steps for Short Term SFR and Long Term Density Increase***

  Ryan – Met with COBA builders last week and provided the following summary:
  - *Karen understand the issue but disagrees with how the City is interpreting the Bend Code Title 16.*
  - *Most builders agree that they need to address stormwater onsite.*
  - *The key issue for builders is not holding up the C-of-O because the onsite stormwater plan has been changed. Currently this would require the builder to re-submit the site plan for review and the review process can take several weeks.*
  - *The builders came to an agreement, that they will submit a revised site plans and certification letter in-lue of a two week plan review delay.*

- ***Public Advisory Group approach and interested participants,*** *Wendy has identified two potential nominees for this committee. The proposed nominees may need City Manager approval.*

- ***As single family development increases, it's becoming harder/ impossible to manage stormwater runoff on-site.*** *Should developers install more drywells in the R.O.W. or build regional controls? The City needs to develop clear polices on stormwater management and consider how the co-mingling of private and public stormwater will affect City permitting? While making sure the stormwater billing structure remains equitable to all customers.*

- ***Inlet Protection Preference Modifications,*** *the City has received several complaints regarding the use of Bio-Bags in bike lanes. Standard inlet protection details will get*

updated during the next spec update. Plan reviews will look for bike lane conflicts and provide comments as needed.

- ***Upcoming Training Opportunities,***
  - *ASCE on-demand webinars on December 20, 2016.*
  - *CESCL training in late February, inspection staff are encourage to attend, look for the upcoming announcement.*

Key Action Items

- Ryan will draft a memo/policy for how to handle onsite single family drainage moderation procedures.

- Gillian - Charter a process to address regional stormwater facilities as part of the UGB expansion project.

Stormwater Regulatory/Ops Coordination Meeting
Thursday December 1, 2016
8:15 AM – 9 AM

I. **Welcome—Agenda Check-in** (2 minutes)

II. **Nels Anderson Drainage** (5 minutes)
Objective: Receive update re: localized flooding post drill-hole decommissioning request

III. **2nd and Hawthorne swale cleanup** (3 minutes)

IV. **Recent Lab Activities and Results** (Jeff) (5 minutes)

V. **Pageant Park Outfall (All)** (5 minutes)
1. Drinking water drainage – status, next steps
2. Sediment manhole discussion—potential for upgrades

VI. **Street Sweeping Updates and Efficiency Efforts** (10 minutes)
1. Updates (new sweeper, GIS)
2. Corp Yards
3. MS4 areas
4. Efficiency communications

VII. **Budget Needs Coordination** (5 minutes)
1. UIC Retrofit – cold weather QA/QC
2. GPS
3. Other

VIII. **Field Perspective – Permanent Controls** (5 minutes)
1. Individual lots
2. Street scape
3. Regional

IX. **Roundtable** (5 minutes)
1. New positions updates
2. Open

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Stormwater Regulatory / Ops
Coordination Meeting:
Thursday - December 1, 2016

Name	Division
1. Wendy Eddie	
2. Travis Somers	
3.	
4. Shannon Osterdorff	
5. David Burn	
6 STEVE PRAZAK	

City of Bend
Stormwater Coordinators:

Stormwater Title 16 Compliance and Enforcement Meeting Summary

April 5, 2017, 10:00 to 11:00 AM
Board Room, City Hall

Attending: Joe McClay, Brad Mandal, Billy Staten, Melanie Paule (CDD Building); Ryan Oster, Kyle Thomas (CDD Engineering); Wendy Edde, Sean Mulderig (Utility Stormwater)

Key Items Discussed

- **Stormwater Utility Program Compliance Specialist.** Attendees discussed roles and responsibilities for the new Stormwater Utility Program Compliance Specialist.
- **Construction Site Compliance SOP.** Attendees discussed draft revisions to the Construction Site Compliance SOP given the addition of the new position.
- **Cross Training Opportunities.** Discussed Sean's recent cross training with inspectors and opportunities to cross train with Planning Techs.
- **Status of SFR Inspector Approval Process/Self-Certification Proposal.** Ryan indicated COBA has not responded to the latest draft proposal yet.

Key Decisions Made/Key Action Items

- Compliance begins with education, verbal, written correspondence with a compliance window, coordination with other inspections including potential delays to stop work order. With continued non-compliance, staff can also work with James Goff for civil infraction compliance.
- Consider a fee-based approach rather than stop work orders for single family residences. Stop work orders require having to secure the site. We missed the fee schedule timing this year but may consider this approach in the future. City will track experience in the coming year prior to next fee schedule opportunity.
- Amy Barry is available to schedule cross training on the planning site plan review with planners. Lindsey and Kathleen can schedule cross training for engineering side.
- Attendees recommended wordsmithing changes to the SOP. Sean will make the edits.
- When staff see erosion and sediment control issues in the field, they will be directed to notify Sean for investigation and follow-up.

Stormwater Coordinating
April 5, 2017

Name	Dept.
1. Wendy Eddie	Utility / Storm
2. Kyle Thomas	PDC
3. Melanie Paul	Bldg
4. Jerry Waugh	Bldg
5. Billy Staten	Bldg
6. Joe McClay	Bldg
7. Brad Mandal	Bldg
8. Sean Mulderig	Utility Dept/ Storm.

City of Bend
Stormwater Coordinators—Streets/Storm O&M
Meeting Attendance Sheet
May 22, 2017

	Name:	Department/Division:
1.	Wendy Edde	Storm
2.	Chris Blake	Streets
3.	Spencer Cashwell	Utilities
4.	David Rueger	Storm
5.	Orrin Liboit	Utilities
6.	Ivan Sousa	Utilities
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City of Bend
Stormwater Liaisons Meeting

Proposed Agenda
Thursday June 29, 2017, 8:00 to 8:50 AM
Eisenhower Conference Room, Utility Department

Purpose: Coordinate Stormwater Activities Among Affected Departments

I. Welcome and Introductions (5 minutes)

Objective: Welcoming remarks. Receive updates on previous action items. Review and modify agenda as needed.

II. Information Needs for Annual Report; Upcoming Performance Standard Requirements, (10 minutes), Wendy

Objective: Receive an overview of information needed to complete the FY2016-17 Annual Report and review the new performance standards that need to be met in the coming year.

III. Public Advisory Group Update and Planning: Permanent Controls Preference with Increasing Density, (15 minutes), Wendy, Ryan, All

Objective: Receive update on progress to date. Discuss approach and strategize next meeting on neighborhood controls.

IV. Improving Street Cleaning Efficiency (10-15 minutes), Wendy, Chuck

Objective: Staff are working together to increase the efficiency of street cleaning efforts. Review the draft Street Cleaning doorhanger, receive updates on GPS deployment, discuss telephone notification outreach, and to what extent electronic "Next Door", neighborhood associations, etc. match up with current routes.

VI. Roundtable Discussion/Updates (5-10 minutes)

Objective: Open discussion. Share stormwater-related issues/news/updates from your section.

City of Bend
Stormwater Liaisons Meeting
June 29, 2017

Name	Division
1. Wendy Edde	Stormwater
2. David Zarate	Storm water
3. Sean Maldering	Stormwater
4. Chris Henningsen	PDED
5. RYAN OSTER	PDED
6. JOSHUA ROMERO	COMMUNICATIONS
7. STEVE PRAZAK	Utility Dept.
8. David Buehler	Streets
9. Chuck Swann	streets

City of Bend
Stormwater Liaisons Meeting Summary

Thursday June 29, 2017, 8:00-8:50 AM

Key Items Discussed:

- **Information Needs for Annual Report.** Discussed data needs for annual report, and reminded about performance standard requirements.
- **Stormwater Public Advisory Group Update and Planning.** Discussions regarding past meeting effectiveness and strategies regarding focusing on street-side (neighborhood) controls.
- **Improving Street Cleaning Efficiency.** Attendees reviewed the draft Street Cleaning doorhanger. Chuck provided updates on GPS deployment (budget has been secured) and other efforts such as reader boards that Streets is taking. There is budget for a new street sweeper in the coming fiscal year as well. Telephone notification is a possibility if we can get the zones down to a workable number.

Key Decisions Made/ Key Action Items

- Attendees will provide initial data needs to Wendy and David for inclusion in the annual report by the end of July.
- Wendy will bring the draft annual report to the next meeting for review.
- Staff will continue to use the SWOT analysis to continue discussions of post-construction control strategies with the Stormwater Public Advisory Group, and will set up the next meeting for the first week of August with a field trip thereafter.
- Wendy will work with the graphic artist to finalize the Street Cleaning doorhanger.
- The City Newsletter will include an educational piece about keeping streets clear for street sweepers and vactors in July that Utility and Streets Dept. worked to develop together with the Communication Dept.

UTILITY DEPARTMENT

Assistant City Manager
Jon Skidmore

Utility Director
Paul Rheault

Executive Assistant
Natalie Donato

Utility Operations Manager
Vacant
(Under Review)

Collection Systems Supervisor
Orrin Libolt

- **Utility – Lead**
  Travis Somers
- **Collection Sys UW**
  Ian Klotz
  Ric Kuss
- **Utility Worker**
  David Oak
- **UW – Apprentice**
  Steve Sullivan
  Mike Prentice
- **Tech Serv Spec – Lead**
  Paul Brick
- **Collection Sys UW**
  David Borrego
  Mike Gillette
  Eric Hobbs
  Bob Hopkins
  Steve Riley
- **Utility – Lead (Interim)**
  Steve Byrd
- **Collection Sys UW**
  Ty Richardson
- **UW – Apprentice**
  Jeff Nelson
- **Flow Monitoring Coordinator**
  Kelly Ristoff

I.C.E. Program Manager
David Leath

- **SCADA Controls System Admin.**
  Stu Richmond
- **Telemetry Specialist**
  David Armenta
- **I&C Technician**
  Tim Carlson
  Lon Moulder
- **Electrician, Journeyman Lead**
  Mark Wolter
- **Electrician, Journeyman**
  Warren Packebush
  Justin Wolsworth
- **Scheduler/Planner**
  Vacant (FY18/19)

Repair & Replacement Supervisor
Troy Beck

- **Utility Lead**
  Brice Blackwelder
  Scott Winter
  Chris Mosher
- **Utility Worker**
  Brandon Follose
  Vacant (Hall)
  Ron Larson
  Sean Petitmermet
  Stu Rounds
  Dan Skaggs
  Robyn Somers
  Joe Holmgren
  Gary Vencill
  Vacant (Winter)
  Rawlin Woods
  Garrett Nichols
  Mark Laymon

Water Operations Supervisor
Rod Mingus

- **Utility – Lead**
  Scott Gardner
  Marcus McCloskey
- **Water System Operator**
  Tyler Babich
  Michael Findley
  Tommy Marinelli
  Corey Mastrud
  Will Milligan
  Chris Wood

WRF Manager
Tim Truax

- **WRF Ops Supervisor**
  Vacant
- **Utility - Lead**
  George McConnell
- **Operator**
  Sam Borgognoni
  Erynne Fore
  Ethan Parent
  Elmer Roshone
  Aaron Utley
  Roy Bradley
- **Maintenance Worker**
  Ed Rogers
- **WRF Apprentice**
  Alaina Floor
- **Utility – Lead**
  Joe Burghardt
- **Utility Mechanic**
  Marc Mickey
  Lance Finney
- **Office Specialist**
  Vacant

Utility Project Manager
Nick McAteer

Water Quality Manager
Steve Prazak

- **Program Manager**
  Stormwater
  Wendy Edde
- **Program Analyst**
  David Buchanan
- **Utility Program Compliance Specialist**
  Sean Muldering
- **Program Technician**
  David Zarate (temp)
- **Program Manager**
  Industrial Pretreatment
  Kelly Graham
- **Industrial Pretreatment Technician**
  Christina Davenport
  Oakley Taylor
- **Lab Supervisor**
  Drexell Barnes
- **Analytical Chemist**
  Stefan D'Angona
- **Lab Technician – Lead**
  Cally Whitman
- **Lab Technician**
  Matthew Hansen
  Tom Walling
- **Program Manager**
  Jeff Buystedt
- **Safe Drinking Water Program Coordinator**
  DJ Buhmann
- **Program Assistant**
  Eric Chamberlain

Water Resources Manager
Patrick Griffiths

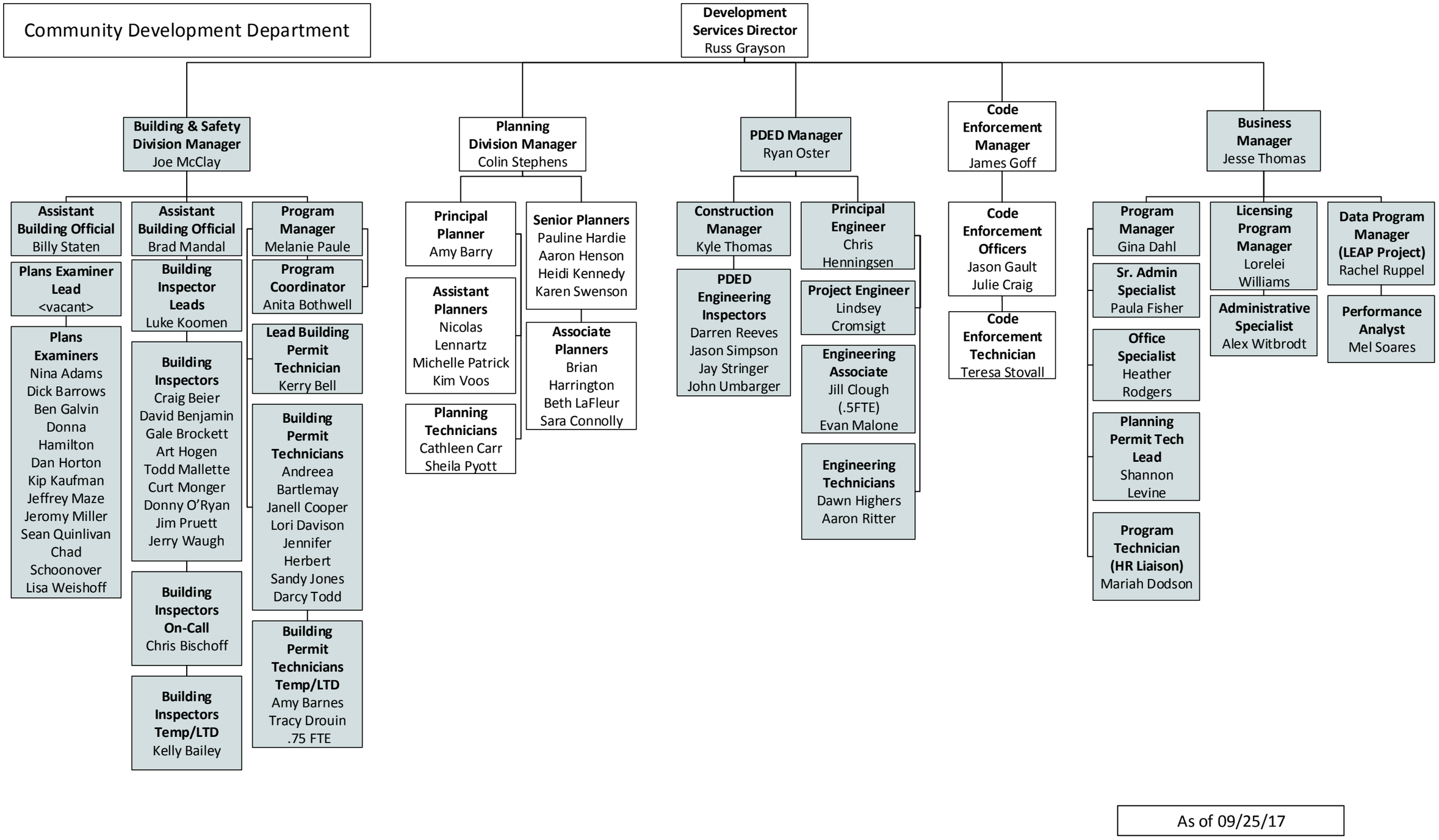
- **Program Manager**
  Water Conservation
  Mike Buettner
- **Utility Program Compliance Specialist**
  Water Conservation
  Dan Denning
  Doug Voderberg (temp)

Utility Support Services Manager
Teresa Briggs

- **Program Manager**
  Data Services
  Spencer Sanvitale
- **Program Technician**
  Spencer Cashwell
  Kyle Winter
  Vacant
- **Performance Analyst**
  Mark Alexander
  Kris Trask
- **Administrative Services Supervisor**
  Kim Wright
- **Office Specialist**
  Connie Sweet
- **Utility Analyst**
  Dave Stensland
- **Program Manager**
  Safety & Training
  Ken Vaughan
- **Program Analyst**
  Mike Edwards
- **Customer Service Supervisor**
  Dave Lee
- **Customer Service Technician**
  Arthur Judd
  Tyler Patterson
- **Program Coodinator**
  Michelle Elpi-Trainor
- **Office Specialist**
  Teresa Findley
- **Program Technician**
  Mary Packebush
  Julie Price

Mission: P.R.I.D.E. – Providing Reliable Infrastructure with Dedication and Excellence

City of Bend Utility Department Organizational Chart Updated: August 10, 2017


Community Development Department
Development Services Director
Russ Grayson
Building & Safety Division Manager
Joe McClay
Planning Division Manager
Colin Stephens
PDED Manager
Ryan Oster
Code Enforcement Manager
James Goff
Business Manager
Jesse Thomas
Assistant Building Official
Billy Staten
Plans Examiner Lead
<vacant>
Plans Examiners
Nina Adams
Dick Barrows
Ben Galvin
Donna Hamilton
Dan Horton
Kip Kaufman
Jeffrey Maze
Jeromy Miller
Sean Quinlivan
Chad Schoonover
Lisa Weishoff
Assistant Building Official
Brad Mandal
Building Inspector Leads
Luke Koomen
Building Inspectors
Craig Beier
David Benjamin
Gale Brockett
Art Hogen
Todd Mallette
Curt Monger
Donny O'Ryan
Jim Pruett
Jerry Waugh
Building Inspectors On-Call
Chris Bischoff
Building Inspectors Temp/LTD
Kelly Bailey
Program Manager
Melanie Paule
Program Coordinator
Anita Bothwell
Lead Building Permit Technician
Kerry Bell
Building Permit Technicians
Andreea Bartlemay
Janell Cooper
Lori Davison
Jennifer Herbert
Sandy Jones
Darcy Todd
Building Permit Technicians Temp/LTD
Amy Barnes
Tracy Drouin
.75 FTE
Principal Planner
Amy Barry
Assistant Planners
Nicolas Lennartz
Michelle Patrick
Kim Voos
Planning Technicians
Cathleen Carr
Sheila Pyott
Senior Planners
Pauline Hardie
Aaron Henson
Heidi Kennedy
Karen Swenson
Associate Planners
Brian Harrington
Beth LaFleur
Sara Connolly
Construction Manager
Kyle Thomas
PDED Engineering Inspectors
Darren Reeves
Jason Simpson
Jay Stringer
John Umbarger
Principal Engineer
Chris Henningsen
Project Engineer
Lindsey Cromsigt
Engineering Associate
Jill Clough
(.5FTE)
Evan Malone
Engineering Technicians
Dawn Highers
Aaron Ritter
Code Enforcement Officers
Jason Gault
Julie Craig
Code Enforcement Technician
Teresa Stovall
Program Manager
Gina Dahl
Sr. Admin Specialist
Paula Fisher
Office Specialist
Heather Rodgers
Planning Permit Tech Lead
Shannon Levine
Program Technician (HR Liaison)
Mariah Dodson
Licensing Program Manager
Lorelei Williams
Administrative Specialist
Alex Witbrodt
Data Program Manager (LEAP Project)
Rachel Ruppel
Performance Analyst
Mel Soares
As of 09/25/17

ENGINEERING



Tom Hickmann PE
Engineering Director
O 541-317-3029
C 541-408-0907



Skip Martin PE, PMP
Principal Engineer
O 541-693-2184
C 503-866-0824



Eric Forster PE, PLS, PMP
Principal Engineer
O 541-317-3040
C 541-388-7974



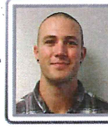
Jessica MacClanahan PE
Project Engineer
O 541-330-4003
C 503-544-7321



Rory Rowan PE
Project Engineer
O 541-388-5575
C 321-289-8799



Jake Sherman EIT
Engineering Associate
O 541-383-4882
C 541-588-2664



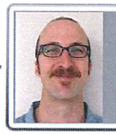
Brad Tower EIT
Engineering Associate
O 541-385-4958
C



Bret Dalrymple
Engineering Inspector
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C 541-480-9490



George
Principal Engineer
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C 541-728-3456



Garrett Sabourin PMP, PE
Project Engineer
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C 802-274-0088



Sinclair Burr PE
Project Engineer
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C 541-408-4042



Drew Wells PE
Project Engineer
O 541-388-5526
C 541-588-0581



Patrick Konop
Engineering Inspector
O 541-323-8592
C 541-903-0811



Joshua Robertson PE
Principal Engineer
O 541-323-8591
C 541-408-6514



Oliver Murray EIT
Engineering Associate
O 541-693-2183
C 503-679-0847



Jason Suhr PE, PMP
Project Engineer
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C 541-678-3813



Brittany Park EIT
Engineering Associate
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C 541-588-0700



Chad Towell
Engineering Inspector Lead
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C 541-280-0168



Chris Struck
Engineering Inspector
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C 541-280-1305



Dana Wilson
Program Manager
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C 541-213-9851



Cindy Hartman
Engineering Tech I
O 541-388-5558

Technical Support Services



Bob DenOuden
Growth Mgt & EIPD
GIS Performance Analyst
O 541.330.4024

Technical Support Services



Adele McAfee
Executive Assistant
O 541-317-3003
C 541-390-5441



Charanne Stein
Office Specialist II/DEQ
O 541-323-8597

Department Admin Support

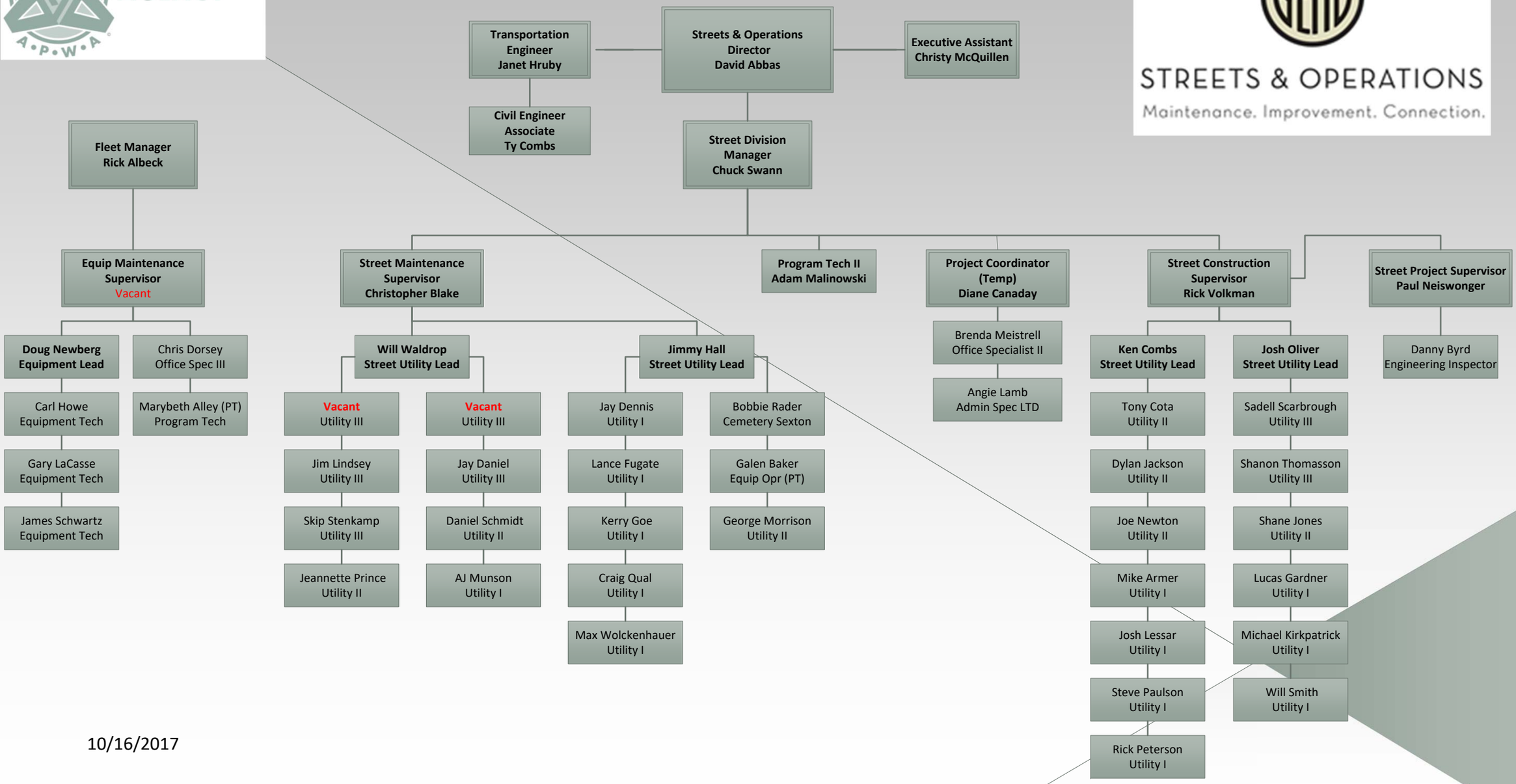
October 2017

ACCREDITED AGENCY

A•P•W•A

STREETS & OPERATIONS

Maintenance. Improvement. Connection.



10/16/2017

Agenda
Bend City Council
June 21, 2017
City Council Chambers/Boardroom, Bend City Hall
710 NW Wall, Bend, Oregon

Light Meal, 4:30 p.m.

CITY OF BEND

BUILDING ON OUR PAST
SERVING THE PRESENT
SHAPING BEND'S FUTURE

City Council Work Session, 5:00 p.m.

1. **Convene Work Session**

2. **Executive Session under authority of ORS 192.660 (2) (e) to conduct deliberations with persons designated to negotiate real property transactions (30 minutes)**

3. **Return to Open Session**

4. **Winter Weather Debrief (90 minutes)**

City Council Regular Meeting, 7:00 p.m.

1. **Roll Call: Mayor Casey Roats, Mayor Pro Tem Sally Russell, Councilor Bill Moseley, Councilor Bruce Abernethy, Councilor Nathan Boddie, Councilor Justin Livingston, Councilor Barb Campbell**

2. **Pledge of Allegiance**

3. **Good of the Order**
   - **A. Clean Water Works Student Video Award**

Wendy Edde, Julie Price, Todd Looby (BendFilm)

Grand Prize winning poem "Flow Rivers" from Lucie Wittwer. Lucie, a first grader, will be in attendance to receive her award.

Grand Prize video winner Akira Talaba
https://www.youtube.com/watch?time_continue=5&v=hVycnss9V8E

Division Winner, Joe Sortor https://www.youtube.com/watch?v=LzLppc9xung

- **B. Downtown Shuttle (Councilor Russell)**

- **C. Immigrant Heritage Month Proclamation and Welcoming America Resolution, (public comment on resolution, if any) (Councilor Boddie)**

MEMORANDUM

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[541] 388-5519
FAX
www.bendoregon.gov

TO: **MAYOR AND CITY COUNCIL**

FROM: **ERIC KING**

SUBJECT: **WEEKLY REPORT**

DATE: **MARCH 3, 2017**

CITY OF BEND

Upcoming City Council meetings and other events

- March 15, work session at 5 p.m., regular meeting at 7 p.m. at City Hall in the Council Chambers
- March 22, Muni Court, 11noon to 5pm, Financial Strategy Session, Part 2
- April 5, work session at 5 p.m., regular meeting at 7 p.m. at City Hall in the Council Chambers
- Early April, TBD, Internal Service Budget Cut Scenarios

City Edition videos

Neighborhood Associations often come to the City with requests for improvements to their neighborhoods. Here is how the City responds to these requests.
https://youtu.be/ylCS4ZiEScc

Construction continues on along 27th Street for the deep sewer line being installed. In this story, engineers explain the advantages of building a gravity line versus using pumps to move sewage to the wastewater treatment plant east of the City.
https://youtu.be/Hwamk_9_cKM

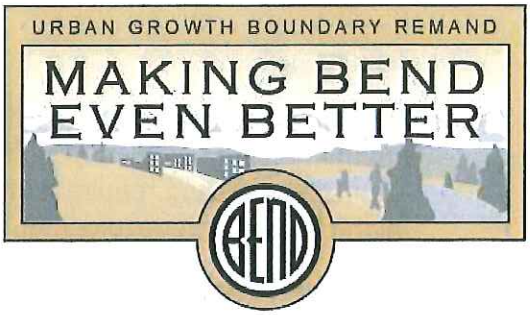
The Deschutes River flows through the center of our community. Here is what the city is doing to reduce sediment from entering the river and tips on what you can do to help.
https://youtu.be/r8r0LydZH_s

Pedestrians have the right of way when crossing streets in most instances. Here officers from the Bend Police Department explain the law and the responsibilities of drivers and pedestrians.
https://youtu.be/HTtJ4Ja6Sto

BPD Calls for Service report

As we are not only seeing a continuation of the increase in our 911 emergency calls for service going up (+34.7%) over the same period a year ago, our mental health calls are also continuing to climb at a record increase. See the attached report for all the details.

Memorandum



February 10, 2017

To: Bend City Council

From: Assistant City Manager and Direct Reports: Growth Management, Community Development, Engineering and Infrastructure Planning, Economic Development, Utilities, and Streets Departments

Re: Council Goal Setting and Implementation of the Urban Growth Boundary – Executive Summary of Recommendations

---

The City of Bend recently completed a years-long process of expanding the Urban Growth Boundary (UGB), adding 2,380 acres across nine expansion areas. The City simultaneously enabled more intensive mixed use development in several "opportunity areas" in the center of the City. Collectively, the opportunity areas and UGB expansion areas represent key components of the City's expected growth over the next 14+ years, but much work remains before developers can fully implement the plan to build needed housing and other development. City Council goal setting and budgeting for 2017 and beyond will have a dramatic impact on the City's ability to deliver on the infrastructure and planning work needed to "unlock" development potential in both opportunity areas and expansion areas.

Coordinating the City's UGB implementation across all departments and programs is one of the most effective strategies the City can employ to implement the UGB. Toward that goal, the following staff recommendations represent a shared set of priorities across the departments listed above, which report to the Assistant City Manager ("ACM Direct Reports group"), based on evaluation of existing work programs and staffing relative to the needs of new growth areas.

The approximate timing of recommended activities is summarized in the attached Preliminary Draft Work Plan – Staff Recommendation. This work plan is **illustrative** only – intended to help the Council see the timing and relationships between the recommendations.

INFRASTRUCTURE

Sewer, Water, and Stormwater

Issues:

- The ability to provide sanitary sewer service to developing areas is a key determinant of when and where urban development will be possible. Water system improvements and extensions are also needed to serve new growth areas.
- The City's infrastructure plans – the Sewer Collection System Master Plan (CSMP), Water System Master Plan (WSMP), and the related Water and Sewer Public Facility Plans (PFPs) – need updates to reflect changes to recommended projects based on the UGB analysis. Updates may be needed to System Development Charge (SDC) project

lists as well.

- Improvements are needed to the City's Water Reclamation Facility (WRF) – the sewage treatment plant – in the near-term to provide adequate capacity for growth City-wide.
- The City's existing requirement to manage stormwater on-site may be an obstacle to the higher intensity redevelopment planned for some opportunity areas.

Recommended priority efforts for the next three years:

- Prepare a technical update and amendment to the CSMP and Sewer PFP based on the UGB analysis, and consider whether updates to the Sewer SDC project list are needed.
- Prepare a technical update and amendment of the WSMP and Water PFP based on the UGB analysis, and consider whether updates to the Water SDC project list are needed.
- Advance design and construction of the Northeast and Southeast Interceptors to connect growth areas to the east and north and increase capacity City-wide.
- Prioritize needed improvements to the WRF.
- Update the WRF Plan and PFP.
- Continue education and dialogue with the Stormwater Public Advisory Group regarding stormwater management and redevelopment/infill situations. Council should consider whether to update the Stormwater Master Plan and PFP.

Transportation System

Issue: There is not a stable and consistent transportation funding source in the City for capital projects, transit or street maintenance. Street maintenance and transit compete for the same limited General Funds, and the City has a long list of transportation capital improvements needed to improve safety, enhance the desirability of opportunity areas, provide access to UGB expansion areas and other developable land, and/or increase capacity on congested roadways.

Recommended priority efforts for the next three years:

- Allocate the current transportation reserve strategically, potentially holding some back as an "opportunity fund" that is responsive to development-related funding gaps.
- Consolidate the multiple committees related to transportation to create a single City-wide transportation advisory committee that can advise Council on the decisions that follow.
- Create new City-wide transportation funding strategies to address capacity, maintenance, and other needs.
- Update the Transportation System Development Charge (SDC) to capture new projects, evaluate financial constraints, and address procedures for credits and other issues.
- Update the Transportation System Plan (TSP), focusing on coordination with the Bend Metropolitan Planning Organization (MPO)'s Metropolitan Transportation Plan, and transportation funding.
- Explore area-specific solutions through the Central Westside Plan Phase 2 (to address transportation funding and other implementation actions for the Central Westside opportunity area) and area plans for UGB expansion areas.
- Support efforts by Central Oregon Intergovernmental Council (COIC)/Cascades East Transit (CET) to create permanent funding for transit in Bend.

CITY OF BEND

2017-2019 ADOPTED BIENNIAL BUDGET IN BRIEF

Funding The City's Operations

City Council Goals & Objectives

The City's General Fund

Where The Money Comes From...And Where It Goes

Learn More About The City's Finances



Stormwater Fund

	ACTUALS 2013-15	ADJUSTED BUDGET 2015-17	ESTIMATE 2015-17	BIENNIAL BUDGET PROPOSED 2017-19	BIENNIAL BUDGET APPROVED 2017-19	BIENNIAL BUDGET ADOPTED 2017-19
RESOURCES						
Beginning working capital	$ 5,041,815	$ 3,457,200	$ 3,738,760	$ 4,778,355	$ 4,778,355	$ 4,778,355
Charges for services	5,105,375	6,592,900	6,711,055	7,452,000	7,452,000	7,452,000
Interfund charges	29,724	34,400	37,342	39,300	39,300	39,300
Interfund transfers	-	39,840	189,212	350	350	350
Investment income	53,921	61,500	102,230	112,100	112,100	112,100
Miscellaneous	3,553	1,800	-	-	-	-
Issuance of long-term debt	-	-	-	820,000	820,000	820,000
TOTAL RESOURCES	$ 10,234,389	$ 10,187,640	$ 10,778,599	$ 13,202,105	$ 13,202,105	$ 13,202,105

	ACTUALS 2013-15	ADJUSTED BUDGET 2015-17	ESTIMATE 2015-17	BIENNIAL BUDGET PROPOSED 2017-19	BIENNIAL BUDGET APPROVED 2017-19	BIENNIAL BUDGET ADOPTED 2017-19
REQUIREMENTS						
By Service Area/Program:						
Infrastructure:						
Operations and maintenance	$ 2,681,514	$ 3,388,607	$ 2,812,015	$ 4,373,200	$ 4,331,800	$ 4,331,800
Regulatory program	-	947,583	762,191	960,200	947,600	947,600
Capital Infrastructure	2,099,875	1,027,000	546,689	952,000	952,000	952,000
Total	4,781,389	5,363,190	4,120,895	6,285,400	6,231,400	6,231,400
Debt service	-	-	-	156,200	156,200	156,200
Interfund transfers	1,714,240	1,923,470	1,879,350	2,665,000	2,719,000	2,719,000
Contingency	-	800,000	-	800,000	800,000	800,000
Reserves	-	2,100,980	-	3,295,505	3,295,505	3,295,505
TOTAL REQUIREMENTS	$ 6,495,629	$ 10,187,640	$ 6,000,244	$ 13,202,105	$ 13,202,105	$ 13,202,105
By Category:						
Personnel services	$ 1,771,384	$ 2,562,220	$ 2,310,502	$ 2,756,700	$ 2,702,700	$ 2,702,700
Materials and services	646,264	1,103,970	701,914	1,236,700	1,236,700	1,236,700
Capital outlay:						
Vehicle/equipment	260,277	420,000	390,141	850,000	850,000	850,000
Repair & replacement	3,589	250,000	171,649	490,000	490,000	490,000
Construction/infrastructure	2,099,875	1,027,000	546,689	952,000	952,000	952,000
Total capital outlay	2,363,741	1,697,000	1,108,478	2,292,000	2,292,000	2,292,000
Debt service	-	-	-	156,200	156,200	156,200
Interfund transfers	1,714,240	1,923,470	1,879,350	2,665,000	2,719,000	2,719,000
Contingency	-	800,000	-	800,000	800,000	800,000
Reserves for:						
Future construction	-	2,100,980	-	3,295,505	3,295,505	3,295,505
TOTAL REQUIREMENTS	$ 6,495,629	$ 10,187,640	$ 6,000,244	$ 13,202,105	$ 13,202,105	$ 13,202,105

INFRASTRUCTURE
Stormwater Utility Fund

Overview

The Stormwater Fund has the primary responsibility of maintaining, repairing and expanding the Stormwater system while complying with mandates from the federal and state government, including the:

- National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer (MS4) Phase II stormwater permit; and
- Underground Injection Control (UIC) Water Pollution Control Facilities (WPCF) permit

Activities within the division include catch basin, pipeline, drill hole and dry well operation and maintenance; stormwater treatment control operation and maintenance; property and public safety with respect to stormwater/flood control; stormwater quality protection; public education and involvement; and a capital improvement program.

Effective implementation of stormwater activities and controls requires a cross-departmental effort. Currently a number of stormwater activities are coordinated with the Streets and Operations Department; the Growth Management Department; the Planning, Engineering and Building divisions of the Community Development Department; and with staff in the Engineering and Infrastructure Planning Department. Illicit discharges and spill response are coordinated with the Police and Fire Departments.

The Utility Department has adopted the One Water model of operation to gain efficiencies by cross training across all three disciplines of the Utility: Water, Water Reclamation and Stormwater. The cross training of staff was a concept borne out of necessity during the recession when the Utility Department of Public Works, along with all other City Departments, was required to reduce or flat line staffing, but provide the same level of service. Having staff trained to perform in all three areas allows the Utility Department to not only be more efficient, but to be more adaptable to changing regulations, operational and maintenance needs, community values and internal City goals and objectives. This new model has changed the budgeting process as many employees are now being paid for by all three funds.

Stormwater Operations and Maintenance Program

The Stormwater Operations and Maintenance program provides for the maintenance and repair of stormwater infrastructure, including pipe and catch basin repair, drill hole reconditioning, water quality controls, and system cleaning. This program pays for system operation, including emergency response during flooding events. This program funds three full time employees within the City street sweeping program, which removes sediment from streets and stormwater runoff thereby protecting catch basin and drill hole operations from prematurely failing.

	ACTUALS 2015-16	ESTIMATE 2016-17	ADOPTED BUDGET 2017-18	2018-19	2017-19
Personnel services	$ 775,256	$ 996,200	$ 988,100	$ 1,031,000	$ 2,019,100
Materials and services	187,327	343,600	493,500	479,200	972,700
Capital outlay:					
Vehicle/equipment	307,983	30,000	500,000	350,000	850,000
Repairs and maintenance	21,649	150,000	340,000	150,000	490,000
Program Total	1,292,215	1,519,800	2,321,600	2,010,200	4,331,800
Debt service	-	-	-	156,200	156,200
Interfund transfers	1,031,150	848,200	815,200	843,800	1,659,000
Operations and Maintenance	$ 2,323,364	$ 2,368,000	$ 3,136,800	$ 3,010,200	$ 6,147,000
Full Time Equivalents	9.56	9.56	9.53	9.53	9.53

Goals for the 2017 – 2019 Biennial Budget

- Efficiently operate and maintain the Stormwater system
- Complete all maintenance as required by the WPCF and NPDES permits
- Implement the Stormwater Capital Improvement Plan
- Fully integrate Asset Management into the Stormwater Maintenance Plan

Key Operational Objectives for the 2017 – 2019 Biennial Budget

- Complete drill hole reconditioning including pretreatment at ten localized flooding sites
- Complete Open-top Dry Well replacement project
- Complete system repair according to integrated capital maintenance plan
- Begin maintenance of stormwater systems at City owned facilities (Police, Fire, Downtown Campus, and Boyd Acres Campus)
- Prioritize and implement improvements from the South Awbrey Butte Drainage Study
- Complete the UIC upgrade project for open grate drywells

Major Accomplishments during the 2015 – 2017 Biennial Budget

- Cleaned and/or inspected all stormwater facilities, meeting permit compliance needs
- Reconditioned eighteen drill holes to reduce flooding in localized areas
- Updated, ranked and prioritized flooding response to better help coordinate City flood response
- Responded during several flood events, preventing damage to properties and improving street safety
- Innovated new internal cleaning methods for drill holes and devices to keep sediment out of the storm system
- Completed cross- training of Stormwater Utility staff with Collection System staff to increase efficiencies across Utility Departments
- Supported modelling and design of the South Awbrey Butte Drainage Study and Galveston Storm line improvement project
- Completed improvements for localized flooding on Shevlin Drive and 5th and Roanoke
- Completed the Drake and Dohema stormwater lift station project

Significant Changes from the 2015 – 2017 Biennial Budget

- Increased funding for swale maintenance

- Purchase of new street sweeper and replacement of one hydro-excavator (Vactor) will be funded by long term debt

Major Capital Projects / Equipment Purchases for the 2017 – 2019 Biennial Budget

- Refer to Five Year Vehicle & Equipment Plan on following page for details
- Refer to Repair & Replacement Capital Project Plan on the following page for details

Stormwater Regulatory Program

The Stormwater Regulatory program focuses on ensuring water quality of the Deschutes River and underground drinking water aquifers by means of stormwater pollution minimization. This program includes coordinating compliance efforts with the City's permits for stormwater that is directed to surface water and stormwater that is injected underground, along with other regulatory requirements such as Total Maximum Daily Loads (currently under development).

	ACTUALS 2015-16	ESTIMATE 2016-17	ADOPTED BUDGET 2017-18	2018-19	2017-19
Personnel services	$ 270,746	$ 268,300	$ 337,300	$ 346,300	$ 683,600
Materials and services	75,887	95,100	152,800	111,200	264,000
Capital outlay:					
Vehicle/equipment	24,858	27,300	-	-	-
Regulatory program	$ 371,491	$ 390,700	$ 490,100	$ 457,500	$ 947,600
Full Time Equivalents	2.70	2.70	2.87	2.77	2.77

Goals for the 2017 – 2019 Biennial Budget

- Negotiate the reissuance of the City's NPDES Municipal Separate Storm Sewer System (MS4) permit and begin implementation
- Comply with the City's permits and regulations related to stormwater pollution prevention
- Prepare for Total Maximum Daily Load development and requirements

Key Operational Objectives for the 2017 – 2019 Biennial Budget

- Implement Integrated Stormwater Management Plan 2022
- Improve inspection/enforcement recordkeeping with implementation of LEAP project
- Increase understanding of location and types of private stormwater facilities for use in increasing closure efficiency during public emergencies, and for improving understanding for regulatory negotiation and compliance
- Be innovative in conducting outreach and public participation program to address multiple regulatory requirements in an incentive-based community-based social marketing manner to increase effectiveness

Major Accomplishments during the 2015 – 2017 Biennial Budget

- City has completed regulatory requirements and provided all regulatory submittals on time
- City conducted successful Clean Water Works community education and outreach pilot project

Capital Infrastructure Program

The Stormwater Capital Improvement Program focuses on implementing the projects identified in the 2014 Stormwater Master Plan update. These projects are coordinated and prioritized with other projects such as the Galveston reconstruction, 3rd Street Accessibility project, and many others.

	ACTUALS 2015-16	ESTIMATE 2016-17	ADOPTED BUDGET 2017-18	2018-19	2017-19
Capital outlay:					
Construction/infrastructure	$ 121,689	$ 425,000	$ 10,000	$ 942,000	$ 952,000
Program Total	121,689	425,000	10,000	942,000	952,000
Interfund transfers	-	-	300,000	760,000	1,060,000
Capital Infrastructure	$ 121,689	$ 425,000	$ 310,000	$ 1,702,000	$ 2,012,000

Goals for the 2017 - 2019 Stormwater Biennial Budget

- Prepare technical updates and amendment to the Stormwater Master Plan applying engineering standards developed during the 2014 Collection System Master Plan Update to create consistency between master planning documents
- Continue to seek synergy projects that address critical stormwater needs with transportation, water, and sewer projects

Key Operational Objectives for the 2017 - 2019 Stormwater Biennial Budget

- Implement the findings for the South Awbrey Butte Drainage Study

Major Accomplishments during the 2015 - 2017 Biennium

- Added over $3.5 million in infrastructure improvements with the completion of South 3rd Street Stormwater Phase I, South 3rd Street Stormwater Phase II and Third Street Underpass

Significant Changes from the 2015 - 2017 Biennial Budget

- Added Galveston Storm Sewer Upgrades
- Added Franklin & Greenwood Underpass
- Added Roosevelt & McKinley

Major Capital Projects / Equipment Purchases for the 2017 – 2019 Biennial Budget

- Refer to Five Year Capital Improvement Program (CIP) schedule on following page for details

INFRASTRUCTURE
Stormwater Utility Fund

PERFORMANCE MEASURES

	ACTUALS 2014-15	ACTUALS 2015-16	ESTIMATE 2016-17	TARGET 2017-18	TARGET 2018-19
Output Measures:					
% Regulatory submittals completed on time	100%	100%	100%	100%	100%
Yards of debris removed	214	234	576	500	500
Storm drains cleaned/inspected	8,677	8,417	9,866	10,130	10,130
UICs cleaned/inspected	5,281	5,001	5,915	5,929	5,929
# Swales maintained	508	673	1,048	1,062	1,062
Effectiveness Measures:					
Average number of work orders per employee per month	481	519	500	500	500
Planned Maintenance hours (%)[1]	32%	31%	53%	58%	58%
Efficiency Measures:					
Customers per FTE	5,320	4,648	4,175	4,233	4,291
Stormwater Fee per Equivalent Dwelling Unit	$ 4.00	$ 5.00	$ 5.15	$ 5.30	$ 5.46

[1] Measurement tracking of Planned Maintenance has changed to be in alignment with AWWA standards.

INFRASTRUCTURE
Utilities Laboratory

Overview

The Utilities Laboratory provides laboratory analysis, sampling and technical / regulatory support for pertinent divisions within the Utility Department and the Engineering Infrastructure and Planning Department. The main functions of the laboratory are to perform the following duties:

- Drinking water analysis
- Wastewater / reuse water / biosolids analysis
- Industrial user waste discharge analysis
- Water Quality Monitoring Program (Deschutes River, Bridge Creek and Tumalo Creek)
- Stormwater sampling / analysis and telemetry
- Hazardous waste management for the Utilities and Streets & Operations Departments
- Specially requested analysis in conjunction with capital improvement projects
- Technical support including data analysis, database management and reporting
- Preparation and distribution of annual water quality report to all Bend water consumers

The data generated is utilized to determine compliance with state and federal regulatory requirements and environmental compliance, water/sewer/stormwater rates, process control, identification of unknown substances and drinking water (surface/groundwater) quality analysis. The laboratory is accredited by the National Environmental Laboratory Accreditation Program (NELAP) as a certified water testing facility.

	ACTUALS	ESTIMATE	ADOPTED BUDGET		
	2015-16	2016-17	2017-18	2018-19	2017-19
Personnel services	$ 703,773	$ 731,500	$ 867,900	$ 905,500	$ 1,773,400
Materials and services	135,357	179,538	189,600	201,700	391,300
Capital outlay:					
Vehicle/equipment	77,865	45,000	108,500	150,000	258,500
Program Total	916,995	956,038	1,166,000	1,257,200	2,423,200
Interfund transfers	121,223	121,700	115,500	121,600	237,100
Utilities Laboratory	$ 1,038,218	$ 1,077,738	$ 1,281,500	$ 1,378,800	$ 2,660,300
Full Time Equivalents	7.00	7.00	7.00	7.00	7.00

Goals for the 2017 – 2019 Biennial Budget

- Perform, manage and report all required testing for all utility divisions
- Maintain The NELAC Institute (TNI) and Oregon Laboratory Accreditation Program (ORELAP) accreditation
- Utilize the LIMS (Laboratory Information Management System) with existing database systems to leverage process efficiencies and improve data availability and quality
- Continue to explore new technologies and automated instrumentation to meet anticipated regulatory mandates and further enhance quality, quantity and efficiency as well as lower operational expenditures

Key Operational Objectives for the 2017 – 2019 Biennial Budget

- Expand list of TNI / ORELAP accredited analysis methods to further ensure regulatory compliance

- Develop method and gain TNI / ORELAP accreditation for the Inductively Coupled Plasma Spectrometer/Mass Selective Detector (ICP-MS) used for the analysis of metals in drinking and surface water, domestic and industrial wastewater, stormwater, soil and biosolids
- Utilize the City's SharePoint technology to gain document management and collaborative work flow efficiencies
- Continue to promote and increase the use of the HACH-WIMS (Hach Water Information Management Solution) database management system for Water Operations, Water Reclamation, Stormwater, Industrial Pretreatment and the Water Resources divisions, as well as data integration with LIMS

Major Accomplishments during the 2015 – 2017 Biennium

- Established Field Sampling and Monitoring program to improve and regulate sample gathering, sample receiving and field instrument data for all field activities
- Maintained TNI / ORELAP accreditation resulting from recertification procedures and on-site audits
- Maintained all State of Oregon Drinking Water Program and United States Environmental Protection Agency (US EPA) regulated drinking water sampling, management, analysis, reporting and data management
- Maintained Oregon Department of Environmental Quality (OR-DEQ) Conditionally Exempt Hazardous Waste Generator Status for all registered location
- Continued and expanded Water Quality Monitoring Program and data reporting and analysis
- Continued to maintain and integrate the HACH WIMS database to improve required reporting and data analyses functions in cooperation with the Water Reclamation Facility (WRF) and Water divisions
- Conducted Quanti Tray 2000 enumeration study in cooperation with manufacturer in order to gain approval for use of Quanti Tray analyses for Total Coliforms and E. Coli detection and compliance in reuse water

Major Capital Projects / Equipment Purchases for the 2017 – 2019 Biennial Budget

- Refer to Five Year Vehicle & Equipment Plan on following page for details

INFRASTRUCTURE
Utilities Laboratory

PERFORMANCE MEASURES

	ACTUALS 2014-15	ACTUALS 2015-16	ESTIMATE 2016-17	TARGET 2017-18	TARGET 2018-19
Output Measures:					
# of Drinking Water Tests	2,950	2,894	3,072	3,115	3,255
- Potable water					
- State / EPA Water Quality Monitoring Tests					
- Source water					
- Operation & maintenance					
- New mains					
# of Wastewater Tests	11,006	10,850	10,505	10,900	11,500
- State Reported / Ops Control tests					
- IPP Local Limits Tests					
- IPP Commercial/industrial Tests					
# of Stormwater Tests	149	155	145	160	175
- Samples collected					
- Sample analyses / data management					
# of Water Quality Monitoring Tests	1,655	1,516	1,510	1,550	1,610
- Deschutes River samples collected					
- Deschutes River sample analyses					
- Bridge Creek samples collected					
- Bridge Creek sample analyses					
Effectiveness Measures:					
NELAC Accreditation	Yes	Yes	Yes	Yes	Yes
Efficiency Measures:					
Tests/hour/person	1.78	1.74	1.72	1.78	1.87

INFRASTRUCTURE
Utilities Laboratory

FIVE YEAR VEHICLE & EQUIPMENT PLAN

	2017-18	2018-19	2019-20	2020-21	2021-22
[1] One (1) YSI ExO Multi-parameter Sonde	$ 18,500	$ -	$ 19,500	$ 20,500	$ -
[2] One (1) Replacement FS3000	90,000	-	-	-	-
[3] One (1) Replacement ICP-MS	-	150,000	-	-	-
[4] One (1) 6' Lab Fume Hood, installed	-	-	17,500	-	19,000
[5] One (1) Replacement Chromatograph	-	-	75,000	-	-
One (1) Replacement SUV	-	-	-	28,000	-
One (1) Replacement Van	-	-	-	-	30,000
Total	**$ 108,500**	**$ 150,000**	**$ 112,000**	**$ 48,500**	**$ 49,000**

Analytical Instrument definition (Items 1 through 5)

[1] Multiparameter instrument for field analysis of pH, nutrients chloride, conductivity, turbidity, temperature, dissolved oxygen, etc…

[2] Flow injection auto-analyzer for nutrients in drinking water, wastewater, stormwater

[3] Laboratory instrument for analyzing trace metals in drinking water, wastewater, stormwater

[4] Laboratory ventilation system

[5] Laboratory instrument for analyzing ions (e.g., fluoride, chloride, nitrate, nitrite, sulfate, lithium, sodium, ammonium, potassium, calcium, and magnesium) in drinking water, wastewater, stormwater

ISWMP 2022 Performance Standards

Public Information and Participation (See Chapters II, III &

Subsection		Performance Standard	Implementation Status			Implementation Date	Comments
			Scheduled	Partial	Full		
Coordination with Existing Opportunities/ Activities	1	Stay sufficiently informed about the programs and materials being developed by Oregon Association of Clean Water Agencies (ACWA) and/or other suitable programs and groups by regularly attending or tracking ACWA or other appropriate stormwater, groundwater and public outreach committees.				July 1, 2014	
	2	Distribute and/or make readily available outreach and educational materials to appropriate audiences within the City. This includes, but is not limited to schools, volunteer committees, neighborhood associations, community groups, business groups and /or other environmental groups.				July 1, 2014	
City Staff and Officials	1	Identify, develop, and communicate at least annually, information about the City's stormwater quality program to city management and elected officials so that they are well informed about the requirements, their role in implementing the local stormwater program, and the City's progress.				July 1, 2014	
	2	Train new employees involved with stormwater pollution prevention activities on their role in implementing the local stormwater program.				July 1, 2014	
Procedures and Training for Handling Telephone Calls from the Public About Stormwater Pollution Prevention	1	Establish procedures for answering, tracking, and efficiently routing stormwater-related telephone calls to the appropriate staff for handling.				July 1, 2014	
	2	Train staff assigned to answering or responding to telephone calls on the established procedures.				July 1, 2014	
	3	Promote the use of a City telephone number to facilitate public reporting of illicit discharges.				July 1, 2014	
Storm Drain Inlet Stencils and Signs	1	The City will have an active program to install stencils/storm drain markers on publicly owned storm drain inlets. This includes installation by municipal staff, contractors, volunteers, and/or community groups.				July 1, 2014	
	2	As a goal, stencils and signs will be maintained sufficiently to be legible.				July 1, 2016	
COORDINATION WITH PUBLIC SCHOOLS (K-12)	1	The Stormwater Program Manager will either be responsible for distributing, or delegating the distribution of, information about school based outreach and educational materials to public schools within the City. This may include disseminating information on how to obtain copies of materials and providing lending opportunities for the watershed diorama, and may include working with outside groups who work directly with school children providing pollution prevention and water education				July 1, 2014	
Local Community Outreach Program	1	The City will participate in community outreach activities from the areas listed below for the purpose of communicating the general stormwater pollution prevention message, complementing regional or statewide coordinated specific messages for target audiences, and facilitating the proper management and disposal of targeted pollutants. The City will participate in at least three activities annually.				July 1, 2014	
	a	Distributing local, regional or statewide information through other venues (e.g., local newsletter, local magazine, mailing to target group, computer web site or network, local telephone directories, etc.).				July 1, 2014	
	b	Participating in existing community events such as fairs, festivals, exhibits, etc. This participation may include setting up a booth, kiosk display, or other creative means for communicating the general stormwater pollution prevention message; using a specific message to a target group; or making a presentation at a local community service group				July 1, 2014	
	c	Initiating new community events or playing a major role in planning and staging a community or city-wide event. Examples include, but are not limited to, Earth Day, Stream Stewardship Day, or other festival or fair, business mixer, seminar or workshop for a target group, contest, or coordination with businesses to provide pollution prevention discounts (e.g., recycled car wash discount).				July 1, 2014	
	d	Developing and raising watershed awareness				July 1, 2014	
	e	Coordinating with local volunteer groups to conduct outreach.				July 1, 2014	

ISWMP 2022 Performance Standards

Illicit Discharge Control (See Chapter V.)

Subsection		Performance Standard	Implementation Status			Implementation Date	Comments
			Scheduled	Partial	Full		
PREPARE FOR ILLICIT DISCHARGE SCREENING AND INVESTIGATIONS	1	Receive information on non-stormwater discharge reports;				July 1, 2014	See Task V.2
	2	Assure that needed follow-up, elimination, and cleanup of illicit discharges are conducted;				July 1, 2014	See Task V.2
	3	Provide other staff with information about the status of source identification and elimination. In particular, staff who identify an illicit discharge will be informed about its outcome;				July 1, 2014	See Task V.7
	4	Make sure required reporting is completed;				July 1, 2014	See Task V.7
	5	Distribute information to the City's management and elected officials, as requested, about the resources needed to implement these performance standards;				July 1, 2014	See Task V.7
	6	Facilitate the implementation of these performance standards; and				July 1, 2014	See Task BMP V-6
	7	Be responsible for sharing activities and findings with the Stormwater Coordinators				July 1, 2014	
	8	Train at least biennially City staff who maintain and repair the municipal storm drain conveyance system. Train other municipal staff who conduct field work where illicit discharges are likely to occur, to recognize illicit discharges and the procedures for responding to these discharges. Train all new staff who fill positions as described above, about illicit discharge recognition and response procedures.				July 1, 2014	See Task V.7
	9	Keep maps of the completed municipal storm drain system sufficiently accurate to be used for tracing illicit discharges.				July 1, 2014	See Task V.5
	10	Train City staff assigned to conduct illicit discharge investigations on the knowledge and skills necessary to be effective. They will be familiar with guidance developed by the City and DEQ staff and these performance standards				July 1, 2015	
CONDUCT FIELD SCREENING	1	Begin program to identify evidence of illicit discharges to the municipal storm drain conveyance system, using municipal maintenance and other local field staff while they are conducting their routine work. Report any evidence of illicit discharges identified during these field screening activities to the Stormwater Program Manager or designee for follow-up.				July 1, 2015	See Task V.7
CONDUCT FIELD INVESTIGATIONS	1	Verify whether an illicit discharge has occurred, using information provided as part of field screening and complaints received from the public or other agencies. The goal will be to initiate follow-up activities within twenty-four business hours from the time the Stormwater Program Manager receives the report.				July 1, 2016	See Task V.2
	2	When an illicit discharge has occurred, find the source and eliminate it, as soon as possible. Trace the source(s) of the illicit discharge using storm drain maps, inspecting manholes, and making surface observations. Record and maintain findings, as appropriate.				July 1, 2016	See Task V.2
	3	Continue to inspect and follow-up illicit discharges until: a. The source of the illicit discharge is found and eliminated1; or b. The discharge has stopped and cannot be traced to a source				July 1, 2016	See Task V.2
	4	If the City identifies three or more illicit discharges in a fiscal year within an area served by any major outfall or a UIC within a two year time of travel or wellhead protection area, additional illicit discharge investigations will be conducted in the area(s) served by the major outfall(s)/UIC during the subsequent fiscal year or sooner. These additional investigations will include one or more of the following, as appropriate: a. Periodic above ground surveillance of the area for visual evidence of illicit discharges; b. Additional inspections of businesses, if appropriate; c. Additional periodic investigations of outfalls, UICs, waterbodies, and open channels for evidence of illicit discharges; and/or d. Additional targeted educational outreach in the area.				July 1, 2018	

ISWMP 2022 Performance Standards

Illicit Discharge Control (See Chapter V.)

Subsection		Performance Standard	Implementation Status			Implementation Date	Comments
			Scheduled	Partial	Full		
FOLLOW-UP TO FIELD SCREENING AND INVESTIGATIONS	1	When a party responsible for an illicit discharge is found, provide the responsible party with: a. educational information about the impacts of his or her actions, b. the requirements of the local stormwater ordinance, c. options for proper discharge or disposal, and/or d. educational materials describing BMPs. When the source of an illicit discharge has not been found, distribute educational outreach materials to residents and/or businesses located in the immediate vicinity of the illicit discharge.				July 1, 2014	
	2	If the discharge is traced to a business, the Stormwater Program Manager, or delegated staff, will distribute appropriate educational and BMP information.				July 1, 2014	
	3	The goal of follow-up investigations will be to stop the illicit discharge(s) as soon as practicable and protect water quality to the maximum extent practicable.				July 1, 2014	
	4	Begin enforcement procedures, if appropriate, as per the enforcement authorities as set forth in the City's municipal ordinances.				July 1, 2016	
	a	Investigate and record reported spill reports and/or complaints about incidents within the City.				July 1, 2014	
	b	Become familiar with existing spill prevention, containment, response, and clean-up programs that cover the city's jurisdiction.				July 1, 2014	See BMPV-6
	c	Coordinate illicit discharge prevention, elimination, and clean-up activities with existing programs				July 1, 2016	See BMPV-6
	d	Establish a mechanism for obtaining information about spill incidents from other agencies and departments within the municipality so that source identification and follow-up activities can be coordinated.				July 1, 2016	See BMPV-6
DOCUMENT AND REPORT COMPLETION	1	Document the number and types of illicit discharge incidents reported and follow-up investigations conducted within the agency's jurisdiction. (This does not include information from fluid spills from automobile accidents.)				July 1, 2014	See Task V.2
	2	Collect information for annual reporting including: a. Number of illicit discharges identified as part of staff investigations; b. Number of illicit discharge reported by other city staff and the public; and c. Follow-up activities.				July 1, 2016	See Task V.2

ISWMP 2022 Performance Standards

New Development, Redevelopment, and Construction Site Controls (See Chapter VI.)

Subsection		Performance Standard	Implementation Status			Implementation Date	Comments
			Scheduled	Partial	Full		
DEVELOPMENT PLAN REVIEW AND PERMITTING	1	Obtain adequate legal authority to implement stormwater quality control measures for development, redevelopment, and construction activities as part of the development plan review and approval process.				July 1, 2014	
	2	Require developers and owner/builders of projects that include permanent stormwater facilities to ensure ongoing operation and maintenance of the facilities, as part of project approval documents.				July 1, 2015	
	3	Require developers and owner/builders of projects with potential for significant erosion and planned construction activity to plan, prepare for and implement effective erosion and sediment controls.				July 1, 2015	
	4	Ensure municipal capital improvement projects also include stormwater quality control measures during and after construction, as appropriate for each project.				July 1, 2015	
	5	Inform developers and owner/builders of projects that disturb a land area of one acre or more in an area that drains to a surface water body of the state requirement to obtain coverage under the DEQ 1200C permit.				July 1, 2016	
	6	Require developers and owner/builders to control stormwater quality impacts of their projects by using appropriate BMPs. Encourage projects with significant stormwater pollution potential to mitigate impacts through site planning or design practices and/or post construction controls4. For such projects, the developer and owner/builder will be encouraged to avoid, minimize, and mitigate, in that order, the potential adverse impacts to water quality.				July 1, 2017	The City has successfully adopted Bend code title 16 (Grading and Drainage Ordinance), and incorporated the Central Oregon Stormwater Manual into our devlopemnt review proces.
	7	Review and refine, if necessary, the stormwater ordinance requiring site planning or design practices and/or post construction controls to protect water quality.				July 1, 2018	
	8	Review, and as appropriate, incorporate policies and implementation measures into the General Plan and Development Code to help preserve and enhance water quality and protect sensitive areas. General Plan and Development Code amendments will be adopted periodically as part of the City's ongoing General Plan and Development Code updates.				July 1, 2019	
ADDITIONAL EROSION AND SEDIMENT CONTROL	1	Maintain an erosion and sediment control program that includes requirements for minimum performance standards, sufficient enforcement authority, training and tools for inspectors, and information for developers and contractors.				July 1, 2015	
	2	As a condition for issuing a grading permit, require developers and owner/builders to prepare, submit for review and approval, and implement effective erosion and sediment control measures as per City regulations.				July 1, 2016	
CONSTRUCTION INSPECTION	1	For development projects with significant erosion potential, require that erosion and sediment control measures are implemented through a construction inspection process. Measures will be implemented in accordance with local ordinances and project conditions of approval, including the approved erosion and sediment control plan. Measures will also be maintained as needed during construction.				July 1, 2014	
	2	Through a construction inspection process, require that construction contractors properly store, use, and dispose of construction materials, chemicals, and wastes from construction sites and prevent illicit discharges to the storm drains and watercourses.				July 1, 2016	The COSM has specific source control requirements in chapter 10.
	3	As part of normal inspections, municipal inspectors will review construction sites for adequacy of stormwater quality control measures. The municipal inspectors will prioritize assistance and guidance to onsite inspectors based on the following criteria: a. Project's potential impact on stormwater quality; b. Size of the project; c. Site topography and soil characteristics; d. Season in which the construction phase occurs; and e. Nature of the construction activity.				July 1, 2016	
	4	Require that each active construction site either be stabilized or have supplies and roll-out plans for immediate stabilization to be deployed prior to a major storm to minimize erosion and discharges of sediment from disturbed areas. As part of normal inspections, municipal inspectors will review to make sure these requirements are being met.				July 1, 2018	
	5	Review the inspection of construction sites with erosion and sediment controls following complaints or reports of sediment or pollutants being discharged in the public right of way.				July 1, 2019	

ISWMP 2022 Performance Standards

New Development, Redevelopment, and Construction Site Controls (See Chapter VI.)

Subsection		Performance Standard	Implementation Status			Implementation Date	Comments
			Scheduled	Partial	Full		
EDUCATION AND OUTREACH	1	Distribute appropriate educational and training materials to city staff, contractors, construction site operators, developers, and owner/builders such as: a. Construction BMPs including erosion and sediment controls; b. Available guidance on the DEQ 1200C permit, if applicable; c. Site planning or design measures and post construction controls; and d. Information provided by DEQ staff regarding State and Federal permit and approval requirements for related project activities. Distribute this information and guidance materials to developers and owner/builders early in the application or design review process, or have available on the City's website as appropriate for the type of project.				July 1, 2014	
	2	Train, at least biennially, appropriate construction inspection staff on inspection procedures, documentation, and enforcement related to stormwater pollution prevention.				July 1, 2015	
	3	Train, at least biennially, staff from planning, building, and public works staff on planning procedures, policies, design guidelines, and BMPs for stormwater pollution prevention and control.				July 1, 2015	
	4	Distribute appropriate educational and outreach materials provided by the DEQ to those utility contractors (water supply, cable, phone, electrical, etc.) seeking encroachment and/or grading permits from the municipality.				July 1, 2015	

ISWMP 2022 Performance Standards

Lifespan Operation and Maintenance Verification (See Chapter VII.)

Subsection		Performance Standard	Implementation Status			Implementation Date	Comments
			Scheduled	Partial	Full		
TARGETING INSPECTIONS TO ACHIEVE THE MOST BENEFIT	1	Develop and update as needed, an operation and maintenance review plan or standard operating procedure (SOP) that describes the following: a. The inspecting divisions/department. b. The division/department that will conduct the stormwater follow-up and/or enforcement. c. How information and resources will be coordinated among agencies/departments. d. Priorities for inspecting stormwater facilities. Identify target businesses, if any, with high potential to discharge pollutants to the municipal storm drains or within wellhead protection areas. e. Proper recordkeeping procedures.The O&M review plan or SOP shall be tailored to the amount of staffing and financial resources available given program priorities.				July 1, 2014	Engineering PMs/inspectors inspect municipal facilities through construction and warranty. Storm facilties are then brought into City's Infor database for inspection and ongoing-maintenance by Utility operations staff. See also Tasks VII.2 and VII.3.
	2	Educate business owners and operators about stormwater pollution prevention, separate from the inspection program.				July 1, 2015	See Clean Water Works Partnership activities.
	3	Respond to complaints or referrals from others about a facility. The response may include actions such as: a. Interviewing the caller concerning the specific nature of the problem; b. Referring the caller to the DEQ staff for compliance questions concerning the State requirements (i.e., 1200 Z permit, etc.). c. Referring the caller to another agency if the facility is outside the City's jurisdiction; d. Calling the facility and providing appropriate BMP information. For substantive complaints not covered above, schedule a facility inspection or site visit as soon as possible.				July 1, 2015	Complaints are directed to O&M, regulatory for illicit discharge, engineering as appropriate for applicable calls, and to appropriate outside agencies if outside the City's jurisdiction. The City Utilities Department tracks customer service requests through Infor.
	4	Inspect and distribute appropriate BMP information to businesses per the operation and maintenance review plan priority. Frequency of inspection should be commensurate to the businesses' potential to flood or discharge pollutants to City facilities and available staffing levels.				July 1, 2016	See Clean Water Works Partnership activities.
	5	Re-evaluate the City's priorities for operation and maintenance of permanent stormwater facilities. Update the operation and maintenance review plan as needed. Coordinate with other city inspectors (e.g,, IPP or fire) to coordinate and minimize the number of inspections per business.)				July 1, 2018	
PREPARING FOR INSPECTIONS	1	Train appropriate City facility inspectors so that each inspector possesses the knowledge and skill necessary to conduct effective stormwater inspections. This includes identifying potential pollutant sources that may be exposed to stormwater runoff and non-stormwater discharges to the storm drains.				July 1, 2015	See Task VII.4
	2	The appropriate City's inspection staff will be responsible with being knowledgeable about the following: a. Stormwater regulations and requirements, including the City's ordinance and applicable state permits; b. Impacts of non-stormwater discharges to the river. surface water and groundwater; c. Inspection techniques and procedures; d. Follow-up and enforcement procedures; and e. Stormwater BMPs. The inspectors and managers will obtain periodic training to support inspection activities and to continue to improve program implementation.				July 1, 2015	See Task II.1 and VII.4
CONDUCTING INSPECTIONS	1	Inspectors will review the facility layout to locate the storm drain system and/or stormwater drainage path.				July 1, 2016	

ISWMP 2022 Performance Standards

Lifespan Operation and Maintenance Verification (See Chapter VII.)

Subsection		Performance Standard	Implementation Status			Implementation Date	Comments
			Scheduled	Partial	Full		
CONDUCTING INSPECTIONS	2	Inspectors will review/inspect the following areas, if access to the area is safe and drains to a stormwater management facility or area from which stormwater flow may ultimately leave the site. a. Outdoor process/manufacturing areas; b. Outdoor material storage areas; c. Outdoor waste storage/disposal areas; d. Outdoor vehicle and heavy equipment storage and maintenance areas; e. Outdoor parking areas and access roads; f. Outdoor wash areas; g. Surface discharge outlets from rooftop equipment; and h. Outdoor drainage from indoor areas. i. The status of onsite stormwater facilities. These areas will be inspected for 1) their need for maintenance; 2) their potential to discharge pollutants from non-stormwater discharges to public facilities, and 3) pollutant exposure to stormwater.				July 1, 2016	
	3	Inspectors will notify the Stormwater Program Manager of potential to discharge pollutants from non-stormwater discharges, and pollutant exposure to stormwater from a business.				July 1, 2016	
	4	When a business that impacts stormwater quality is identified, the City 's Stormwater Program Manager will either be responsible for conducting, or delegating, the following: a. Communicate stormwater requirements. b. Distribute facility representatives with appropriate stormwater BMP5 information, educational materials, and inter/intra-agency referrals as needed. Ask the facility representative whether employees have been trained about how to prevent stormwater pollution. c. Inform the facility representative of any problems or violations found. A schedule for correcting problems identified during the inspection, and a means for verifying their implementation will be discussed with the facility representative. This information will be noted and tracked. d. Document and track inspection activities, follow-up, and enforcement activities for reporting to the DEQ in annual reports.				July 1, 2016	See also Task V-7.
ACHIEVING FACILITY COMPLIANCE	1	If a problem is identified during an inspection, the Stormwater Program Manager will either be responsible for performing, or delegating a follow-up site visit or initiating a self-certification process where the facility representative certifies in writing that the problem has been remedied within the time specified by the Stormwater Program Manager.				July 1, 2019	
	2	Begin enforcement procedures, if appropriate, as per the enforcement authorities as set forth in the City's municipal ordinances.				July 1, 2019	

ISWMP 2022 Performance Standards

Corporation Yards (See Chapter V.)

Subsection		Performance Standard	Implementation Status			Implementation Date	Comments
			Scheduled	Partial	Full		
GENERAL STANDARDS/ TRAINING	1	Prepare and maintain a current Corporation Yard Stormwater Pollution Prevention Plan (SWPPP).				July 1, 2014	Developed 3/7/11 review and update scheduled in FY2014-15
	2	Prepare spill containment kits and store them in locations that have potential for spills (e.g., fueling areas, etc.). Conduct training annually, or as appropriate, on how to use the kits.				July 1, 2015	See Task VIII.6
	3	Mark or stencil inlets to the storm drainage system with a "protect our waters-no dumping"-type message.				July 1, 2015	See Task V.3
	4	Survey the facility annually for compliance with the performance standards. Any performance standard that has not been implemented will be identified in the annual report, along with a schedule for implementation.				July 1, 2016	See Task VIII.8
	5	Post educational materials about these performance standards and best management practices in appropriate areas.				July 1, 2016	See Task V.7. Using Compli
	6	For each corporation yard, assign one person the primary responsibility for ensuring that performance standards are implemented and that all persons using the facility are aware of these performance standards.				July 1, 2016	See Tasks II.1 and VIII.8
	7	Describe activities conducted to educate staff regarding the performance standards in the annual report.				July 1, 2017	See Task V.7
GENERAL HOUSEKEEPING	1	Dispose of often, material removed from streets and storm drainage facilities to eliminate exposure to rainwater and runoff to the storm drain system.				July 1, 2014	Materials are dewatered at 15th Street (dewatering washwater is ultimately directed to sanitary sewer). Materials are then sifted to recover basalt rock for winter traction reuse and remaining materails are disposed of at Knott Landfill.
	2	Keep chemical storage areas neat and orderly				July 1, 2014	See Task VIII.8
	3	Inspect the yard at least semiannually to ensure that there are no illicit discharges to the storm drain system. Train employees to report potential pollutant discharges when noticed to ensure pollutant discharges are controlled to the MEP.				July 1, 2016	See Task VIII.8
	4	Sweep the corporation yard at least bimonthly				July 1, 2016	Bimonthly sweeping to begin Oct. 2016. Neither corporation yard drains to the MS4/river or is in a time of travel area for UICs. Portions of 15th corp yards drain to surface swales or sheet flows to adjacent landscaping.
	5	Stockpile materials away from streets, gutters, storm drain inlets, or water channels when possible.				July 1, 2019	Occurring at 15th Street.
REFUSE HOLDING AREAS	1	When materials removed from storm drainage facilities are stored on site, store the materials on a concrete pad or other type of impermeable material away from storm drainage facilities. Use covers or other methods as appropriate to prevent blowing away of debris. Drain wastewater to the sanitary sewer, only upon approval from the local sanitary sewer agency, or allow to evaporate to prevent discharges to the storm drain system. Dispose of the material at an appropriate facility.				July 1, 2015	Materials are dewatered at 15th Street (dewatering washwater is ultimately directed to sanitary sewer). Materials are then sifted to recover basalt rock for winter traction reuse and remaining materails are disposed of at Knott Landfill.
AUXILIARY STORAGE AREAS/YARDS	1	Store chemicals in appropriate areas to prevent pollutant discharge to the storm drains.				July 1, 2014	See Task VIII.8
CHEMICAL STORAGE	1	Keep all containers containing hazardous materials or waste closed when not filling or emptying. Properly label containers using the NFPA or HMIS system (or other appropriate system as approved by City management). Protect the storage area from vandalism				July 1, 2014	See Task VIII.8
	2	Review the Spill Prevention Plan and/or other appropriate materials (e.g. MSDS) for hazardous materials storage requirements.				July 1, 2016	City has a service for easy MSDS availability.
	3	Store paint and other chemicals in an approved covered containment area. Design the floor so that spilled materials will be contained and easily removed.				July 1, 2017	See Task VIII.8 and Task V.7
	4	If any material containers (not limited to hazardous material containers) are stored outside, keep the containers in a contained area that prevents discharge to the storm drain system from spills or exposure to rain. Ensure that all the containers are closed with tight-fitting lids. Design the area to prevent "run-on" of stormwater and runoff of spills.				July 1, 2017	Training occuring. See Task VIII.8 and Task V.7
	5	When never-before-used materials are purchased, review the Material Safety Data Sheet (MSDS) to ensure that incompatible materials have the appropriate separation.				July 1, 2017	City has a service for easy MSDS availability and their use is encouraged by Safety and Risk Program Manager regularly at meetings.

ISWMP 2022 Performance Standards

Corporation Yards (See Chapter V.)

Subsection		Performance Standard	Implementation Status			Implementation Date	Comments
			Scheduled	Partial	Full		
CHEMICAL USAGE	1	Ensure that necessary safety equipment and spill containment kits are readily accessible in areas where chemicals are used. Inspect safety equipment (e.g., eye wash) regularly to ensure they are operational.				July 1, 2014	See Task VIII.6
	2	Review MSDSs.				July 1, 2014	The City subscribes to a MSDS website for quick access.
	3	Minimize use of chemicals. Use water-based paints and non-toxic chemicals as much as possible.				July 1, 2014	Training occuring. See Task VIII.8 and Task V.7
CHEMICAL USAGE	4	Recycle or dispose of excess chemicals at an approved local Household Hazardous Waste Facility or other approved location, or via an appropriate contractor who handles and disposes of materials properly.				July 1, 2014	City uses Knott Landfill.
	5	Ensure chemical containers have secure lids and are secured properly to the vehicle during transport.				July 1, 2014	Training occuring. See Task VIII.8 and Task V.7
	6	Properly remove any soils contaminated with spilled materials				July 1, 2014	Training occuring. See Task VIII.8 and Task V.7
Oil-based Paints	1	Wipe paint out of brushes. Filter and reuse thinners or dispose of as hazardous waste. Dispose of the excess paint as hazardous waste or recycle. If there is too much paint to dry, recycle the paint or dispose of properly.				July 1, 2014	Training occuring. See Task VIII.8 and Task V.7
Water-based Paints	1	Rinse paint out of brushes and discharge rinse water to the sanitary sewer. Recycle or dry excess paint in cans and dispose of the cans in the trash. If there is too much paint to dry, recycle the paint or dispose as hazardous waste.				July 1, 2014	Training occuring. See Task VIII.8 and Task V.7
Automotive Fluids	1	Collect used fluids and recycle or dispose at an appropriate facility.				July 1, 2014	Training occuring. See Task VIII.8 and Task V.7
Pesticides	1	Refer to the State of Oregon pesticide applicator requirements for pesticide mixing, application, storage and disposal requirements.				July 1, 2014	Only certified applicators use pesticides.
	2	Consider using integrated pest management methods. Given a choice, use the least toxic pesticides and herbicides that will accomplish the job.				July 1, 2014	City landscape crews do this taking in consideration location, workload, and staffing. Only certified applicators use pesticides.
	3	Apply pesticides at appropriate times to maximize their effectiveness and minimize their potential to run off.				July 1, 2014	See above. Stormwater Program Manager conducted a ride-along in FY 2015-16 with pesticide applicator for mutual education and to confirm.
	4	Mix only as much pesticide as needed. Do not mix or load pesticides next to storm drain inlets or watercourses.				July 1, 2014	See above. Stormwater Program Manager conducted a ride-along in FY 2015-16 with pesticide applicator for mutual education and to confirm.
Solvent/Cleaning Solutions	1	Properly recycle or dispose of used solvents/chemicals				July 1, 2014	Training occuring. See Task VIII.8 and Task V.7
WASHING VEHICLES/ EQUIPMENT	1	Clean all vehicles/equipment on designated wash areas that discharges washwater to landscaping, the sanitary sewer or recycling system. (Wash areas might be off-site to ensure discharge to the sanitary sewer or recycling system.)				July 1, 2015	Training occuring. See Task VIII.8 and Task V.7
	2	Ensure wash area and sump (if applicable) are large enough so that all washwater drains to the sanitary sewer or recycling system. If necessary, re-grade area or install dikes to convey the washwater.				July 1, 2015	Most vehicles are washed off site through a contract with a local car wash. Boyd Acres Utility Corp Yard has a designated wash area.
	3	Visually monitor the wash area to make sure it is consistently used.				July 1, 2015	See Task VIII.8
FUEL DISPENSING AREAS	1	Store spill containment kits nearby. If spill occurs, use dry methods to clean and follow procedures in the Hazardous Materials Business Plan and/or Spill Prevention Plan.				July 1, 2014	See Task VIII.6
	2	Train employees in proper fueling, cleaning, and spill response procedures				July 1, 2014	See Task V.7. Using Compli
	3	Discourage mobile fueling. If mobile equipment is fueled with a mobile fuel truck, have spill kits available and choose an area away from storm drain facilities, sanitary sewer systems, and waterbodies for fueling.				July 1, 2014	Fuel station on 15th Street scheduled for removal in FY2016-17. Employees use commercial-only fill stations within the
	4	Design new fueling area(s) to prevent "run-on" of stormwater and runoff of spills				July 1, 2014	Stormwater regulations and staff were consulted in design of a small tank at 15th Street in FY2015/16.
	5	Install signs reminding people not to "top off" tanks				July 1, 2018	Majority of fueling is conducted off-site now.
	6	Consider covering fuel dispensing areas. Prohibit fueling over open ground; ground should be covered by concrete or asphalt protected with a sealant.				July 1, 2018	See comments above.
FLEET MAINTENANCE/VEHICLE PARKING AREAS	1	Inspect equipment for leaks on a regular basis. Use drip pans under leaking vehicles. Repair vehicles with significant leaks.				July 1, 2014	Training occuring. See Task VIII.8 and Task V.7
	2	Drain and replace motor oil and other fluids in a covered shop area. If fluids are changed outdoors, designate an area where there are no connections to the storm drains, watercourses, or the sanitary sewer. Select a designated area where spills can be easily cleaned up or drain to a closed pan and return to shop for proper disposal.				July 1, 2014	Training occuring. See Task VIII.8 and Task V.7
	3	Periodically dry sweep the area.				July 1, 2014	Training occuring. See Task VIII.8 and Task V.7
	4	Schedule outdoor repair activities for dry weather, if possible. Prevent repair supplies or work material from entering storm drains or watercourses				July 1, 2014	Training occuring. See Task VIII.8 and Task V.7

ISWMP 2022 Performance Standards

Corporation Yards (See Chapter V.)

Subsection		Performance Standard	Implementation Status			Implementation Date	Comments
			Scheduled	Partial	Full		
	5	Clean equipment as it comes in for repairs using proper collection and disposal methods when necessary. Inspect equipment as it comes in for routine maintenance and clean if needed.				July 1, 2015	Training occuring. See Task VIII.8 and Task V.7

ISWMP 2022 Performance Standards

Litter Control (See Chapter VIII.)

Subsection		Performance Standard	Implementation Status			Implementation Date	Comments
			Scheduled	Partial	Full		
SERVICES	1	Pick up litter receptacles located on City-owned property on a frequent enough basis to minimize or prevent spillage.				July 1, 2014	
	2	Provide an adequate number of litter receptacles on City-owned property. The City will make every effort to contain litter in receptacles.				July 1, 2015	
EDUCATION AND ENFORCEMENT	1	Encourage participation in and assist with the litter removal activities associated with the Stream Stewardship Day or other similar clean-up event				July 1, 2014	
	2	Encourage public education efforts to include an anti-littering message				July 1, 2019	See Clean Water Works Student Film Contest

ISWMP 2022 Performance Standards

Municipal Maintenance (See Chapter VIII.)

Subsection		Performance Standard	Implementation Status			Implementation Date	Comments
			Scheduled	Partial	Full		
STREET SWEEPING FREQUENCY	1	Clean streets according to the City's Sweeping Plan.				July 1, 2014	
PROBLEMS ASSOCIATED WITH EFFICIENT STREET CLEANING	1	Maintain a consistent sweeping schedule.				July 1, 2014	
	2	Obtain copies of garbage and recycling collection schedules and work with water utility personnel to understand schedules of major water line flushing effort to improve coordination (e.g., to prevent conflicts with sweeping on days when collection barrels are in the road or to sweep pollutants off streets prior to major water line flushing).				July 1, 2016	
	3	Take appropriate measures to keep curbed areas clear during street cleaning. Measures may include, but are not limited to, developing and distributing newsletters and/or other public education materials notifying residents and businesses of street sweeping schedules; setting out temporary or permanent street signs; sending announcements through neighborhood association chairs, or website postings.				July 1, 2018	Examining potential use of reader boards, or other outreach to improve efficiency.
	4	Provide adequate staff for conveniently reporting trees interfering with street cleaning.				July 1, 2016	Staff looking to refine doorhanger
STREET CLEANING OPERATION TO MAXIMIZE POLLUTANT REMOVAL	1	Provide a clean looking street. Conduct tandem driving in areas of heavy load to minimize dirt tracks, trails, or debris to degree practicable given weather and winter road safety measures.				July 1, 2014	
	2	Check street cleaning equipment for proper adjustment.				July 1, 2014	
	3	Operate street cleaning equipment at the speed specified by the manufacturer.				July 1, 2014	
STREET CLEANING MAINTENANCE TO MAXIMIZE POLLUTANT REMOVAL	1	Regularly inspect and maintain street cleaning equipment.				July 1, 2014	
	2	Replace worn components as required to maximize efficiency.				July 1, 2014	Purchased a new sweeper in FY2015-16.
SPILL RESPONSE	1	Report spills observed on streets immediately for quick response by appropriate personnel.				July 1, 2014	
	2	Respond to spills in accordance with appropriate response procedures. This includes appropriate measures to block storm drain inlets to prevent and minimize discharges from entering storm drainage facilities in the event of an accident, spill, or emergency fire-fighting activity.				July 1, 2014	
RECORD KEEPING	1	Track miles swept using a broom odometer or by tracking mileage.				July 1, 2014	
	2	Track volume or weight of material removed for street cleaning.				July 1, 2014	
	3	Report summary of sweeping data in annual report.				July 1, 2014	
	4	Document and track areas where spills were reported and coordinate with the City's illicit discharge control field surveys..				July 1, 2015	
	5	As needed, identify and target areas for: 1) more frequent cleaning throughout the year or just prior to the rainy season; 2) additional efforts to remove vehicles; 3) distribution of public education materials to discourage illegal dumping, etc.				July 1, 2018	
EDUCATION/TRAINING	1	Train annually, municipal staff, as appropriate, responsible for street sweeping to identify and report illicit discharges, and to comply with the other street sweeping performance standards.				July 1, 2014	Met with Sweeper Supervisors (See Chapter 2). See also Task V.7.

ISWMP 2022 Performance Standards

Operation and Maintenance of Stormwater Pump Stations (See Chapter VIII.)

Subsection		Performance Standard	Implementation Status			Implementation Date	Comments
			Scheduled	Partial	Full		
VISUAL INSPECTIONS	1	Inspect wet wells or forebays once per month for oil spills or other noticeable pollutant discharge.				July 1, 2014	
MAXIMIZE REMOVAL OF POLLUTANTS PRIOR TO DISCHARGE	1	Conduct at least one comprehensive cleaning of wet wells annually to remove sediment prior to the start of the rainy season to minimize discharge of sediment. Clean wet wells with a vactor, if possible.				July 1, 2014	
	2	If there is a large potential for pollutant discharge, have a spill kit readily available.				July 1, 2014	
	3	If any spill is reported or observed, try to remove the material at the nearest access point. As practical, shut down the pump station if the material may reach it. (A storm event may necessitate operation of the pump station.) As possible, prevent spill from discharging.				July 1, 2014	
	4	Store oil absorbent materials in appropriate maintenance vehicles.				July 1, 2014	
	5	Track spills upstream to try and locate the source(s) of pollution. Document spill incidents as part of the illicit discharge program. Implement enforcement, as appropriate.				July 1, 2017	See also Task V.7.
	6	Conduct at least one comprehensive cleaning of wet wells annually to remove sediment prior to the start of the rainy season to minimize discharge of sediment. Clean wet wells with a vactor, if possible.				July 1, 2019	
DISPOSAL	1	Dispose of screenings at a landfill, sediment at a location that will not re-enter the storm drain system or receiving waters through erosion, and oil-absorbed materials at a site licensed to accept hazardous waste.				July 1, 2014	
EDUCATION/TRAINING	1	Educate all personnel responsible for maintaining stormwater pump stations about these performance standards. City staff will conduct or provide at least one training session annually to educate pump station personnel about these performance standards and illicit discharge identification and reporting.				July 1, 2015	
	2	Conduct drills as part of the training, as appropriate				July 1, 2017	

ISWMP 2022 Performance Standards

Road Repair and Maintenance (See Chapter VII.)

Subsection		Performance Standard	Implementation Status			Implementation Date	Comments
			Scheduled	Partial	Full		
GENERAL PRACTICES/ TRAINING	1	Schedule excavation and road maintenance activities for dry weather, if feasible.				July 1, 2014	
	2	Equipment repairs and fueling or maintaining vehicles and equipment will be conducted in accordance with the Corporation Yard Performance Standards.				July 1, 2014	
	3	Recycle used motor oil, diesel oil, concrete, broken asphalt, etc. whenever possible.				July 1, 2014	
	4	Distribute educational and outreach materials, as appropriate, to those utility contractors (e.g., water supply, sewer, cable, phone, electrical, etc.) seeking encroachment and/or grading permits from the City.				July 1, 2016	Community Development Department distributes materials as appropriate.
	5	Train at least biennially municipal staff and contractors conducting road repair and maintenance to comply with these performance standards.				July 1, 2016	Municipal staff are trained. See Task V.7. The City project manager is responsible for making their contractor aware of local requirements.
ASPHALT/CONCRETE REMOVAL	1	After breaking up old pavement, remove and recycle as much as possible to avoid contact with rainfall and stormwater runoff.				July 1, 2014	
	2	Take measures to protect storm drain inlets prior to asphalt breaking or concrete sawing operations (e.g., place sand bags or filtering barrier around inlets). Clean afterwards by sweeping or removing as much material as possible. Do not wash down to the storm drain.				July 1, 2016	Training occurring. See Task V.7.
	3	During saw-cutting operations, block or berm around storm drain inlets using sand bags or an equivalent appropriate filter device, or absorbent materials such as pads, pillows, or socks to contain slurry, or wet/dry vacuum the slurry. If slurry enters the storm drain system, remove the material immediately.				July 1, 2016	Training occurring. See Task V.7.
	4	Remove saw-cut slurry (e.g., with a shovel or vacuum) before leaving at the end of the day.				July 1, 2016	Training occurring. See Task V.7.
PATCHING AND RESURFACING	1	To minimize runoff from patching and resurfacing activities, materials will not be stockpiled in streets, gutter areas, or near storm drain inlets or waterbodies unless these areas are protected (i.e., stockpiled material should be covered to minimize stormwater runoff.)				July 1, 2014	
	2	Cover and seal manholes and storm drain inlets before applying seal coat, slurry seal, etc				July 1, 2014	
	3	Never wash excess material from exposed aggregate concrete or similar treatments into a street or storm drain inlet. Designate an unpaved area for clean up and proper disposal of excess materials.				July 1, 2014	
	4	Use only as much water as necessary for dust control to avoid runoff.				July 1, 2014	
	5	Sweep up as much material as possible and dispose of properly.				July 1, 2014	
	6	Clean up spills and leaks from other equipment and work site areas using “dry” methods (absorbent materials and/or rags). Properly dispose of absorbent materials and rags. If spills occur on dirt areas, the contaminated soil will be removed properly and on a timely basis				July 1, 2014	
	7	After the job is complete, remove stockpiles (asphalt materials, sand, etc.) and other extra materials as soon as possible.				July 1, 2014	
	8	If it rains unexpectedly, take appropriate action to prevent pollution of stormwater runoff (e.g., divert runoff around work areas).				July 1, 2016	Training occurring. See Task V.7.
	9	Wash down of streets is only permitted if runoff is controlled or contained, or appropriate best management practices are followed.				July 1, 2017	Training occurring. Washdown of spills is not allowed. See Task V.7.
SIGNING AND STRIPING	1	Have spill kits or store spill absorbent materials on trucks to be used in the event of a spill.				July 1, 2014	
	2	Contain and clean up waste materials and dispose of them properly according to the MSDS.				July 1, 2014	

ISWMP 2022 Performance Standards

Road Repair and Maintenance (See Chapter VII.)

Subsection		Performance Standard	Implementation Status			Implementation Date	Comments
			Scheduled	Partial	Full		
EQUIPMENT CLEAN UP/STORAGE	1	Clean sprayers, patch and paving equipment at the end of the day. Use approved collection methods and dispose or recycle waste materials at an approved facility.				July 1, 2014	
	2	If stored outdoors, cover sprayers, patch and paving equipment, if they contain pollutants, to prevent rainfall from transporting pollutants to the storm drain system.				July 1, 2014	
	3	Flush paint sprayer supply lines at the corporation yard. Use approved collection methods and dispose or recycle waste materials at an approved hazardous waste facility				July 1, 2015	

ISWMP 2022 Performance Standards

Storm Drain Facilities (See Chapter VIII.)

Subsection		Performance Standard	Implementation Status			Implementation Date	Comments
			Scheduled	Partial	Full		
ROUTINE INSPECTION AND CLEANING6	1	When cleaning storm drain inlets and lines, remove the maximum amount of material at the nearest access point to minimize the potential for discharges to watercourses.				July 1, 2014	
	2	Inspect and clean as necessary, storm drain facilities (catch basins, UICs, inlets, culverts, and v-ditches) at least biennially. The inspections and needed cleaning will preferably occur prior to winter.				July 1, 2017	
RECORD KEEPING	1	Report the amount of material removed when cleaning storm drainage facilities in monthly record keeping forms.				July 1, 2014	
	2	Document and track areas where spills were reported and coordinate with the City's illicit discharge control staff.				July 1, 2016	
	3	As needed, identify and target areas for: 1) more frequent cleaning throughout the year or just prior to the rainy season; and 2) distribution of public education materials to discourage illegal dumping, etc.				July 1, 2018	
SPILL RESPONSE (MULTIPLE AGENCIES INVOLVED)	1	If non-hazardous materials are spilled, maintenance staff will contain the spill area immediately and clean when practical to prevent additional release and discharge of pollutants into the storm drain system.				July 1, 2014	
	2	Maintenance staff will establish a response/removal procedure for non-hazardous materials after work hours (e.g., per spill plan).				July 1, 2014	
	3	Maintenance staff will coordinate to determine the most appropriate follow-up response (e.g., tracking the source of a spill, identifying product labels, contacting Building and Planning Departments, contacting Stormwater Program Analyst with records and for educational follow-up, sending a clean-up bill to the responsible party, etc.).				July 1, 2014	
	4	Work with local Fire and Police Departments to obtain summaries or copies of spill reports to the Stormwater Manager or his/her designee.				July 1, 2016	For any spills with the potential to impact Utilities, our Utility Risk Management and Safety Program Manager Ken Vaughan gets advised. As our assigned point person it Utilities, Ken is working with Police and Fire to finalize the udpate to the Emergency Operations plan. Of note, our Fire (Doug Koellermeier) and Police (Steve Esselstyne) contacts have both retired and Bill Boos (Fire) and Paul Kansky (Police) have taken over the roles as utility liaisons.
	5	Maintenance staff will be aware and up to date on the City's around-the-clock immediate response/removal procedure for hazardous or unknown materials.				July 1, 2017	
DISPOSAL OF MATERIAL	1	Store material removed from storm drainage facilities on a concrete pad or other type of impermeable material away from storm drainage facilities. Drain wastewater to the sanitary sewer or allow to evaporate to prevent discharges to the storm drain system. Dispose of the material at an appropriate facility. Contact collections utility's staff prior to any new type of discharge in sanitary sewer.				July 1, 2017	

ISWMP 2022 Performance Standards

Winter Road Care (See Chapter VII.)

Subsection		Performance Standard	Implementation Status			Implementation Date	Comments
			Scheduled	Partial	Full		
WINTER ROAD CARE TO MINIMIZE POLLUTANT CONTRIBUTION	1	City will consider full long-term social costs and environmental/public safety risks when determining winter road care strategies.				July 1, 2014	Training occurring (See also Task V.7)
	2	The City will use alternative materials, such as basalt application, as much as possible and appropriate to minimize the use of chemical deicier (e.g., Mag Chloride), especially in sensitive areas.				July 1, 2015	
	3	Chemical deicers will be properly stored and handled per the chemical storage performance standards.				July 1, 2015	
	4	Any solid deicers used shall be properly covered to prevent contact with stormwater, and be stored outside of the 100 year floodplain.				July 1, 2017	Both corp yards are outside the 100 year floodplain. Streets corp yard contains several new large huts for material protection.
SPILL RESPONSE	1	Report spills observed on streets immediately for quick response by appropriate personnel.				July 1, 2014	
	2	Respond to spills in accordance with appropriate response procedures.				July 1, 2014	
RECORD KEEPING	1	Track amount of product used per month (chemical deicer and basalt sanding).				July 1, 2015	
EDUCATION/TRAINING	1	Train at least biennially, municipal staff and contractors, as appropriate, responsible for winter road care and chemical deicer (e.g., MgCl2) application to minimize overuse, to vary amounts to reflect site-specific characteristics, such as road width and design, traffic concentration, and proximity to surface waters and sensitive areas; to identify and report illicit discharges, and to comply with the other winter road care performance standards.				July 1, 2014	See FY2012-13 Annual Report Appendix G. See also Task V.7.

ISWMP 2022 Performance Standards

Monitoring

(See Chapter VIIII.)

Subsection		Performance Standard	Implementation Status			Implementation Date	Comments
			Scheduled	Partial	Full		
Facility Procedures	1	Maintain a NELAC accredited facility for stormwater-related laboratory testing.				July 1, 2014	Latest NELAP accreditation certificate is dated 8/23/2015.
Preparing for and Conducting Monitoring Activities	1	Maintain sampling plans and quality assurance plans, as appropriate.				July 1, 2014	
	2	Conduct appropriate recordkeeping and reporting.				July 1, 2014	

Appendix B

Public Education and Outreach on Stormwater Impacts

CITY OF BEND

A Newsletter for Bend Citizens

PUBLISHED BY THE CITY OF BEND

JULY 2016

CONTENTS:

27th Street Sewer Work Kick Off

Utility Rate Increases

Flammable Vegetation Tips

WaterWise Workshops

Deschutes River Cleanup

ANNUAL WATER QUALITY REPORT

Want to know where our water comes from, and what lab tests on our drinking water show? The City's Annual Water Quality Report is available online at www.bendoregon.gov/waterreport. Call 541-317-3000 x2 to receive a paper version, or request a copy online at www.bendoregon.gov/reportrequest.

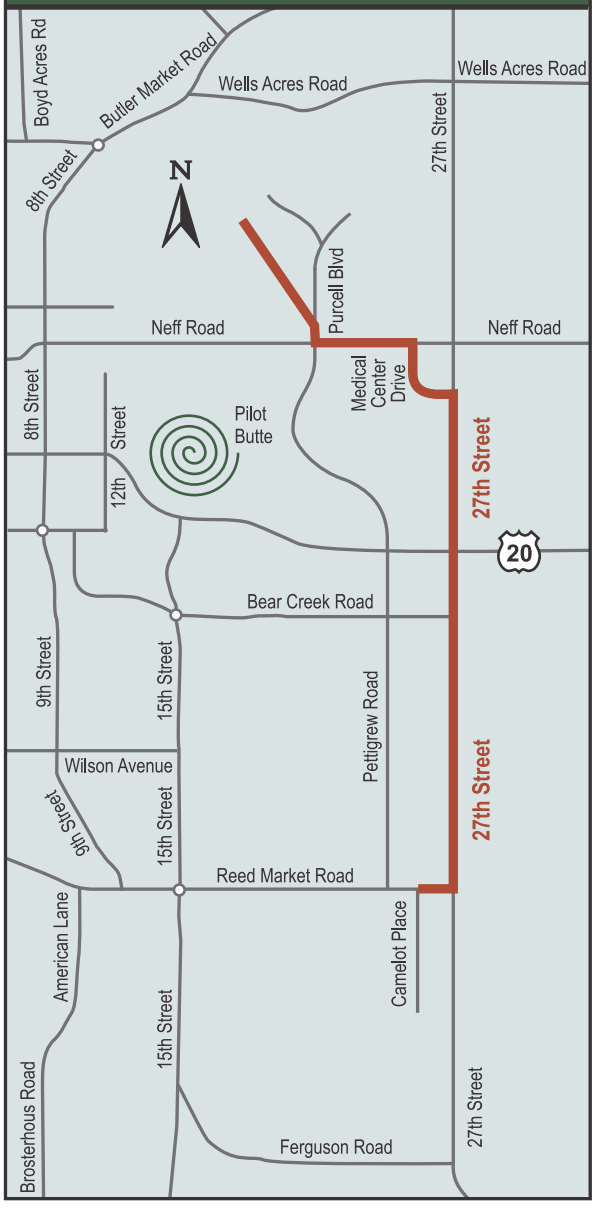
27TH STREET SEWER WORK KICK OFF

This month, the City kicks off the 27th Street sewer line project, a nearly two-year construction project that will temporarily change the way people use 27th Street from Neff Road to Reed Market Road. The City will install approximately two miles of sewer main under 27th Street and repave the entire stretch of road.

During construction, traffic along 27th Street north of Bear Creek Road will be reduced to one lane of traffic going each direction. The segment south of Bear Creek Road will be reduced to one lane of traffic, southbound only. The project will progress in segments, and each segment will have impacts on different neighborhoods, businesses and services.

The sewer line is a much-needed project that will relieve sewer capacity issues throughout the City and create the availability of sewer service to currently unsewered properties. Learn more at www.bendoregon.gov/sei.

27TH STREET SEWER LINE PROJECT MAP





CITY OF BEND

UTILITY RATE INCREASES

Ratepayers can expect to see changes in their bills starting in August 2016. Each year, the City reviews its revenue needs to pay for your water, sewer and stormwater utilities. Rates are based on those revenues needs.

Increases are typical to cover inflation on capital improvement projects, ongoing operations and maintenance, and additional state and federal regulations. Bend's utilities expect general inflationary costs at 2 percent for water and 3 percent for stormwater utilities this year. The City is also building major sewer lines which creates a need for a 6 percent revenue increase for sewer.

Increases affect ratepayers' bills differently because of rate structure changes implemented in 2015. All customers now pay a base charge and a volume charge for both the sewer and water usage. Sewer volume is based on average winter water consumption. To improve equity among ratepayers, commercial businesses that discharge wastewater that is tougher to treat, such as breweries, pay a higher charge than residential customers.

DESCHUTES RIVER CLEANUP: STREAM STEWARDSHIP DAY

Stream Stewardship Day is an opportunity for the community to remove trash, pull weeds and restore the Deschutes River. The Upper Deschutes Watershed Council and the City of Bend invite volunteers of all ages to join the annual Deschutes River cleanup on Saturday, August 6, starting at 10 a.m. at Riverbend Park. Information: Kolleen Miller at kmiller@restorethedeschutes.org.

FLAMMABLE VEGETATION TIPS



Along with summer comes dry vegetation and a high fire danger. The Code Enforcement Department would like to remind residents that it is the responsibility of every property owner or manager to reduce flammable weeds, grass, vines, brush and other vegetation on their property. If flammable vegetation is within the adjacent right-of-way, it is the owner's responsibility to remove it. Reducing flammable vegetation can confine fires to an individual property and prevent fire from spreading. Cutting or removing vegetation as close to the ground as reasonably possible will reduce risks. Contact Julie Craig at 541-388-5527 or visit www.bendoregon.gov/veg for more information.

To obtain this information in an alternate format such as Braille, large print, electronic format and audio cassette tape please contact Karin Morris at 541-693-2141 or email kmorris@bendoregon.gov.

We'd like your feedback:
City of Bend, City Manager's Office • P.O. Box 431, Bend, OR 97709 • communications@bendoregon.gov • **www.bendoregon.gov**

CITY OF BEND

A Newsletter for Bend Citizens

PUBLISHED BY THE CITY OF BEND

AUGUST 2016

CONTENTS:

Pedestrian Improvement Project

Water Leak Detection

Bend's Drinking Water Quality

New Parking Citations

SOUTH THIRD STREET PEDESTRIAN IMPROVEMENT PROJECT

The City of Bend will be improving South Third Street between Wilson Avenue and Powers Road to enhance accessibility for everyone and improve Bend's overall transportation system.

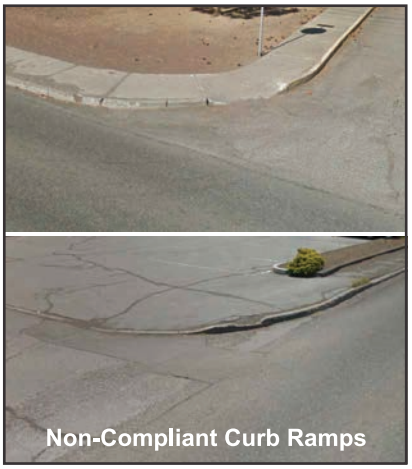
Construction will begin in the fall, halt during the winter months, and resume in March, 2017. Construction hours will be from 5 a.m. to 2 p.m. Overall project completion is anticipated in July, 2017.

Construction work will be limited to one side of the road at a time while that direction of travel will be reduced to a single traffic lane during active construction hours. Expect congestion and consider using alternative routes. Be aware of pedestrians and cyclists.

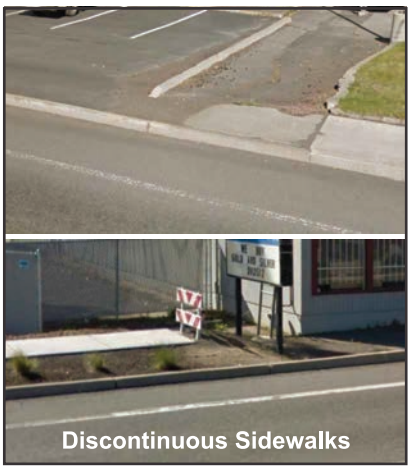
The project will provide a continuous pedestrian corridor along South Third Street. It will:

- Bring curb ramps, sidewalks, and bus stops into compliance with the Americans with Disabilities Act (ADA)
- Enhance safety and walkability
- Improve bike lanes
- Replace sub-standard infrastructure

Please check **www.bendoregon.gov/thirdstreetsidewalks** for updates.



Non-Compliant Curb Ramps



Discontinuous Sidewalks

WATER LEAK DETECTION

Locating and fixing water leaks is an important focus for the City of Bend to prevent water waste. The City's Utility Department regularly inspects for and repairs leaks throughout its water distribution system. Staff use a combination of acoustic listening devices to identify underground leaks and electronic

(continued on back)

CITY COUNCIL

The Bend City Council meets the first and third Wednesdays of each month. For upcoming meeting dates, agendas and more information, visit www.bendoregon.gov.



CITY OF BEND

(Leak Detection... continued)

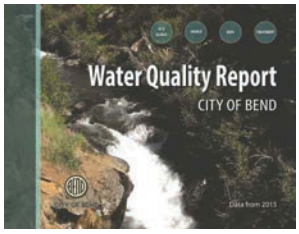
correlators to pinpoint their exact location. Once a leak location is identified, repair crews dig, isolate the leak and make the repair. These efforts help keep the City's leakage rate of 3.8 percent well below the Oregon Water Resources Department goal of 15 percent or, if feasible, 10 percent or less. Staff have identified and repaired 18 system leaks so far in 2016.

The City also monitors customer water use records using new technology that can detect potential leaks on its customers' side of the water meters. Monthly reports documenting constant water consumption are reviewed to identify potential customer leaks. Those customer accounts that are verified as likely having leaks are contacted by Finance Department or Utility Department personnel in an effort to identify where the leak is occurring and to help resolve the issue. This will save both water and money.



CURIOUS ABOUT THE QUALITY OF BEND'S DRINKING WATER?

Drinking water quality is a national concern these days, and the City is proud to announce the release of the City's Annual Water Quality Report which once again shows what high quality, safe and reliable drinking water Bend's customers have.



In 2015, the City of Bend's drinking water met or surpassed the over 130 drinking water quality standards set by the Oregon Health Authority and the U.S. EPA. In fact, Bend is proud to say that it has never violated a maximum contaminant level standard established by the EPA.

Bend's Annual Water Quality Report is at **www.bendoregon.gov/waterreport**. To receive a paper version of the report please call 541-317-3000, x2.

NEW PARKING CITATIONS

The City of Bend is issuing new parking citations to comply with Oregon Revised Statutes. The language in the citations and the process by which the city will collect overdue parking citation fines have changed.

The new citations include an arraignment date for those interested in contesting a ticket. The new citation language will also initiate a new process for residents and visitors who receive parking citations. Also, unpaid parking citations will now be processed by Bend Municipal Court.

It is the City's hope that the changes will result in a more clear process for those who receive citations. Revenue from fines collected and the sale of parking permits pay for management of the City's downtown parking district, which includes the parking garage.

To obtain this information in an alternate format such as Braille, large print, electronic format and audio cassette tape please contact Karin Morris at 541-693-2141 or email kmorris@bendoregon.gov.

We'd like your feedback:
City of Bend, City Manager's Office • P.O. Box 431, Bend, OR 97709 • communications@bendoregon.gov • **www.bendoregon.gov**

CITY OF BEND

A Newsletter for Bend Citizens

PUBLISHED BY THE CITY OF BEND

NOVEMBER 2016

CONTENTS:

Winter Road Maintenance

"Urban Drool" Prevention

Santa Express

City Code on Snow Removal

CITY COUNCIL

The Bend City Council meets the first and third Wednesdays of each month. For upcoming meeting dates, agendas and more information, visit www.bendoregon.gov.

WINTER ROAD MAINTENANCE



Did you know the average snowfall in Bend is 34 inches each winter?

The Streets Department maintains 840 lane miles. When it snows, it's not possible to remove all the snow simultaneously from all streets. So here's what to expect:

When 2 inches of snow accumulates, City crews and equipment prioritize plowing a connected network of high-volume streets primarily for emergency service operations – major roads such as Third Street, 27th Street, Mt. Washington Drive and Reed Market Road. Then crews focus on routes to medical facilities, schools, major employment centers and places that need special attention such as steep hills or curves. **After 6 inches of snow accumulates**, the City may call private contractors to plow residential streets if necessary.

If the weather **forecast calls for icy conditions**, crews apply magnesium chloride ahead of time to prevent ice buildup. On the newest roundabouts, materials are still curing so deicer is not applied during the first winter season. In these roundabouts, crushed rock is applied for traction, so use extra caution. On hills, intersections, curves, corners and other problem areas, the City spreads crushed rock for traction.



There are many factors that affect the City's snow and ice operations, including how hard it's snowing, how wet the snow is, the time of day and duration of the storm. It's our goal to keep traffic flowing in a safe and orderly fashion. Drive with patience and give yourself extra time when it snows.

For more information on our Snow and Ice Control Plan, visit www.bendoregon.gov/streets.



CITY OF BEND

"URBAN DROOL" PREVENTION



Have you ever wondered how the City prevents and minimizes pollutants (aka "urban drool") from getting to the Deschutes River or our underground drinking water supplies?

Each year, the City prepares a detailed report for the Oregon Department of Environmental Quality outlining our pollution prevention activities, which include public education, illicit discharge detection and elimination, construction activities, City maintenance work and underground drinking water protections and more.

Ten years' worth of annual reports, including the most recent, from July 1, 2015 through June 30, 2016, can be found at **www.bendoregon.gov/stormannualreport**. Contact Wendy Edde, Stormwater Program Manager at 541-317-3018 for more information.

Remember: ***Only rain in the storm drain!***

DID YOU KNOW...

City Code requires businesses and residents to clear snow from sidewalks within six hours of a snowfall? That ensures that Bend residents can access sidewalks and bus stops even in the winter.

SANTA EXPRESS

Annually, the Santa Express collects an average of 3,000 pounds of food for The Salvation Army, which provides food during the holidays to hundreds of Bend and Central Oregon families.

Fire trucks will travel through Bend neighborhoods December 5-8, with volunteers (and Santa himself!) helping to collect food, clothing and toys. All the toys go to kids who may otherwise go without. Donations can also be dropped off at locations around town.

Santa Express driving routes and drop locations: **www.bendoregon.gov/santaexpress**.



Anything helps - one can of food or a small toy. The Salvation Army reminds everyone that there's a need for gifts for teenage kids as well.

The Santa Express is a collaboration of the Bend Firefighters Association and Bend Fire and Rescue to help The Salvation Army collect non-perishable food items, clothing and toys for needy families in Bend and Central Oregon.

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CITY OF BEND

A Newsletter for Bend Citizens

PUBLISHED BY THE CITY OF BEND

JANUARY 2017

CONTENTS:

City Budget

Bicycle Friendly Community

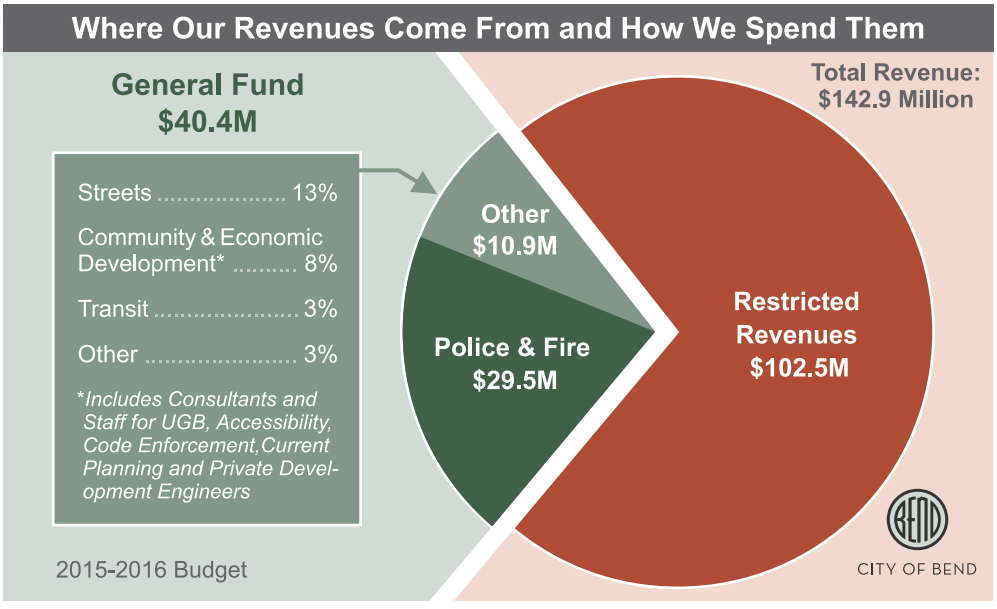
HOW THE CITY BUDGET WORKS

The City provides many crucial programs and services to the citizens of Bend, including: police, fire and emergency medical services, sewer, water, street maintenance, planning, building inspections, and the administrative support needed to make it all happen. These services are paid for primarily through taxes, fees and charges.

More than 2/3 of the annual revenue the City receives is restricted for a specific purpose. For example, money from the monthly utility bills (water, sewer, storm-water) you pay must be used to maintain and operate those systems. Revenue received from system development charges (also known as impact fees) that a builder or developer pays when acquiring a permit for new construction can only be used to build projects that are needed for growth associated with the project; those funds can't be used for maintenance.

The other approximately 1/3 of the annual revenue makes up what's called the General Fund. A significant portion of the General Fund comes from property taxes. The City Council has the most discretion over spending in the General Fund. Over 2/3 of the General Fund is dedicated to police and fire services.

The new City Council will develop its goals this spring, which will be incorporated into the budget process for the next biennial budget that will be adopted in June 2017.



(continued on back)

CITY COUNCIL

The Bend City Council meets the first and third Wednesdays of each month. For upcoming meeting dates, agendas and more information, visit www.bendoregon.gov.



CITY OF BEND

(How the City Budget Works, continued)

Property taxes make up the largest revenue source in the General Fund. But in the 1990s, state Measures 5 and 50 established limits on Oregon's property taxes. The City's permanent tax rate of $2.80 per $1,000 of taxable assessed property value cannot be increased. Also, the taxable assessed value upon which that rate is applied can go up no more than 3 percent per year.

For each dollar you pay in property taxes, about 21 cents goes to the City of Bend to pay for City services. But there are other separate taxing districts that provide other services such as schools, parks, health and human services and library services.

Each property tax dollar you spend is allocated to the various taxing districts within the city limits, and is divided into many segments as illustrated by this chart. More information: **www.bendoregon.gov/budget**



BEND IS A BIKE FRIENDLY COMMUNITY

The League of American Bicyclists recently named the City of Bend as a Bicycle Friendly Community. Bend's efforts to build a safe, biking-friendly community include a:

THE LEAGUE OF AMERICAN BICYCLISTS — BICYCLE FRIENDLY COMMUNITY

- Collaborative, intergovernmental approach
- Comprehensive Plan for sustainable, compact urban development, over sprawl
- New bike facilities, such as the Colorado Avenue trail undercrossing, more than 10 miles of new bike lanes, buffered bike lanes and parking protected bike lanes
- Plan to build Neighborhood Greenways on existing residential streets so that everyone can walk and bike without being on busy roads

Bend is one of only 73 cities in the country with this designation.

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CITY OF BEND

A Newsletter for Bend Citizens

PUBLISHED BY THE CITY OF BEND

MARCH 2017

CONTENTS:

Multi-Family Housing

Film Contest For Kids

27th Street Sewer Line Update

MULTI-FAMILY HOUSING HELPS ADDRESS HOUSING NEEDS



As the seventh-fastest growing metro area in the U.S., Bend needs to accommodate a greater number and variety of housing that accommodates all income levels.

The recently-approved Urban Growth Boundary (UGB) growth plan includes a Housing Needs Analysis that identifies types of housing that would meet our growing needs. Currently, about 21 percent of Bend's housing is multi-family (duplexes, triplexes and apartments). The analysis says Bend needs 35 percent of our supply to be multi-family. Info: **www.bendoregon.gov/BendUGB**.

The City is responding to the changes in this dynamic community and moving that direction. Since 2014, Bend has seen an increase in the number of multi-family housing units. In 2016 alone, developers built more than 290 multi-family units.

This will improve access to housing. Additional multi-family developments help make housing more available and less expensive. Even at market rate, new multi-family developments help increase availability, which drives down costs and creates more affordable accommodations.

Bend's Affordable Housing Program also plays an important role in increasing availability. Affordable housing is defined as housing for families at or below 80 percent of the median household income - which is $59,400 in Bend. The City's nationally-recognized program encourages developers to invest in building affordable housing. Info: **www.bendoregon.gov/affordablehousing**.

FUN FILM CONTEST FOR KIDS WHO CARE ABOUT CLEAN WATER



As part of the City's Clean Water Works water quality improvement program, the City is inviting all 5th through 12th grade students to submit short entries in a video contest. The Utility Department is looking for 30-second spots themed "Clean Water Works." The videos should the effects of pollutants

(continued on back)

Come See Us at the Earth Day Fair!

Come fill your water bottle with some of the City's award-winning water and visit with staff at the City of Bend booth at The Environmental Center's 2017 Earth Day Fair. The fair takes place Saturday, April 22, 2017, immediately after the parade, which begins at 11:30 a.m. The City booth will be on Kansas Avenue.

CITY OF BEND

(Fun Film Contest for Kids Who Care About Clean Water, continued)

and how to reduce them in our storm drains and waters.

Cash prizes await! And, for the budding videographer, this is a unique opportunity: the grand prize winner will have the opportunity to work in-studio with Zolo Media to help turn their winning entry into a professional public service announcement. The final product will get recognized at the BendFilm Festival.

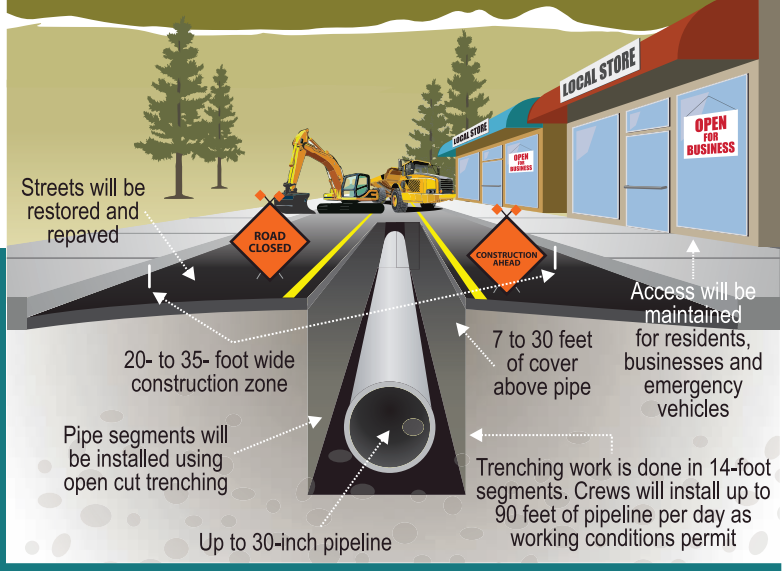
This public-private-non-profit partnership is a terrific opportunity for students interested in film or television. Contest details and a downloadable kid's activity guide are available by clicking on the kid's page of the City's Clean Water Works program: **www.bendoregon.gov/cleanwaterworks**. Entries are due by April 29.

27TH STREET SEWER LINE UPDATE

The ongoing construction of the 27th Street Sewer Line has been focused most recently around the Neff Road area. The project is part of the multi-phased Southeast Interceptor, an underground 30-inch gravity sewer line that will convey wastewater to the Water Reclamation Facility. The pipeline relieves capacity issues around Bend. By building a gravity pipeline, the City can decommission up to 24 sewer pump stations, which saves energy and provides long-term reliability in this essential service.

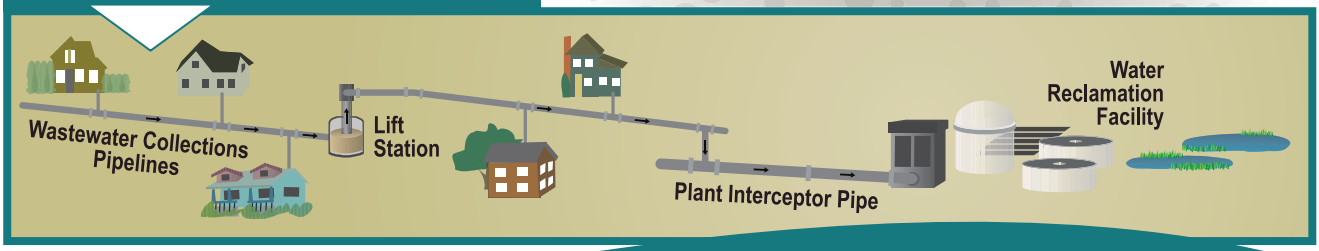
The City of Bend protects drinking water sources, public health and the environment by conveying and treating wastewater. The Southeast Interceptor sewer line is expected to be in service in early 2018, with completion of roadway paving in July 2018.

Here's what happens during construction:



Where does the sewage go after it leaves my home or business?

To protect public health and the environment, sewage travels through a network of buried pipelines and pumps (the sewer collection system) to the water reclamation facility northeast of Bend. It is cleaned before being returned to the environment.



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We'd like your feedback:

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(Spring Into Savings – Water Is Not All You Save, continued)

Water conservation staff will conduct regular surveys throughout the 2017 growing season to help identify water wasted through irrigation overspray and runoff. Although the amount of water that ends up on the street may seem minimal, it adds up to serious waste, can wash debris or pollutants into storm drains and can pose safety risks to pedestrians and bicyclists.

If you have an irrigation system that irrigates the street, now is the time to consider water efficient alternatives.

THE CITY STRIVES TO PROTECT THE DESCHUTES RIVER



The Deschutes River in Bend is federally listed for sediment and turbidity - pollutants of concern. Excess sediment in the river can harm fish and wildlife by burying spawning areas, clogging gills and making water cloudy so fry cannot find food.

Much of the Deschutes River sediment is related to bank erosion due to river level fluctuations, but additional sediments, such as construction or landscaping soils and debris, or traction sand on the roads, can also run off of streets during rain storms and end up in the river.

The City recent hired a Stormwater Utility Program Compliance Specialist to help inspect construction sites to better control sediment. The City is also improving its sweeper program and boosting sediment prevention education.

Recently, several local construction and engineering-related businesses joined City staff in earning a Certified Erosion and Sediment Control Lead certification to become proficient in preventing soil sediments from moving off construction sites. All construction sites within Bend are required to keep sediments on site.

CELEBRATE DESCHUTES COUNTY HERITAGE IN MAY



May is National Preservation Month. The Deschutes County Historical Society, Deschutes County Historic Landmarks Commission, Redmond and Bend Landmarks Commissions, the Tower Theatre Foundation, the Deschutes Land Trust and other volunteers partner each year to celebrate the many ways that historic preservation enhances our quality of life.

There are many ways to celebrate our area's heritage. Visit **www.deschuteshistory.org** for a complete list of events taking place all month.

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CITY OF BEND

A Newsletter for Bend Citizens

PUBLISHED BY THE CITY OF BEND

JUNE 2017

CONTENTS:

City Council Goals

Street Funding

Neff / Purcell Sewer Line Segment

Clean Water Works

CITY COUNCIL GOALS

The Bend City Council 2017-2019 goals that help shape the proposed two-year budget are:

- Implement a growth plan that is consistent with community goals for the economy, environment and affordability
- Move people and products around Bend efficiently, safely and reliably
- Increase affordable housing options
- Keep residents safe with innovative and cost-effective public safety services
- Modernize and professionalize how City government operates

More detailed objectives that support the goals can be found at **www.bendoregon.gov/citycouncil**.

These goals represent a renewed focus on essential core services: public safety, investment in infrastructure such as roads and sewer systems and community and economic development.

Council goals help drive decisions about how to invest discretionary funding. The entire 2017-2019 budget, which gets adopted in June, can be found at **www.bendoregon.gov/budget**.

STREET FUNDING

Efforts continue to improve road conditions and build new transportation facilities to help reduce congestion, improve safety and provide more choices for users. This is reflected in the proposed 2017-2019 budget with:



- *Approximately $5.7 million of annual funding for street preservation.* Through a multi-pronged strategy, additional one-time funding has been reallocated to improve street conditions during the next biennium.
- *$10 million for Empire Avenue and $10 million for the Murphy Road corridor in the five-year Transportation Capital Improvement Program*. The budget allows for the design of a roundabout at Purcell Boulevard and Empire Avenue and improvements to the Purcell Canal Bridge and the Purcell intersection at Butler Market Road. The budget also includes Citywide Safety projects such as pedestrian crossings on Third Street and improving sections of 14th Street.

eNews

Stay informed and get City news, information, Weekly Road and Traffic Reports and more, delivered right to your inbox. Sign up for eNews at **www.bendoregon.gov/enews**.

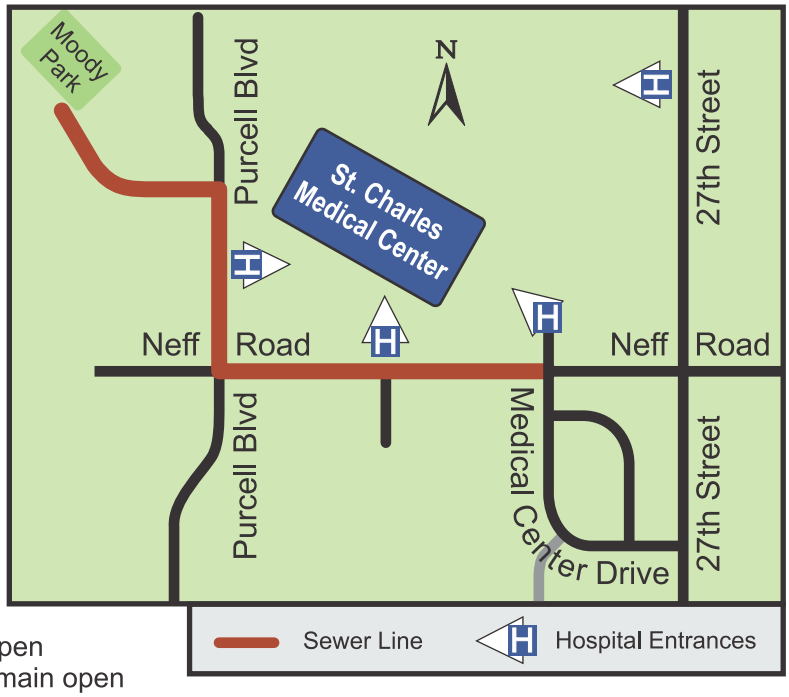
CITY OF BEND

NEFF / PURCELL SEWER LINE SEGMENT

Construction of the Neff Road and Purcell Boulevard segment of the Southeast Interceptor, a multi-phased sewer line project, is expected to begin in July and last through April 2018. Construction of this segment will be completed in phases to reduce impact on area residents and local traffic.

This segment runs under Neff Road from Medical Center Drive to Purcell Boulevard, under Purcell Boulevard to the north and then west to Moody Park.

Questions? Contact Ron Hand at rhand @dowl.com or Jessica MacClanahan, jmacclanahan@bendoregon.gov. More info: www.bendoregon.gov/SEI.



The pipe project relieves capacity issues in the southwest, southeast, northeast and central areas in Bend, allows the City to decommission up to 24 sewer pump stations and creates availability of gravity sewer service to a significant number of unsewered properties. During construction:

- Traffic detours will be posted
- Follow H signs to get to the hospital
- Access to all businesses will remain open
- Access for emergency vehicles will remain open

CLEAN WATER WORKS

The City of Bend Clean Water Works program recognizes businesses and organizations that help protect our underground and surface water quality.

In turn, the business partners offer discounts to area residents and visitors using the Clean Water Works discount card. Print your discount card from the "DISCOUNTS + PARTNERS" link at www.bendoregon.gov/cleanwaterworks.

Seventeen organizations are participating. This year's campaign targeted food service, carpet cleaners, construction contractors, commercial car washes, clean water volunteers, landscape professionals, pressure washers and recreational vehicle dealers.

Results from prior campaigns showed an increase in concern for water pollution prevention and better understanding of our stormwater system. Partners also said the program made their employees think about the importance of protecting water quality.

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We'd like your feedback:

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Proper Disposal of RV Wastes
Protecting Oregon's Treasures

Recreational Vehicle Waste Disposal Stations are readily available. Please use them and these tips to protect human health, our waters, and your pocketbook!

WHAT TO DO / WHAT NOT TO DO

- Do not dump to a storm drain.
- Wastewater must be held in a watertight and sanitary container, and dumped ONLY in a designated wastewater sump, a flush toilet, or a holding tank dump station.
- Do not drain wastewater onto the ground or into an open container.
- Do not dump into pit toilets or sealed vault toilets.
- Close blackwater tank valves and dump when it is equal to or more than half full. Dumping when less than half full can cause improper system operation.
- Use the graywater tank to help clear the hose after flushing the blackwater tank.



It's the Law

It is illegal to dump RV waste to streets and storm drains. Improper disposal can result in fines and traffic violations.

Oregon Law: "No person shall operate a recreational vehicle which is equipped with a plumbing, sink or toilet fixture upon any public way while the disposal system is unsealed or uncapped unless said disposal system is being discharged into or connected with a sewage disposal system approved by the State Board of Health." ORS 815.260



WHAT TO USE / WHAT NOT TO USE

- Use a tank flushing device (not a potable water hose) each time after dumping your holding tank.
- Use only treatments or deodorizers recommended by the manufacturer.
- Do not use bleach to treat or "sweeten" a tank; bleach damages valves, seals, and gaskets.
- Products such as formaldehyde also harm waste disposal systems.
- Products labeled "biodegradable" are not necessarily safe for the environment or humans.
- Choose environmentally safe products in holding tanks, such as enzyme or bacterial-based products. Follow directions carefully, and dump your holding tanks often to reduce the need for tank treatments and deodorizers.



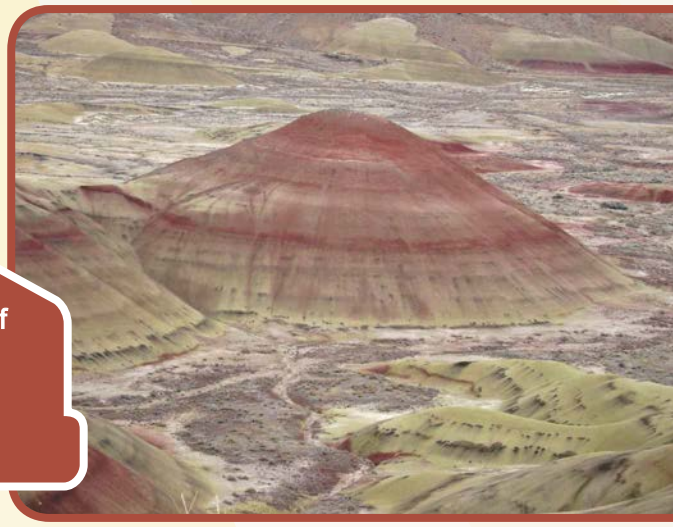
PLACES FOR RV WASTE DISPOSAL

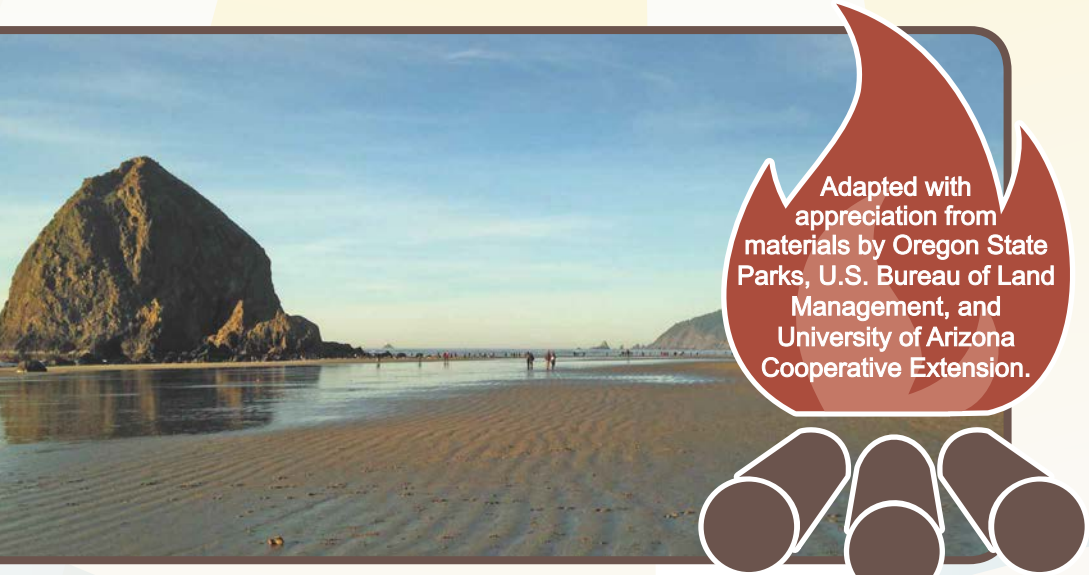
- 27 Oregon State Parks
- 3 Oregon Department of Transportation (ODOT) rest areas
- Private RV parks
- Many service station truck stops
- Several municipal water reclamation facilities (sewage treatment plants)

FIND SPECIFIC RV DISPOSAL STATIONS

- ODOT Trip Check
  www.tripcheck.com/Pages/RArv.asp
- RV Dump Stations
  www.rvdumps.com/oregon/
- Sanidumps
  www.sanidumps.com/sanidumps_usa.php?id=51
- Oregon State Parks offices and materials
  www.library.state.or.us/repository/2010/201012091601164/2007.pdf
- Local Oregon Automobile Club (AAA) offices and Chamber of Commerce Visitor Centers may also be of assistance.

Proper disposal costs are free or nominal.





Adapted with appreciation from materials by Oregon State Parks, U.S. Bureau of Land Management, and University of Arizona Cooperative Extension.

BEND
UTILITY DEPARTMENT
62975 Boyd Acres Road
Bend, Oregon, 97701

541-317-3000
FAX: 541-317-3046

www.bendoregon.gov/cleanwaterworks

CLEAN WATER WORKS
BEND
We work for clean water

Accommodation Information for People with Disabilities
To obtain this information in an alternate format such as Braille, large print, or electronic, please contact 541-317-3000 opt. 2 or email utilities@bendoregon.gov.

Landscape Maintenance
For Healthy Waters and Happy Customers

The work you do is important. It can uplift peoples moods, invigorate their beings, even improve their health. Working in this field, it is obvious that you are in touch with the earth, with nature, and with people. Extending that care to protecting our life-giving waters is only natural.

Did you know that pesticides, herbicides and fertilizers, large debris, even soils can all pollute our streams, rivers and our underground drinking water supplies?

They increase the sediment deposits in our streams and rivers, clogging fish gills and disturbing oxygen levels in the water.





Yard debris such as grass, leaves, pine needles, and soils that are in the road can plug storm drains.

Pesticides & Fertilizers Best Management Practices

- Minimize chemical use. Use possible mechanical and biological controls where appropriate.
- Purchase only the amount of pesticides and fertilizer that you need for your site.
- Use pesticides, herbicides and fertilizers according to the manufacturer's recommendations. Read labels carefully; follow all instructions. Apply spot treatments.
- Use slow-release fertilizers to prevent wash off; consider using organic products.
- Do not apply pesticides, herbicides or fertilizers under windy conditions or when rain is predicted within the next 48 hours.
- Sweep up overblown product.
- Dispose unused material as hazardous waste.
- Store fertilizers and other chemicals under cover to protect from wind and rain.

Water-Front Landscaping Best Management Practices

- Use a buffer strip of native plants between the waterway and the yard to filter out pollutants.
- Do not burn near the water's edge.
- Consider planting trees and shade plants near water's edge to help keep the water cool.

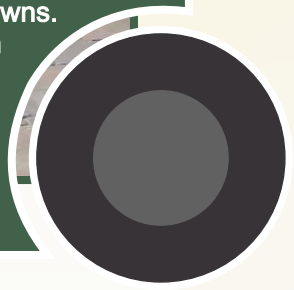


Fortunately there are simple steps that you can do to help protect both human and natural health.

Landscape Maintenance Best Management Practices



- Use all reasonable measures to reduce pollutants from entering storm drains (e.g., litter, fertilizers, etc.).
- Never stockpile landscaping material (e.g. dirt, bark dust, sand and gravels) in the roadway.
  - Properly compost or dispose of debris daily; or place in the yard waste container (provided by your local garbage company) or haul to the landfill.
  - Inspect and clean the landscaped storm drainage facilities (e.g., rain gardens, bio-retention, swales) as needed (inspect at least twice a year) to ensure they operate as originally designed.
  - Do not blow trash, yard debris, soil, or dust into streets or gutters.
  - Mow lawns high–aim for 3 inches to promote a healthier lawn with less need for fertilizer.
  - Consider using a mulcher lawn mower to provide natural food sources for lawns.
  - Make sure slopes are planted with dense ground covering plants to prevent erosion.
    - No irrigation overspray or runoff.



Compost yard debris





Sweep up excess fertilizer



Pull noxious weeds



Don't blow or dump yard debris in the roadway



Don't let landscape water runoff into the roadway



Consider becoming an Ecobiz certified landscaper.
Visit www.ecobiz.org to learn more.

Accommodation Information for People with Disabilities
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UTILITY DEPARTMENT
62975 Boyd Acres Road • Bend, OR 97701
541-317-3000 • FAX: 541-317-3046
www.bendoregon.gov/cleanwaterworks

CLEAN WATER WORKS
We work for clean water

Looking to Hire a Landscape Maintenance Service?

CLEAN WATER WORKS
We work for clean water

When interviewing, ask your landscape maintenance contractor to commit to using these best management practices (BMPs) to help protect our waters, our environment, and those you love!



Healthy Waters

Healthy Families



Healthy Plants

Properly compost or dispose of debris at the end of each work shift.

Landscape chemicals and debris can pollute our streams, rivers and our underground drinking water supplies.

Avoid runoff.

Inspect and safely clean the onsite landscape storm drainage facilities (e.g., rain gardens, bio-retention, swales) to ensure they operate as originally designed.

Do not blow or sweep trash, yard debris, soils, chemicals or dust into streets or gutters. Collect it and properly dispose.

Mow high–aim for 3 inches.

Purchase the least amount of landscape chemicals needed for your site.

Check local rules! Never stockpile landscaping material (e.g., dirt, bark dust, sand and gravels) in the roadway unless your municipality allows it.

Adjust sprinklers to minimize irrigation overspray.

Store fertilizers and other chemicals under cover.



Use integrated pest management practices.*

Keep pollutants (e.g., litter, fertilizers, soils, mulch, etc.) from entering storm drains.

Roots hold soils in place. Plant slopes with dense ground covering plants to prevent erosion.

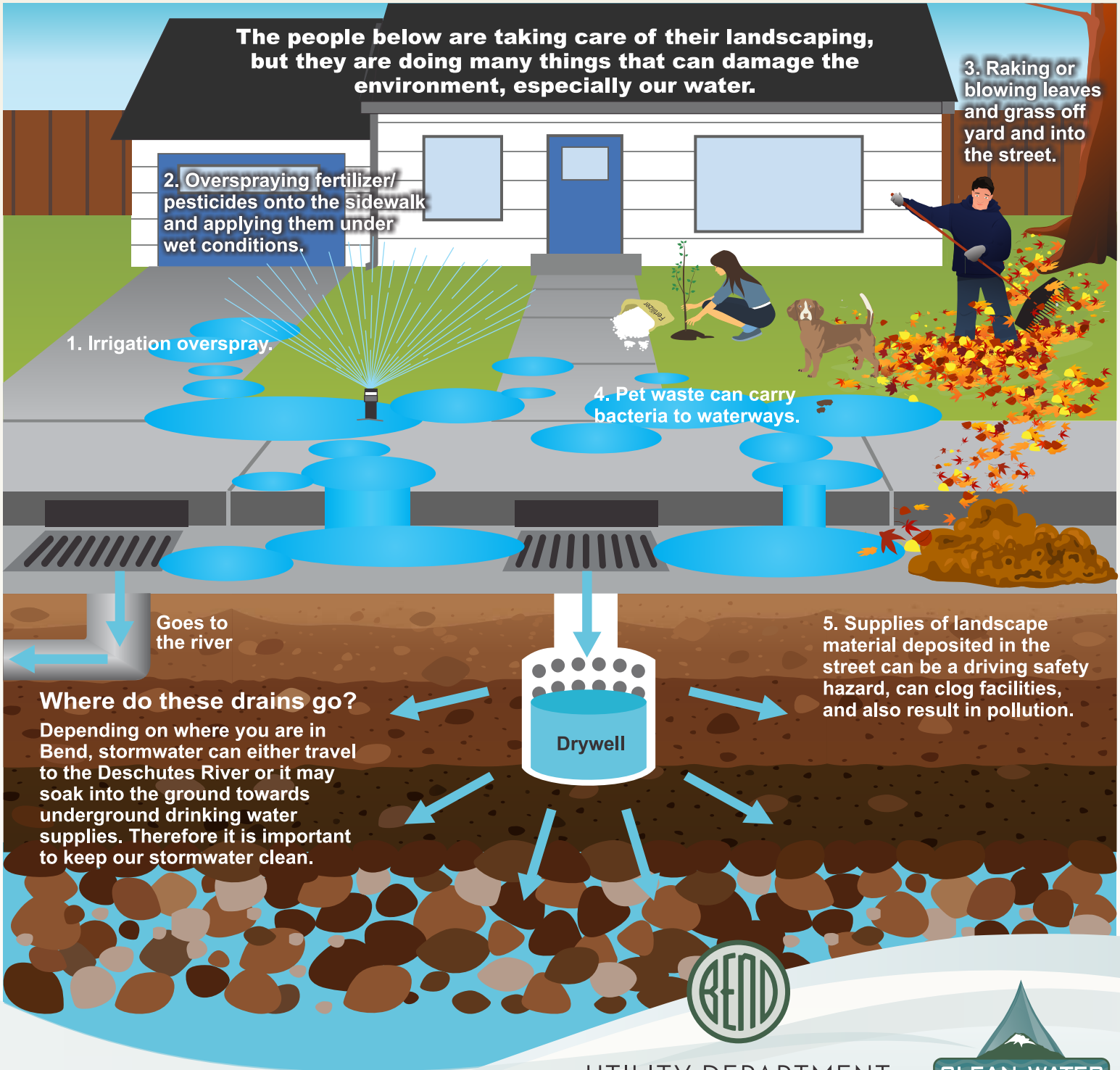
*See http://ecobiz.org/wp-content/uploads/LANDSCAPE.pdf

Why Bother with Best Management Practices?

Best Management Practices (BMPs) are designed to protect both our river and underground drinking water quality, and prevent clogging of stormwater facilities. While it may not seem like much, implementing BMPs can really make a positive difference to help protect our waters, properties, and public health.

Do not apply pesticides, herbicides or fertilizers under windy conditions, or when rain, snow, sleet or hail is predicted within the next 48 hours.

SUN	MON	TUE	WED	THU	FRI	SAT
✔	✔	✘	✘	✘	✘	✔



Accommodation Information for People with Disabilities
To obtain this information in an alternate format such as Braille, large print, or electronic, please contact 541-317-3000 opt. 2 or email utilities@bendoregon.gov.

UTILITY DEPARTMENT
62975 Boyd Acres Road • Bend, OR 97701
541-317-3000 • FAX: 541-317-3046
www.bendoregon.gov/cleanwaterworks

CLEAN WATER WORKS
We work for clean water

Pressure Washing and Surface Cleaning for Clean Water

Pollutants of Concern: Oil, Sediment, Metals and Phosphates (Soap)

What Is the Problem?

Although convenient for cleaning surfaces and equipment, pressure washing runoff can release oil, soap, chemicals, metals, sediment and grime that are harmful to nature into the storm drain system. In Bend most storm drains have minimal treatment and drain directly toward the groundwater we all drink or the Deschutes River.

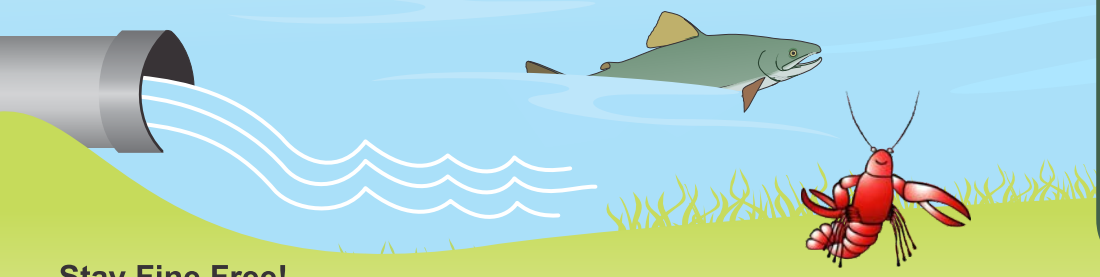
- Sediment clouds the water, hurts aquatic plant growth and clogs fish gills.
- Even biodegradable soaps rob water of life-giving oxygen.
- Household hazardous wastes, like pesticides, paints, solvents, and auto fluids that runoff from driveways and other outside surfaces can poison aquatic life. Animals and people can become sick or die after consuming polluted water or fish.



What Can You Do as a Bend Resident? Plan Before You Spray.

- Use dry cleanup methods first (sweep, blow, vacuum). Dispose of debris in the trash.
- Soak up oil and fluids using absorbents (cat litter, sawdust, sand) and dry-cleanup methods before washing. This, too, can go in the trash.
- Direct pressure washing runoff into a lawn or landscaped areas away from the storm drain system. Do not allow runoff to enter the stormwater system.





Stay Fine Free!

Polluted discharges from any property that enter a storm drain system are considered an illicit discharge violation.

Additional Resources

Illicit Discharge Minimization Best Management Practices Manual
www.bendoregon.gov/idmanual

Accommodation Information for People with Disabilities
To obtain this information in an alternate format such as Braille, large print, or electronic, please contact 541-317-3000 opt. 2 or email utilities@bendoregon.gov.

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What to Know Before You Power Wash

CLEAN WATER WORKS
We work for clean water

Power washing releases oil, soap, chemicals, metals, sediment and grime that are harmful to people, pets, wildlife and water. Don't just "wash it away." Plan ahead before you start.

- Be sure you know how to operate your pressure washer safely. Use protective gear.
- Soak up oil and fluids using absorbents like cat litter, sawdust or sand.
- Sweep up and dispose of loose debris in the trash.
- Never direct wash water or debris to a gutter or storm drain.







- Direct runoff to a lawn or landscaped area away from the storm drain system.
- Use a wet vacuum, containment pad, or small sump pump to collect wash water in the lowest spot and pump to landscaping or a container for later disposal.





Protect our drinking waters, rivers and streams.

BEND

UTILITY DEPARTMENT

62975 Boyd Acres Road • Bend, OR 97701

541-317-3000 • FAX: 541-317-3046

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UTILITY DEPARTMENT

March 22, 2017

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BEND, OR 97701
541-317-3000 opt. 2
Relay Users Dial 7-1-1
541-317-3046 fax
bendoregon.gov

MAYOR
Casey Roats

MAYOR PRO TEM
Sally Russell

CITY COUNCILORS
Justin Livingston
Bill Moseley
Bruce Abernethy
Nathan Boddie
Barb Campbell

CITY MANAGER
Eric King

RE: Clean Water Works Partnership Opportunity

Dear Pressure Washer Rental or Sales Business:

The City of Bend Stormwater Utility would like to partner with you to help keep our waters clean. If you appreciate clean water *and* business enhancement, please consider this voluntary opportunity. The City of Bend is undertaking an exciting incentive-based watershed campaign entitled Clean Water Works. Please see our website at: bendoregon.gov/cleanwaterworks. Here you can see that we have both educational and partnership aspects to the campaign.

We are seeking to support recreational vehicles businesses that are working to keep our waters clean. We have selected Recreational Vehicles Sales and Service businesses within the City of Bend as potential Clean Water Works Partners. Should you choose to participate, the City would like to reward you by providing the following promotional materials:

➢**Promotion** on our "Discounts and Partners" page on our website (bendoregon.gov/cleanwaterworkspartners) and by other electronic media means (e.g., mention on Facebook, Twitter, or radio advertisements). We will actively encourage people to visit this page beginning from April through December, 2017 and likely beyond. The campaign will include: TV, radio, print, events and social media.

➢**Decal—**The City will provide you a Clean Water Works window decal (see image at right) to help advertise your business as one that cares about Clean Water!

➢**Discount Card**—The City will list your business and the discount of *your* choosing (e.g., $1 off or 5% off) on our website "Discount and Partner" page, and if you respond by April 9, 2017 we will list your business and discount on the back of our discount cards on a first come/first served basis that we will print and distribute at outreach events throughout the 2017 campaign and mention your business in a Clean Water Works partner radio advertisement. The discount card will also be available on line for your customers to print. (See back for an example discount card layout.)

- **Employee Giveaways**—The City will provide you and your employees (should you wish) Clean Water Works Partner logo-ed products for your enjoyment.

- **Display Holder Promotion(s)** for your waiting room(s) with a Clean Water Works Partner outreach sheet promoting your participation as a company that cares about clean water to your customers.





The partnership works like this—if you meet the following basic steps for your business category, just fill out the attached certification form and you can take part. The criteria for your business category is as follows:

- ✓ You have registered for a Bend Business license (and if you are receiving this letter, then you already have!),
- ☐ You agree to label your businesses onsite catch basins with a pollution-prevention message—good news, the City can provide a free "do not dump" storm drain marker for your use if your drains are not already marked.
- ☐ You agree to share the attached Pressure Washer fact sheet with your staff.
- ☐ You agree to share the attached Pressure Washer fact sheet with your customers, by attaching a City provided fact sheet to customer receipts (we can provide pads of fact sheets to facilitate this) –And/OR—You agree to place educational equipment tags on your pressure washers for rent / sale.
- ☐ You agree to honor the discount that you specify through at least December 31, 2017.

Just review the fact sheet, complete the short partnership form and email it to me at wedde@bendoregon.gov or fax it to 541-317-3046. You may also mail it to my attention at: 62975 Boyd Acres Road, Bend, OR 97701. Please contact me directly at 541-317-3018 should you have any questions. And remember, if you contact me by April 9, 2017, we will do our best to include your business name on the back of the Discount card, and a mention of your business on our spring partner radio/television commercials on a first come first served basis.

Remember, this is a voluntary program and a means to appreciate your interest and efforts in keeping our river and drinking waters clean! Should you have any questions or requests, please do not hesitate to contact me at the phone number or email above.

We look forward to working with you.

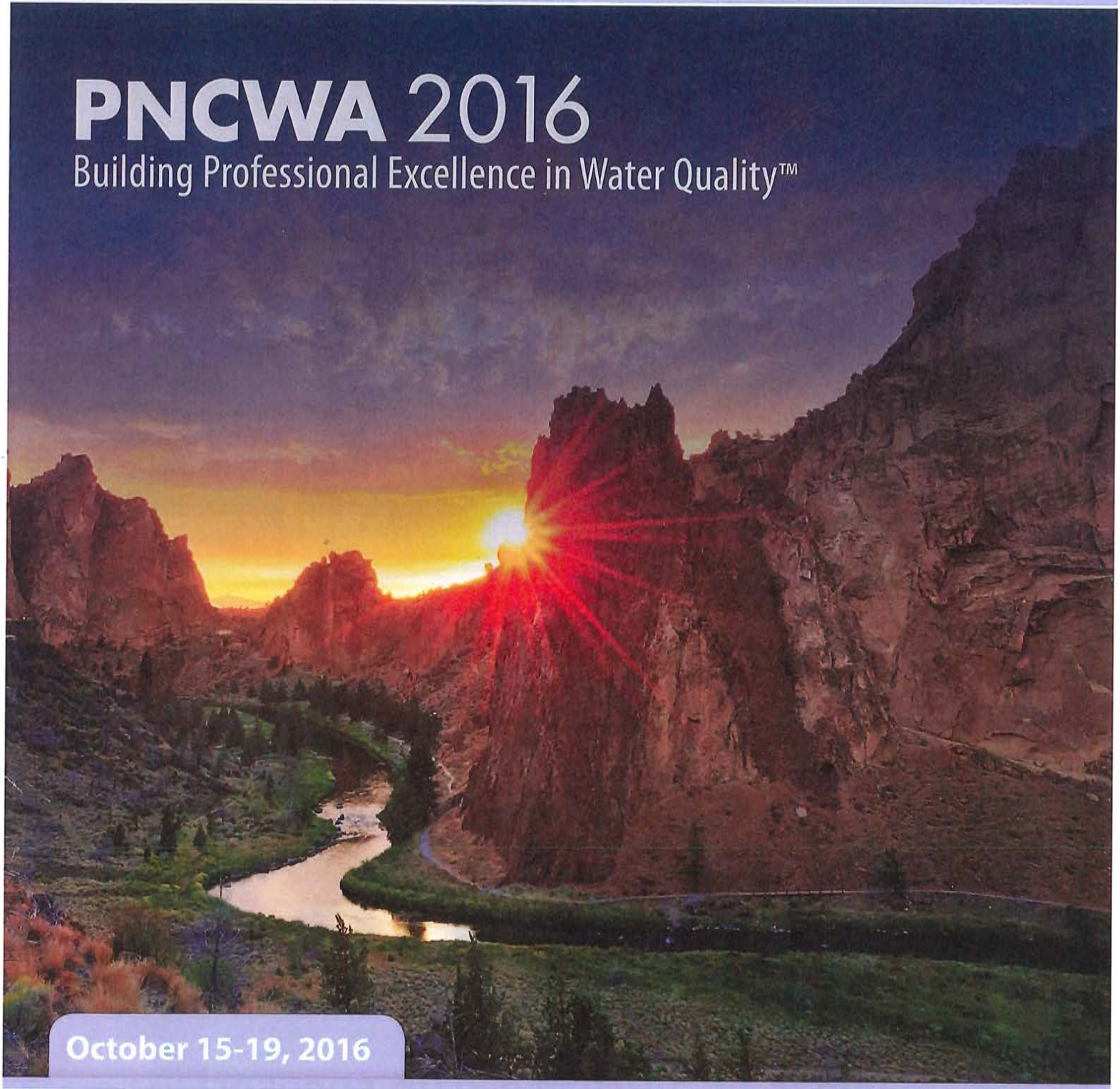
Sincerely,

Wendy Edde, CSM
Stormwater Program Manager
City of Bend Utility Department
Att: Pressure Washer (Residential) Fact Sheet, Clean Water Works Partnership form

Annual Conference & Exhibition
Riverhouse on the Deschutes
Bend, Oregon

PNCWA 2016

Building Professional Excellence in Water Quality™



October 15-19, 2016

Pacific Northwest Clean Water Association
PNCWA

wef
member association

Pre-conference Workshops

Attendance only with separate registration—not included in regular conference registration

Build a Rain Garden

Sunday, October 16 — **8:30 AM–4:30 PM**
Cost (*lunch included*): **$120 Members, $145 Nonmembers**
CEUs: **0.6 (requested)**

Sponsored by: PNCWA Stormwater Committee
Moderator: Jadene Stensland, *Clean Water Services*
Speakers: Wendy Edde, *City of Bend, OR*
Tony Gilbertson, *Clean Water Services*
Keri Handaly, *City of Gresham, OR*
Kim Reid, *formerly EPA Region 4*
Cari Simson, *Urban Systems Design*
Jadene Stensland, *Clean Water Services*

You've seen them as part of new residential or commercial development: attractively planted swales. But these vegetated depressions are more than just eye candy; they are vital pieces of green infrastructure that slow down and treat stormwater runoff from impervious surfaces and improve water quality in streams and groundwater. In this hands-on workshop we will spend the morning learning about creative opportunities in site selection, design basics, stakeholder involvement, anticipated benefits, regulatory compliance and maintenance concerns from experience. After lunch (provided), we will travel to a prepared site to move some soil and install the plants. Plan to get dirty!

More development means increased runoff from rain landing on roofs, driveways and sidewalks. This runoff carries pollutants such as heavy metals, fertilizer, oil, pesticides and pet waste into storm drains and thus into streams. Rain gardens minimize runoff flowing to or from impervious surfaces, thereby enabling pollutants to be absorbed by native plants and reducing flooding by limiting the amount of water transported directly to streams during rain storms. This replenishes ground water while helping diminish flooding in local streams. Rain gardens can cut down pollution within streams by up to 30 percent. As an added bonus, a rain garden planted with natives attracts birds, butterflies and bees.

This workshop is for design professionals, regulators, contractors or anyone with an interest in enhancing the environment, and will cover the following topics and questions:

- Why build a rain garden? You can solve drainage problems, improve water quality and meet regulatory requirements.
- Where to build? Will water infiltrate or mostly be detained and discharge?
- How to design? Materials, labor and costs. What kind of water quality improvements can be expected?
- How to get your rain garden built? Site visit and work party (tools to be provided).
- Whew! It's built! Now what? Maintenance and troubleshooting.

Best Practices in Emerging Instrumentation Technologies

Sunday, October 16 — **9:00 AM–4:30 PM**
Cost (*lunch included*): **$120 Members, $145 Nonmembers**
CEUs: **0.6 (requested)**

Sponsored by: PNCWA Plant Operations and Maintenance Committee
Moderators: Joel Borchers, *Clean Water Services*
David Gordon, *FCS Group*
Speakers: Anthony Benavidez, *CH2M*
Dan Hanthorn, *ZAPS*
Adrienne Menniti, *Clean Water Services*
Alvin Smith, *HACH*
Rob Smith, *Xylem*
Mark Walter, *Oak Lodge Sanitary District*

Emerging instrumentation technology is transforming wastewater operations. Without proper processes, procedures, and decision making, however, even the best technology may fall flat at your plant. The goal of this pre-conference workshop is to enable operators as well as managers to realize the full potential of new instrumentation technology to better serve customers and meet strategic goals. Participants will leave with a better understanding of emerging instrumentation technologies and the skills to apply these new tools to improve decision making.

There are three focus areas for this workshop:

How to be on the bleeding edge without bleeding?

New technology may have the ability to solve pressing operational challenges. But being one of the first of your peers to integrate the new technology is risky. This session will focus on methods and case studies for being one of the first to apply new technologies. Participants will learn best practices for reducing risk and realizing potential.

Integrating emerging instrumentation technology in decision making

Improved instrumentation should not result in a data-rich but knowledge-poor environment. This section will focus on utilizing new instrumentation technology to improve decision making. It will focus on real-world scenarios and highlight the importance of information sharing through operations and management.

Trends in emerging technology

What is next in instrumentation technology? How can an organization best embrace the next generation of instrumentation technology? Speakers will highlight upcoming technologies and industry trends with the goal of educating participants on what these new technologies may mean for their operations.

Facility Tours

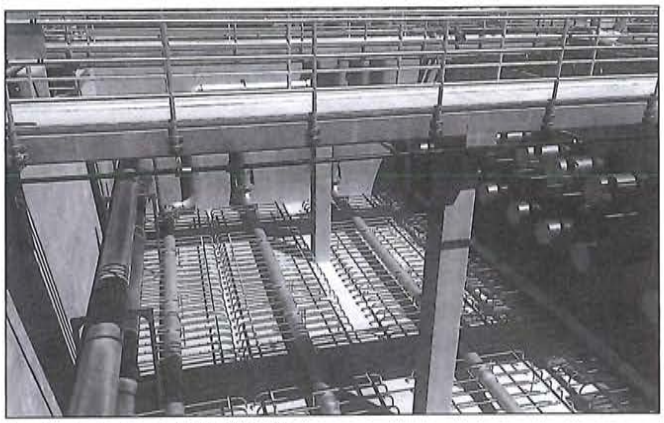
City of Bend Water Reclamation Facility Tour

Monday, October 17 **1:15 PM–3:45 PM**

The City of Bend's Water Reclamation Facility (WRF) is a conventional activated sludge plant built in 1980, with an average daily capacity of 6.0 million gallons. Presently, the City experiences an average flow of 5.5 million gallons per day. The water reclamation system is comprised of approximately 455 miles of sanitary sewer lines, 336 pump stations and serves over 27,000 customers. The WRF produces Class A recycled water, which is provided to the Pronghorn signature golf courses.

Currently, the WRF is under construction for a $60 M major expansion to meet 2030 Facility Plan requirements. Completed upgrades to the facility include a new primary clarifier, primary sludge pumping improvements, a new aeration basin and secondary treatment process, new turbo blowers, and upgraded SCADA infrastructure. Components of the project still under construction include the UV disinfection system, yard piping, solids handling and headworks improvements.

This tour will focus on a new process implementation that features an integrated fixed-film activated sludge (IFAS) process. IFAS offers the unique opportunity to provide a construction-free phasing approach for future capacity. Once this initial modification to the aeration basins is complete, the amount of IFAS media included in the reactors will determine the associated capacity of the WRF. This construction-free phasing approach allows for a "pay as you go" funding opportunity. After the initial construction phase, future capacity can be incorporated into the facility by simply purchasing additional media. IFAS offers the nitrification benefits inherent to biofilm reactors, with increased stability and improved performance during peak influent loading. This tour will also feature information about Bend's biosolids program, and the unique path taken to obtain Class A material.

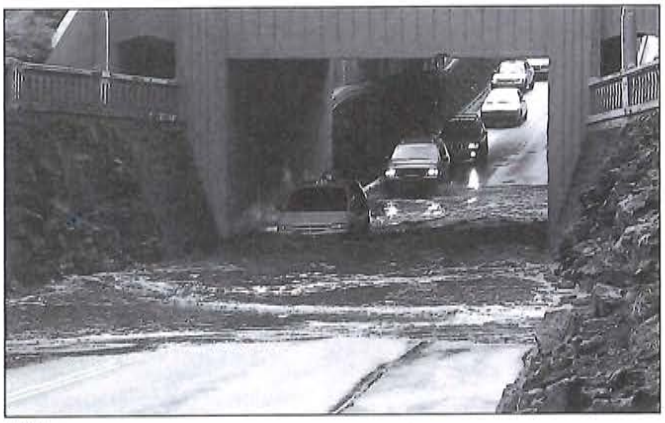


Aeration basin 4 ready for IFAS media

City of Bend Stormwater Tour

Tuesday, October 18 **1:15 PM–3:45 PM**

This tour will feature three intriguing projects that utilize low impact development (LID) to handle stormwater runoff. The first stop on this tour will be a volunteer created and maintained community garden that was developed in part to help solve localized flooding issues in a creative, useful, cost-effective manner. The second site will feature an extensive project to upgrade the Third Street underpass. This project addressed historic 50-year old flooding issues as well as replaced four critical deep stormwater drill holes, helping protect groundwater quality. The project features multiple LID techniques throughout the 56-acre drainage basin and includes a constructed stormwater pump station and infiltration basin. The third stop on this tour will feature the Bend Parks and Recreation District administration building green roof and parking lot stormwater system located at picturesque Riverbend Park.



2007 storm



Bend Parks and Recreation admin building green roof

City of Bend Colorado Lift Station and Deschutes Brewery Pretreatment Tour

Tuesday, October 18 **1:15 PM–3:45 PM**



Colorado Lift Station construction

The City of Bend is constructing the Colorado Lift Station at the north end of McKay Park along the banks of the Deschutes River. This new pump station provides improved redundancy and increased capacity for wastewater conveyance on Bend's west side. The $10.6M construction project was identified and prioritized through the City's optimized Collection System Master Plan update in 2013. The 3.9 mgd (firm capacity) pump station features dry pit immersible pumps, self-cleaning wet well, a standby engine-driven pump, a 5,660 feet long dual 12-inch forcemains, including a portion suspended from Colorado Street Bridge. The pump station design includes liquid and vapor phase odor control facilities, engine generator, site and architectural design to suit public park visibility and neighborhood context. The project is being constructed in coordination with ongoing McKay Park, Deschutes River Trail, and Bend Whitewater Park construction, and residential condominium development along the pipeline corridor. The pump station will start up in Fall 2016. The design engineer, construction manager and City of Bend Utilities staff will participate in the tour.

Deschutes Brewery is the largest craft brewer in Bend and discharges an average of 65,000 gallons per day to the City sewer. As Bend's brewing industry has grown, management of brewery waste within the wastewater system has received significant attention including modification of the City's "high strength" waste charges, efficiencies in brewing practices including water conservation, side-streaming and segregation of wastes, and recycling of spent grain. Collaboration has resulted in sharing of best practices within the Bend craft brewing community and the City's Industrial Pretreatment Program. This tour will review on-site liquid waste management facilities, liquid storage and loadout facilities, control systems, and discussion of how buildout of the Deschutes Brewery facility will be accommodated by the City's collection system. This will also include an overview of how Bend's Extra Strength Charge program was developed and implemented to help properly fund treatment of high strength wastewater.

The tour will start at Deschutes Brewery and then walk down to the pump station site. Portions of the tour may not be accessible.

Redmond Water Pollution Control Facility

Wednesday, October 19 **8:00 AM–10:30 AM**

The City of Redmond operates a 2.99 MGD (design) Water Pollution Control Facility (WPCF). The WPCF currently serves a population of 28,000, and over 9,000 customers. The wastewater division has 137 miles of sewer mains and 13 sewage lift stations. The WPCF utilizes an oxidation ditch process, which produces Class C Recycled Water. The City operates an irrigation site, farming 146 acres of orchard grass, utilizing recycled water and biosolids as a soil amendment. New process control improvements to WAS systems will be covered along with the implementation of real-time monitoring of influent and effluent through the use of a new technology that has the ability to monitor multiple process parameters through one probe.



Redmond WPCF

Tour FAQs

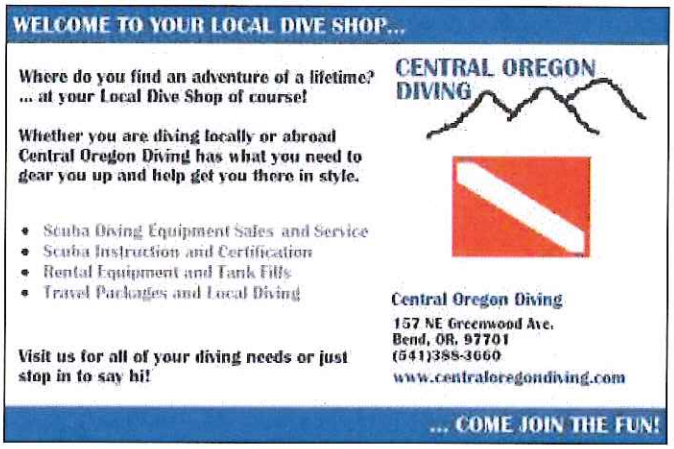
No preregistration required
First-come, first served

- No additional cost to conference attendees
- CEUs available based on tour presentation time

Closed-toe shoes required









Summer Camp

Days end with evening campfires, skits, singing, laughter and gorgeous sunsets over Dark Lake.

Registration begins January 1, 2017 at www.camptamarack.com

Traditional Camp

On the shores of Dark Lake in Deschutes National Forest, our traditional camp offers water fun, outdoor adventures, games, arts & crafts and independence, all in a magical, forested setting. Campers live in rustic cabins that house 6 to 8 children. Programs are age-specific to bring out everyone's best. Younger campers try their hand at camp activities with close supervision and bedtime routines to help them feel comfortable away from home. Older campers discover more challenging activities & leadership opportunities, plus all the traditional camp activities. All campers choose from a variety of activities -- art projects, swimming, boating, archery, sports & games.





Type 1 Diabetes Camp

At On Belay Type 1 Diabetes Camp, children with diabetes and their buddy or sibling have the opportunity to meet all the challenges and adventures offered at Camp Tamarack safely and responsibly. The On Belay concept of "I've got your back" will be promoted by activities and outings. Buddies will learn to recognize diabetic emergencies and assist if needed with on-site medical staff, educators and counselors. Children with Type 1 Diabetes are invited to this active, supportive and creative community to be inspired in the great outdoors.

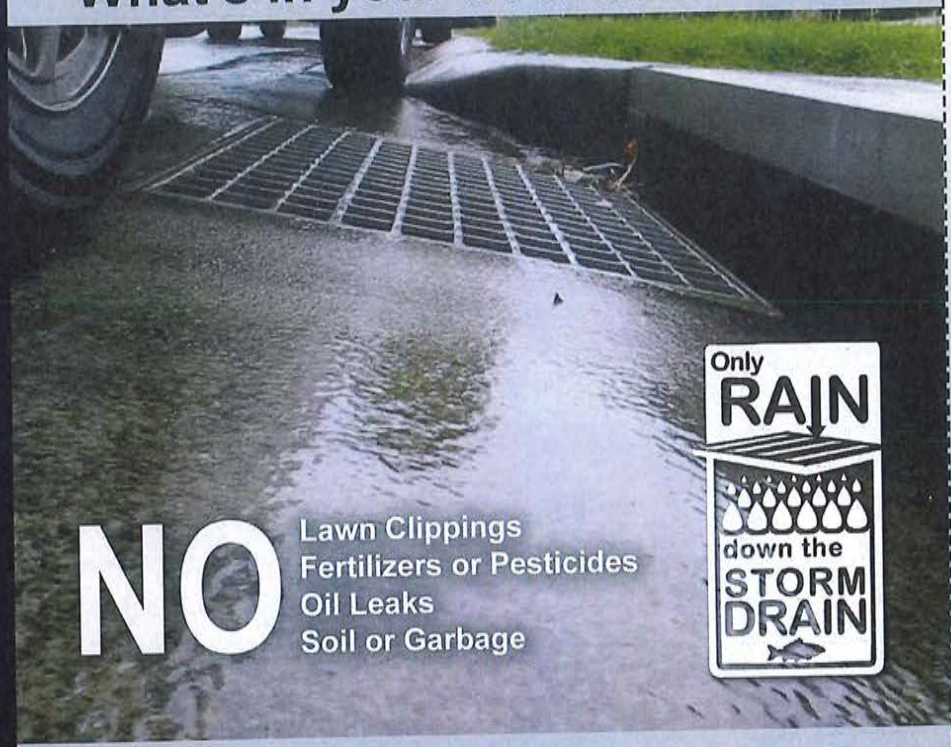

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Fertilizers or Pesticides
Oil Leaks
Soil or Garbage

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PER PERSON, PER DAY

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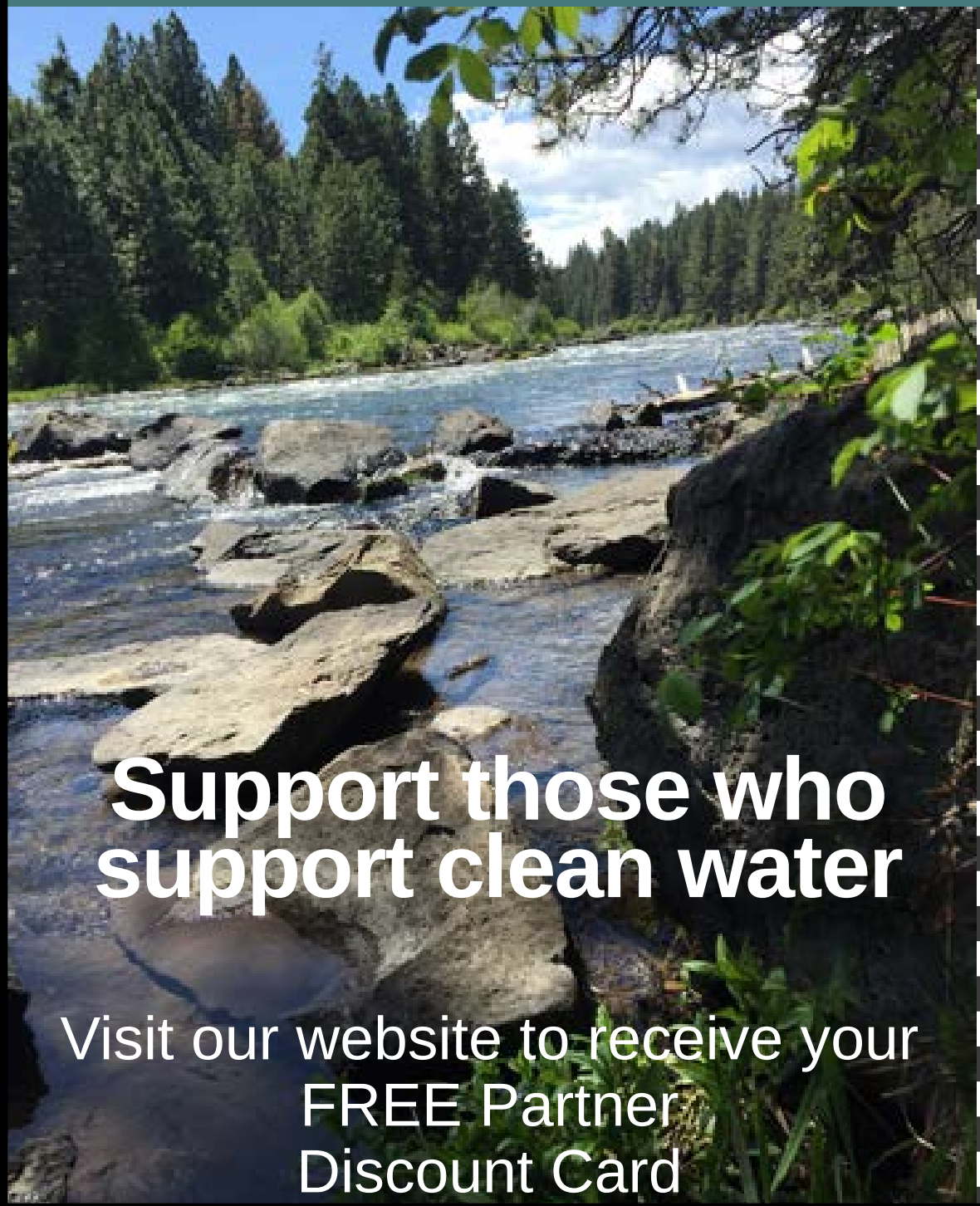
All Central Oregon
BI-Mart Stores,
the Deschutes County Fair
and Expo Office
in Redmond and the
Ticket Mill
in The Old Mill District,
Bend. For more info
call 541-548-2711
or expo.deschutes.org.

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The Source Weekly – The Green Issue April 2017



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the environmental center



City of Bend and The Environmental Center
Our Water System: A Journey Through Bend

Annual Activity Report
May 24, 2017

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Overview

"Our Water System: A Journey Through Bend" is a classroom and field-based education program designed to educate middle and high school students about Bend's water sources, distribution, wastewater and stormwater management systems, and water conservation. Each lesson and corresponding field trip educates students about the system, as well as how to make choices that reduce their environmental impact at school and at home.

"Water, Water Everywhere" is an in-class lesson geared to intermediate (3rd - 5th) elementary students. Students learn where water comes from, and learn ways to conserve water in and out of the home.

Summary statistics for the 2016-2017 school year:

Our Water System: A Journey Through Bend	Contract goals for 2016-2017 school year	Actual data for 2016-2017 school year
Total contacts	2,000	1,996
Number of presentations	75	49
Number of classes	15	19

Water, Water Everywhere	Contract goals for 2016-2017 school year	Actual data for 2016-2017 school year
Total contacts	500	604
Number of presentations	20	23
Number of classes	20	23

Program Promotion

- The Environmental Center's website: The water education program is listed with our youth education programs: https://envirocenter.org/programs/youth-education/school-programs/classroom-lessons/

- School visits: Jess Ludmer visited the science department at Mountain View High School and Pacific Crest Middle School. Materials and contacts were made with the following schools: Pilot Butte Middle School, Cascade Middle School, High Desert Middle School, Westside Village Magnet, and REALMS.

- Teachers Night Out: The water education program was shared with teachers who stopped by The Environmental Center's booth at the High Desert Museum's Teachers Night Out on September 22nd, 2017.

- Living the Green Newsletter: Lauren Williams, Membership and Communications Manager, highlighted the program in an electronic newsletter.

- Discover Nature Festival: The water education program was shared with those who stopped by The Environmental Center's booth at the Children's Forest of Central Oregon's Discover Nature Festival on September 24th, 2017.

- KPOV : Jess Ludmer was interviewed for "The Point," by Linda Spring. Jess gave program highlights and information for sign up.

Program Marketing Materials

The following documents were used to market the water education program this year. The following documents were shared with middle and high school teachers at face-to-face events. Updates to the documents included correlating Next Generation Science Standards and Common Core standards. This critical change provides justification and incentive for participating teachers.

Our Water System: A Journey through Bend

The Environmental Center, in partnership with the City of Bend, presents a series about water in Bend; where it comes from and where it goes along its cycle through the city. Lessons are free and correlate to NGSS standards.

the environmental center

Classroom presentations

Watersheds and Water Users

Students take a virtual tour of the watershed, learn about Bend's dual source water system, identify ways they connect with water, learn how our community uses water as well as the impacts that result.

Ins and Outs of Water:

Students tour their school grounds to explore how water gets into and out of our schools. They will research water and sewer lines on city maps to gain an understanding of the city infrastructure needed to provide and manage water, including customer pre-treatment and reclamation systems.

Sewer Studies

Students learn what happens to wastewater once it leaves our schools, homes, and businesses and enters the City's sewage system. They learn what can and cannot go down drains and toilets. Lastly, they learn how water is treated at the reclamation facility before it is released back into the environment.

Be Water Wise

Students generate reasons and methods to conserve water based on what they learned during the series. Students explore a personal commitment to conservation based off of their beliefs and interests.

Field trips

From Mountains to Homes

Take a half day to visit the Bridge Creek Intake and Outback Water Filtration Facility to experience our water sources, the system of pipelines that bring water into the City, and see filtration firsthand.

Wastewaters New Life

Take a second half day to visit the Wastewater Reclamation Facility and adjacent Hatfield Ponds. Students will tour the facility, observe the cleaning process, learn about the hidden organisms that clean water, and see where the cleaned water releases into natural systems.

Stormwater QUEST

Students solve a puzzle as they visit locations along the Deschutes River, including Farewell Bend and River Bend Parks. As they travel along the quest, they will learn about Stormwater and City infrastructure which minimize the impact of Stormwater pollution.

For inquiries and scheduling contact:

Jess Ludmer 541.385.6908 x16

Jess@envirocenter.org

www.envirocenter.org

NGSS and Common Core Alignment

Watersheds and Water Users

MS-ESS2-4. Develop a model to describe cycling of water through Earth's systems driven by energy from the sun and the force of gravity.

RI.6.7and RST.6 –8.7. Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.

SL.6.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.

Ins and Outs of Water

MS-ESS3-1. Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.

MS-ESS3-4. Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

RI.6.7and RST.6 –8.7. Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.

SL.6.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.

Sewer Studies

MS-ESS3-4. Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

RI.6.7and RST.6 –8.7. Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.

SL.6.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.

Be Water Wise

MS-ESS3-3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

SL.6.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.

Deliverables

List of schools and delivered presentations:

School /teacher	Lesson
Central Oregon Homeschool Group Sarah Valenzuela	• Stormwater Quest
St. Francis of Assisi Catholic School Stephanie Naegele, 3rd Erika Pakalnis, 4th	• Ins and Outs of Water • Sewer Studies • Be Water Wise • Stormwater Quest • Outback Water Filtration Facility tour
Marshall High School Katie Lyons, 11th	• Watersheds and Water Users • Ins and Outs of Water • Sewer Studies • Be Water Wise • Wastewaters New Life
Mountain View High School Julie McCabe, 11th	• Pre-test and pre-lesson • Watersheds and water users • Ins and outs of water • Sewer studies • Be Water Wise • Wastewaters New Life • Post test
New Leaf Academy Kelli Anderson, 5th - 11th	• Watersheds and Water users • Wastewaters New Life & Hatfield Ponds w/ Audubon Society • Ins and outs of water • Be Water Wise • Outback Filtration Facility Tour and Intake Facility • Stormwater Quest
Pacific Crest Middle School Jane Ward, 6th Jane Shein, 6th Sarah Durfee, 6th	• Pre test • Watersheds and Water users • Ins and outs of water • Outback Water Filtration Facility • Wastewaters New Life • Be Water Wise • Stormwater Quest • Post test
Americorps Team Presentation	• Be Water Wise
USFS Volunteers Karen Gentry	• Ins and Outs of Water

Amity Creek Elementary School Wendy Pierce	• Water, Water Everywhere
Lava Ridge Elementary School Laurie Perez, 3rd Allison Barrett, 3rd Michele Gottschalk, 3rd Jennifer Ketner, 3rd	• Water, Water Everywhere
Pine Ridge Elementary School Becky Crawford, 3rd Erika Nyden, 3rd	• Water, Water Everywhere
Ponderosa Elementary School Angela Szymanski, 3rd Becca Swain, 3rd Maddi Swan, 3rd	• Water, Water Everywhere
RE Jewell Elementary School Jane Williams, 5th Kristel Masterson, 5th Nanda Giglio-Webb, 5th	• Water, Water Everywhere
Seven Peaks School Tracy Jenson, 3rd Amanda Gylling, 2nd	• Water, Water Everywhere
Silver Rail Elementary Ona Larsell, 4th Tyler Miller, 4th Bobbi Maclaughlin, 4th	• Water, Water Everywhere
WE Miller Elementary Erin Kerr, 4th	• Water, Water Everywhere
Bear Creek Elementary Jen Temple, 5th Kristen Carter, 5th Maria Schwab, 5th Larissa Herzog, 5th	• Water, Water Everywhere

Curriculum Summary

Curriculum Google Drive:
The current lesson plans, marketing materials and photos are available via a Google Drive that has been shared with Mary Packebush and the participating teachers. Use this link to access the drive:
https://drive.google.com/drive/folders/0By3auy3oW9PUV2ZWOXpKSVdaQnM?usp=sharing

Water Filtration Facility Tour
Tour the Outback Treatment site to learn how water is treated before reaching our taps.

Wastewaters New Life
Visit the Wastewater Reclamation Facility and adjacent Hatfield Ponds to observe the cleaning process, learn about the microorganisms that do the work, and see where treated water is released back to the natural world at Hatfield Ponds, a rich wildlife habitat.

Watersheds and Water Users
In this lesson, students take a virtual tour of the watershed, learn about Bend's dual-source water system, identify ways they connect with water, and learn the various ways that our community uses water.

Ins and Outs of Water
Students participate in a tour of the school grounds to learn how water gets into and out of our schools, including customer pre-treatment and sewer systems. They look at water and sewer lines on city maps to gain an understanding of the city infrastructure needed to provide and manage water.

Sewer Studies
Students learn what happens to wastewater once it leaves our schools, homes and businesses and enters the City's sewage system. They learn what can and cannot go down the drains and toilets, as well as how water is treated at the Water Reclamation Facility before being released back into the environment.

Stormwater QUEST
Students and parent chaperones solve a puzzle as they visit locations along the Deschutes River in Farewell Bend and Riverbend parks to learn about Stormwater and City infrastructure that minimize the impact of Stormwater on the Deschutes River.

Be Water Wise
Students generate reasons to conserve water based on what they learned during the series and identify and commit to conservation methods both inside and outside the home.

Performance Measures for "Our Water System: A Journey Through Bend"

Students contacted

Total student contacts (this does not count adult chaperones): 1,961

Central Oregon Homeschool Group
- 20 student contacts
- 20 individual students

St. Francis of Assisi Catholic School
- 95 student contacts

- 25 individual students

Marshall High School
- 125 student contacts
- 25 individual students

Mountain View High School
- 481 student contacts
- 114 individual students

New Leaf Academy
- 90 student contacts
- 15 individual students

Pacific Crest Middle School
- 1,128 student contacts
- 100 total students

Americorps Team
- 12 student contacts
- 12 total students

USFS Volunteers
- 35 student contacts
- 35 total students

Presentations provided

Total Presentations delivered: 49
- Central Oregon Homeschool: 1
- St. Francis School: 5
- Marshall High School: 5
- Mountain View High School: 5
- New Leaf Academy: 6
- Pacific Crest Middle School: 24
- Americorps: 1
- USFS Volunteers: 1

Classes reached

- Number of classes reached: 19

Performance Measures for "Water, Water Everywhere"

Students contacted

Total student contacts: 604

Amit Creek Elementary School
- 33 student contacts
- 33 individual students

Bear Creek Elementary School
- 120 student contacts
- 120 individual students

Lava Ridge Elementary School
- 100 student contacts
- 100 individual students

Pine Ridge Elementary School
- 44 student contacts
- 44 individual students

Ponderosa Elementary School
- 75 student contacts
- 75 individual students

RE Jewell Elementary School
- 89 student contacts
- 89 individual students

Seven Peaks School
- 45 student contacts
- 45 individual students

Silver Rail Elementary School
- 66 student contacts
- 66 individual students

WE Miller Elementary School
- 32 student contacts
- 32 individual students

Presentations provided

Total Presentations delivered: 23

Classes reached

- Number of classes reached: 23

Materials distributed:

Indoor conservation brochure	324
Outdoor conservation brochure	324
Goody bags (funnels, grease lids, grease scrapers, notepads, raindrop toy, stickers)	130
Stylus pens	200
Highlighters	200
Stormwater Student workbook:	150
Sewer dos and don'ts brochure	324

% of students involved in the program who can trace the water path from source to treatment.

- On the pretest, 41% of survey respondents could identify the two sources of Bend's dual-source water system. On the post test, the percentage increased to 92%.

- On the pre-test 86% of survey respondents could correctly summarize the process by which city water gets to our taps. This increased to 92% on the post test.

- On the pre-test, 67% of survey respondents accurately identified that a City utility bill includes sewage treatment, Stormwater treatment, pre-customer water treatment and yard irrigation water. This response increased to 79% on the post-test.

- On the pretest, 77% of respondents accurately identified that wastewater goes down a drain or toilet goes to the water reclamation facility via sewer pipes. By the post test, accurate responses increased to 90%.

- On the pretest, 52% of respondents accurately noted that biosolids are recycled as compost on crops. Correct responses increased to 76% on the post test.

% of students who identify with one or more conservation strategy.

- On the pre-test, 61% of survey respondents could identify that water conservation is important for the City of Bend because it prolongs current water supplies, reduces energy consumption and saves money for customers. This increased to 69% on the post test.

- Student's added classic conservation strategies to an open ended survey question. Strategies included: take shorter showers, turn off the faucet while

brushing teeth, utilizing a low-flow showerhead/faucet or installing an aerator, reusing water or ice to water plants, eating foods that require less water to produce (including less beef), utilizing a rain barrel, checking for leaks, and installing efficient washing machines and dishwashers.

Evaluation of the program:

Teacher feedback of "Our Water System: A Journey Through Bend"

Teachers who participated were sent an evaluative survey upon completion of the program. The following is a summary of teacher feedback received.

- All teachers who responded noted that the presenter's interactions with students, knowledge of content, ability to present clearly, and ease of scheduling were highly effective.
- All teachers who responded noted that the appropriateness, quality, connections to classroom material, and general effectiveness were effective to highly effective.
- All teachers who responded noted that they would schedule the series again.
- Water Wise was rated as the most effective lesson, receiving all "highly effective" ratings, whereas the other three lessons received "effective" to "highly effective" ratings.
- One teacher suggested the following addition to the curriculum: "It would be great to see some time and content that deals with current local problems the city is dealing with, such as the current sewer system and its limitations with population growth."

Successes:

- The program reached more classes than expected. The contract set a goal of 15 classes but we reached 18 classes.
- All 6th grade students at Pacific Crest Middle School participated in the program. The material, content, and field trips were appropriate for this age group. The cooperating teachers are interested in incorporating the lessons again next year.
- Pacific Crest Middle School used the PNWCWA grant to pay for subs and busses for their trips to the WFF, WRF, and Stormwater Quest.
- The addition of a "Water, Water Everywhere" lesson, delivered to intermediate

elementary school students, allowed us to reach an additional 600 students.

- The program was modified for the homeschool group and delivered at The Environmental Center. The participating families were pleased with the program, and enjoyed the UIC model and Enviroscape model.

- The Outback staff responded well to feedback from Pacific Crest Middle School. The tours were appropriate for 6th grade and above, the content may be too advanced for younger grades.

- Using Survey Monkey allowed us to receive over 300 responses for the pre and post tests. Survey Monkey was also used to gather feedback from participating teachers.

- The addition of highlighters and stylus pens were a huge hit. Especially with students at Pacific Crest, who use their iPads daily and benefit from the use of the pen.

- Please keep the following documents available for future lessons:
  - City Edition: History of Surface Rights in Bend. https://www.youtube.com/watch?v=JKJV-QPBCmk
  - Bend's Wastewater history: http://bendoregon.gov/modules/showdocument.aspx?documentid=15999
  - Residential Sewer Pipe awareness brochure: http://www.bend.or.us/modules/showdocument.aspx?documentid=6785
  - Water Reclamation Facility Virtual Tour: http://www.bend.or.us/index.aspx?page=201
  - Introduction to Wastewater treatment http://www.bend.or.us/index.aspx?page=201
  - Water conservation brochures: indoors and outdoors

Challenges:

- Due to the time of year of the program, Pacific Crest Middle School was unable to access Hatfield Ponds or the Intake Facility. Discussing a later program might open up more opportunities for field trips.

- We were unable to make contact with Pilot Butte Middle School, who had received the program last year. After repeated phone calls and emails, we moved to marketing the material with high school science departments.

Suggestions for next year, improvements:

- We continue to receive interest from upper elementary classrooms to take part in "Our Water System." If allowances were made to visit the WRF, we may be able to reach more students. We often find it's easier to schedule the program with elementary teachers because they do not have conflicting periods to contend with, or short bussing schedules.

- Water conservation kits would be successful as a parting gift for finishing the program. All students learned about low-flow showerheads and aerators, and many were interested in purchasing them, but offering them for free could be a great incentive. Another great addition to the kits would be a dish scraper, grease can lid, and a shower timer. We saw less enthusiasm with the motor oil funnel.

- Many schools still prefer a mini-series that could include a pre lesson, field trip and a follow up lesson. This may be more appropriate and popular when advertising the program. Scheduling four lessons proved difficult. A suggestion would be to combine the "Watersheds and Water Users" lesson with "Ins and Outs," and "Sewer Studies" with "Water Wise."

- Interested teachers, including those who have already hosted the program in their classrooms, could be trained to deliver the lessons themselves (with support from TEC staff) to expand our reach and increase student contacts. Trained teachers could deliver the in-class lessons and the contracted educator could support them by coordinating and delivering the field trips to WRF and WFF.

Photo Gallery (additional photos can be found on Google Drive):



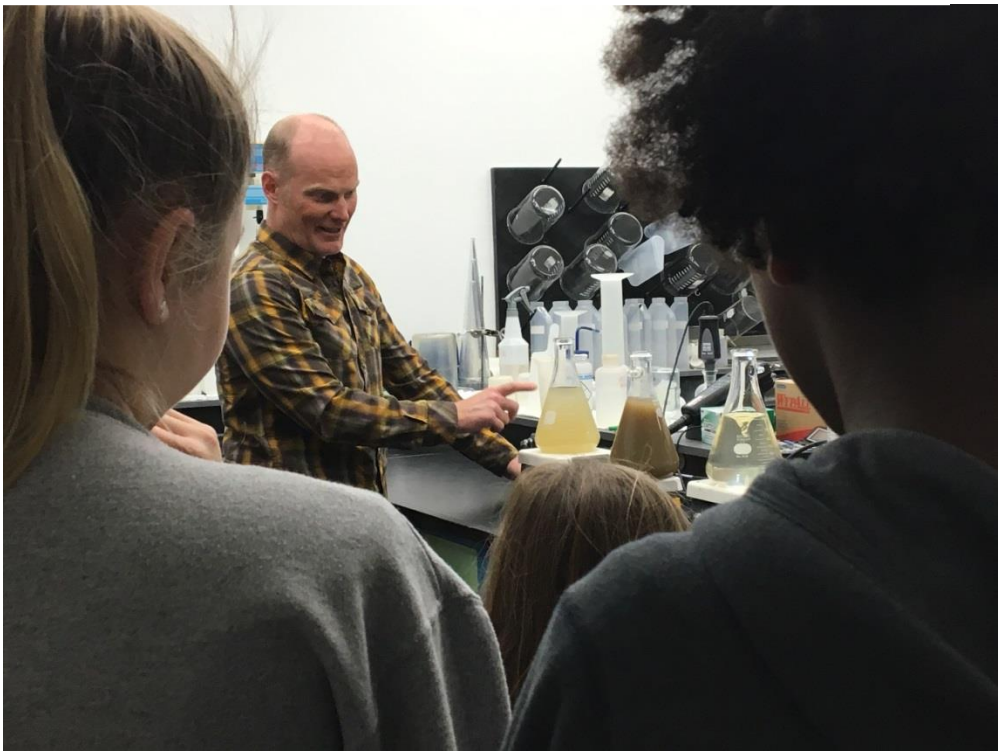
New Leaf Academy students search for the Red-winged Blackbird as Sherrie Pierce, East Cascades Audubon Society, informs them of their markings.



New Leaf Academy students enjoy the clarity and coolness of Bridge Creek.



Sherrie Pierce helps students identify birds at Hatfield Ponds.



Students predict which sample represents wastewater entering the plant. Once again, they're foiled (it's the first).



Rod Mingus explains feed pumps at the Water Filtration Facility to St. Francis students.



St. Francis students examine the cross-section of a filter.

Appendix C

Public Involvement and Participation

City of Bend

Stormwater Public Advisory Group (January 2017)

CITY OF BEND

	Last name	First Name	Organization	Representing
1	Anderson	Katie	Bend Chamber of Commerce	Business/Industry: Large
2	Palmer	Gretchen	Palmer Homes	Business/Industry: Small
3	Rich	Barbara	Citizen, Richcraft Studios	Citizen At Large
4	Norgang	Galen	DEA	Consulting/Engineering
5	Headley	Tom	Century-West	Consulting/Engineering
6	Gustafson	Karna	COBA	Developers--Excavation/Homebuilding
7	Hart-Henderson	Chris	Heart Spring Design	Developers--Landscape Architect or Design
8	Reuter	Ron	OSU Cascades	Environmental Group--Education
9	Richter	Joanne	Upper Deschutes Watershed Council	Environmental Group--Watershed
10	Ellington	Mark	Bend Park and Recreation District	Intergovernmental Coordination
11	Cleveland	Todd	Environmental Health, Deschutes County	Intergovernmental Coordination
12	Klein	Lawrence	Wylder Solutions, LLC	Neighborhood Association or Citizen at Large
13	Ratliff	Krista	Oregon Department of Environmental Quality	Regulatory Liaison
14	Edde	Wendy	Stormwater Program Manager City of Bend	Stormwater Staff
15	Buchanan	David	Stormwater Program Analyst, City of Bend	Stormwater Staff
16	Sabourin	Garrett	Project Engineer, City of Bend	City Staff
	Interested Parties			
17	Nichols	Rick	COID	Irrigation/Canals
18	Ockner	Gillian	Senior Policy Analyst City of Bend	City Staff
19	Rheault	Paul	Utility Director, City of Bend	City Staff
20	Prazak	Steve	Water Quality Manager City of Bend	City Staff

Stormwater Quality

Public Advisory Group Meeting

Wednesday, October 26, 2016
8:00 AM – 9:30 AM
City Utility Annex—Eisenhower Conference Room
62975 Boyd Acres

Proposed Agenda

I. **Welcoming Remarks and Introductions**, All, 5 minutes
Objectives: Introductions, review agenda; provide comments on June meeting summary.

II. **General Updates,** All, 10 min.
Objectives: Receive updates on Stormwater Program activities since our last meeting including regulatory issues (e.g. NPDES permit reissuance; UIC permits), infrastructure improvement projects; UIC retrofit project update, summer outreach, Clean Water Works Partnership Program timeline revision, new compliance technician position, etc.

III. **Review: DRAFT FY2015-16 Annual Report** All, 15-20 minutes
Objectives: Provide comments on draft FY2015-16 Annual Report, a final version of which is due to Oregon DEQ by November 1, 2016.

IV. **Sweeper Efficiency Discussion,** Wendy, All, 10-15 minutes
Objectives: Review and help refine ideas to improve street sweeping efficiency

V. **Monitoring Program**, All, 10-15 minutes
Objectives: Review current monitoring program and discuss potential special projects.

VI. **Future Meetings Preparation: Long term Drainage Post-Construction Controls in an Increasingly Densifying Environment**, All, 10-15 minutes minutes
Objectives: Receive introduction to topic issues and discuss next steps.

VII. **Upcoming Trainings,** Wendy, 5 minutes
Objectives: Review upcoming trainings; discuss additional needs.

VIII. **Roundtable Discussion,** All, 5-10 minutes
Objectives: Open discussion, sharing of ideas.

City of Bend
Stormwater Quality Public Advisory Group
Meeting Attendance Sheet
October 26, 2016

	Name:	Organization:	Check if Yes, request final AR hardcopy:
1.	Wendy Edde	City of Bend	✓
2.	Tom Headley	Century West Engineering	✓
3.	Chris Hart-Henderson	Heart Springs Landscape Design	
4.	Steve Reazal	City of Bend	
5.	Jeff Buysteedt	COB	
6.	Ron Reuter	OSU	switch address to 1500 SW Chandler Way 97702
7.	Karna Gustafson	CBA	
8.	Gretchen Palmer	Palmer Homes	
9.	Barbara Riehl	Riehcraft Studios	✓
10.	Todd Cleveland	Deschutes Co. EDO	
11.			
12.			
13.			
14.			
15.			

CITY OF BEND

Stormwater Quality

Public Advisory Group Meeting

Wednesday, October 26, 2016
8:00 AM – 9:30 AM

Attending

Todd Cleveland (Deschutes County); Tom Headley (Century-West), Kelly Walker (Resonant Agency), Chris Hart Henderson (Heart Spring Design), Joanne Richter (UDWC); Krista Ratliff (DEQ), Wendy Edde (City of Bend)

Key Items Discussed

- **General Updates:** DEQ released the statewide NPDES MS4 Phase II permit for a 35 day public review in July and early August. Several comments were received and DEQ is currently evaluating the comments and next steps. The City has been moving forward on the drywell retrofit project—and is evaluating the first year dry-well catch-basin inserts incorporating a 36" sump in freeze-thaw conditions for quality assurance before purchasing additional. They appear to be performing well with the ring welded on for more support. Other infrastructure improvement projects for stormwater include the Awbrey Butte study, and drill hole reconditioning. The City is postponing the Clean Water Works Partnership Program until 2017 given the lack of contest entries making the original kick-off date obsolete. The City is in the midst of conducting interviews for the new stormwater Environmental Compliance position.

- **Future Meetings Preparation: Long term drainage Post-Construction Controls in an Increasingly Densifying Environment:** Wendy introduced the concept of having the PAG meet bimonthly and examine the strategies Bend uses to handle stormwater in light of the recent UGB passage that includes plans for Bend to increase in density by 67% over the planning period. Concepts to be evaluated will include lot level, neighborhood scale, and regional solutions, and considerations such as our geology.

  On the near term, Karna provided an overview of the Central Oregon Builder Associations concerns about onsite drainage reviews for residential properties. COBA has been working with Community Development Department personnel to formulate solutions to procedural project delays. But there is also interest to examine abilities to keep stormwater on site in situations with larger lot coverage and smaller lots.

- **Annual Report.** The PAG reviewed the draft annual report and provided comments for improving the report and the program.

- **Street Sweeping Efficiency.** City staff are working together to determine ways to improve Street Sweeping Efficiency. Concepts being considered include finding ways to clear streets of cars (via email notification, or voicemail notification, or sign boards).

- **Monitoring Program.** City staff walked through changes to the UIC monitoring program plan related to Changes in the sub-contractor changing for laboratory services, which requires revisions to the sample container sizes, shipping procedures, and chain of custody form; the need to change a sampling location on the Boyd Acres Corp Yard site to the UIC at the low point on the site due to the installation of a drywell insert; and removing temperature, PH and connectivity analytes from the monitoring plan and changing flow monitoring to optional as they were not required by the WPCF permit.

- **Trainings.** The City recently participated in a rain garden workshop, with Chris Hart-Henderson's assistance, and a stormwater tour as part of the Pacific Northwest Clean Water Agency conference. The City is providing year-end on-demand webinar trainings again this year, focused on erosion and sediment control and post-construction controls. The City is planning to host a Certified Erosion and Sediment Control Lead training in early 2017.

Key Decisions Made/Key Action Items

- The next meeting will focus on near-term solutions to stormwater drainage procedural and lot sizing drainage issues. Future meetings will focus on a series of post-construction control strategies. The goal will be to hold regular meetings every other month.
- Wendy will work to fill vacancies prior to the post-construction meeting series kick-off.
- The City will make modifications to the annual report and send the final to DEQ by the November 1 regulatory deadline.

Stormwater Quality

Public Advisory Group Meeting

CITY OF BEND

Thursday, February 2, 2017
1:30 PM – 3:00 PM
City Utility Annex—Eisenhower Conference Room
62975 Boyd Acres Rd.

Proposed Agenda

I. **Welcoming Remarks and Introductions,** All, 5-10 minutes
Objectives: Introductions, review agenda; provide comments on June meeting summary. Welcome new members. Introduce City's new Stormwater Utility Program Compliance Specialist, Sean Mulderig.

II. **General Stormwater Updates,** All, 5-10 min.
Objectives: Receive updates on Stormwater Utility activities since our last meeting: annual report submittal; NPDES permit reissuance status; monitoring plan; budget; UIC Retrofits; Awbrey Butte Drainage Study, private database development, Clean Water Works Partnership Program; public outreach pieces, sweeper efficiency.

III. **Waterwise Landscape Manual and Irrigation Dry Weather Flow Reduction Activities**, Michael Buettner, 5-10 min.
Objectives: Receive final guide that PAG reviewed last spring and brief overview of City's efforts to increase irrigation efficiency and reduce overspray that leads to dry weather flows and water waste. Receive update on additional new guides under preparation.

IV. **Certified Erosion and Sediment Control Lead Training,** 5 min.
Objectives: Receive brief update on upcoming CESCL training open to public and City staff, coming up February 27th-28th. Brief discussion on what problem areas PAG members are seeing that would be good to address/emphasize in the training.

V. **How Stormwater Drainage is Handled in Bend,** Wendy Edde, 10 min.
Objectives: Receive a brief overview of how stormwater drainage is handled in Bend, given our geological and climatic influences, and regulatory compliance needs. This presentation will provide a baseline understanding as we discuss post-construction controls and future strategies over the coming months.

VI. **Review 2017-2018 PAG Schedule and Focus** All, 5-10 min.
Objectives: City staff have outlined a schedule for future meetings on a bimonthly basis. Discuss content and timing. Agree to standing meeting date.

VII. **Near Term Residential Drainage Inspection Compliant and Proposed Solution Discussion,** Joe McClay, Ryan Oster, Karna Gustafson, Russ Grayson, All 30-40 min.

Objectives: Understand drainage review process and goals, concerns regarding, and steps taken to date to address. Provide input on benefits of, areas still needing consideration, and ideas for consideration to resolve any outstanding issues related to proposed approach (-es).

VIII. **Meeting Effectiveness Check-in/ Roundtable Discussion,** All, 5-10 min.

Objectives: Review what worked and areas to improve for next meeting.
Open discussion, sharing of ideas.

CITY OF BEND

City of Bend
Stormwater Quality Public Advisory Group
Meeting Attendance Sheet
February 2, 2017

	Name:	Organization:	Place Checkmark if Public Attendee:
	RYAN OSTER	COB	
1.	David Zarate Jr.	N/A	✓
2.	Todd Cleveland	Deschutes County CDD	
3.	David Buckley	City of Bend	
4.	Dennis Collins	Storm Water Services	
5.	GREG BRIDGE	STORM WATER SERVICES	
6.	Rondo		
7.	Lawrence Klein	Wylder Solutions	✓
8.	STEVE PRIAZAK	City of Bend	
9.	Sean Mulderig	City of Bend	
10.	Gillian Ockerer	city of Bend	
11.	MIKE DUETTNER	city of Bend	
12.	Wendy	City of Bend	
13.	Gretchen Palmer	Palmer Homes	
14.	Katie Anderson	chamber	✓
15.	Karra Gustafson	COBA	
16.	Krista Rodriguez	DEQ	
	Barbara Rich	N/A	
	Jim Lord	Ashley & Vance Engineering	✓

OVER

17. Tom Headley Centum Test Engineering

18. _____

19. _____

20. _____

21. _____

22. _____

23. _____

24. _____

25. _____

CITY OF BEND

Stormwater Quality

Public Advisory Group Meeting

Thursday, February 2, 2017
1:30 PM – 3:00 PM

Members and City Staff Attending

Katie Anderson (Bend Chamber/Aperion Management Group), Gretchen Palme (Palmer Homes), Barbara Rich (Citizen at Large), Karna Gustafson (COBA), Lawrence Klein (Wylder Solutions),Todd Cleveland (Deschutes County); Tom Headley (Century-West), Krista Ratliff (DEQ), David Buchanan, Mike Buettner, Wendy Edde, Brad Mandal, Sean Mulderig, Gillian Ockner, Ryan Oster, Steve Prazak (City of Bend)

Key Items Discussed

- **General Updates:**
  - Sean Mulderig was introduced as the City's new Stormwater Program Utility Compliance Specialist. His work will focus on assisting with inspections for erosion and sediment controls, and post-construction controls operation and maintenance verification.
  - City submitted the Stormwater Annual report by the November 1 deadline and also received approval from DEQ for the changes to the UIC Monitoring Plan that the City submitted last fall—the changes were in response to (a) need to move one location at the Utility corporation yard due to a conflict with an open grate UIC upgrade; (b) changes as a result of changing lab; and (c) removal from the plan of optional items not required by permit.
  - City staff have been working on next year's budget and that process will continue to higher levels including Budget Committee and Council review through the spring.
  - UIC Drywell Open Grate Retrofit Project—City has installed 26 upgrades with a drop-in catch-basin (36-inch sump) to date. The City has tracked these through cold and wet weather as part of a quality assurance process, and is happy with the results given some in-field adjustments crews are able to make. The City will be placing another order soon.
  - Awbrey Butte Drainage Study. Staff provided an overview of this study and how it ties in with the need to replace the Newport stormwater line.
  - City is working to hire a temporary employee to help compile existing data in developing a private stormwater facility database to help (a) know locations for protection during emergency situations, and (b) to help refine our understanding of the amount of stormwater being managed by means other than public discharge to the river.

- City is working to kick off the 2017 Clean Water Works Partnership Program in April with Earth Day. Student video and poetry contests are occurring with an April 29 due date. The program will focus on similar partners as the original but we are looking to increase reach to RV rental/dealers, landscapers, and pressure washers as well.

- **Waterwise Landscape Manual and Irrigation Dry Weather Flow Reduction Activities.** Mike Buettner provided a one page overview of the water conservation program and distributed copies of the Waterwise Landscape Guide that the Public Advisory Group had reviewed a draft text version of in 2016. Mike indicated that 40 of the City's water supply is used for irrigation. The water conservation program is working towards code changes in 2017, and continuing their sprinkler inspection program, which helps reduce dry weather flows that can pick up and carry pollutants to the storm drains. They will also conduct outreach to landscape contractors and are working on additional educational materials. Karna (COBA) expressed interest in potentially reducing landscaping requirements which she indicated would help reduce irrigation water needs.

- **Certified Erosion and Sediment Control Lead Training.** The training is open to the public and City staff, and will take place February 27-28. The training includes an in depth overview of erosion and sediment control needs and best management practices both in classroom and with a field component. The certification is good for both Washington and Oregon for three years.

- **Overview of How Stormwater Drainage is Handled in Bend.** Presentation provided a baseline overview of how stormwater is handled in Bend, including piped system to the river, underground injection controls, and surface infiltration.

- **Review 2017-2018 draft PAG Schedule and Focus.** Attendees reviewed a handout for key focus topics and standard meetings for the upcoming years. Attendees discussed best meeting times and days. The PAG group is proposing to change from an as needed basis, to a schedule every other month on a fixed day schedule. The plan is to meet for the next year and a half to review the onsite drainage requirements and options available. Site tours may be included.

- **Near Term Residential Drainage Inspection Complaint and Proposed Solution Discussion.** Ryan Oster (City Engineer) and Karna Gustafson (COBA) provided an overview of recent efforts address concerns brought by COBA regarding City inspection review of onsite drainage facilities. City is working with COBA. Smaller lots, more density and a couple field experience issue have risen to the surface.

  Per Bend Code Title 16, single family residential/duplex developments adding 5,000 sf need to submit a drainage submittal to manage that stormwater. There are additional instances where a drainage submittal is required for duplex or single family including if the project part of a land division or a phased development, if the project proposes a UIC facility, or if a clearing, grading and erosion control permit is required.

  The permit process for reviewing those plans can slow down Certificate of Occupancy from being issued as the contractor modifies the onsite drainage plan for necessary in-field adjustments (e.g., since the plans are so rudimentary they do not include key items such as topographical information. This can result in a plan showing an infiltration swale at the high point of the lot.) The loss of time has been costly for developers, so COBA approached the City.

  Ryan Oster indicated that short term solutions discussed include:

Stormwater Quality

Public Advisory Group Meeting

Thursday, April 6, 2017
10:10 AM – 12:00 PM
Deschutes County Library—Brooks Room
601 NW Wall Street

Proposed Agenda

I. **Welcoming Remarks and Introductions,** All, 5-10 minutes
Objectives: Introductions, review agenda; provide comments on February meeting summary.

II. **Near Term Residential Drainage Inspection Compliant and Proposed Solution Update,** Ryan Oster 5-10 min.
Objectives: Understand status and changes to drainage review process and goals, concerns regarding, and steps taken to date to address

III. **Post-Construction Stormwater Controls—Overview of Scales and Problem Definition,** Wendy Edde, 15 min.
Objectives: Review goals. Receive a brief overview of the three scales of long-term stormwater drainage facilities that the PAG will be considering in the upcoming months. . This presentation will provide a baseline understanding as we discuss post-construction controls and future strategies over the coming months.

IV. **Post-Construction Stormwater Controls and UGB Changes—Filling out the Problem Definition**, All, 45-50 min.
Objectives: Frame and define the problem(s) and underlying causes related to planned increases in density related to stormwater management. Discussions will lead to improved understanding of potential obstacles and potential options.

V. **Review Revisions to 2017-2018 PAG Schedule,** Wendy, All, 5 min.
Objectives: City staff have outlined a schedule for future meetings on a bimonthly basis. Discuss revisions to timing.

VI. **General Stormwater Updates,** All, 5-10 min.
Objectives: Receive updates on Stormwater Utility activities since our last meeting: Clean Water Works Partnership Program; NPDES permit reissuance status; UIC Retrofits; CIP projects, private database development, CESCL Training results, upcoming training opportunities.

VII. **Meeting Effectiveness Check-in/ Roundtable Discussion,** All, 10 min.
Objectives: Review what worked and areas to improve for next meeting.
Open discussion, sharing of ideas.

CITY OF BEND

City of Bend
Stormwater Quality Public Advisory Group
Meeting Attendance Sheet
April 6, 2017

	Name:	Organization:
1.	Wendy Edde	Utility - Stormwater
2.	Lawrence Klein	Wylder Solutions
3.	Brad Mandal	COB - BCDD
4.	Garrett Sabourin	COB - EIPD
5.	Joanne Richter	UDWC
6.	Daniel Buchan	COB
7.	Karra Gustafson	COBA
8.	Chris Hart-Henderson	OLCA
9.	MARK ELLINGTON	BPRD
10.	Gillian Ockner	COB
11.	RYAN OSTER	COB
12.		
13.		
14.		
15.		
16.		

CITY OF BEND

Stormwater Quality

Public Advisory Group Meeting

Thursday, April 6, 2017
10:10 AM – 12:00 PM

Members and City Staff Attending

Joanne Richter (UDWC), Karna Gustafson (COBA), Chris Hart-Henderson (Heart Springs Landscape Design), Mark Ellington (BPRD), Lawrence Klein (Wylder Solutions), David Buchanan, Wendy Edde, Brad Mandal, Gillian Ockner, Ryan Oster, Garrett Sabourin (City of Bend)

Key Items Discussed

- **General Updates:**
  - Clean Water Works campaign is scheduled to kick off on Earth Day (April 22, 2017). The City is scheduled to host a booth downtown at the Environmental Center Earth Day Fair and Parade. Stormwater staff will be handing out discount cards and working with OSU Graduate Students to mark storm drains with the "Do Not Dump" markers.
  - The City has contracted with a local graphic designer to develop several new fact sheets including; RV Waste Disposal, Pressure Washing and How to Select a Landscaper. Copies of the fact sheets were handed out to the attending PAG members.
  - The NPDES MS4 permit re-issuance is still under negotiation with Oregon DEQ. A new public draft version of the proposed general permit is currently scheduled for release at the end of September 2017.
  - The City is working to develop a private stormwater facility database. A temporary employee is currently reviewing private drainage plans and entering stormwater facility data into database along with coordinate data. Once complete the data will be uploaded into a GIS layer.

- **Near Term Residential Drainage Inspection Compliant and Proposed** (Ryan)
  The City has a long-term goal of developing revised guidelines for residential stormwater controls. Infill projects with smaller lots are making it harder to keep stormwater onsite. City staff have identified some procedural issues with the existing residential stormwater inspection process that have resulted in delays. Builders are having projects delayed due to in-field changes made to the approved drainage plan. This interim process is design to fill the gap and transfer liability of those changes to the contractor. The City hopes to officially implement the revised process in the near future. Prior to finalizing the process, Karna would like to present the draft memorandum at the next COBA meeting.

- **Post-Construction Stormwater Controls—Overview of Scales and Problem Definition** (Wendy)
  Wendy gave an overview presentation on the varying scales of stormwater management including regional basin, neighborhood/street, and lot level design considerations. She showed several examples of regional stormwater retention ponds, street level planter boxes and on-site rain gardens; along with geologic and climatic considerations. With the upcoming UGB changes and smaller lot requirements, stormwater is going to play larger role in shaping development. The presentation focused on the importance of accurately and thoroughly defining the problem and set up the group exercise.

- **Post-Construction Stormwater Controls and UGB Changes**
  Filling out the Problem Definition
  Wendy provided a brief overview on the group exercises, designed to help the PAG identify the stormwater problems associated with increasing density, what is causing the issues, and what is the effect. Several large paper pads were placed throughout the room and PAG members split up into five groups to examine the issue through different perspectives: Design/Builders, Property Owners, Operations and Maintenance, Environmental Quality, Public Safety. The results of this exercise have been attached for your review.

- **Key Questions and Answers**
  - How will drainage information be carried through the subsequent property owners?
    - Commercial developments are required to have recorded stormwater maintenance agreements on the title. Residential needs improvement.
  - It would be helpful if homeowners had access to drainage plans.
    - City staff will look into available options given current and upcoming software.
  - Is there any way to notify new customers about stormwater facilities?
    - City utility staff are starting work on a new customer booklet/brochure that would be sent out to all new customers that might prove to be a vehicle for this.
  - How do road cinders that City crews put down (for winter traction) affect water quality?
    - City switched from cinders to a crushed basalt about 8 years ago; this material is much harder and doesn't turn into dust. The City has sweeping and catch basin cleaning programs to remove this material. The basalt is currently reused.
  - What is a TMDL?
    - A Total Maximum Daily Load (TMDL) is a regulatory term, describing a plan for restoring impaired waters that identifies the maximum amount of a pollutant that a body of water can receive while still meeting water quality standards.
  - Would a goal to pave unpaved roads and alleys result in increased runoff?
    - Gravel roads are compacted and considered impervious. Gravel roads will have a slow time of concentration, but generate similar amounts of runoff; it just takes more time for it to reach the drainage structures. There are a lot of good pervious surface options that could be used on alleys, such as pervious pavements.

- **Meeting Effectiveness Check-in**
  - Keep on topic, the first topic ran a little long.
  - The group provided positive feedback on the group activity.

Key Decisions Made/Key Action Items

- Attendees provided minor corrections to the February meeting summary. Wendy will make the changes.
- Next meeting is tentatively scheduled for June 1.
- Staff will work to improve communication of on site stormwater drainage facilities to subsequent landowners, especially for residential.
- Wendy asked the group if they would like to schedule an optional stormwater facility field visit in conjunction with the next meeting or would the group prefer it on the off month? The group consensus was to schedule the optional tour on the off month.
- Wendy will send out upcoming training opportunities.
- Wendy will send out the meeting group exercise to get input from public advisory group members who were not able to attend prior to the next meeting.
- The upcoming schedule of PAG meetings will be modified to examine regional controls first, then neighborhood, then onsite.

Attachment - PAG Group Brainstorm Exercise Results

Hypothesis: Increasing density will result in increased runoff and the associated problems if not properly addressed. What set of controls should the City promote/require to address in a pareto efficient and equitable manner?

Examine: what is the issue(s), what is causing the problem, what is the effect/opportunity

Design/Builders

- Affordable housing
- Lack of usable garden space
- Wheel chair accessibility
- Precipitation (historical vs. projected)
- Soil Capacity, rock, tuff, etc.
- One size does not fit all “codes”
- Code needs to address full variety of conditions.
- Readily available access to soil infiltration conditions and accompanied acceptable strategies
- Too many hard surfaces
- Lots too small, loss of usable outdoor space (swales)
- Impervious surfaces are connected directly to or on top of soil surface (tree house, stilt house & bridges)
- Last infill developer should not be responsible for entire pervious development stormwater
- Building codes limit potential solutions
- Snow storage areas are limited, not melt of areas

Property Owners/ Lifecycle Issue

- Onsite drainage control awareness
- Useful life / Maintenance
- City vs. Owner Responsibility
- Individual site vs. regional controls
- Timing of drainage controls if SDC vs. onsite (private)
- Initial cost / limited space/ varying infiltration rates
- Alternative designs

Operations and Maintenance

- Responsibility/ owner awareness
- Stormwater Maintenance Agreements (public/private interaction)

Environmental Quality

- Too much impervious surface resulting in untreated stormwater going to the river and groundwater
- Water quality protection, need pre-treatment.
- Need more storage of stormwater (to meet water shortage needs)
- We don't charge enough to deal with stormwater treatment and volume control
- Need more incentives.
- Need more regional / neighborhood storage and treatment
- Need more piolet projects build by City (education opportunities)

Public Safety

- Impervious surface ➲ increases runoff volumes ➲ road flooding
- Impervious surface ➲ increases flow rates ➲ road flooding
- Natural geology ➲ lack of infiltration ➲ increases runoff ➲ road flooding
- Leaf litter ➲ clogging of facilities ➲ road flooding
- Soil/Sediment ➲ clogging of facilities ➲ road flooding
- Road cinders ➲ clogging of facilities ➲ road flooding
- Snow ➲ clogging of facilities ➲ road flooding
- Narrow frill hole ➲ facility-types ➲ clogging of facilities ➲ road flooding
- Underground (out of sight out of mind) ➲ facility-types ➲ clogging of facilities ➲ road flooding
- Facility placed in wrong location (high point) road flooding
- Not enough facilities/ undersized drainage area ➲ road flooding
- Road flooding ➲ Emergency staff operation center
- Road flooding ➲ minimizes access
- Road flooding ➲ contribute to accidents

Stormwater Quality

Public Advisory Group

Regional/Neighborhood Facility Tour

Monday, May 15, 2017

9:00 AM – 11:30 AM
Gather at: City Utility Annex—Lobby
62975 Boyd Acres Rd.

Proposed Agenda

I. **Franklin's Garden,** Cheryl Howard, COB Volunteer Coordinator, 9:10-9:20 AM
Objectives: Volunteer effort neighborhood facility—community garden, ADA, stormwater

II. **Bear Creek Swales and Craven Way Private Streetside,** 9:25-9:40 AM
Objectives: 100-year design, and O&M

III. **Third Street Neighborhood and Regional Controls**, 9:40-10:05 AM
Objectives: Capital Improvement Project: Integrated 55-acre Drainage Basin

IV. **River Canyon Estates,** 10:15 AM
Objectives: HOA Subdivision

V. **Discovery Park,** 10:35 AM min.
Objectives: Regional Subdivision-Park Facilities.

VI. **Drainage Concept at College and Saginaw,** Jim Guild, 11:05 AM
Objectives: Hillside, conceptual public-private

VII. **Tour Effectiveness Check-in/ Roundtable Discussion,** All, 11:25 min.
Objectives: Review what worked and areas to improve for next meeting.
Open discussion, sharing of ideas.

Stormwater Quality

Public Advisory Group

Proposed Agenda

Thursday, June 8, 2017

2:00 PM – 3:30 PM
City Utility Annex—Eisenhower Conference Room
62975 Boyd Acres Rd.

Proposed Agenda

I. **Welcome and Introductions,** All, 2:00-2:10 PM
Objectives: Introductions. Review agenda and previous meeting summary. Provide brief overview of result of May tour of neighborhood and regional controls.

II. **Regional Controls: SWOT Analysis Brainstorm,** 2:10-2:30 PM
Objectives: Conduct a brief brainstorming session on the strengths, weaknesses, opportunities, and threats/barriers to regional stormwater controls in Bend considering water quality and increasing density projections.

III. **Review and Discussion: Regional Controls**, 2:30-3:15 PM
Objectives: Consider regional controls as a potential solution to addressing density increases. Explore brainstorm results and discuss; determine perspective differences (City, builder, private owner); (Geological area; drainage outfall; topography); capture questions and additional data needs.

IV. **Roundtable Discussion,** 3:15-3:22 PM
Objectives: Open discussion: e.g., recent program and member updates, upcoming events.

V. **Meeting Summary and Effectiveness Check-ins,** 3:22 – 3:30 PM
Objectives: Ensure consistency in the key messages communicated. Improve future meetings with analysis of this one. Confirm next meeting.

CITY OF BEND

City of Bend
Stormwater Quality Public Advisory Group
Field Trip Attendance Sheet
June 8, 2017

	Name:	Organization:
1.	Wendy Edde	City of Bend
2.	Karna Gustafson	COBA
3.	Barbara Rich	@ large
4.	Brad Mandal	Bend CDD
5.	Chris Hart Henderson	Heart Springs Landscape
6.	Joanne Richter	UDWC
7.	STEVE PRAZAK	City of Bend
8.	Krista Rath	DEQ
9.	David Buchan	City of Bend
10.	MARK ELLINGTON	BPRD
11.	Gillian Ockner	City of Bend
12.		
13.		
14.		
15.		
16.		

CITY OF BEND

Stormwater Quality

Public Advisory Group Meeting

Thursday, June 8, 2017
2:00 PM – 3:00 PM

Members and City Staff Attending

Joanne Richter (UDWC); Karna Gustafson (COBA); Chris Hart-Henderson (Heart Springs Landscape Design); Mark Ellington (BPRD); Barbara Rich (Citizen-at-Large), Krista Ratliff (DEQ), David Buchanan, Wendy Edde, Brad Mandal, Gillian Ockner, Ryan Oster (City of Bend)

Key Items Discussed

- **General Updates:**
    - Wendy provided an update on the Clean Water Works Video Contest. The City received 17 video submissions this year--a significant increase over last year. The videos were posted on the City`s website and the public was encouraged to vote for their favorite film. The video web page received more than 4,000 hits, most of which came in the last several hours of voting. In comparison, the City had approximately 1200 hits to its stormwater pages in the entire year before. This year the City also added a poetry contest that ran in conjunction with the video contest, and received one entry. Grand prize winners will be announced at the City Council meeting on June 21, and posted to the web thereafter.

- **PAG Group Regional Stormwater Controls SWOT Exercise – See Attachment Below**

- **Key Questions and Answers**

  Attendees discussed the following:

    - What scale is regional scale? Neighborhood, major basins, minor basins? For this effort, regional could take a subdivision(s), or may be at the end of a street. It typically stays within a subbasin.

    - Why can't parks be built in the low point of a development? Parks are built by developers and given to the Parks Department. Developers selects the least desirable / valuable land and turn that area into the park.

    - Can sports fields be used as a stormwater retention pond? Yes, but it was noted that sports fields have a lot of pressures to be usable during all weather conditions. Central Oregon hosts many tournaments. Limiting access to fields during storm events could

have an economic impacts on the region. Determination of how long they might be out of action or need for backups in case of a scheduled event should be determined.

- What information can the City provide the designers and developers to help them better address stormwater? Addressing the common misconception that "It doesn't rain here" and providing more incentives could help. Contractors tend to build to the minimum requirements.

- Managing runoff on infill lots is a big issue, the last-to-build builder should not be responsible for correcting previously approved problems.

- Does the City have a map showing the overlays where infiltration is better? The Stormwater Master Plan includes some basic infiltration zones and identifies several areas of perched groundwater. There is a lot of variability in Bend when it comes to infiltration rates, even on a single taxlot. One size doesn't fit all, need to plan for each geographic area and master plan.

- Bend is not that unique and looking outside the area is good. We do not need to reinvent the wheel every time. The City of Reno has a great program and similar climate.

Meeting Effectiveness Check-in

- The group provided positive feedback on the SWOT activity.
- Appreciation was expressed for all the varying viewpoints.
- Where is all this information going? The City will continue with this SWOT exercise for neighborhood scale and on-site, and then work with the PAG to provide and refine a written summary, revisiting areas as needed and developing recommendations for direction and/or additional study needed to help determine best direction.

Key Decisions Made/Key Action Items

- Correct typos on May summary (one of front page and one on second page)
- Recommend comparison cost data between the different facility types and scale
- Recommend looking into stormwater reuse and cost analysis.
- Research septic set back requirements from stormwater facilities.
- Need training on stormwater design for builders, based on Bend's soils.

Attachment - PAG Group Regional Stormwater Controls SWOT Exercise Results

Strengths:

- Certainty
- Visibility
- Cost Share
- Dual purpose
- Maintenance occurs
- More uniform design and construction
- Incorporates into planning much earlier
- Treatment
- Spill control

Weaknesses:

- Too far away - Expensive
- Need to incorporate into planning much earlier
- Landscapes version, takes land
- Loss of buildable lots
- Safety
- Mosquitos
- Weed control
- Expectation as a play area
- Cost?

Opportunities:

- Dual purpose (sports fields)
- Aesthetics
- Open space
- Less water usage
- Snow Storage
- Educational components
- Maintenance certainty
- Wildlife Habitat / Open Area for neighborhood gatherings
- Public Private Partnership- Public
- Cisterns
- Keeps water / pollutants out of the river
- Real-estate on “nice” water is more valuable
- Water storage
- Incentives for builders

Threats:

- Muni staffing levels
- Enforcement of maintenance
- Changing regulations
- Increased maintenance fees
- Loss of tax revenues - Local
- Lack of willing partners
- Liability - needs multiply agreements
- Design review
- Siting septic could be impacted?
- Density
- Cost- Making the lot pencil out.

DESCHUTES RIVER CLEAN-UP



Saturday, August 6th
Riverbend Park
10 am - 2 pm

www.UpperDeschutesWatershedCouncil.org

#EnjoyProtectRespect

Bend Park & Recreation District

UPPER DESCHUTES WATERSHED COUNCIL

CITY OF BEND

bendbroadband™

CALL FOR ENTRIES

CLEAN WATER WORKS
We work for clean water

PRODUCTION	Clean Water Works - TV Commercial
DIRECTOR	Student Filmmakers Grades 5-12
LOCATION	Bend, Oregon
DATE	

Entries due: Aug. 22, 2016

FREE WORKSHOP

BENDFILM
a celebration of independent cinema

"How to Make a Sweet Film on Your Mobile Device!"

Sat., August 6th
9-10am
Right before UDWC's Stream Stewardship Day
Riverbend Park

SCENE SHORT

Contest—Create a 30-Sec. Commercial

$150 Grand Prize

Chance to work with television industry professionals in studio

Chance to help out our planet

No fee to enter

Open to amateur filmmakers only from 5-12th grade

Check out last year's winner: https://youtu.be/rIOa3GCB4fQ

FOCUS

We're looking for a 30 sec spot that makes people consider the effects of pollution in our storm drains and waters.

Pollutants in Our Waters:

Where Do They Come From?

Where Do They Go?

What Can We Do?

Why Should We Care?

AWARDS

Grand prize:
- **$150**
- **Professional reproduction of film for local TV on-air flight**
- **Film screened at: BendFilm Future Filmmaker event**

Division Winners:
→ 5th-8th Grade: $100
→ 9th-12th Grade Prize: $100
→People's Choice Award: $100

All Winners:
-Entrance into Future Filmmaker award ceremony
-Film/Commercial featured on social media.

HOW TO ENTER / MORE INFO

Visit www.bendoregon.gov/cleanwaterworks,

Click the "Kid's" button

WANT B-ROLL?

Save the date: Stream Stewardship Day (10AM -1PM at Riverbend Park, Saturday August 6) and join BendFilm for the free workshop, open to all ages, just beforehand!

PC-M1

BEND UTILITY DEPARTMENT

BENDFILM a celebration of independent cinema

zolo

Kodak

Accommodation Information for People with Disabilities
To obtain this information in an alternate format such as Braille, large print, electronic formats and audio cassette tape, please contact Karin Morris at (541)693-2141, or email Kmorris@bendoregon.gov.

UTILITY DEPARTMENT

April 5, 2017

62975 BOYD ACRES RD.
BEND, OR 97701
541-317-3000 opt. 2
Relay Users Dial 7-1-1
541-317-3046 fax
bendoregon.gov

MAYOR
Casey Roats

MAYOR PRO TEM
Sally Russell

CITY COUNCILORS
Justin Livingston
Bill Moseley
Bruce Abernethy
Nathan Boddie
Barb Campbell

CITY MANAGER
Eric King

RE: Clean Water Works Partnership Opportunity

Dear Clean Water Volunteer:

Thank you for your interest in the City of Bend Clean Water Works Partner program. The City of Bend Stormwater Utility would like to partner with you to help keep our waters clean. If you appreciate clean water *and* business enhancement, and you have already shown that you do through your work, please consider this voluntary opportunity. The City of Bend is undertaking an exciting incentive-based watershed campaign entitled Clean Water Works. Please see our website at: bendoregon.gov/cleanwaterworks. Here you can see that we have both educational and partnership aspects to the campaign.

We are seeking to support businesses and organizations like yours that are working to keep our waters clean. Should you choose to participate, the City would like to reward you by providing the following promotional materials:

➢**Promotion** on our "Discounts and Partners" page on our website (bendoregon.gov/cleanwaterworkspartners) and by other electronic media means (e.g., mention on Facebook, Twitter, or radio advertisements). We will actively encourage people to visit this page beginning in April through December, 2017 and likely beyond. The campaign will include: TV, radio, print, events and social media.



➢**Decal—**The City will provide you a Clean Water Works window decal (see image at right) to help advertise your business as one that cares about Clean Water!

➢**Discount Card**—The City will list your business and the discount of your choosing (e.g., $1 off or "buy one get one free") on our website "Discount and Partner" page, and if you respond by April 9, 2017 we will on a first come/first served basis list your business and discount on the back of our discount cards that we will print and distribute at outreach events throughout the 2017 campaign and mention your business in a Clean Water Works partner radio advertisement. The discount card will

also be available on line for your customers to print. (See below for an example discount card layout.)

- **Employee Giveaways**—The City will provide you and your employees (should you wish) Clean Water Works Partner logo-ed products for your enjoyment.

- **Display Holder Promotion** for your customer waiting area with a Clean Water Works Partner outreach sheet promoting your participation as a company that cares about clean water to your customers.

The partnership works like this—once you meet the basic criteria for this category, just fill out the attached certification form and you can take part. The criteria for your business category is as follows:

- ✓ You agree have volunteered at least three hours in the past year to protect clean water within Bend and the surrounding area (and if you are receiving this letter, then you already have!),
- ☐ You review the City of Bend Illicit Discharge fact sheet and share the information with your staff,
- ☐ You agree to label your businesses onsite storm drains, as applicable, with a pollution-prevention message—good news, the City can provide a free "do not dump" type storm drain marker for your use if your drains are not already marked.
- ☐ You agree to honor any discount that you specify through at least December 31, 2017.



Just review the attached fact sheet or available directly here:

(http://www.bendoregon.gov/home/showdocument?id=22513), complete the short, attached partnership form and email it to me at wedde@bendoregon.gov or fax it to 541-317-3046. You may also mail it to my attention at: 62975 Boyd Acres Road, Bend, OR 97701. Please contact me directly at 541-317-3018 should you have any questions. And remember, if you contact me by April 9th and offer a discount, we will do our best to include your business name on the back of the Discount card on a first come first served basis, and a mention of your business on our radio commercial.

Remember, this is a voluntary program and a means to appreciate your interest and efforts in keeping our river and drinking waters clean. Should you have any questions or if you wish additional brochures or brochures in an electronic format to distribute them to your staff, please do not hesitate to contact me at the phone number or email above.

We look forward to working with you, and thank you for your support of clean water.

Sincerely,

Wendy Edde, CSM, Stormwater Program Manager
City of Bend Utility Department
Att: Illicit Discharge Fact Sheet, Clean Water Works Partnership form

Appendix D

Illicit Discharge Controls

UTILITY DEPARTMENT

March 23, 2017

62975 BOYD ACRES RD.
BEND, OR 97701
541-317-3000 opt. 2
Relay Users Dial 7-1-1
541-317-3046 fax
bendoregon.gov

MAYOR
Casey Roats

MAYOR PRO TEM
Sally Russell

CITY COUNCILORS
Justin Livingston
Bill Moseley
Bruce Abernethy
Nathan Boddie
Barb Campbell

CITY MANAGER
Eric King

RE: Clean Water Works Partnership Opportunity

Dear Food Service Facility Owner:

The City of Bend Stormwater Utility would like to partner with you to help keep our waters clean. If you appreciate clean water *and* business enhancement, please consider this voluntary opportunity. The City of Bend is undertaking an exciting incentive-based watershed campaign entitled Clean Water Works. Please see our website at: bendoregon.gov/cleanwaterworks. Here you can see that we have both educational and partnership aspects to the campaign.

We are seeking to support businesses that are working to keep our waters clean. We have selected Food Service/Restaurant facilities within the City of Bend as potential Clean Water Works Partners. Should you choose to participate, the City would like to reward you by providing the following promotional materials:

➢**Promotion** on our "Discounts and Partners" page on our website (bendoregon.gov/cleanwaterworkspartners) and by other electronic media means (e.g., mention on Facebook, Twitter, or radio advertisements). We will actively encourage people to visit this page beginning in April through December, 2017 and likely beyond. The campaign will include: TV, radio, print, events and social media.



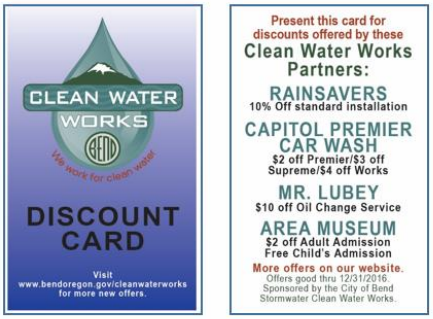
➢**Decal—**The City will provide you a Clean Water Works window decal (see image at right) to help advertise your business as one that cares about Clean Water!

➢**Discount Card**—The City will list your business and the discount of your choosing (e.g., $1 off or "buy one get one free") on our website "Discount and Partner" page, and if you respond by April 9, 2017 we will list your business and discount on the back of our discount cards that we will print and distribute at outreach events throughout the 2017 campaign and mention your business in a Clean Water Works partner radio advertisement

on a first come/first served basis. The discount card will also be available on line for your customers to print. (See back for an example discount card layout.)

- **Employee Giveaways**—The City will provide you and your employees (should you wish) Clean Water Works Partner logo-ed products for your enjoyment.

- **Display Holder Promotion** for your customer waiting area with a Clean Water Works Partner outreach sheet promoting your participation as a company that cares about clean water to your customers.



The partnership works like this—if you meet the following basic steps for your business category, just fill out the attached certification form and you can take part. The criteria for your business category is as follows:

- ✓ You have registered for a Bend Business license (and if you are receiving this letter, then you already have!),
- ✓ Your grease trap program is in good standing per the City's Industrial Pretreatment Program (and if you are receiving this letter, then you already have!),
- ☐ You agree to follow best management practices for keeping food-service-related pollutants out of the storm drain and you agree to share the best management practices information in the attached fact sheet with your staff (we can provide multiple copies upon request);
- ☐ You agree to label your businesses onsite catch basins with a pollution-prevention message—good news, the City can provide a free "do not dump" storm drain marker for your use if your drains are not already marked.
- ☐ You agree to honor the discount that you specify through at least Dec. 31, 2017.

Just review the fact sheet, complete the short partnership form and email it to me at wedde@bendoregon.gov or fax it to 541-317-3046. You may also mail it to my attention at: 62975 Boyd Acres Road, Bend, OR 97701. Please contact me directly at 541-317-3018 should you have any questions. And remember, if you contact me by April 9, 2017, we will do our best on a first come first served basis to include your business name on the back of the Discount card and a mention of your business on our fall radio commercial.

Remember, this is a voluntary program and a means to appreciate your interest and efforts in keeping our river and drinking waters clean. Should you have any questions or if you wish additional fact sheets or fact sheets in an electronic format to distribute them to your staff, please do not hesitate to contact me at the phone number or email above.

We look forward to working with you.

Sincerely,

Wendy Edde

Wendy Edde, CSM, Stormwater Program Manager
City of Bend Utility Department

Att: Food Service Fact Sheet, Clean Water Works Partnership form

Clean Water Works

2017 Partnership Participation

Yes! I would like my business to be recognized as a Clean Water Works Partner! I certify that I/my business will meet the overall criteria of the Clean Water Works Partnership program to participate.

Name (Please Print) _____ Signature _____

Business Name _____ Business Category _____

# of Employees (optional)
For # of Handouts /CWW giveaways _____

# of Point of Purchase Displays Requested
(5"x7" Tabletop Displays) _____

Discount I Will Offer and Honor _____ Discount End Date (if any) _____

☐ I would like City staff to give a brief presentation to us on clean water best management practices.

So that we may contact you to coordinate on the promotional materials, please provide the following information (please print clearly):

Email Address _____ Phone _____

Business Website _____

Please scan and email to Wendy Edde, Stormwater Program Manager, City of Bend at wedde@bendoregon.gov, fax 541-317-3046, or mail to 62975 Boyd Acres Road, Bend, OR 97701. If you would like to be recognized with your logo, please send that as well either together with this form or as soon as possible thereafter (.jpg, .png, .tiff, High resolution (≥300 dpi). Any questions, please contact Wendy at 541-317-3018.

Accommodation Information for People with Disabilities
To obtain this information in an alternate format such as Braille, large print, or electronic, please contact 541-317-3000 ext. 2 or email utilities@bendoregon.gov.

UTILITY DEPARTMENT

CLEAN WATER TIPS FOR FOOD SERVICE

Pollutant of Concern: Grease and Oil, Debris

What's the Problem?

Did you know that anything that is dumped or spilled onto outside surfaces, or is hosed into the gutter eventually gets washed by rainwater into storm drains? Unlike sanitary sewers (sinks, toilets, etc.) that flow to the water reclamation plant for treatment, our storm drains in Bend flow directly to the Deschutes River or into the ground towards our drinking water supplies without treatment.



- When it comes to cleaning, do the right thing because it's all connected! Help keep the water you serve clean!
- Take this quick survey. Do you or your staff do any of the following?

Food Service Activity Consideration	Yes	No	N/A
Do you or your staff wash kitchen mats outside in the alley or on the sidewalk?	☐	☐	☐
Do you wash building exteriors or other outside areas using soaps without blocking the storm drains, vacuuming up the wash water and pumping it to the sanitary sewer?	☐	☐	☐
Do you wash waste and dirt particles from trash containers or enclosures into the alley or street gutter?	☐	☐	☐
Do you dump grease into trash bins, street gutters, or sewers?	☐	☐	☐
Do you litter?	☐	☐	☐
Do you look the other way when an activity is occurring that can pollute our waters or harm our stormwater or sanitary sewer facilities?	☐	☐	☐

These types of activities can cause pollutants to enter and clog or pollute the storm drain system and our waters. If you answered **Yes** to any of these questions, please see the back of this fact sheet for best management practices to help keep the water you serve clean!

POLLUTANT: MULTIPLE

What Can You Do At Your Food Service Establishment to Keep Our River and Drinking Waters Clean?

Please review and implement these best management practices.

- Wash mats indoors near the kitchen floor drain or in the mop sink. If you do not have a mop sink or floor drain, take the mats to a coin- operated car wash.
- Clean outside waste storage areas and parking areas by first sweeping up food particles, cigarette butts, and trash. Then, if water or cleansers are needed, spot mop the area and dispose of water into a mop sink or toilet.
- Discharge all wash waters to the sanitary sewer. If it contains grease or oil or fats, it must be sent through a grease trap. Contract with a mobile cleaning company who agrees to collect all wash water for proper disposal.
- Keep grease storage areas clean. Collect bulk grease in containers, use a grease trap, and contract a company to haul them away. Look under "grease traps and service" in your phone directory.
- Control pests using less toxic pest management methods and appropriate timing of use.
- Train your staff to understand and use these best management practices. Be a part of the pollution solution. After all, it's all connected.
- Disposing of grease into the sanitary sewer or outside in the storm drain is prohibited. It clogs the pipes and facilities. Never put fats, grease, or oil down the storm drain or sanitary sewer.
- Make sure landscaping maintenance activities do not involve blowing, sweeping, or washing dirt and debris to the street or storm drain system. Use dry sweeping and collection methods.
- Provide adequate waste receptacles and keep dumpster lids closed.

Resources

City of Bend Illicit Discharge Minimization Best Management Practices Manual—Simple Steps to Protect Your Drinking Water and Our Beautiful Deschutes River
Bendoregon.gov/idmanual

Clean Water Works Business Resources Webpage –
access from the "Business Resources" tab on bendoregon.gov/cleanwaterworks

Commercial Illicit Discharge Prevention Fact Sheet
http://www.bendoregon.gov/modules/showdocument.aspx?documentid=22513

Bend Code Title 16.20 Illicit Discharges
http://www.bend.or.us/Modules/ShowDocument.aspx?documentid=7216

Fines & Penalties
Violating Bend Code Title 16 is a Class-A Civil Infraction, and could result in a maximum civil penalty of $750.00 per day. Each day that a violation remains uncured in effect is a separate violation.

The City of Bend gratefully acknowledges the City of Santa Monica and the Alameda Countywide Clean Water Program for the original concept and best practices noted herein.

Accommodation Information for People with Disabilities
To obtain this information in an alternate format such as Braille, large print, or electronic, please contact 541-317-3000 ext. 2 or email utilities@bendoregon.gov.

UTILITY DEPARTMENT

City of Bend (FY16-17)
Illicit Discharge Follow-up Database

Date Reported	Reported By	Type	Description	Location	Date/Time Noticed	Reported To	Followed up By	Date followed up	Status	Actions Taken/ Comments	MS4 / WPCF	Educ. Info. Provided	Enforcement Taken	Date Followed up with Reporter
7/14/2016	Public	Landscape Maintenance	Caller reported that a neighboring propert is using a landscape crew is routinely blowing pine needles and yard debris onto his side of the street.	742 SE Glenwood	Ongoing	Julie Craig	David Buchanan	7/15/2016	Closed	City staff inspected the site and could not find any signs of excessive pine needles or debris in the road. City staff tried to contact the property owner but could not locate a current phone number. City staff asked the reporter to call back next time they see the maintenance crew back out on site so City staff can provide educational materials to the crew.	WPCF	No	No	7/18/2016
7/25/2016	City of Bend	Industrial Process Water	Recived a report of white colored water running down an alley in the balsalt business park.	20732 High Desert Ct.	7/25/16 1:00 PM	David Buchanan	David Buchanan	7/25/16 12:00 AM	Closed	City Staff inspected the site and observed an opaque white colored water running out of the loading dock area and down into the alley. City staff spoke with the owner about the issue, the owner said they were doing some clean-up over the weekend and may have hosed some material out the door. This business makes solid surface (Corian) countertops and has an on-site filter system to collect and recycle the process water. A lady working at the front desk mentioned that the filters may have plugged. City staff informed the Business Owner that discharging such material into the alley is prohibited and could cause pluggin of the on-site UIC drainage system.	WPCF (Private UIC)	Yes, IDDE Manual	Verbal Warinig	7/25/2016
7/28/2016	Public	Erosion Control Issue	Caller reported that the contractor working on the Riverside Market doesn't have any erosion control installed and allot of dirt has gotten into the storm drain.	285 NW RIVERSIDE BLVD	7/28/16 12:00 AM	David Buchanan	David Buchanan	7/28/16 12:00 AM	Closed	City Staff inspected the site and found that a contractor has removed the north curb line and sidewalk. The existing storm drains did not have inlet protection and the catch basin had a significant amount of dirt in it. City stormwater staff notified City ROW inspection staff of the issue, the inspector met with the contractor. The contractor is going to remove the material form the pipe and install inlet protection.	NPDES	No	Withheld Inspection until clean-up is competed	N/A- Caller did not provide contact information.
8/16/2016	City of Bend	Concrete Washout	City of Bend sweeper staff noticed a concrete truck being washed out into a stormwater swale at the 15th and Bear creek roundabout. The work was part of the CET bus stop project.	1509 SE BEAR CREEK RD	8/16/16 10:00 AM	Adam Malinowski	David Buchanan	8/16/16 1:30 PM	Closed	Cascade Eeast Transit is working with a local contractor to install bus stops at multiple locations through the City. Stormwater Staff contacted both City inspection staff and CET project manager informing them of the issue. Stormwater staff received a follow-up email from the Contractor (Wayne Schatz). City staff spoke with Wayne, where he admitted to washing out the concrete truck into the swale. Stormwater staff informed Wayne that washing out concrete slurry into a swale is not allowed and they need to collect and disposed of the waste properly.	Surface Discharge	Yes, Verbal	Verbal Warinig	8/16/2016 2:30PM
8/23/2016	City of Bend	Carpet Cleaning	A City of Bend water treatment operator noticed a hose discharging carping cleaning waste into the street in downtown Bend. The caller notified stormwater maintenance crews who forwarded the message to the water quality group.	750 NW Lava	8/23/16 10:30 AM	Ian Klotz	David Buchanan	8/23/16 10:45 AM	Closed	City Crew went out and inspected the site, and found a carpet cleaner discharging soapy water int the street near 750 NW Lava Rd. City staff spoke with the Stanley Steemer van operator "Keith". City staff provided Keith a copy of the IDDE flyer and an Illicit Discharge Manual. Keith quickly shut down the cleaner and removed the hose from the roadway. City Staff followed up on 8/30 with a written notice of violation.	WPCF	Yes, IDDE Flyer and IDDE Manual	NOV/ Written Warning	8/23/2016
9/14/2016	City of Bend	Construction Sediment	City Planning held up a final plat under sediment issues cleared/cleaned.	27th Street, Livingston Drive & Benson Way	9/8/16 by inspectors; 9/14/2016 by planning to Utilities	Wendy Edde	Aaron Henson; Wendy Edde	9/14/16 12:00 AM	Closed	Aaron Henson indicated final plat would not be signed off until punch list complete. Ty Cosntruciton codnucted additional work and sent photos. Wendy Edde asked for sweeping of tracked sediments. Ty indicated they had swept but would sweep again.	WPCF	Yes; Aaron provided a spec sheet	Delayed sign-off	9/14/2016

City of Bend (FY16-17)
Illicit Discharge Follow-up Database

Date Reported	Reported By	Type	Description	Location	Date/Time Noticed	Reported To	Followed up By	Date followed up	Status	Actions Taken/ Comments	MS4 / WPCF	Educ. Info. Provided	Enforcement Taken	Date Followed up with Reporter
9/26/2016	Public (private citizen)	Asphalt Equipment Cleanout	A asphalt sealing company looked to be dumping materail from a large tank onto the ground and into a cacth basin. It's likely draining into a private UIC on their site although I have not confirmed that	at 821 NE 2nd Street	9/26/2016 10:20am	Wendy Edde	Wendy Edde and Matt Kohlbecker (DEQ)	9/26/16 1:04 PM	Open	City staff conducted a site visit and researched the DEQ UIC database. There is no registered or rule authorized UICs listed for that site and It does not appear to have left the site or impact our drywell on NE2nd DDW007539. Because of the registration on on-site illicit discharge combo, City staff notified DEQ for registration and enforcement coordination. City staff contacted the owner via certified letter (due to full voicemail) and email and facilitieated communication with DEQ staff. During an onsite inspection, City staff noted that there is evidence of in the past another asphalt/slurry type discharge leaving the site crossing our sidewalk on NE2nd and entering a dirt swale towards our DDH009551. (See photos). I am planning on reaching out to the company with regards to this issue as well. City staff created CSR to have staff clean up sidewalk/swale.	WPCF	Yes	DEQ Issued a Fine	11/8/2106
9/27/2016	Public	Vegetation Debris	Homeowner at 1415 Awbrey Road indicated he has asked 3 times of the homeowner/landscaper at 1414 Awbrey Road to not blow leaves across the street It continues. Usually there on Tuesdays from 11:30-12 Noon. Also upset about lack of street sweeping since spa went in and lots of cars on roadway.	1414 Awbrey Raod	Tuesdays 11:30-Noon	Wendy Edde	Wendy Edde	10/4/16 (late, conflict) ; 10/11/16; 10/18/16; 11/8/16	Closed	Drove by on Tuesday's once late. Did not see problem any worse than on the rest of the street. Homes were cleaned but could have been properly disposed of. Contacted caller on 10/19 to provide update, request if he sees it again to take photos or video. Caller complained we had not done anything and he threatened physical violence (to homeowner). Calmed him down and explained steps we were taking. Visited site on 11/8 and saw and spoke with landscapers (unmarked green truck)--Angie. Angie said they would stop sending to street and would pass along the door hanger to the homeowner. Complainant expressed appreciation during follow-up call on 11/8/16.	MS4	Yes, provide Code envofrcmeent yard debris/rubbish door hanger to Angie.	Education; Written and Verbal	10/19/2016;11/8/2016
9/29/2016	Public	Car Washing	A new neighbor has moved in next door and was operating a car detailing business out of his home. Neighbor has since stopped professionally cleaning cars but person did cleaned a U-Haul truck they had rented.	19899 Quale Pine Loop	Ongoing	Wendy Edde	David Buchanan	11/15/16 11:00 AM		City of Bend Staff spoke with the Tenant and provided him with a copy of the BMP manual and a pressure washing brochure. He said that he no longer washes vehicle at the house and that he is now using Red Carpet Car Wash.	WPCF	Yes	Verbal Warinig	
10/5/2016	City of Bend	Erosion Control Issue	Contractor is tracking material out into the roadway, project has no inlet protection on catch bains.	19194 NW Park Commons DR	10/5/16 12:00 AM	Wendy Edde	Dave Lee / David Buchanan	11/15/16 10:30 AM	Closed	City of Bend Staff inspected the site and found a landscaper had built a gravel berm to protect the curb. The landscaper agreed to remove the gravel a sweep the roadway. City staff recommend they use wood ramps to protect the curb.	WPCF	Yes	Verbal Warinig	
11/14/2016	City of Bend	Leaky Vehicle	His nighbor parks a leaking surbanban in the roadway, leaving large stains on the road.	1736 NE Heavenly Dr	11/14/16 12:00 AM	David Buchanan	David Buchanan	11/15/16 10:15 AM	Closed	City staff left an IDDE flyer on front door and one on vehicle windshield.	WPCF	Yes	Flyer	11/15/16 1:30 PM
11/14/2016	City of Bend	Erosion Control Issue	Stock piles in roadway.	Tri-star / Boyd Acers	11/14/2016	David Buchanan	David Buchanan	11/15/16 10:00 AM	Closed	Could not locate the issue.	WPCF	No	NA	11/15/16 1:30 PM
11/18/2016	Public	Industrial Process Water	City staff received a call from a citizen indicating that a white dust residue is being washed down into a storm drain at 63595 Hunnell Road from the workers at "Rock Hard Granite" in Suite 120. The caller has talked to them and their landlord and the practice has not stopped. He says they have been doing it the last year and the storm drain is now pooling up to the degree they now have to walk around it. He says they hose it down and the company mixes concrete, etc. He would like to remain anonymous unless it escalates to a court action and then he would be willing to be a witness. He would like us to let him know the steps we take. I told him we start with education.	63595 Hunnell Road	11/18/16 12:00 PM	Wendy Edde	David Buchanan	11/18/16 12:00 AM	Open	City staff inspected the site and spoke with Kyle Burch, Rock Hard Granite manager. The site has onsite sumps that they use to collect the saw cut water, some material is getting tracked out into the back parking lot/loading area by a fork lift. Kyle said they contract with a private sweeper to clean the area weekly. City staff provided Kyle with an illicit discharge fact sheet and a BMP manual. Adjoining business owner has a trailer parked along the curb line, preventing the sweeper from fully cleaning up that area.	WPCF	Yes	Verbal Warinig	11/18/15 1:00 PM

City of Bend (FY16-17)
Illicit Discharge Follow-up Database

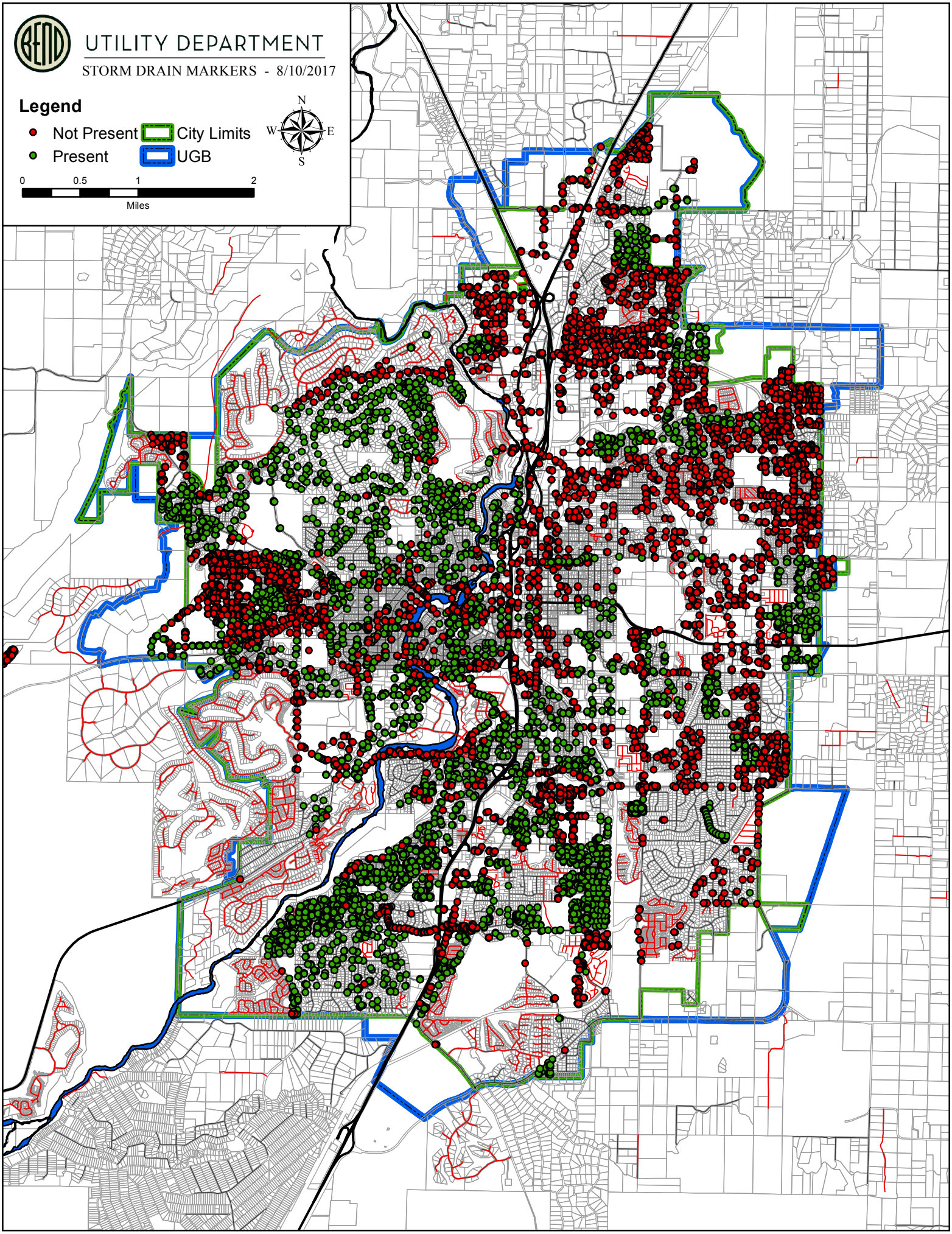
Date Reported	Reported By	Type	Description	Location	Date/Time Noticed	Reported To	Followed up By	Date followed up	Status	Actions Taken/ Comments	MS4 / WPCF	Educ. Info. Provided	Enforcement Taken	Date Followed up with Reporter
11/29/2016	Public (CSR 63271)	Spill	City staff received a call from a concerned citizen who observed a home being demolished, and excavator knocking over an old heating oil tank. Some fluid came out of tank and spilled onto the ground.	61320 Blakey Rd	11/29/16 12:16 PM	David Buchanan	David Buchanan	11/29/16 1:30 PM	Closed	City staff went out and spoke with the contractor. The Contractor said they were hired to tear down the home and were not aware of the oil tank. The contractor told staff that a fitting had broken off the tank leaking 20-30 gallons of oil before they could stop the leak. He said they planned on hauling the reaming oil and tank to an off site location to reuse the remaining oil in his furnace. City staff also contacted Oregon DEQ, according to DEQ they are only responsible for underground tanks and that the Fire Marshal oversees above ground tanks. DEQ didn't think the fire marshal had any permit requirements for decommissioning. DEQ was concerned with the spilled oil, but said that estimated spilled quantity was below DEQ's action level.	NA	Yes	Verbal Warinig	11/29/2016 2:30pm
12/30/2016	Public	Spill	Bend Garbage broke a hydrolic line in the parking lot behind 378 NE Greenwood Ave and was requesting assistance with the clean-up	378 NE Greenwood Ave.	12/30/16 6:00 AM	David Buchanan	David Buchanan	1/3/16 8:30 AM	Closed	City staff was out of the office, and returned the call on 1/3/2016. City staff left a voive mail with Bend Garbage.	Private UIC	NA	NA	NA
1/26/2017	Public	Leaky Vehicle	Contractor has parked a leaking forklist in the roadway.	1472 NW Discovery Park Dr.	1/26/17 3:20 PM	David Buchanan	David Buchanan	1/26/17 3:30 PM	Closed	City of Bend stormwater staff contacted Aaron with Salvensen Homes at 541-788-4572 and asked them to clean up the spilled material. City staff stopped by the site on Friday at 11:20 am and left an illicit discharge flyer with framer on-site, at that point the Builder had applied some absorbent in the roadway, additional cleanup was still needed. Off duty city staff drove by on Sunday afternoon and the leaked material was not fully cleaned up. City Staff called back on Monday (1/30/2017) at 8:30 am, staff requested that the Builder remove oil soaked slush in the street and place additional absorbent in the roadway. City crews cleaned the down stream sed-manhole, staff noted an oily sheen in sed-manhole.	Discovery Pond	Verbal	Warning	1/27/17 9:00 AM
3/1/2014	DEQ	Saw Cut Slurry	Nelson Tile and Stone, countertop saw cut slurry is running down into the onsite catch basin.	1875 NE Division St	Ongoing	David Buchanan	David Buchanan	3/7/2017 2:00PM	Open	Stormwater staff inspected the site on and did not see any signs of				
3/9/2017	Public	Portable Toilet	I'm not sure if I'm contacting the correct department with this question, but it is in regards to a storm drain in front of my property and what had been flowing into it for at least a month. With new building construction taking place in my neighborhood, the realtor in charge had a portable toilet moved away from the work site and placed ~ 10-20 from the storm drain in the street. I contacted the company with my concerns and was assured it would be moved. 5 to 6 weeks later, and several phone calls, it was finally moved. However a lot of detritus from the toilet being emptied is still on the road and with the snow and rain, is being carried into the drain. I am not sure if this is something you care to know about or if it is a big deal or not. This all transpired in front of 60963 Miles court if this helps. If someone wants to ask further questions of me, feel free to use either my email, or my phone number 541-508-8226. Justin	60952 SE Miles	3/9/17 8:00 AM	City of Bend: Utility Customer Comment	Buchanan / Mulderig	3/9/17 10:00 AM	Closed	City stormwater staff performed a site Inspection on 3/9/201 at 10:00 am. City found a portable toiled had Bend place in the road/cul-de-sac, City staff noticed some sediment and construction debris present in the roadway. There was no obvious signs of toilet leakage . City stall call and left a message for the Builder, Franklin Brother LLC.	NPDES	No	Yes	3/9/2017

City of Bend (FY16-17)
Illicit Discharge Follow-up Database

Date Reported	Reported By	Type	Description	Location	Date/Time Noticed	Reported To	Followed up By	Date followed up	Status	Actions Taken/ Comments	MS4 / WPCF	Educ. Info. Provided	Enforcement Taken	Date Followed up with Reporter
4/11/2017	Public	Sewer Overflow	Recived a report that the Sage Springs Aprartment had sewer flowing out of a manhole and into a stormwater swale.	900 NE Warner Pl	4/11/17 9:00 AM	David Buchanan	David Buchanan	4/11/17 9:15 AM	Open	City staff inspected the parking area at Sage Springs Apartments Building off of Boyd Acres and found a manhole on the north side of the property was overflowing into a swale. Stormwater Staff contacted City Collections staff, according to City collection staff, this is the second overflow event at the site. They said a private plumber responded to the first overflow and noted that the pump station was poorly designed and was not getting maintained properly. I talked with City of Bend Water Quality Manager about the issue and City staff decided to notify DEQ for enforcement, given the public health risk.	Private Surface Discharge	No	NOV/ Written Warning	NA
4/13/2017	City of Bend	Pesticide	City of Bend staff noticed some pesticide in the bike lane near 18th and Brinson.	62915 18TH ST	4/14/17 2:45 PM	David Buchanan	David Buchanan	4/13/17 3:20 PM	Closed	City staff inspected the site and took several photos of the issue, small white pellets where observed in the bike lane mixed in to the road cinder. City staff left a Message for the Basalt Business Park using the phone number posed on the web site on 4/14/2017. City staff had not received a call back by 4/19. On 4/19 City staff contacted the onsite tenant, they directed City staff to contact Compass Commercial. City staff talked with Paul (Property Maintenance manager), and He said they hire out the landscaping to (Bill) with Summit Landscaping Ph# 541-280-3290. City staff left a message for Bill's voicemail on 4/19. City staff spoke with Bill at Summit Landscaping on 4/49/2017. City staff informed Bill of the Issue, Bill said he would talk with his staff. Bill said their normal practice is to blow the material back into the planning areas.	WPCF	Yes	Verbal Warinig	4/19/2017
4/19/2017	City of Bend	Oil Spill / Dumping	Stormwater maintanence crews noticed some oil in a catch basin on Red Rock Ln	1982 Red Rock Ln	4/18/17 2:00 PM	Sean Mulderig	David Buchanan	4/19/2017	Closed	City staff inspected the area and found signs of oil staining on the ground near catch basin DCB000334. Looked like someone may be parking a leaking vehicle over the catch basin, or possibly dumping oil onto the ground. City staff left IDDE flyers on the front doors of the surrounding homes.	WPCF	Yes	IDDE flyers	4/19/2017
4/25/2017	Forwareded From Code Inforcement	Sewer Overflow	Recived a report that the Sage Springs Aprartment had sewer flowing out of a manhole and into a stormwater swale.	900 NE Warner Pl	4/25/17 9:00 AM	David Buchanan	David Buchanan	4/25/17 9:30 AM	Open	City of Bend staff went out and took photos of the overflow and contacted the property management company (Greg Bigford & Norris and Stevens Property Management 503-225-8447 .	Private Surface Discharge	Yes	NOV Mailed on previous event.	
4/26/2017	City of Bend	Concrete Washout	Stormwater maintenance crews noticed someone had rinsed some concrete waste into a swale at the end of Outcrop Lane.	20950 NE TALUS PL	4/26/17 10:30 AM	David Buchanan	David Buchanan / Sean Mulderig	4/26/17 11:00 AM	Closed	City of Bend staff went out to the site to investigate. Staff took several photos and spoke to the construction site Forman working across the street. The contractor did not think his trucks had cleaned out in the swale and showed City staff the location they have been using to clean out concrete trucks. City of Bend inspector noted a debris pile that had potential to cause erosion. Contactor responded on 4/28 say they had removed the concrete from the stormwater swale and cleaned up the debris pile.	Surface Discharge	Yes, Verbal	ESC Manual	4/28/2017
5/2/2017	City of Bend	Sewer Overflow	Received a call that from City stormwater maintenance that someone may have dumped an RV waste tank in the catch basin near Dean Swift Road and Damascus Lane.	21033 Damascus Lane	5/2/17 8:00 AM	David Buchanan	David Buchanan	5/2/17 9:00 AM	Closed	Stormwater staff inspected the site and found a recently repaired pressure lateral. Looks like the sewage came from the grass planter strip between the curb and sidewalk, ran overtop the curb and down into the catch basin. Stormwater department will forward this to the collections department for cleanup.	WPCF	NA	NA	5/2/2017
5/14/2017	City of Bend	Range Hood Cleaning	City of Bend Staff received an anonymous complaint that the restaurant is washing down the Range hood in the parking lot.	62910 O.B. Riley Road	Ongoing	David Buchanan	David Buchanan	5/15/17 1:30 PM	Closed	City of Bend Staff stopped by on 5/18/2017 at 1:30 pm and spoke with the kitchen manager. He said that they hire out the hood cleaning to a separate business. City staff informant the kitchen manager that wash water from hood cleaning is not allowed in the catch basin. Water should be collected and disposed in the sanitary sewer. City staff provided pressure cleaning brochure and IDDE manual.	WPCF	IDDE Manual, Pressure Washing Guide	Verbal Warinig	5/19/2017

City of Bend (FY16-17)
Illicit Discharge Follow-up Database

Date Reported	Reported By	Type	Description	Location	Date/Time Noticed	Reported To	Followed up By	Date followed up	Status	Actions Taken/ Comments	MS4 / WPCF	Educ. Info. Provided	Enforcement Taken	Date Followed up with Reporter
5/15/2017	City of Bend	Landscape Maintenance	City staff noticed some white granular pellets in the bike land and several feet ou into the travel lane. The material looked like some sort of fertilizer material. A Mill Point landscape maintenance truck was parked in the area.	Reed Market Rd / Brookswood Blvd RAB	5/15/17 10:15 AM	David Buchanan	David Buchanan	5/15/17 10:15 AM	Closed	Doug with water conservation stopped by Mill Site earlier in the morning and spoke to the maintenance supervisor.	WPCF	Yes, Verbal	Verbal Warinig	5/15/2017
5/18/2017	Public	Auto Shop	City staff received a complaint that Northgate Auto Repair on Halfway Rd off Jamison drains tubes from vehicle to storm drain - appears to be draining vehicle fluid.	20360 Halfway Rd	5/18/2017 12:15PM	David Buchanan	David Buchanan	5/15/17 1:00 PM	Closed	City of Bend inspected both onsite and public catch basins in the area. Staff did not see any residual materials on any of the grates. A private contractor was onsite collecting HAZ waste materials being stored in barrels behind the shop. City staff talked with the shop's owner, informing them of the complaint. The shop owner said that they spend allot of money on a HAZ waste Contractor to properly dispose of their waste.	WPCF	Yes, Verbal	Verbal Warinig	
6/9/2017	City of Bend	RV Waste Dumping	City maintance crews noticed an RV park near a catch bain that looked like it had dumped an unkowin substance.	59 SW Hayes Ave	6/9/17 5:45 AM	David Buchanan	David Buchanan	6/9/17 7:30 PM	Closed	City staff knocked on the RV`s door, but nobody answered. Staff left and IDDE flyer and RV waste disposal fact sheet on the windshield. Plate # HD00316. Stormwater Staff also notified Bend PD to coordinate enforcement. Re-inspected the site on 6/19/2017 and the RV was gone.	WPCF	Yes, Flyers	Bend PD	5/9/2017
6/20/2017	City of Bend	Catch Basin Dumping	Received a complaint that a business is dumping waste from a floor cleaner into an onsite drywell.	20724 Carmen Loop #120	6/20/17 3:21 PM	David Buchanan	David Buchanan		Closed	City of Bend inspected the site and spoke with the onsite manager. According to the manager this was done by accident, a new employee dump the waste and had not been properly trained. Later that day Stormwater staff also spoke with the business owner over the phone. City staff provided the manager with a copy of the IDDE manual and the ID flyer.	Private WPCF	Yes		
6/30/2017	City of Bend	Brewery Waste	Stormwater maintenance crews reported strong yeast smell from a catch basin down stream from the brewery.		6/30/17 10:45 AM	David Buchanan	David Buchanan	6/30/2017	Closed	Inspected the site and took photos. Most likely the material either came from a spill by agri-cycle while transferring waste or from washing down a spill in the parking lot. Stormwater staff coordinated a follow-up response with IPP. IPP already had a meeting scheduled with the on-site manager for the following week. To resolve this issue permanently, a new berm will need to be installed to contain any spill onsite.	WPCF	Verbal	Verbal Warinig	6/30/2017
7/1/2017	Public	Spill	Neighbor continues to dump motor oil in alley to controll dust.	Florida Ave	7/21/2017	Wendy Edde	David Buchanan	8/2/2017	Open	City staff went out to the area and spoke with a coulpe of the neighbors.				
7/24/2017	City of Bend & Public	Sewer Overflow	Recived a report that the Sage Springs Apartment had sewer flowing out of a manhole and into a stormwater swale.	900 NE Warner Pl	7/24/17 8:15 AM	David Buchanan	David Buchanan	7/24/17 10:00 AM	Open	City of Bend staff took photos of the overflow and contacted the property management company (Greg Bigford & Norris and Stevens Property Management 503-225-8447).	Private Surface Discharge		NOV - Final Notice	


UTILITY DEPARTMENT
STORM DRAIN MARKERS - 8/10/2017
Legend
Not Present
Present
City Limits
UGB
N
W
E
S
0
0.5
1
2
Miles

Compliance Detail

City of Bend

Filtered by: Training: Concrete Use and Disposal

Row	Assigned To	Assigned Location	Progress	Due Date	Start	Completed By	Completed On	View
1	Lansdowne, Heidi	Wall St Annex	Not Started	2/28/17				
2	Newton, Joe	Pilot Butte Campus	Complete	2/28/17	2/7/17	Newton, Joe	2/7/17	View
3	Packebush, Warren	Boyd Acres	Complete	2/28/17	1/31/17	Packebush, Warren	1/31/17	View
4	Hartman, Cindy	Wall St Annex	Complete	2/28/17	2/2/17	Hartman, Cindy	2/2/17	View
5	Hamilton, Grant	Boyd Acres	Not Started	2/28/17				
6	Brick, Paul	Boyd Acres	Complete	2/28/17	3/20/17	Brick, Paul	3/20/17	View
7	Gillette, Mike	Boyd Acres	Complete	2/28/17	2/10/17	Gillette, Mike	2/10/17	View
8	Mickey, Marc	Water Reclamation Facility	Complete	2/28/17	3/17/17	Mickey, Marc	3/17/17	View
9	Ristoff, Kelly	Boyd Acres	Complete	2/28/17	2/2/17	Ristoff, Kelly	2/2/17	View
10	McCloskey, Marcus	Boyd Acres	Complete	2/28/17	1/31/17	McCloskey, Marcus	1/31/17	View
11	Cannon, Dennis	Pilot Butte Campus	Not Started	2/28/17				
12	Vaughan, Ken	Boyd Acres	Complete	2/28/17	1/31/17	Vaughan, Ken	1/31/17	View
13	Towell, Chad	Pilot Butte Campus	Complete	2/28/17	2/2/17	Towell, Chad	2/2/17	View
14	Hopkins, Robert	Boyd Acres	Complete	2/28/17	1/31/17	Hopkins, Robert	1/31/17	View
15	Malinowski, Adam	Pilot Butte Campus	Complete	2/28/17	2/9/17	Malinowski, Adam	2/9/17	View
16	Blackwelder, Brice	Boyd Acres	Complete	2/28/17	2/9/17	Blackwelder, Brice	2/9/17	View
17	Qual, Craig	Pilot Butte Campus	Complete	2/28/17	2/22/17	Qual, Craig	2/22/17	View
18	Byrd, Steve	Boyd Acres	Complete	2/28/17	2/9/17	Byrd, Steve	2/9/17	View
19	Walsworth, Justin	Boyd Acres	Complete	2/28/17	2/9/17	Walsworth, Justin	2/9/17	View
20	Rogers, William "Ed"	Water Reclamation Facility	Complete	2/28/17	3/17/17	Rogers, William "Ed"	3/17/17	View
21	Roshone, Elmer	Water Reclamation Facility	Complete	2/28/17	2/13/17	Roshone, Elmer	2/13/17	View
22	Buhmann, Donald	Boyd Acres	Complete	2/28/17	3/3/17	Buhmann, Donald	3/3/17	View
23	Milligan, Will	Boyd Acres	Complete	2/28/17	2/1/17	Milligan, Will	2/1/17	View
24	Skaggs, Dan	Boyd Acres	Complete	2/28/17	2/24/17	Skaggs, Dan	2/24/17	View
25	Findley, Mike	Boyd Acres	Complete	2/28/17	1/31/17	Findley, Mike	1/31/17	View

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City of Bend

Filtered by: Training: Concrete Use and Disposal

26	Newberg, Doug	Pilot Butte Campus	Complete	2/28/17	2/2/17	Newberg, Doug	2/2/17	View
27	Mosher, Chris	Boyd Acres	Complete	2/28/17	2/17/17	Mosher, Chris	2/17/17	View
28	Patterson, Tyler	Boyd Acres	Complete	2/28/17	2/23/17	Patterson, Tyler	2/23/17	View
29	Carlson, Tim	Water Reclamation Facility	Complete	2/28/17	2/1/17	Carlson, Tim	2/1/17	View
30	Howe, Carl	Pilot Butte Campus	Complete	2/28/17	2/11/17	Howe, Carl	2/11/17	View
31	Smith, William	Pilot Butte Campus	Complete	2/28/17	2/2/17	Smith, William	2/2/17	View
32	Oak, David	Boyd Acres	Complete	2/28/17	2/2/17	Oak, David	2/2/17	View
33	Fore, Erynne	Water Reclamation Facility	Complete	2/28/17	2/22/17	Fore, Erynne	2/22/17	View
34	Rounds, Stuart	Boyd Acres	Complete	2/28/17	2/2/17	Rounds, Stuart	2/2/17	View
35	England, Jeff	Wall St Annex	Not Started	2/28/17				
36	Suhr, Jason	Wall St Annex	Not Started	2/28/17				
37	Blake, Christopher	Pilot Butte Campus	Complete	2/28/17	3/23/17	Blake, Christopher	3/23/17	View
38	Klotz, Ian	Boyd Acres	Complete	2/28/17	2/2/17	Klotz, Ian	2/2/17	View
39	Moulder, Lon	Water Reclamation Facility	Complete	2/28/17	2/14/17	Moulder, Lon	2/14/17	View
40	Follose, Brandon	Boyd Acres	Complete	2/28/17	2/2/17	Follose, Brandon	2/2/17	View
41	Armenta, David	Boyd Acres	Complete	2/28/17	2/9/17	Armenta, David	2/9/17	View
42	Gardner, Lucas	Pilot Butte Campus	Complete	2/28/17	2/9/17	Gardner, Lucas	2/9/17	View
43	Lessar, Joshua	Pilot Butte Campus	Complete	2/28/17	2/1/17	Lessar, Joshua	2/1/17	View
44	Davenport, Christina	Boyd Acres	Complete	2/28/17	3/13/17	Davenport, Christina	3/13/17	View
45	Schmidt, Daniel	Pilot Butte Campus	Complete	2/28/17	2/15/17	Schmidt, Daniel	2/15/17	View
46	Goe, Kerry	Pilot Butte Campus	Complete	2/28/17	2/2/17	Goe, Kerry	2/2/17	View
47	Petitmermet, Sean	Boyd Acres	Complete	2/28/17	2/8/17	Petitmermet, Sean	2/8/17	View
48	Hall, Matt	Boyd Acres	Complete	2/28/17	1/30/17	Hall, Matt	1/30/17	View
49	Dalrymple, Bret	Wall St Annex	Complete	2/28/17	2/2/17	Dalrymple, Bret	2/2/17	View
50	Beck, Troy	Boyd Acres	Complete	2/28/17	2/9/17	Beck, Troy	2/9/17	View
51	Robertson, Joshua	Wall St Annex	Not Started	2/28/17				

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City of Bend

Filtered by: Training: Concrete Use and Disposal

52	Sabourin, Garrett	Wall St Annex	Not Started	2/28/17				
53	Webster, Jessica	Wall St Annex	Complete	2/28/17	2/10/17	Webster, Jessica	2/10/17	View
54	Leath, David	Boyd Acres	Complete	2/28/17	2/24/17	Leath, David	2/24/17	View
55	Gillespie, Rhett	Bend Municipal Airport	Complete	2/28/17	3/2/17	Gillespie, Rhett	3/2/17	View
56	Baker, Galen	Pilot Butte Campus	Complete	2/28/17	3/20/17	Baker, Galen	3/20/17	View
57	Barnard, Justin	Pilot Butte Campus	Not Started	2/28/17				
58	Bean, Everett	Pilot Butte Campus	Not Started	2/28/17				
59	Nichols, Garrett	Boyd Acres	Complete	2/28/17	2/9/17	Nichols, Garrett	2/9/17	View
60	Denning, Dan	Boyd Acres	Complete	2/28/17	1/30/17	Denning, Dan	1/31/17	View
61	Marinelli, Tommy	Boyd Acres	Complete	2/28/17	2/9/17	Marinelli, Tommy	2/9/17	View
62	Kirkpatrick, Michael	Pilot Butte Campus	Complete	2/28/17	2/16/17	Kirkpatrick, Michael	2/16/17	View
63	Nelson, Jeff	Boyd Acres	Complete	2/28/17	2/2/17	Nelson, Jeff	2/2/17	View
64	Sullivan, Steven	Boyd Acres	Complete	2/28/17	2/24/17	Sullivan, Steven	2/24/17	View
65	Volkman, Richard	Pilot Butte Campus	Complete	2/28/17	3/9/17	Volkman, Richard	3/9/17	View
66	Parent, Ethan	Water Reclamation Facility	Complete	2/28/17	2/9/17	Parent, Ethan	2/9/17	View
67	Byrd, Daniel	Pilot Butte Campus	Complete	2/28/17	1/30/17	Byrd, Daniel	1/30/17	View
68	Neiswonger, Paul	Pilot Butte Campus	Complete	2/28/17	2/2/17	Neiswonger, Paul	2/2/17	View
69	Lancaster, Quirt	Pilot Butte Campus	Complete	2/28/17	2/17/17	Lancaster, Quirt	2/17/17	View
70	Rader, Barbara	Pilot Butte Campus	Complete	2/28/17	2/3/17	Rader, Barbara	2/3/17	View
71	Munson, AJ	Pilot Butte Campus	Complete	2/28/17	2/9/17	Munson, AJ	2/9/17	View
72	Dennis, Jay	Pilot Butte Campus	Complete	2/28/17	2/2/17	Dennis, Jay	2/2/17	View
73	Hall, Harold "Jimmy"	Pilot Butte Campus	Complete	2/28/17	3/9/17	Hall, Harold "Jimmy"	3/9/17	View
74	Combs, Ken	Pilot Butte Campus	Complete	2/28/17	2/3/17	Combs, Ken	2/3/17	View
75	Edwards, Mike	Boyd Acres	Complete	2/28/17	2/23/17	Edwards, Mike	2/23/17	View
76	Struck, Christopher	Wall St Annex	Complete	2/28/17	2/2/17	Struck, Christopher	2/2/17	View
77	Somers, Robyn	Boyd Acres	Complete	2/28/17	1/31/17	Somers, Robyn	1/31/17	View

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City of Bend

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78	Cashwell, Spencer	Boyd Acres	Complete	2/28/17	2/2/17	Cashwell, Spencer	2/2/17	View
79	Somers, Travis	Boyd Acres	Complete	2/28/17	2/3/17	Somers, Travis	2/3/17	View
80	Mingus, Rod	Boyd Acres	Complete	2/28/17	3/6/17	Mingus, Rod	3/6/17	View
81	Woods, Rawlin	Boyd Acres	Complete	2/28/17	2/1/17	Woods, Rawlin	2/1/17	View
82	Gardner, Greg "Scott"	Boyd Acres	Complete	2/28/17	2/24/17	Gardner, Greg "Scott"	2/24/17	View
83	Judd, Arthur	Boyd Acres	Complete	2/28/17	3/16/17	Judd, Arthur	3/16/17	View
84	Riley, Steve	Boyd Acres	Complete	2/28/17	1/31/17	Riley, Steve	1/31/17	View
85	Taylor, Oakley	Boyd Acres	Complete	2/28/17	3/9/17	Taylor, Oakley	3/9/17	View
86	Kuss, Richard	Boyd Acres	Complete	2/28/17	2/9/17	Kuss, Richard	2/9/17	View
87	Babich, Tyler	Boyd Acres	Complete	2/28/17	3/15/17	Babich, Tyler	3/15/17	View
88	Richardson, Ty	Boyd Acres	Complete	2/28/17	3/9/17	Richardson, Ty	3/9/17	View
89	Forster, Eric	Wall St Annex	Not Started	2/28/17				
90	Winter, Scott	Boyd Acres	Complete	2/28/17	1/30/17	Winter, Scott	1/30/17	View
91	Wood, Chris	Boyd Acres	Complete	2/28/17	1/31/17	Wood, Chris	1/31/17	View
92	Murray, Oliver	Wall St Annex	Complete	2/28/17	2/2/17	Murray, Oliver	2/2/17	View
93	Konop, Patrick	Wall St Annex	Complete	2/28/17	2/7/17	Konop, Patrick	2/7/17	View
94	Chamberlain, Eric	Boyd Acres	Complete	2/28/17	2/2/17	Chamberlain, Eric	2/2/17	View
95	Homgren, Joseph	Boyd Acres	Complete	2/28/17	2/6/17	Homgren, Joseph	2/6/17	View
96	Prentice, Mike	Boyd Acres	Complete	2/28/17	2/23/17	Prentice, Mike	2/23/17	View
97	Combs, Ty	Pilot Butte Campus	Complete	2/28/17	2/16/17	Combs, Ty	2/16/17	View
98	Fugate, Lance	Pilot Butte Campus	Complete	2/28/17	2/6/17	Fugate, Lance	2/6/17	View
99	Spencer, Peggy	Wall St Annex	Not Started	2/28/17				
100	Vencill, Gary	Boyd Acres	Complete	2/28/17	2/7/17	Vencill, Gary	2/7/17	View
101	Hobbs, Eric	Boyd Acres	Complete	2/28/17	2/2/17	Hobbs, Eric	2/2/17	View
102	Libolt, Orrin	Boyd Acres	Complete	2/28/17	2/2/17	Libolt, Orrin	2/2/17	View
103	Wolter, Mark	Boyd Acres	Complete	2/28/17	2/9/17	Wolter, Mark	2/9/17	View
104	Graham, Kelly	Boyd Acres	Complete	2/28/17	1/30/17	Graham, Kelly	1/30/17	View
105	Lee, Dave	Boyd Acres	Complete	2/28/17	2/16/17	Lee, Dave	2/16/17	View
106	Hickmann, Tom	Wall St Annex	Not Started	2/28/17				
107	Borrego, David	Boyd Acres	Complete	2/28/17	2/2/17	Borrego, David	2/2/17	View
108	Oster, Ryan	Wall St Annex	Not Started	2/28/17				
109	Larson, Ron	Boyd Acres	Complete	2/28/17	2/8/17	Larson, Ron	2/8/17	View

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City of Bend

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110	Mastrud, Corey	Boyd Acres	Complete	2/28/17	2/8/17	Mastrud, Corey	2/8/17	View
111	Franklet, George	Wall St Annex	Not Started	2/28/17				
112	Mulderig, Sean	Boyd Acres	Complete	2/28/17	2/3/17	Mulderig, Sean	2/3/17	View
113	Stenkamp, Skippy	Pilot Butte Campus	Complete	2/28/17	2/13/17	Stenkamp, Skippy	2/13/17	View
114	Borgognoni, Sam	Water Reclamation Facility	Complete	2/28/17	2/2/17	Borgognoni, Sam	2/2/17	View
115	Thomasson, Shanon (John)	Pilot Butte Campus	Complete	2/28/17	2/23/17	Thomasson, Shanon (John)	2/23/17	View
116	Lindsey, James	Pilot Butte Campus	Complete	2/28/17	2/7/17	Lindsey, James	2/7/17	View
117	Daniel, Jay	Pilot Butte Campus	Complete	2/28/17	2/2/17	Daniel, Jay	2/2/17	View
118	McConnell, George	Water Reclamation Facility	Complete	2/28/17	1/30/17	McConnell, George	1/30/17	View
119	Thompson, Scott	Water Reclamation Facility	Complete	2/28/17	3/20/17	Thompson, Scott	3/20/17	View
120	Burghardt, Joe	Water Reclamation Facility	Complete	2/28/17	2/21/17	Burghardt, Joe	2/21/17	View
121	Jones, Shane	Pilot Butte Campus	Complete	2/28/17	2/6/17	Jones, Shane	2/6/17	View
122	Cota, Tony	Pilot Butte Campus	Complete	2/28/17	2/24/17	Cota, Tony	2/24/17	View
123	Schwartz, James	Pilot Butte Campus	Complete	2/28/17	3/17/17	Schwartz, James	3/17/17	View
124	Waldrop, Will	Pilot Butte Campus	Complete	2/28/17	2/16/17	Waldrop, Will	2/16/17	View
125	Scarbrough, Saedell	Pilot Butte Campus	Complete	2/28/17	2/23/17	Scarbrough, Saedell	2/23/17	View
126	Prince, Jeannette	Pilot Butte Campus	Complete	2/28/17	2/1/17	Prince, Jeannette	2/1/17	View
127	Morrison, George	Pilot Butte Campus	Complete	2/28/17	1/31/17	Morrison, George	1/31/17	View
128	Armer, Mike	Pilot Butte Campus	Complete	2/28/17	2/22/17	Armer, Mike	2/22/17	View
129	Finney, Lance	Water Reclamation Facility	Complete	2/28/17	3/17/17	Finney, Lance	3/17/17	View
130	Bradley III, Roy	Water Reclamation Facility	Complete	2/28/17	3/3/17	Bradley III, Roy	3/3/17	View

Minutes since last data refresh: 4

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City of Bend

Filtered by: Training: Leaky Equipment and Fueling Training

Row	Assigned To	Assigned Location	Progress	Due Date	Start	Completed By	Completed On	View
1	Thompson, Scott	Water Reclamation Facility	Complete	9/18/15	9/10/15	Thompson, Scott	9/10/15	View
2	Vencill, Gary	Boyd Acres	Complete	9/18/15	9/8/15	Vencill, Gary	9/8/15	View
3	Newton, Joe	Pilot Butte Campus	Complete	9/18/15	9/15/15	Newton, Joe	9/15/15	View
4	Edwards, Mike	Boyd Acres	Complete	9/18/15	9/16/15	Edwards, Mike	9/16/15	View
5	Sweet, Connie	Boyd Acres	Complete	9/18/15	9/10/15	Sweet, Connie	9/10/15	View
6	Hamilton, Grant	Boyd Acres	Complete	9/18/15	9/9/15	Hamilton, Grant	9/9/15	View
7	Libolt, Orrin	Boyd Acres	Complete	9/18/15	9/10/15	Libolt, Orrin	9/10/15	View
8	Brick, Paul	Boyd Acres	Complete	9/18/15	12/10/15	Brick, Paul	12/10/15	View
9	Wolter, Mark	Boyd Acres	Complete	9/18/15	12/24/15	Wolter, Mark	12/24/15	View
10	Daniel, Jay	Pilot Butte Campus	Complete	9/18/15	11/23/15	Daniel, Jay	11/23/15	View
11	Graham, Kelly	Boyd Acres	Complete	9/18/15	9/8/15	Graham, Kelly	9/8/15	View
12	Thomasson, Shanon (John)	Pilot Butte Campus	Complete	9/18/15	11/3/15	Thomasson, Shanon (John)	11/3/15	View
13	Cashwell, Spencer	Boyd Acres	Complete	9/18/15	9/10/15	Cashwell, Spencer	9/10/15	View
14	Vaughan, Ken	Boyd Acres	Complete	9/18/15	9/10/15	Vaughan, Ken	9/10/15	View
15	Somers, Travis	Boyd Acres	Complete	9/18/15	9/10/15	Somers, Travis	12/24/15	View
16	Ristoff (AKA: Briggs), Teresa	Boyd Acres	Complete	9/18/15	9/14/15	Ristoff (AKA: Briggs), Teresa	9/14/15	View
17	Waldrop, Will	Pilot Butte Campus	Complete	9/18/15	9/17/15	Waldrop, Will	9/17/15	View
18	Canaday, Diane	Pilot Butte Campus	Complete	9/18/15	10/29/15	Canaday, Diane	10/29/15	View
19	Scarbrough, Saedell	Pilot Butte Campus	Complete	9/18/15	10/30/15	Scarbrough, Saedell	10/30/15	View
20	Hopkins, Robert	Boyd Acres	Complete	9/18/15	9/8/15	Hopkins, Robert	9/8/15	View
21	Burghardt, Joe	Water Reclamation Facility	Complete	9/18/15	9/10/15	Burghardt, Joe	9/10/15	View
22	Lee, Dave	Boyd Acres	Complete	9/18/15	10/12/15	Lee, Dave	10/12/15	View
23	Woods, Rawlin	Boyd Acres	Complete	9/18/15	9/14/15	Woods, Rawlin	9/14/15	View
24	Malinowski, Adam	Pilot Butte Campus	Complete	9/18/15	10/1/15	Malinowski, Adam	10/1/15	View
25	Byrd, Steve	Boyd Acres	Complete	9/18/15	9/14/15	Byrd, Steve	9/14/15	View

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26	Dorsey, Christine	Pilot Butte Campus	Complete	9/18/15	9/11/15	Dorsey, Christine	9/11/15	View
27	Volkman, Richard	Pilot Butte Campus	Complete	9/18/15	10/1/15	Volkman, Richard	10/1/15	View
28	Judd, Arthur	Boyd Acres	Complete	9/18/15	9/8/15	Judd, Arthur	9/8/15	View
29	Riley, Steve	Boyd Acres	Complete	9/18/15	9/17/15	Riley, Steve	9/17/15	View
30	Alley, Mary Beth	Pilot Butte Campus	Complete	9/18/15	9/14/15	Alley, Mary Beth	9/14/15	View
31	Taylor, Oakley	Boyd Acres	Complete	9/18/15	10/12/15	Taylor, Oakley	10/12/15	View
32	Walsworth, Justin	Boyd Acres	Complete	9/18/15	9/17/15	Walsworth, Justin	9/17/15	View
33	Rogers, William "Ed"	Water Reclamation Facility	Complete	9/18/15	12/10/15	Rogers, William "Ed"	12/10/15	View
34	Roshone, Elmer	Water Reclamation Facility	Complete	9/18/15	9/13/15	Roshone, Elmer	9/13/15	View
35	Hanson, Hardy	Pilot Butte Campus	Not Started	9/18/15				
36	Morrison, George	Pilot Butte Campus	Complete	9/18/15	10/18/16	Morrison, George	10/18/16	View
37	Alexander, Mark	Pilot Butte Campus	Complete	9/18/15	12/9/15	Alexander, Mark	12/9/15	View
38	Borrego, David	Boyd Acres	Complete	9/18/15	9/10/15	Borrego, David	9/10/15	View
39	Kadow, Gina	Bend Municipal Airport	Complete	9/18/15	9/24/15	Kadow, Gina	9/24/15	View
40	Patterson, Tyler	Boyd Acres	Complete	9/18/15	10/28/15	Patterson, Tyler	10/28/15	View
41	Howe, Carl	Pilot Butte Campus	Complete	9/18/15	7/20/16	Howe, Carl	7/20/16	View
42	Elpi-Trainor, Michelle	Water Reclamation Facility	Complete	9/18/15	10/4/15	Elpi-Trainor, Michelle	10/4/15	View
43	Fore, Erynne	Water Reclamation Facility	Complete	9/18/15	9/8/15	Fore, Erynne	9/8/15	View
44	Rounds, Stuart	Boyd Acres	Complete	9/18/15	9/10/15	Rounds, Stuart	9/10/15	View
45	Combs, Ty	Pilot Butte Campus	Complete	9/18/15	9/21/15	Combs, Ty	9/21/15	View
46	Abbas, David	Pilot Butte Campus	Complete	9/18/15	3/27/17	Abbas, David	3/27/17	View
47	Cota, Tony	Pilot Butte Campus	Complete	9/18/15	9/14/15	Cota, Tony	9/14/15	View
48	Combs, Ken	Pilot Butte Campus	Complete	9/18/15	9/16/15	Combs, Ken	9/16/15	View
49	Neiswonger, Paul	Pilot Butte Campus	Complete	9/18/15	10/15/15	Neiswonger, Paul	10/15/15	View

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50	Parent, Ethan	Water Reclamation Facility	Complete	9/18/15	9/10/15	Parent, Ethan	9/10/15	View
51	Walling, Tom	Water Reclamation Facility	Complete	9/18/15	9/17/15	Walling, Tom	9/17/15	View
52	Oliver, Josh	Pilot Butte Campus	Complete	9/18/15	10/28/15	Oliver, Josh	10/28/15	View
53	Utley, Aaron	Water Reclamation Facility	Complete	9/18/15	9/8/15	Utley, Aaron	9/8/15	View
54	Follose, Brandon	Boyd Acres	Complete	9/18/15	9/10/15	Follose, Brandon	9/10/15	View
55	Armenta, David	Boyd Acres	Complete	9/18/15	9/10/15	Armenta, David	9/10/15	View
56	Lessar, Joshua	Pilot Butte Campus	Complete	9/18/15	9/10/15	Lessar, Joshua	9/10/15	View
57	Winter, Scott	Boyd Acres	Complete	9/18/15	9/4/15	Winter, Scott	9/4/15	View
58	Goe, Kerry	Pilot Butte Campus	Complete	9/18/15	11/18/15	Goe, Kerry	11/18/15	View
59	Wood, Chris	Boyd Acres	Complete	9/18/15	9/9/15	Wood, Chris	9/9/15	View
60	Beck, Troy	Boyd Acres	Complete	9/18/15	11/30/15	Beck, Troy	11/30/15	View
61	McQuillen, Christy	Pilot Butte Campus	Complete	9/18/15	12/30/16	McQuillen, Christy	12/30/16	View
62	Trask, Kris	Boyd Acres	Complete	9/18/15	1/20/16	Trask, Kris	1/20/16	View
63	Finney, Lance	Water Reclamation Facility	Complete	11/30/15	12/15/15	Finney, Lance	12/15/15	View
64	Gillespie, Rhett	Bend Municipal Airport	Complete	1/4/16	2/17/16	Gillespie, Rhett	2/17/16	View
65	Bradley III, Roy	Water Reclamation Facility	Complete	3/21/16	3/30/16	Bradley III, Roy	3/30/16	View
66	LaCasse, Gary	Pilot Butte Campus	Complete	5/26/16	8/3/16	LaCasse, Gary	8/3/16	View
67	Bean, Everett	Pilot Butte Campus	Not Started	4/12/16				
68	Nichols, Garrett	Boyd Acres	Complete	8/15/16	1/23/17	Nichols, Garrett	1/23/17	View
69	Marinelli, Tommy	Boyd Acres	Complete	8/29/16	11/8/16	Marinelli, Tommy	11/8/16	View
70	Nelson, Jeff	Boyd Acres	Complete	12/27/16	1/24/17	Nelson, Jeff	1/24/17	View
71	Mulderig, Sean	Boyd Acres	Complete	1/26/17	2/3/17	Mulderig, Sean	2/3/17	View
72	Anzalone, Alta	Pilot Butte Campus	Complete	8/10/16	2/23/17	Anzalone, Alta	2/23/17	View
73	Packebush, Warren	Boyd Acres	Complete	9/18/15	9/17/15	Packebush, Warren	9/17/15	View
74	Hobbs, Eric	Boyd Acres	Complete	9/18/15	9/9/15	Hobbs, Eric	9/9/15	View

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75	Price, Julie	Boyd Acres	Complete	9/18/15	10/29/15	Price, Julie	10/29/15	View
76	Somers, Robyn	Boyd Acres	Complete	9/18/15	9/10/15	Somers, Robyn	9/10/15	View
77	McCloskey, Marcus	Boyd Acres	Complete	9/18/15	9/10/15	McCloskey, Marcus	9/10/15	View
78	Mingus, Rod	Boyd Acres	Complete	9/18/15	11/13/15	Mingus, Rod	11/13/15	View
79	Sanvitale, Spencer	Boyd Acres	Complete	9/18/15	9/10/15	Sanvitale, Spencer	9/10/15	View
80	Blackwelder, Brice	Boyd Acres	Complete	9/18/15	9/17/15	Blackwelder, Brice	9/17/15	View
81	Prazak, Steve	Boyd Acres	Complete	9/18/15	9/17/15	Prazak, Steve	9/17/15	View
82	Buchanan, David	Boyd Acres	Complete	9/18/15	9/17/15	Buchanan, David	9/17/15	View
83	Milligan, Will	Boyd Acres	Complete	9/18/15	9/11/15	Milligan, Will	9/11/15	View
84	Skaggs, Dan	Boyd Acres	Complete	9/18/15	9/17/15	Skaggs, Dan	9/17/15	View
85	Findley, Mike	Boyd Acres	Complete	9/18/15	11/23/15	Findley, Mike	11/23/15	View
86	Mosher, Chris	Boyd Acres	Complete	9/18/15	12/3/15	Mosher, Chris	12/3/15	View
87	Oak, David	Boyd Acres	Complete	9/18/15	9/18/15	Oak, David	9/18/15	View
88	Winter, Kyle	Boyd Acres	Complete	9/18/15	9/10/15	Winter, Kyle	9/10/15	View
89	Mastrud, Corey	Boyd Acres	Complete	9/18/15	9/8/15	Mastrud, Corey	9/8/15	View
90	Stensland, David	Boyd Acres	Complete	9/18/15	9/17/15	Stensland, David	9/17/15	View
91	Leath, David	Boyd Acres	Complete	9/28/15	4/28/16	Leath, David	4/28/16	View
92	Chamberlain, Eric	Boyd Acres	Complete	5/10/16	5/23/16	Chamberlain, Eric	5/23/16	View
93	Sullivan, Steven	Boyd Acres	Complete	1/10/17	2/24/17	Sullivan, Steven	2/24/17	View
94	Buystedt, Jeff	Water Reclamation Facility	Complete	9/18/15	2/4/16	Buystedt, Jeff	2/4/16	View
95	Barnes, Drexell	Water Reclamation Facility	Complete	9/18/15	9/17/15	Barnes, Drexell	9/17/15	View
96	McConnell, George	Water Reclamation Facility	Complete	9/18/15	9/11/15	McConnell, George	9/11/15	View
97	Hansen, Matthew	Water Reclamation Facility	Complete	9/18/15	1/2/16	Hansen, Matthew	1/2/16	View
98	Carlson, Tim	Water Reclamation Facility	Complete	9/18/15	9/17/15	Carlson, Tim	9/17/15	View
99	Lindsey, James	Pilot Butte Campus	Complete	9/18/15	9/9/15	Lindsey, James	9/9/15	View
100	Qual, Craig	Pilot Butte Campus	Complete	9/18/15	10/12/15	Qual, Craig	10/12/15	View
101	Truax, Tim	Water Reclamation Facility	Complete	11/10/15	3/24/17	Truax, Tim	3/24/17	View

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102	Prince, Jeannette	Pilot Butte Campus	Complete	9/18/15	9/8/15	Prince, Jeannette	9/8/15	View
103	Meistrell, Brenda	Pilot Butte Campus	Complete	9/18/15	9/10/15	Meistrell, Brenda	9/10/15	View
104	Byrd, Daniel	Pilot Butte Campus	Complete	9/18/15	9/16/15	Byrd, Daniel	9/16/15	View
105	Jackson, Dylan	Pilot Butte Campus	Complete	9/18/15	9/14/15	Jackson, Dylan	9/14/15	View
106	Gardner, Lucas	Pilot Butte Campus	Complete	9/18/15	9/10/15	Gardner, Lucas	9/10/15	View
107	Armer, Mike	Pilot Butte Campus	Complete	9/18/15	9/9/15	Armer, Mike	9/9/15	View
108	Schmidt, Daniel	Pilot Butte Campus	Complete	9/18/15	10/19/15	Schmidt, Daniel	10/19/15	View
109	Baker, Galen	Pilot Butte Campus	Complete	9/18/15	3/20/17	Baker, Galen	3/20/17	View
110	Barnard, Justin	Pilot Butte Campus	Complete	3/28/16	5/17/16	Barnard, Justin	5/17/16	View
111	Kirkpatrick, Michael	Pilot Butte Campus	Complete	9/6/16	11/22/16	Kirkpatrick, Michael	11/22/16	View
112	Gillette, Mike	Boyd Acres	Complete	9/18/15	11/5/15	Gillette, Mike	11/5/15	View
113	Packebush (pka: Kristiansen), Mary	Boyd Acres	Complete	9/18/15	9/4/15	Packebush (pka: Kristiansen), Mary	9/4/15	View
114	Ristoff, Kelly	Boyd Acres	Complete	9/18/15	9/18/15	Ristoff, Kelly	9/18/15	View
115	Wright, Kim	Boyd Acres	Complete	9/18/15	9/9/15	Wright, Kim	9/9/15	View
116	Edde, Wendy	Boyd Acres	Complete	9/18/15	10/1/15	Edde, Wendy	10/1/15	View
117	Gardner, Greg "Scott"	Boyd Acres	Complete	9/18/15	9/8/15	Gardner, Greg "Scott"	9/8/15	View
118	Buhmann, Donald	Boyd Acres	Complete	9/18/15	9/28/15	Buhmann, Donald	9/28/15	View
119	Kuss, Richard	Boyd Acres	Complete	9/18/15	9/17/15	Kuss, Richard	9/17/15	View
120	Richmond, Paul "Stu"	Boyd Acres	Complete	9/18/15	9/10/15	Richmond, Paul "Stu"	9/10/15	View
121	Judd, Gary	Bend Municipal Airport	Complete	9/18/15	9/10/15	Judd, Gary	9/10/15	View
122	Babich, Tyler	Boyd Acres	Complete	9/18/15	9/11/15	Babich, Tyler	9/11/15	View
123	Richardson, Ty	Boyd Acres	Complete	9/18/15	1/28/16	Richardson, Ty	1/28/16	View
124	Klotz, Ian	Boyd Acres	Complete	9/18/15	9/22/15	Klotz, Ian	9/22/15	View
125	Ostendorff, Shannon	Boyd Acres	Complete	9/18/15	7/14/16	Ostendorff, Shannon	7/14/16	View
126	Larson, Ron	Boyd Acres	Complete	9/18/15	9/9/15	Larson, Ron	9/9/15	View
127	Davenport, Christina	Boyd Acres	Complete	9/18/15	9/29/15	Davenport, Christina	9/29/15	View
128	Donato, Natalie	Boyd Acres	Complete	9/18/15	9/10/15	Donato, Natalie	9/10/15	View

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129	Petitmermet, Sean	Boyd Acres	Complete	9/18/15	9/10/15	Petitmermet, Sean	9/10/15	View
130	Hall, Matt	Boyd Acres	Complete	9/18/15	9/21/15	Hall, Matt	9/21/15	View
131	McAteer, Nick	Boyd Acres	Complete	12/7/15	12/31/15	McAteer, Nick	12/31/15	View
132	Denning, Dan	Boyd Acres	Complete	8/8/16	9/8/16	Denning, Dan	9/8/16	View
133	Prentice, Mike	Boyd Acres	Complete	2/13/17	2/24/17	Prentice, Mike	2/24/17	View
134	Mickey, Marc	Water Reclamation Facility	Complete	9/18/15	9/11/15	Mickey, Marc	9/11/15	View
135	Stenkamp, Skippy	Pilot Butte Campus	Complete	9/18/15	9/8/15	Stenkamp, Skippy	9/8/15	View
136	Lancaster, Quirt	Pilot Butte Campus	Complete	9/18/15	9/18/15	Lancaster, Quirt	9/18/15	View
137	Schwartz, James	Pilot Butte Campus	Complete	9/18/15	7/7/16	Schwartz, James	7/7/16	View
138	Rader, Barbara	Pilot Butte Campus	Complete	9/18/15	9/17/15	Rader, Barbara	9/17/15	View
139	Moulder, Lon	Water Reclamation Facility	Complete	9/18/15	9/22/15	Moulder, Lon	9/22/15	View
140	Borgognoni, Sam	Water Reclamation Facility	Complete	9/18/15	9/18/15	Borgognoni, Sam	9/18/15	View
141	Jones, Shane	Pilot Butte Campus	Complete	9/18/15	10/20/15	Jones, Shane	10/20/15	View
142	Newberg, Doug	Pilot Butte Campus	Complete	9/18/15	9/10/15	Newberg, Doug	9/10/15	View
143	Smith, William	Pilot Butte Campus	Complete	9/18/15	12/16/15	Smith, William	12/16/15	View
144	Hall, Harold "Jimmy"	Pilot Butte Campus	Complete	9/18/15	9/9/15	Hall, Harold "Jimmy"	9/9/15	View
145	Blake, Christopher	Pilot Butte Campus	Complete	9/18/15	9/23/15	Blake, Christopher	9/23/15	View
146	Munson, AJ	Pilot Butte Campus	Complete	9/18/15	9/14/15	Munson, AJ	9/14/15	View
147	Dennis, Jay	Pilot Butte Campus	Complete	3/28/16	5/19/16	Dennis, Jay	5/19/16	View

Minutes since last data refresh: 5

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Row	Assigned To	Assigned Location	Progress	Due Date	Start	Completed By	Completed On	View
1	Thompson, Scott	Water Reclamation Facility	Complete	9/30/15	1/25/16	Thompson, Scott	1/25/16	View
2	Edwards, Mike	Boyd Acres	Complete	9/30/15	9/16/15	Edwards, Mike	9/16/15	View
3	Packebush, Warren	Boyd Acres	Complete	9/30/15	9/17/15	Packebush, Warren	9/17/15	View
4	Brick, Paul	Boyd Acres	Complete	9/30/15	12/10/15	Brick, Paul	12/10/15	View
5	Gillette, Mike	Boyd Acres	Complete	9/30/15	11/5/15	Gillette, Mike	11/5/15	View
6	Lindsey, James	Pilot Butte Campus	Complete	9/30/15	10/9/15	Lindsey, James	10/9/15	View
7	Wolter, Mark	Boyd Acres	Complete	9/30/15	12/24/15	Wolter, Mark	12/24/15	View
8	Daniel, Jay	Pilot Butte Campus	Complete	9/30/15	11/23/15	Daniel, Jay	11/23/15	View
9	Graham, Kelly	Boyd Acres	Complete	9/30/15	10/1/15	Graham, Kelly	10/1/15	View
10	Packebush (pka: Kristiansen), Mary	Boyd Acres	Complete	9/30/15	9/30/15	Packebush (pka: Kristiansen), Mary	9/30/15	View
11	Price, Julie	Boyd Acres	Complete	9/30/15	10/29/15	Price, Julie	10/29/15	View
12	McCloskey, Marcus	Boyd Acres	Complete	9/30/15	10/1/15	McCloskey, Marcus	10/1/15	View
13	Wright, Kim	Boyd Acres	Complete	9/30/15	9/24/15	Wright, Kim	9/24/15	View
14	Somers, Travis	Boyd Acres	Complete	9/30/15	12/24/15	Somers, Travis	12/24/15	View
15	Schwartz, James	Pilot Butte Campus	Complete	9/30/15	7/7/16	Schwartz, James	7/7/16	View
16	Canaday, Diane	Pilot Butte Campus	Complete	9/30/15	10/29/15	Canaday, Diane	10/29/15	View
17	Scarbrough, Saedell	Pilot Butte Campus	Complete	9/30/15	10/9/15	Scarbrough, Saedell	10/9/15	View
18	Sanvitale, Spencer	Boyd Acres	Complete	9/30/15	9/17/15	Sanvitale, Spencer	9/17/15	View
19	McConnell, George	Water Reclamation Facility	Complete	9/30/15	9/24/15	McConnell, George	9/24/15	View
20	Woods, Rawlin	Boyd Acres	Complete	9/30/15	9/17/15	Woods, Rawlin	10/1/15	View
21	Malinowski, Adam	Pilot Butte Campus	Complete	9/30/15	10/1/15	Malinowski, Adam	10/1/15	View
22	Rader, Barbara	Pilot Butte Campus	Complete	9/30/15	9/17/15	Rader, Barbara	9/17/15	View
23	Byrd, Steve	Boyd Acres	Complete	9/30/15	9/21/15	Byrd, Steve	9/21/15	View
24	Volkman, Richard	Pilot Butte Campus	Complete	9/30/15	10/1/15	Volkman, Richard	10/1/15	View
25	Judd, Arthur	Boyd Acres	Complete	9/30/15	9/17/15	Judd, Arthur	9/17/15	View

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26	Riley, Steve	Boyd Acres	Complete	9/30/15	9/17/15	Riley, Steve	9/17/15	View
27	Prince, Jeannette	Pilot Butte Campus	Complete	9/30/15	9/17/15	Prince, Jeannette	9/17/15	View
28	Alley, Mary Beth	Pilot Butte Campus	Complete	9/30/15	9/21/15	Alley, Mary Beth	9/21/15	View
29	Walsworth, Justin	Boyd Acres	Complete	9/30/15	9/17/15	Walsworth, Justin	9/17/15	View
30	Rogers, William "Ed"	Water Reclamation Facility	Complete	9/30/15	12/10/15	Rogers, William "Ed"	12/10/15	View
31	Roshone, Elmer	Water Reclamation Facility	Complete	9/30/15	9/20/15	Roshone, Elmer	9/20/15	View
32	Hanson, Hardy	Pilot Butte Campus	Not Started	9/30/15				
33	Buhmann, Donald	Boyd Acres	Complete	9/30/15	9/28/15	Buhmann, Donald	9/28/15	View
34	Skaggs, Dan	Boyd Acres	Complete	9/30/15	9/17/15	Skaggs, Dan	9/17/15	View
35	Kuss, Richard	Boyd Acres	Complete	9/30/15	9/17/15	Kuss, Richard	9/17/15	View
36	Newberg, Doug	Pilot Butte Campus	Complete	9/30/15	9/17/15	Newberg, Doug	9/17/15	View
37	Hansen, Matthew	Water Reclamation Facility	Complete	9/30/15	1/2/16	Hansen, Matthew	1/2/16	View
38	Mosher, Chris	Boyd Acres	Complete	9/30/15	12/3/15	Mosher, Chris	12/3/15	View
39	Babich, Tyler	Boyd Acres	Complete	9/30/15	9/24/15	Babich, Tyler	9/24/15	View
40	Patterson, Tyler	Boyd Acres	Complete	9/30/15	10/28/15	Patterson, Tyler	10/28/15	View
41	Oak, David	Boyd Acres	Complete	9/30/15	9/18/15	Oak, David	9/18/15	View
42	Elpi-Trainor, Michelle	Water Reclamation Facility	Complete	9/30/15	10/4/15	Elpi-Trainor, Michelle	10/4/15	View
43	Hall, Harold "Jimmy"	Pilot Butte Campus	Complete	9/30/15	10/9/15	Hall, Harold "Jimmy"	10/9/15	View
44	Blake, Christopher	Pilot Butte Campus	Complete	9/30/15	10/12/15	Blake, Christopher	10/12/15	View
45	Byrd, Daniel	Pilot Butte Campus	Complete	9/30/15	9/16/15	Byrd, Daniel	9/16/15	View
46	Cota, Tony	Pilot Butte Campus	Complete	9/30/15	10/28/15	Cota, Tony	10/28/15	View
47	Klotz, Ian	Boyd Acres	Complete	9/30/15	11/9/15	Klotz, Ian	11/9/15	View
48	Combs, Ken	Pilot Butte Campus	Complete	9/30/15	9/16/15	Combs, Ken	9/16/15	View
49	Walling, Tom	Water Reclamation Facility	Complete	9/30/15	9/17/15	Walling, Tom	9/17/15	View
50	Oliver, Josh	Pilot Butte Campus	Complete	9/30/15	10/28/15	Oliver, Josh	10/28/15	View

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51	Moulder, Lon	Water Reclamation Facility	Complete	9/30/15	9/22/15	Moulder, Lon	9/22/15	View
52	Utley, Aaron	Water Reclamation Facility	Complete	9/30/15	9/17/15	Utley, Aaron	9/17/15	View
53	Winter, Kyle	Boyd Acres	Complete	9/30/15	10/1/15	Winter, Kyle	10/1/15	View
54	Larson, Ron	Boyd Acres	Complete	9/30/15	9/16/15	Larson, Ron	9/16/15	View
55	Armenta, David	Boyd Acres	Complete	9/30/15	10/8/15	Armenta, David	10/8/15	View
56	Lessar, Joshua	Pilot Butte Campus	Complete	9/30/15	9/17/15	Lessar, Joshua	9/17/15	View
57	Davenport, Christina	Boyd Acres	Complete	9/30/15	9/29/15	Davenport, Christina	9/29/15	View
58	Schmidt, Daniel	Pilot Butte Campus	Complete	9/30/15	10/19/15	Schmidt, Daniel	10/19/15	View
59	Mastrud, Corey	Boyd Acres	Complete	9/30/15	10/23/15	Mastrud, Corey	10/23/15	View
60	Goe, Kerry	Pilot Butte Campus	Complete	9/30/15	11/17/15	Goe, Kerry	11/17/15	View
61	Petitmermet, Sean	Boyd Acres	Complete	9/30/15	9/21/15	Petitmermet, Sean	9/21/15	View
62	Hall, Matt	Boyd Acres	Complete	9/30/15	9/21/15	Hall, Matt	9/21/15	View
63	Beck, Troy	Boyd Acres	Complete	9/30/15	11/30/15	Beck, Troy	11/30/15	View
64	Leath, David	Boyd Acres	Complete	9/30/15	10/13/15	Leath, David	10/13/15	View
65	Trask, Kris	Boyd Acres	Complete	9/30/15	4/25/16	Trask, Kris	4/25/16	View
66	Truax, Tim	Water Reclamation Facility	Complete	11/10/15	3/24/17	Truax, Tim	3/24/17	View
67	Gillespie, Rhett	Bend Municipal Airport	Complete	1/4/16	2/17/16	Gillespie, Rhett	2/17/16	View
68	Barnard, Justin	Pilot Butte Campus	Complete	3/28/16	5/18/16	Barnard, Justin	5/18/16	View
69	Chamberlain, Eric	Boyd Acres	Complete	5/10/16	5/23/16	Chamberlain, Eric	5/23/16	View
70	Bean, Everett	Pilot Butte Campus	Not Started	4/12/16				
71	Denning, Dan	Boyd Acres	Complete	8/8/16	9/8/16	Denning, Dan	9/8/16	View
72	Kirkpatrick, Michael	Pilot Butte Campus	Complete	9/6/16	11/23/16	Kirkpatrick, Michael	11/23/16	View
73	Nelson, Jeff	Boyd Acres	Complete	12/27/16	1/24/17	Nelson, Jeff	1/24/17	View
74	Sullivan, Steven	Boyd Acres	Complete	1/10/17	2/24/17	Sullivan, Steven	2/24/17	View
75	Sweet, Connie	Boyd Acres	Complete	9/30/15	9/24/15	Sweet, Connie	9/24/15	View
76	Hobbs, Eric	Boyd Acres	Complete	9/30/15	9/23/15	Hobbs, Eric	9/23/15	View
77	Somers, Robyn	Boyd Acres	Complete	9/30/15	9/24/15	Somers, Robyn	9/24/15	View

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78	Cashwell, Spencer	Boyd Acres	Complete	9/30/15	9/21/15	Cashwell, Spencer	9/21/15	View
79	Ristoff (AKA: Briggs), Teresa	Boyd Acres	Complete	9/30/15	9/21/15	Ristoff (AKA: Briggs), Teresa	9/21/15	View
80	Hopkins, Robert	Boyd Acres	Complete	9/30/15	9/15/15	Hopkins, Robert	9/15/15	View
81	Mingus, Rod	Boyd Acres	Complete	9/30/15	11/13/15	Mingus, Rod	11/13/15	View
82	Edde, Wendy	Boyd Acres	Complete	9/30/15	10/1/15	Edde, Wendy	10/1/15	View
83	Gardner, Greg "Scott"	Boyd Acres	Complete	9/30/15	10/1/15	Gardner, Greg "Scott"	10/1/15	View
84	Blackwelder, Brice	Boyd Acres	Complete	9/30/15	9/17/15	Blackwelder, Brice	9/17/15	View
85	Prazak, Steve	Boyd Acres	Complete	9/30/15	10/1/15	Prazak, Steve	10/1/15	View
86	Taylor, Oakley	Boyd Acres	Complete	9/30/15	10/12/15	Taylor, Oakley	10/12/15	View
87	Buchanan, David	Boyd Acres	Complete	9/30/15	9/17/15	Buchanan, David	9/17/15	View
88	Borrego, David	Boyd Acres	Complete	9/30/15	9/17/15	Borrego, David	9/17/15	View
89	Kadow, Gina	Bend Municipal Airport	Complete	9/30/15	9/24/15	Kadow, Gina	9/24/15	View
90	Follose, Brandon	Boyd Acres	Complete	9/30/15	9/17/15	Follose, Brandon	9/17/15	View
91	Winter, Scott	Boyd Acres	Complete	9/30/15	9/18/15	Winter, Scott	9/18/15	View
92	McAteer, Nick	Boyd Acres	Complete	12/7/15	1/22/16	McAteer, Nick	1/22/16	View
93	Prentice, Mike	Boyd Acres	Complete	2/13/17	2/23/17	Prentice, Mike	2/24/17	View
94	Burghardt, Joe	Water Reclamation Facility	Complete	9/30/15	9/24/15	Burghardt, Joe	9/24/15	View
95	Carlson, Tim	Water Reclamation Facility	Complete	9/30/15	9/17/15	Carlson, Tim	9/17/15	View
96	Fore, Erynne	Water Reclamation Facility	Complete	9/30/15	10/6/15	Fore, Erynne	10/6/15	View
97	Borgognoni, Sam	Water Reclamation Facility	Complete	9/30/15	9/18/15	Borgognoni, Sam	9/18/15	View
98	Bradley III, Roy	Water Reclamation Facility	Complete	3/21/16	3/30/16	Bradley III, Roy	3/30/16	View
99	Jones, Shane	Pilot Butte Campus	Complete	9/30/15	10/20/15	Jones, Shane	10/20/15	View
100	Morrison, George	Pilot Butte Campus	Complete	9/30/15	10/21/16	Morrison, George	10/21/16	View
101	Alexander, Mark	Pilot Butte Campus	Complete	9/30/15	12/9/15	Alexander, Mark	12/9/15	View
102	Meistrell, Brenda	Pilot Butte Campus	Complete	9/30/15	9/17/15	Meistrell, Brenda	9/17/15	View

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103	Howe, Carl	Pilot Butte Campus	Complete	9/30/15	7/20/16	Howe, Carl	7/20/16	View
104	Gardner, Lucas	Pilot Butte Campus	Complete	9/30/15	9/15/15	Gardner, Lucas	9/15/15	View
105	McQuillen, Christy	Pilot Butte Campus	Complete	9/30/15	12/30/16	McQuillen, Christy	12/30/16	View
106	Baker, Galen	Pilot Butte Campus	Complete	9/30/15	3/20/17	Baker, Galen	3/20/17	View
107	Dennis, Jay	Pilot Butte Campus	Complete	3/28/16	5/19/16	Dennis, Jay	5/19/16	View
108	Vencill, Gary	Boyd Acres	Complete	9/30/15	9/17/15	Vencill, Gary	9/17/15	View
109	Hamilton, Grant	Boyd Acres	Complete	9/30/15	9/18/15	Hamilton, Grant	9/18/15	View
110	Libolt, Orrin	Boyd Acres	Complete	9/30/15	9/17/15	Libolt, Orrin	9/17/15	View
111	Ristoff, Kelly	Boyd Acres	Complete	9/30/15	9/18/15	Ristoff, Kelly	9/18/15	View
112	Vaughan, Ken	Boyd Acres	Complete	9/30/15	9/17/15	Vaughan, Ken	9/17/15	View
113	Lee, Dave	Boyd Acres	Complete	9/30/15	10/12/15	Lee, Dave	10/12/15	View
114	Milligan, Will	Boyd Acres	Complete	9/30/15	9/29/15	Milligan, Will	9/29/15	View
115	Richmond, Paul "Stu"	Boyd Acres	Complete	9/30/15	9/17/15	Richmond, Paul "Stu"	9/17/15	View
116	Findley, Mike	Boyd Acres	Complete	9/30/15	11/23/15	Findley, Mike	11/23/15	View
117	Judd, Gary	Bend Municipal Airport	Complete	9/30/15	9/18/15	Judd, Gary	9/18/15	View
118	Richardson, Ty	Boyd Acres	Complete	9/30/15	1/28/16	Richardson, Ty	1/28/16	View
119	Rounds, Stuart	Boyd Acres	Complete	9/30/15	9/21/15	Rounds, Stuart	9/21/15	View
120	Ostendorff, Shannon	Boyd Acres	Complete	9/30/15	7/14/16	Ostendorff, Shannon	7/14/16	View
121	Donato, Natalie	Boyd Acres	Complete	9/30/15	9/17/15	Donato, Natalie	9/17/15	View
122	Wood, Chris	Boyd Acres	Complete	9/30/15	9/16/15	Wood, Chris	9/16/15	View
123	Stensland, David	Boyd Acres	Complete	9/30/15	9/17/15	Stensland, David	9/17/15	View
124	Nichols, Garrett	Boyd Acres	Complete	8/15/16	2/1/17	Nichols, Garrett	2/1/17	View
125	Marinelli, Tommy	Boyd Acres	Complete	8/29/16	11/7/16	Marinelli, Tommy	11/7/16	View
126	Mulderig, Sean	Boyd Acres	Complete	1/26/17	2/3/17	Mulderig, Sean	2/3/17	View
127	Mickey, Marc	Water Reclamation Facility	Complete	9/30/15	9/24/15	Mickey, Marc	9/24/15	View
128	Buystedt, Jeff	Water Reclamation Facility	Complete	9/30/15	10/2/15	Buystedt, Jeff	10/2/15	View
129	Barnes, Drexell	Water Reclamation Facility	Complete	9/30/15	9/17/15	Barnes, Drexell	9/17/15	View

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130	Stenkamp, Skippy	Pilot Butte Campus	Complete	9/30/15	9/21/15	Stenkamp, Skippy	9/21/15	View
131	Newton, Joe	Pilot Butte Campus	Complete	9/30/15	9/15/15	Newton, Joe	9/15/15	View
132	Thomasson, Shanon (John)	Pilot Butte Campus	Complete	9/30/15	11/5/15	Thomasson, Shanon (John)	11/5/15	View
133	Lancaster, Quirt	Pilot Butte Campus	Complete	9/30/15	9/18/15	Lancaster, Quirt	9/18/15	View
134	Waldrop, Will	Pilot Butte Campus	Complete	9/30/15	9/17/15	Waldrop, Will	9/17/15	View
135	Qual, Craig	Pilot Butte Campus	Complete	9/30/15	10/12/15	Qual, Craig	10/12/15	View
136	Dorsey, Christine	Pilot Butte Campus	Complete	9/30/15	9/17/15	Dorsey, Christine	9/17/15	View
137	Parent, Ethan	Water Reclamation Facility	Complete	9/30/15	9/29/15	Parent, Ethan	9/29/15	View
138	Finney, Lance	Water Reclamation Facility	Complete	11/30/15	12/15/15	Finney, Lance	12/15/15	View
139	Smith, William	Pilot Butte Campus	Complete	9/30/15	12/16/15	Smith, William	12/16/15	View
140	Combs, Ty	Pilot Butte Campus	Complete	9/30/15	9/21/15	Combs, Ty	9/21/15	View
141	Abbas, David	Pilot Butte Campus	Complete	9/30/15	3/27/17	Abbas, David	3/27/17	View
142	Neiswonger, Paul	Pilot Butte Campus	Complete	9/30/15	10/15/15	Neiswonger, Paul	10/15/15	View
143	Jackson, Dylan	Pilot Butte Campus	Complete	9/30/15	1/8/16	Jackson, Dylan	1/8/16	View
144	Munson, AJ	Pilot Butte Campus	Complete	9/30/15	9/15/15	Munson, AJ	9/15/15	View
145	Armer, Mike	Pilot Butte Campus	Complete	9/30/15	9/22/15	Armer, Mike	9/22/15	View
146	LaCasse, Gary	Pilot Butte Campus	Complete	5/26/16	8/3/16	LaCasse, Gary	8/3/16	View
147	Anzalone, Alta	Pilot Butte Campus	Complete	8/10/16	2/23/17	Anzalone, Alta	2/23/17	View

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	Assigned					Completed		
Row	To	Location	Progress	Due Date	Start	By	On	View
1	Vencill, Gary	Boyd Acres	Complete	5/31/16	5/6/16	Vencill, Gary	5/6/16	View
2	Packebush, Warren	Boyd Acres	Complete	5/31/16	5/24/16	Packebush, Warren	5/24/16	View
3	Gillette, Mike	Boyd Acres	Complete	5/31/16	5/9/16	Gillette, Mike	5/9/16	View
4	Wolter, Mark	Boyd Acres	Complete	5/31/16	5/9/16	Wolter, Mark	5/9/16	View
5	Daniel, Jay	Pilot Butte Campus	Complete	5/31/16	6/23/16	Daniel, Jay	6/23/16	View
6	Thomasson, Shanon (John)	Pilot Butte Campus	Complete	5/31/16	11/30/16	Thomasson, Shanon (John)	11/30/16	View
7	Ristoff, Kelly	Boyd Acres	Complete	5/31/16	5/17/16	Ristoff, Kelly	5/17/16	View
8	Somers, Robyn	Boyd Acres	Complete	5/31/16	5/5/16	Somers, Robyn	5/5/16	View
9	Lancaster, Quirt	Pilot Butte Campus	Complete	5/31/16	5/16/16	Lancaster, Quirt	5/16/16	View
10	Cashwell, Spencer	Boyd Acres	Complete	5/31/16	5/5/16	Cashwell, Spencer	5/5/16	View
11	Cannon, Dennis	Pilot Butte Campus	Complete	5/31/16	11/29/16	Cannon, Dennis	11/29/16	View
12	Schwartz, James	Pilot Butte Campus	Complete	5/31/16	7/7/16	Schwartz, James	7/7/16	View
13	Hopkins, Robert	Boyd Acres	Complete	5/31/16	5/3/16	Hopkins, Robert	5/3/16	View
14	Mingus, Rod	Boyd Acres	Complete	5/31/16	5/16/16	Mingus, Rod	5/16/16	View
15	Lee, Dave	Boyd Acres	Complete	5/31/16	5/3/16	Lee, Dave	5/3/16	View
16	Woods, Rawlin	Boyd Acres	Complete	5/31/16	5/5/16	Woods, Rawlin	5/5/16	View
17	Blackwelder, Brice	Boyd Acres	Complete	5/31/16	6/17/16	Blackwelder, Brice	6/17/16	View
18	Qual, Craig	Pilot Butte Campus	Complete	5/31/16	5/5/16	Qual, Craig	5/5/16	View
19	Judd, Arthur	Boyd Acres	Complete	5/31/16	10/14/16	Judd, Arthur	10/14/16	View
20	Riley, Steve	Boyd Acres	Complete	5/31/16	6/2/16	Riley, Steve	6/2/16	View
21	Prince, Jeannette	Pilot Butte Campus	Complete	5/31/16	5/4/16	Prince, Jeannette	5/4/16	View
22	Taylor, Oakley	Boyd Acres	Complete	5/31/16	5/5/16	Taylor, Oakley	5/5/16	View
23	Buchanan, David	Boyd Acres	Complete	5/31/16	2/2/17	Buchanan, David	2/2/17	View
24	Findley, Mike	Boyd Acres	Complete	5/31/16	5/19/16	Findley, Mike	5/19/16	View
25	Mosher, Chris	Boyd Acres	Complete	5/31/16	5/26/16	Mosher, Chris	5/26/16	View
26	Babich, Tyler	Boyd Acres	Complete	5/31/16	5/11/16	Babich, Tyler	5/11/16	View
27	Patterson, Tyler	Boyd Acres	Complete	5/31/16	5/25/16	Patterson, Tyler	5/25/16	View
28	Carlson, Tim	Water Reclamation Facility	Complete	5/31/16	5/26/16	Carlson, Tim	5/26/16	View

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29	Smith, William	Pilot Butte Campus	Complete	5/31/16	5/5/16	Smith, William	5/5/16	View
30	Richardson, Ty	Boyd Acres	Complete	5/31/16	6/14/16	Richardson, Ty	6/14/16	View
31	Fore, Erynne	Water Reclamation Facility	Complete	5/31/16	5/5/16	Fore, Erynne	5/5/16	View
32	Rounds, Stuart	Boyd Acres	Complete	5/31/16	5/5/16	Rounds, Stuart	5/5/16	View
33	Blake, Christopher	Pilot Butte Campus	Complete	5/31/16	5/4/16	Blake, Christopher	5/4/16	View
34	Cota, Tony	Pilot Butte Campus	Complete	5/31/16	6/21/16	Cota, Tony	6/21/16	View
35	Klotz, Ian	Boyd Acres	Complete	5/31/16	7/21/16	Klotz, Ian	2/2/17	View
36	Combs, Ken	Pilot Butte Campus	Complete	5/31/16	5/17/16	Combs, Ken	5/17/16	View
37	Neiswonger, Paul	Pilot Butte Campus	Complete	5/31/16	6/2/16	Neiswonger, Paul	6/2/16	View
38	Follose, Brandon	Boyd Acres	Complete	5/31/16	5/5/16	Follose, Brandon	5/5/16	View
39	Larson, Ron	Boyd Acres	Complete	5/31/16	5/2/16	Larson, Ron	5/2/16	View
40	Gardner, Lucas	Pilot Butte Campus	Complete	5/31/16	5/18/16	Gardner, Lucas	5/18/16	View
41	Munson, AJ	Pilot Butte Campus	Complete	5/31/16	5/5/16	Munson, AJ	5/5/16	View
42	Lessar, Joshua	Pilot Butte Campus	Complete	5/31/16	5/2/16	Lessar, Joshua	5/2/16	View
43	Armer, Mike	Pilot Butte Campus	Complete	5/31/16	5/11/16	Armer, Mike	5/11/16	View
44	Borgognoni, Sam	Water Reclamation Facility	Complete	5/31/16	5/3/16	Borgognoni, Sam	5/3/16	View
45	Davenport, Christina	Boyd Acres	Complete	5/31/16	6/13/16	Davenport, Christina	6/13/16	View
46	Goe, Kerry	Pilot Butte Campus	Complete	5/31/16	5/18/16	Goe, Kerry	5/18/16	View
47	Wood, Chris	Boyd Acres	Complete	5/31/16	5/3/16	Wood, Chris	5/3/16	View
48	Petitmermet, Sean	Boyd Acres	Complete	5/31/16	5/4/16	Petitmermet, Sean	5/4/16	View
49	Hall, Matt	Boyd Acres	Complete	5/31/16	5/6/16	Hall, Matt	5/6/16	View
50	Konop, Patrick	Wall St Annex	Complete	5/31/16	6/9/16	Konop, Patrick	6/9/16	View
51	Robertson, Joshua	Wall St Annex	Not Started	5/31/16				
52	Webster, Jessica	Wall St Annex	Complete	5/31/16	6/2/16	Webster, Jessica	6/2/16	View
53	Barnard, Justin	Pilot Butte Campus	Complete	5/31/16	5/17/16	Barnard, Justin	5/17/16	View
54	Chamberlain, Eric	Boyd Acres	Complete	5/31/16	5/23/16	Chamberlain, Eric	5/23/16	View

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55	Bean, Everett	Pilot Butte Campus	Not Started	5/31/16				
56	Homgren, Joseph	Boyd Acres	Complete	7/26/16	10/10/16	Homgren, Joseph	10/10/16	View
57	Nichols, Garrett	Boyd Acres	Complete	8/15/16	12/13/16	Nichols, Garrett	12/28/16	View
58	Kirkpatrick, Michael	Pilot Butte Campus	Complete	9/6/16	11/22/16	Kirkpatrick, Michael	11/22/16	View
59	Nelson, Jeff	Boyd Acres	Complete	12/27/16	1/24/17	Nelson, Jeff	1/24/17	View
60	Sullivan, Steven	Boyd Acres	Complete	1/10/17	2/24/17	Sullivan, Steven	2/24/17	View
61	Thompson, Scott	Water Reclamation Facility	Complete	5/31/16	8/31/16	Thompson, Scott	8/31/16	View
62	Mickey, Marc	Water Reclamation Facility	Complete	5/31/16	5/9/16	Mickey, Marc	5/9/16	View
63	Rogers, William "Ed"	Water Reclamation Facility	Complete	5/31/16	6/9/16	Rogers, William "Ed"	6/9/16	View
64	Roshone, Elmer	Water Reclamation Facility	Complete	5/31/16	5/9/16	Roshone, Elmer	5/9/16	View
65	Stenkamp, Skippy	Pilot Butte Campus	Complete	5/31/16	5/10/16	Stenkamp, Skippy	5/10/16	View
66	Waldrop, Will	Pilot Butte Campus	Complete	5/31/16	5/10/16	Waldrop, Will	5/10/16	View
67	Rader, Barbara	Pilot Butte Campus	Complete	5/31/16	5/11/16	Rader, Barbara	5/11/16	View
68	Parent, Ethan	Water Reclamation Facility	Complete	5/31/16	5/24/16	Parent, Ethan	5/24/16	View
69	Bradley III, Roy	Water Reclamation Facility	Complete	5/31/16	6/2/16	Bradley III, Roy	6/2/16	View
70	Volkman, Richard	Pilot Butte Campus	Complete	5/31/16	5/5/16	Volkman, Richard	5/5/16	View
71	Jones, Shane	Pilot Butte Campus	Complete	5/31/16	11/16/16	Jones, Shane	11/16/16	View
72	Howe, Carl	Pilot Butte Campus	Complete	5/31/16	3/7/17	Howe, Carl	3/7/17	View
73	Hall, Harold "Jimmy"	Pilot Butte Campus	Complete	5/31/16	6/28/16	Hall, Harold "Jimmy"	6/28/16	View
74	Byrd, Daniel	Pilot Butte Campus	Complete	5/31/16	5/9/16	Byrd, Daniel	5/9/16	View
75	Dennis, Jay	Pilot Butte Campus	Complete	5/31/16	5/19/16	Dennis, Jay	5/19/16	View
76	Edwards, Mike	Boyd Acres	Complete	5/31/16	5/5/16	Edwards, Mike	5/5/16	View
77	Hobbs, Eric	Boyd Acres	Complete	5/31/16	5/12/16	Hobbs, Eric	5/12/16	View
78	Brick, Paul	Boyd Acres	Complete	5/31/16	8/18/16	Brick, Paul	8/18/16	View

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79	Somers, Travis	Boyd Acres	Complete	5/31/16	2/3/17	Somers, Travis	2/3/17	View
80	Gardner, Greg "Scott"	Boyd Acres	Complete	5/31/16	8/19/16	Gardner, Greg "Scott"	8/19/16	View
81	Byrd, Steve	Boyd Acres	Complete	5/31/16	5/5/16	Byrd, Steve	5/5/16	View
82	Buhmann, Donald	Boyd Acres	Complete	5/31/16	6/22/16	Buhmann, Donald	6/22/16	View
83	Milligan, Will	Boyd Acres	Complete	5/31/16	5/6/16	Milligan, Will	5/6/16	View
84	Kuss, Richard	Boyd Acres	Complete	5/31/16	5/5/16	Kuss, Richard	5/5/16	View
85	Winter, Scott	Boyd Acres	Complete	5/31/16	5/5/16	Winter, Scott	5/5/16	View
86	Mastrud, Corey	Boyd Acres	Complete	5/31/16	6/20/16	Mastrud, Corey	6/20/16	View
87	Beck, Troy	Boyd Acres	Complete	5/31/16	5/9/16	Beck, Troy	5/9/16	View
88	Denning, Dan	Boyd Acres	Complete	8/8/16	9/8/16	Denning, Dan	9/8/16	View
89	Prentice, Mike	Boyd Acres	Complete	2/13/17	2/23/17	Prentice, Mike	2/24/17	View
90	Burghardt, Joe	Water Reclamation Facility	Complete	5/31/16	5/9/16	Burghardt, Joe	5/9/16	View
91	McConnell, George	Water Reclamation Facility	Complete	5/31/16	5/5/16	McConnell, George	5/5/16	View
92	Newton, Joe	Pilot Butte Campus	Complete	5/31/16	5/25/16	Newton, Joe	5/25/16	View
93	Lindsey, James	Pilot Butte Campus	Complete	5/31/16	5/13/16	Lindsey, James	5/13/16	View
94	Scarbrough, Saedell	Pilot Butte Campus	Complete	5/31/16	9/8/16	Scarbrough, Saedell	9/8/16	View
95	Malinowski, Adam	Pilot Butte Campus	Complete	5/31/16	5/12/16	Malinowski, Adam	5/12/16	View
96	Moulder, Lon	Water Reclamation Facility	Complete	5/31/16	6/9/16	Moulder, Lon	6/9/16	View
97	Finney, Lance	Water Reclamation Facility	Complete	5/31/16	6/23/16	Finney, Lance	6/23/16	View
98	Morrison, George	Pilot Butte Campus	Complete	5/31/16	10/19/16	Morrison, George	10/19/16	View
99	Newberg, Doug	Pilot Butte Campus	Complete	5/31/16	5/9/16	Newberg, Doug	5/9/16	View
100	Combs, Ty	Pilot Butte Campus	Complete	5/31/16	6/2/16	Combs, Ty	6/2/16	View
101	Schmidt, Daniel	Pilot Butte Campus	Complete	5/31/16	5/17/16	Schmidt, Daniel	5/17/16	View
102	Baker, Galen	Pilot Butte Campus	Complete	5/31/16	3/13/17	Baker, Galen	3/13/17	View
103	Fugate, Lance	Pilot Butte Campus	Complete	6/16/16	8/3/16	Fugate, Lance	8/3/16	View
104	Hamilton, Grant	Boyd Acres	Complete	5/31/16	5/5/16	Hamilton, Grant	5/5/16	View
105	Libolt, Orrin	Boyd Acres	Complete	5/31/16	5/5/16	Libolt, Orrin	5/5/16	View

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106	Graham, Kelly	Boyd Acres	Complete	5/31/16	5/5/16	Graham, Kelly	5/5/16	View
107	McCloskey, Marcus	Boyd Acres	Complete	5/31/16	6/23/16	McCloskey, Marcus	6/23/16	View
108	Vaughan, Ken	Boyd Acres	Complete	5/31/16	5/5/16	Vaughan, Ken	5/5/16	View
109	Edde, Wendy	Boyd Acres	Complete	5/31/16	2/23/17	Edde, Wendy	2/23/17	View
110	Walsworth, Justin	Boyd Acres	Complete	5/31/16	5/5/16	Walsworth, Justin	5/5/16	View
111	Skaggs, Dan	Boyd Acres	Complete	5/31/16	5/5/16	Skaggs, Dan	5/5/16	View
112	Borrego, David	Boyd Acres	Complete	5/31/16	5/5/16	Borrego, David	5/5/16	View
113	Oak, David	Boyd Acres	Complete	5/31/16	5/12/16	Oak, David	5/12/16	View
114	Armenta, David	Boyd Acres	Complete	5/31/16	5/5/16	Armenta, David	5/5/16	View
115	Sabourin, Garrett	Wall St Annex	Not Started	5/31/16				
116	Leath, David	Boyd Acres	Complete	5/31/16	5/5/16	Leath, David	5/5/16	View
117	Gillespie, Rhett	Bend Municipal Airport	Complete	5/31/16	6/14/16	Gillespie, Rhett	6/14/16	View
118	Marinelli, Tommy	Boyd Acres	Complete	8/29/16	11/8/16	Marinelli, Tommy	11/8/16	View
119	Mulderig, Sean	Boyd Acres	Complete	1/26/17	2/3/17	Mulderig, Sean	2/3/17	View

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Row	Assigned To	Assigned Location	Progress	Due Date	Start	Completed By	Completed On	View
1	Vencill, Gary	Boyd Acres	Complete	11/30/16	11/14/16	Vencill, Gary	11/14/16	View
2	Edwards, Mike	Boyd Acres	Complete	11/30/16	10/31/16	Edwards, Mike	10/31/16	View
3	Sweet, Connie	Boyd Acres	Complete	11/30/16	12/22/16	Sweet, Connie	12/22/16	View
4	Hobbs, Eric	Boyd Acres	Complete	11/30/16	12/1/16	Hobbs, Eric	12/1/16	View
5	Gillette, Mike	Boyd Acres	Complete	11/30/16	11/1/16	Gillette, Mike	11/1/16	View
6	Wolter, Mark	Boyd Acres	Complete	11/30/16	11/3/16	Wolter, Mark	11/3/16	View
7	Daniel, Jay	Pilot Butte Campus	Complete	11/30/16	2/2/17	Daniel, Jay	2/2/17	View
8	Graham, Kelly	Boyd Acres	Complete	11/30/16	11/17/16	Graham, Kelly	11/17/16	View
9	Thomasson, Shanon (John)	Pilot Butte Campus	Complete	11/30/16	11/30/16	Thomasson, Shanon (John)	11/30/16	View
10	Mickey, Marc	Water Reclamation Facility	Complete	11/30/16	11/18/16	Mickey, Marc	11/18/16	View
11	Cashwell, Spencer	Boyd Acres	Complete	11/30/16	11/10/16	Cashwell, Spencer	11/10/16	View
12	Somers, Travis	Boyd Acres	Complete	11/30/16	2/3/17	Somers, Travis	2/3/17	View
13	Waldrop, Will	Pilot Butte Campus	Complete	11/30/16	12/29/16	Waldrop, Will	12/29/16	View
14	Mingus, Rod	Boyd Acres	Complete	11/30/16	12/23/16	Mingus, Rod	12/23/16	View
15	Edde, Wendy	Boyd Acres	Complete	11/30/16	12/2/16	Edde, Wendy	12/2/16	View
16	Lee, Dave	Boyd Acres	Complete	11/30/16	10/31/16	Lee, Dave	10/31/16	View
17	Woods, Rawlin	Boyd Acres	Complete	11/30/16	11/4/16	Woods, Rawlin	11/4/16	View
18	Gardner, Greg "Scott"	Boyd Acres	Complete	11/30/16	12/22/16	Gardner, Greg "Scott"	12/22/16	View
19	Malinowski, Adam	Pilot Butte Campus	Complete	11/30/16	11/17/16	Malinowski, Adam	11/17/16	View
20	Qual, Craig	Pilot Butte Campus	Complete	11/30/16	11/17/16	Qual, Craig	11/17/16	View
21	Prazak, Steve	Boyd Acres	Complete	11/30/16	2/2/17	Prazak, Steve	2/2/17	View
22	Byrd, Steve	Boyd Acres	Complete	11/30/16	11/3/16	Byrd, Steve	11/3/16	View
23	Dorsey, Christine	Pilot Butte Campus	Complete	11/30/16	11/3/16	Dorsey, Christine	11/3/16	View
24	Riley, Steve	Boyd Acres	Complete	11/30/16	12/6/16	Riley, Steve	12/6/16	View
25	Prince, Jeannette	Pilot Butte Campus	Complete	11/30/16	11/8/16	Prince, Jeannette	11/8/16	View
26	Walsworth, Justin	Boyd Acres	Complete	11/30/16	11/15/16	Walsworth, Justin	11/15/16	View
27	Hanson, Hardy	Pilot Butte Campus	Not Started	11/30/16				

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28	Buhmann, Donald	Boyd Acres	Complete	11/30/16	12/2/16	Buhmann, Donald	12/2/16	View
29	Milligan, Will	Boyd Acres	Complete	11/30/16	11/29/16	Milligan, Will	11/29/16	View
30	Skaggs, Dan	Boyd Acres	Complete	11/30/16	12/8/16	Skaggs, Dan	12/8/16	View
31	Kuss, Richard	Boyd Acres	Complete	11/30/16	11/10/16	Kuss, Richard	11/10/16	View
32	Richmond, Paul "Stu"	Boyd Acres	Complete	11/30/16	11/10/16	Richmond, Paul "Stu"	11/10/16	View
33	Borrego, David	Boyd Acres	Complete	11/30/16	11/3/16	Borrego, David	11/3/16	View
34	Hansen, Matthew	Water Reclamation Facility	Complete	11/30/16	3/10/17	Hansen, Matthew	3/10/17	View
35	Meistrell, Brenda	Pilot Butte Campus	Complete	11/30/16	11/10/16	Meistrell, Brenda	11/10/16	View
36	Carlson, Tim	Water Reclamation Facility	Complete	11/30/16	11/14/16	Carlson, Tim	11/14/16	View
37	Oak, David	Boyd Acres	Complete	11/30/16	11/9/16	Oak, David	11/9/16	View
38	Elpi-Trainor, Michelle	Water Reclamation Facility	Complete	11/30/16	11/17/16	Elpi-Trainor, Michelle	11/17/16	View
39	Fore, Erynne	Water Reclamation Facility	Complete	11/30/16	11/28/16	Fore, Erynne	11/28/16	View
40	Hall, Harold "Jimmy"	Pilot Butte Campus	Complete	11/30/16	12/12/16	Hall, Harold "Jimmy"	12/12/16	View
41	Abbas, David	Pilot Butte Campus	Complete	11/30/16	3/27/17	Abbas, David	3/27/17	View
42	Byrd, Daniel	Pilot Butte Campus	Complete	11/30/16	11/3/16	Byrd, Daniel	11/3/16	View
43	Cota, Tony	Pilot Butte Campus	Complete	11/30/16	11/11/16	Cota, Tony	11/11/16	View
44	Combs, Ken	Pilot Butte Campus	Complete	11/30/16	11/11/16	Combs, Ken	11/11/16	View
45	Parent, Ethan	Water Reclamation Facility	Complete	11/30/16	11/3/16	Parent, Ethan	11/3/16	View
46	Walling, Tom	Water Reclamation Facility	Complete	11/30/16	1/24/17	Walling, Tom	1/24/17	View
47	Oliver, Josh	Pilot Butte Campus	Complete	11/30/16	12/5/16	Oliver, Josh	12/5/16	View
48	Moulder, Lon	Water Reclamation Facility	Complete	11/30/16	11/22/16	Moulder, Lon	11/22/16	View
49	Jackson, Dylan	Pilot Butte Campus	Complete	11/30/16	2/16/17	Jackson, Dylan	2/16/17	View
50	Winter, Kyle	Boyd Acres	Complete	11/30/16	12/1/16	Winter, Kyle	12/1/16	View
51	Larson, Ron	Boyd Acres	Complete	11/30/16	11/3/16	Larson, Ron	11/3/16	View

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52	Gardner, Lucas	Pilot Butte Campus	Complete	11/30/16	11/23/16	Gardner, Lucas	11/23/16	View
53	Munson, AJ	Pilot Butte Campus	Complete	11/30/16	11/2/16	Munson, AJ	11/2/16	View
54	Armer, Mike	Pilot Butte Campus	Complete	11/30/16	11/1/16	Armer, Mike	11/1/16	View
55	Winter, Scott	Boyd Acres	Complete	11/30/16	11/3/16	Winter, Scott	11/3/16	View
56	Schmidt, Daniel	Pilot Butte Campus	Complete	11/30/16	11/3/16	Schmidt, Daniel	11/3/16	View
57	Donato, Natalie	Boyd Acres	Complete	11/30/16	11/10/16	Donato, Natalie	11/10/16	View
58	Goe, Kerry	Pilot Butte Campus	Complete	11/30/16	11/21/16	Goe, Kerry	11/21/16	View
59	Wood, Chris	Boyd Acres	Complete	11/30/16	11/3/16	Wood, Chris	11/3/16	View
60	Petitmermet, Sean	Boyd Acres	Complete	11/30/16	11/14/16	Petitmermet, Sean	11/14/16	View
61	Hall, Matt	Boyd Acres	Complete	11/30/16	11/3/16	Hall, Matt	11/3/16	View
62	Stensland, David	Boyd Acres	Complete	11/30/16	11/17/16	Stensland, David	11/17/16	View
63	McQuillen, Christy	Pilot Butte Campus	Complete	11/30/16	3/23/17	McQuillen, Christy	3/23/17	View
64	Leath, David	Boyd Acres	Complete	11/30/16	12/21/16	Leath, David	12/21/16	View
65	Trask, Kris	Boyd Acres	Complete	11/30/16	11/3/16	Trask, Kris	11/3/16	View
66	Truax, Tim	Water Reclamation Facility	Complete	11/30/16	3/24/17	Truax, Tim	3/24/17	View
67	Bradley III, Roy	Water Reclamation Facility	Complete	11/30/16	12/21/16	Bradley III, Roy	12/21/16	View
68	Barnard, Justin	Pilot Butte Campus	Not Started	11/30/16				
69	Dennis, Jay	Pilot Butte Campus	Complete	11/30/16	11/8/16	Dennis, Jay	11/8/16	View
70	LaCasse, Gary	Pilot Butte Campus	Complete	11/30/16	11/3/16	LaCasse, Gary	11/3/16	View
71	Nichols, Garrett	Boyd Acres	Complete	11/30/16	2/1/17	Nichols, Garrett	2/1/17	View
72	Marinelli, Tommy	Boyd Acres	Complete	11/30/16	11/8/16	Marinelli, Tommy	11/8/16	View
73	Prentice, Mike	Boyd Acres	Complete	2/13/17	2/24/17	Prentice, Mike	2/24/17	View
74	Hamilton, Grant	Boyd Acres	Complete	11/30/16	11/3/16	Hamilton, Grant	11/3/16	View
75	Brick, Paul	Boyd Acres	Complete	11/30/16	3/20/17	Brick, Paul	3/20/17	View
76	Price, Julie	Boyd Acres	Complete	11/30/16	12/1/16	Price, Julie	12/1/16	View
77	McCloskey, Marcus	Boyd Acres	Complete	11/30/16	12/15/16	McCloskey, Marcus	12/15/16	View
78	Vaughan, Ken	Boyd Acres	Complete	11/30/16	11/3/16	Vaughan, Ken	11/3/16	View
79	Ristoff (AKA: Briggs), Teresa	Boyd Acres	Complete	11/30/16	11/3/16	Ristoff (AKA: Briggs), Teresa	11/3/16	View

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80	Hopkins, Robert	Boyd Acres	Complete	11/30/16	10/31/16	Hopkins, Robert	10/31/16	View
81	Sanvitale, Spencer	Boyd Acres	Complete	11/30/16	11/3/16	Sanvitale, Spencer	11/3/16	View
82	Taylor, Oakley	Boyd Acres	Complete	11/30/16	11/17/16	Taylor, Oakley	11/17/16	View
83	Buchanan, David	Boyd Acres	Complete	11/30/16	11/3/16	Buchanan, David	11/3/16	View
84	Judd, Gary	Bend Municipal Airport	Complete	11/30/16	11/17/16	Judd, Gary	11/17/16	View
85	Mosher, Chris	Boyd Acres	Complete	11/30/16	11/21/16	Mosher, Chris	11/21/16	View
86	Ostendorff, Shannon	Boyd Acres	Complete	11/30/16	12/2/16	Ostendorff, Shannon	12/2/16	View
87	Armenta, David	Boyd Acres	Complete	11/30/16	11/8/16	Armenta, David	11/8/16	View
88	Davenport, Christina	Boyd Acres	Complete	11/30/16	12/6/16	Davenport, Christina	12/6/16	View
89	McAteer, Nick	Boyd Acres	Complete	11/30/16	12/8/16	McAteer, Nick	12/8/16	View
90	Chamberlain, Eric	Boyd Acres	Complete	11/30/16	11/16/16	Chamberlain, Eric	11/16/16	View
91	Nelson, Jeff	Boyd Acres	Complete	12/27/16	1/24/17	Nelson, Jeff	1/24/17	View
92	Mulderig, Sean	Boyd Acres	Complete	1/26/17	2/3/17	Mulderig, Sean	2/3/17	View
93	Thompson, Scott	Water Reclamation Facility	Complete	11/30/16	3/20/17	Thompson, Scott	3/20/17	View
94	Barnes, Drexell	Water Reclamation Facility	Complete	11/30/16	12/5/16	Barnes, Drexell	12/5/16	View
95	McConnell, George	Water Reclamation Facility	Complete	11/30/16	11/7/16	McConnell, George	11/7/16	View
96	Roshone, Elmer	Water Reclamation Facility	Complete	11/30/16	11/3/16	Roshone, Elmer	11/3/16	View
97	Newton, Joe	Pilot Butte Campus	Complete	11/30/16	11/16/16	Newton, Joe	11/16/16	View
98	Lancaster, Quirt	Pilot Butte Campus	Complete	11/30/16	11/7/16	Lancaster, Quirt	11/7/16	View
99	Utley, Aaron	Water Reclamation Facility	Complete	11/30/16	11/3/16	Utley, Aaron	11/3/16	View
100	Borgognoni, Sam	Water Reclamation Facility	Complete	11/30/16	12/2/16	Borgognoni, Sam	12/2/16	View
101	Finney, Lance	Water Reclamation Facility	Complete	11/30/16	1/24/17	Finney, Lance	1/24/17	View
102	Alley, Mary Beth	Pilot Butte Campus	Complete	11/30/16	11/30/16	Alley, Mary Beth	11/30/16	View

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103	Morrison, George	Pilot Butte Campus	Complete	11/30/16	10/31/16	Morrison, George	10/31/16	View
104	Alexander, Mark	Pilot Butte Campus	Complete	11/30/16	11/4/16	Alexander, Mark	11/4/16	View
105	Howe, Carl	Pilot Butte Campus	Complete	11/30/16	2/11/17	Howe, Carl	2/11/17	View
106	Smith, William	Pilot Butte Campus	Complete	11/30/16	2/2/17	Smith, William	2/2/17	View
107	Combs, Ty	Pilot Butte Campus	Complete	11/30/16	11/3/16	Combs, Ty	11/3/16	View
108	Blake, Christopher	Pilot Butte Campus	Complete	11/30/16	12/23/16	Blake, Christopher	12/23/16	View
109	Lessar, Joshua	Pilot Butte Campus	Complete	11/30/16	11/3/16	Lessar, Joshua	11/3/16	View
110	Anzalone, Alta	Pilot Butte Campus	Complete	11/30/16	2/23/17	Anzalone, Alta	2/23/17	View
111	Packebush, Warren	Boyd Acres	Complete	11/30/16	11/30/16	Packebush, Warren	11/30/16	View
112	Libolt, Orrin	Boyd Acres	Complete	11/30/16	12/1/16	Libolt, Orrin	12/1/16	View
113	Packebush (pka: Kristiansen), Mary	Boyd Acres	Complete	11/30/16	12/13/16	Packebush (pka: Kristiansen), Mary	12/13/16	View
114	Ristoff, Kelly	Boyd Acres	Complete	11/30/16	11/30/16	Ristoff, Kelly	11/30/16	View
115	Somers, Robyn	Boyd Acres	Complete	11/30/16	11/3/16	Somers, Robyn	11/3/16	View
116	Wright, Kim	Boyd Acres	Complete	11/30/16	12/8/16	Wright, Kim	12/8/16	View
117	Blackwelder, Brice	Boyd Acres	Complete	11/30/16	2/9/17	Blackwelder, Brice	2/9/17	View
118	Judd, Arthur	Boyd Acres	Complete	11/30/16	12/15/16	Judd, Arthur	12/15/16	View
119	Findley, Mike	Boyd Acres	Complete	11/30/16	11/7/16	Findley, Mike	11/7/16	View
120	Kadow, Gina	Bend Municipal Airport	Complete	11/30/16	11/17/16	Kadow, Gina	11/17/16	View
121	Babich, Tyler	Boyd Acres	Complete	11/30/16	11/4/16	Babich, Tyler	11/4/16	View
122	Patterson, Tyler	Boyd Acres	Complete	11/30/16	11/16/16	Patterson, Tyler	11/16/16	View
123	Richardson, Ty	Boyd Acres	Complete	11/30/16	3/9/17	Richardson, Ty	3/9/17	View
124	Rounds, Stuart	Boyd Acres	Complete	11/30/16	11/18/16	Rounds, Stuart	11/18/16	View
125	Klotz, Ian	Boyd Acres	Complete	11/30/16	2/2/17	Klotz, Ian	2/2/17	View
126	Follose, Brandon	Boyd Acres	Complete	11/30/16	11/8/16	Follose, Brandon	11/8/16	View
127	Mastrud, Corey	Boyd Acres	Complete	11/30/16	11/7/16	Mastrud, Corey	11/7/16	View
128	Beck, Troy	Boyd Acres	Complete	11/30/16	12/29/16	Beck, Troy	12/29/16	View
129	Gillespie, Rhett	Bend Municipal Airport	Complete	11/30/16	12/13/16	Gillespie, Rhett	12/13/16	View

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130	Denning, Dan	Boyd Acres	Complete	11/30/16	11/29/16	Denning, Dan	11/29/16	View
131	Sullivan, Steven	Boyd Acres	Complete	1/10/17	2/24/17	Sullivan, Steven	2/24/17	View
132	Buystedt, Jeff	Water Reclamation Facility	Complete	11/30/16	1/19/17	Buystedt, Jeff	1/19/17	View
133	Burghardt, Joe	Water Reclamation Facility	Complete	11/30/16	11/8/16	Burghardt, Joe	11/8/16	View
134	Rogers, William "Ed"	Water Reclamation Facility	Complete	11/30/16	3/17/17	Rogers, William "Ed"	3/17/17	View
135	Stenkamp, Skippy	Pilot Butte Campus	Complete	11/30/16	11/3/16	Stenkamp, Skippy	11/3/16	View
136	Lindsey, James	Pilot Butte Campus	Complete	11/30/16	12/28/16	Lindsey, James	12/28/16	View
137	Schwartz, James	Pilot Butte Campus	Complete	11/30/16	3/17/17	Schwartz, James	3/17/17	View
138	Canaday, Diane	Pilot Butte Campus	Complete	11/30/16	11/3/16	Canaday, Diane	11/3/16	View
139	Scarbrough, Saedell	Pilot Butte Campus	Complete	11/30/16	11/11/16	Scarbrough, Saedell	11/11/16	View
140	Rader, Barbara	Pilot Butte Campus	Complete	11/30/16	11/3/16	Rader, Barbara	11/3/16	View
141	Volkman, Richard	Pilot Butte Campus	Complete	11/30/16	11/22/16	Volkman, Richard	11/22/16	View
142	Jones, Shane	Pilot Butte Campus	Complete	11/30/16	11/16/16	Jones, Shane	11/16/16	View
143	Newberg, Doug	Pilot Butte Campus	Complete	11/30/16	11/3/16	Newberg, Doug	11/3/16	View
144	Neiswonger, Paul	Pilot Butte Campus	Complete	11/30/16	11/2/16	Neiswonger, Paul	11/2/16	View
145	Baker, Galen	Pilot Butte Campus	Complete	11/30/16	3/20/17	Baker, Galen	3/20/17	View
146	Bean, Everett	Pilot Butte Campus	Not Started	11/30/16				
147	Kirkpatrick, Michael	Pilot Butte Campus	Complete	11/30/16	11/23/16	Kirkpatrick, Michael	11/23/16	View

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	Assigned					Completed		
Row	To	Location	Progress	Due Date	Start	By	On	View
1	Thompson, Scott	Water Reclamation Facility	Complete	1/23/09	1/15/09	Thompson, Scott	2/12/09	View
2	Newton, Joe	Pilot Butte Campus	Complete	1/23/09	1/7/09	Newton, Joe	3/19/09	View
3	Packebush, Warren	Boyd Acres	Complete	1/23/09	1/8/09	Packebush, Warren	1/8/09	View
4	Hamilton, Grant	Boyd Acres	Complete	1/23/09	1/5/09	Hamilton, Grant	1/5/09	View
5	Libolt, Orrin	Boyd Acres	Complete	1/23/09	1/7/09	Libolt, Orrin	1/15/09	View
6	Daniel, Jay	Pilot Butte Campus	Complete	1/23/09	2/17/09	Daniel, Jay	2/17/09	View
7	Mickey, Marc	Water Reclamation Facility	Complete	1/23/09	1/8/09	Mickey, Marc	1/8/09	View
8	Lancaster, Quirt	Pilot Butte Campus	Complete	1/23/09	2/11/09	Lancaster, Quirt	2/11/09	View
9	Cashwell, Spencer	Boyd Acres	Complete	1/23/09	1/8/09	Cashwell, Spencer	1/8/09	View
10	Vaughan, Ken	Boyd Acres	Complete	1/23/09	1/8/09	Vaughan, Ken	1/8/09	View
11	Somers, Travis	Boyd Acres	Complete	1/23/09	2/18/09	Somers, Travis	2/18/09	View
12	Ristoff (AKA: Briggs), Teresa	Boyd Acres	Complete	1/23/09	1/8/09	Ristoff (AKA: Briggs), Teresa	1/8/09	View
13	Schwartz, James	Pilot Butte Campus	Complete	1/23/09	3/27/12	Schwartz, James	6/3/15	View
14	Canaday, Diane	Pilot Butte Campus	Complete	1/23/09	2/3/09	Canaday, Diane	2/3/09	View
15	Hopkins, Robert	Boyd Acres	Complete	1/23/09	1/2/09	Hopkins, Robert	1/2/09	View
16	Buystedt, Jeff	Water Reclamation Facility	Complete	1/23/09	9/24/09	Buystedt, Jeff	9/24/09	View
17	Mingus, Rod	Boyd Acres	Complete	1/23/09	1/8/09	Mingus, Rod	1/8/09	View
18	Edde, Wendy	Boyd Acres	Complete	1/23/09	12/30/08	Edde, Wendy	12/30/08	View
19	Barnes, Drexell	Water Reclamation Facility	Complete	1/23/09	9/21/09	Barnes, Drexell	9/19/11	View
20	McConnell, George	Water Reclamation Facility	Complete	1/23/09	3/2/09	McConnell, George	3/2/09	View
21	Malinowski, Adam	Pilot Butte Campus	Complete	1/23/09	2/9/09	Malinowski, Adam	2/9/09	View
22	Blackwelder, Brice	Boyd Acres	Complete	1/23/09	1/8/09	Blackwelder, Brice	1/8/09	View

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23	Rader, Barbara	Pilot Butte Campus	Complete	1/23/09	1/8/09	Rader, Barbara	1/8/09	View
24	Prazak, Steve	Boyd Acres	Complete	1/23/09	2/5/09	Prazak, Steve	2/5/09	View
25	Byrd, Steve	Boyd Acres	Complete	1/23/09	1/16/09	Byrd, Steve	1/16/09	View
26	Dorsey, Christine	Pilot Butte Campus	Complete	1/23/09	1/8/09	Dorsey, Christine	1/8/09	View
27	Judd, Arthur	Boyd Acres	Complete	1/23/09	1/8/09	Judd, Arthur	1/14/09	View
28	Alley, Mary Beth	Pilot Butte Campus	Complete	1/23/09	1/15/09	Alley, Mary Beth	1/15/09	View
29	Walsworth, Justin	Boyd Acres	Complete	1/23/09	1/8/09	Walsworth, Justin	1/8/09	View
30	Buchanan, David	Boyd Acres	Complete	1/23/09	1/8/09	Buchanan, David	1/8/09	View
31	Buhmann, Donald	Boyd Acres	Complete	1/23/09	1/14/09	Buhmann, Donald	1/14/09	View
32	Milligan, Will	Boyd Acres	Complete	1/23/09	1/6/09	Milligan, Will	1/6/09	View
33	Alexander, Mark	Pilot Butte Campus	Complete	1/23/09	3/10/16	Alexander, Mark	3/10/16	View
34	Findley, Mike	Boyd Acres	Complete	1/23/09	1/8/09	Findley, Mike	1/8/09	View
35	Judd, Gary	Bend Municipal Airport	Complete	4/16/09	5/15/09	Judd, Gary	5/22/09	View
36	Kadow, Gina	Bend Municipal Airport	Complete	1/23/09	4/30/09	Kadow, Gina	6/23/09	View
37	Hansen, Matthew	Water Reclamation Facility	Complete	8/10/09	8/31/09	Hansen, Matthew	9/3/09	View
38	Meistrell, Brenda	Pilot Butte Campus	Complete	11/10/09	4/26/10	Meistrell, Brenda	4/29/10	View
39	Babich, Tyler	Boyd Acres	Complete	11/9/09	12/7/09	Babich, Tyler	12/10/09	View
40	Oak, David	Boyd Acres	Complete	9/13/10	3/18/11	Oak, David	9/26/11	View
41	Rounds, Stuart	Boyd Acres	Complete	11/29/10	1/27/11	Rounds, Stuart	1/27/11	View
42	Hall, Harold "Jimmy"	Pilot Butte Campus	Complete	12/27/10	10/12/11	Hall, Harold "Jimmy"	3/13/13	View
43	Klotz, Ian	Boyd Acres	Complete	11/6/12	12/7/12	Klotz, Ian	12/7/12	View
44	Parent, Ethan	Water Reclamation Facility	Complete	2/12/13	3/4/13	Parent, Ethan	3/14/13	View
45	Ostendorff, Shannon	Boyd Acres	Complete	2/25/13	1/21/14	Ostendorff, Shannon	1/21/14	View
46	Walling, Tom	Water Reclamation Facility	Complete	5/6/13	6/27/13	Walling, Tom	7/12/13	View
47	Larson, Ron	Boyd Acres	Complete	4/21/14	7/8/14	Larson, Ron	7/8/14	View
48	Munson, AJ	Pilot Butte Campus	Complete	7/7/14	9/23/14	Munson, AJ	10/21/14	View
49	Winter, Scott	Boyd Acres	Complete	6/23/14	9/5/14	Winter, Scott	9/5/14	View

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50	Borgognoni, Sam	Water Reclamation Facility	Complete	8/12/14	8/27/14	Borgognoni, Sam	8/27/14	View
51	Davenport, Christina	Boyd Acres	Complete	8/4/14	9/4/14	Davenport, Christina	11/13/14	View
52	Schmidt, Daniel	Pilot Butte Campus	Complete	6/23/14	10/27/14	Schmidt, Daniel	10/27/14	View
53	Mastrud, Corey	Boyd Acres	Complete	10/27/14	1/9/15	Mastrud, Corey	4/24/15	View
54	Donato, Natalie	Boyd Acres	Complete	10/27/14	12/24/14	Donato, Natalie	12/24/14	View
55	Goe, Kerry	Pilot Butte Campus	Complete	12/3/14	1/14/15	Goe, Kerry	2/4/15	View
56	Hall, Matt	Boyd Acres	Complete	1/12/15	2/26/15	Hall, Matt	2/27/15	View
57	Stensland, David	Boyd Acres	Complete	7/8/13	4/2/15	Stensland, David	4/2/15	View
58	Truax, Tim	Water Reclamation Facility	Complete	11/10/15	1/22/16	Truax, Tim	1/22/16	View
59	Finney, Lance	Water Reclamation Facility	Complete	11/30/15	12/15/15	Finney, Lance	1/19/16	View
60	McAteer, Nick	Boyd Acres	Complete	12/7/15	12/31/15	McAteer, Nick	3/17/17	View
61	Gillespie, Rhett	Bend Municipal Airport	Complete	1/4/16	2/17/16	Gillespie, Rhett	6/14/16	View
62	Bradley III, Roy	Water Reclamation Facility	Complete	3/21/16	4/5/16	Bradley III, Roy	4/5/16	View
63	Barnard, Justin	Pilot Butte Campus	Complete	3/28/16	5/17/16	Barnard, Justin	5/18/16	View
64	Nichols, Garrett	Boyd Acres	Complete	8/15/16	2/9/17	Nichols, Garrett	3/24/17	View
65	Denning, Dan	Boyd Acres	Complete	8/8/16	9/8/16	Denning, Dan	9/8/16	View
66	Mulderig, Sean	Boyd Acres	Complete	1/26/17	2/3/17	Mulderig, Sean	2/3/17	View
67	Prentice, Mike	Boyd Acres	Complete	2/13/17	2/24/17	Prentice, Mike	3/7/17	View
68	Vencill, Gary	Boyd Acres	Complete	1/23/09	1/7/09	Vencill, Gary	1/7/09	View
69	Edwards, Mike	Boyd Acres	Complete	1/23/09	1/8/09	Edwards, Mike	1/8/09	View
70	Sweet, Connie	Boyd Acres	Complete	1/23/09	1/12/09	Sweet, Connie	1/12/09	View
71	Brick, Paul	Boyd Acres	Complete	1/23/09	1/15/09	Brick, Paul	1/15/09	View
72	Gillette, Mike	Boyd Acres	Complete	1/23/09	1/13/09	Gillette, Mike	1/13/09	View
73	Packebush (pka: Kristiansen), Mary	Boyd Acres	Complete	1/23/09	12/30/08	Packebush (pka: Kristiansen), Mary	12/30/08	View
74	Ristoff, Kelly	Boyd Acres	Complete	1/23/09	1/2/09	Ristoff, Kelly	1/2/09	View
75	Price, Julie	Boyd Acres	Complete	5/31/11	8/18/11	Price, Julie	8/18/11	View

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76	McCloskey, Marcus	Boyd Acres	Complete	1/23/09	2/17/09	McCloskey, Marcus	2/17/09	View
77	Wright, Kim	Boyd Acres	Complete	1/23/09	1/8/09	Wright, Kim	8/16/10	View
78	Sanvitale, Spencer	Boyd Acres	Complete	1/23/09	1/8/09	Sanvitale, Spencer	1/8/09	View
79	Gardner, Greg "Scott"	Boyd Acres	Complete	1/23/09	1/8/09	Gardner, Greg "Scott"	1/8/09	View
80	Riley, Steve	Boyd Acres	Complete	1/23/09	1/9/09	Riley, Steve	1/9/09	View
81	Kuss, Richard	Boyd Acres	Complete	1/23/09	1/8/09	Kuss, Richard	1/8/09	View
82	Richmond, Paul "Stu"	Boyd Acres	Complete	1/23/09	1/28/09	Richmond, Paul "Stu"	1/28/09	View
83	Borrego, David	Boyd Acres	Complete	2/10/09	3/5/09	Borrego, David	3/5/09	View
84	Winter, Kyle	Boyd Acres	Complete	4/1/14	5/30/14	Winter, Kyle	5/30/14	View
85	Follose, Brandon	Boyd Acres	Complete	5/20/13	4/11/14	Follose, Brandon	4/11/14	View
86	Armenta, David	Boyd Acres	Complete	7/14/14	7/29/14	Armenta, David	7/29/14	View
87	Wood, Chris	Boyd Acres	Complete	12/10/14	12/21/14	Wood, Chris	12/21/14	View
88	Petitmermet, Sean	Boyd Acres	Complete	12/26/14	1/16/15	Petitmermet, Sean	2/6/15	View
89	Beck, Troy	Boyd Acres	Complete	2/10/15	11/30/15	Beck, Troy	9/30/16	View
90	Leath, David	Boyd Acres	Complete	9/28/15	4/28/16	Leath, David	4/28/16	View
91	Chamberlain, Eric	Boyd Acres	Complete	5/10/16	5/26/16	Chamberlain, Eric	5/26/16	View
92	Marinelli, Tommy	Boyd Acres	Complete	8/29/16	11/16/16	Marinelli, Tommy	11/21/16	View
93	Sullivan, Steven	Boyd Acres	Complete	1/10/17	3/7/17	Sullivan, Steven	3/7/17	View
94	Rogers, William "Ed"	Water Reclamation Facility	Complete	1/23/09	1/9/09	Rogers, William "Ed"	1/9/09	View
95	Stenkamp, Skippy	Pilot Butte Campus	Complete	1/23/09	1/8/09	Stenkamp, Skippy	1/8/09	View
96	Lindsey, James	Pilot Butte Campus	Complete	1/23/09	2/6/09	Lindsey, James	2/6/09	View
97	Waldrop, Will	Pilot Butte Campus	Complete	1/23/09	1/7/09	Waldrop, Will	1/7/09	View
98	Scarbrough, Saedell	Pilot Butte Campus	Complete	1/23/09	1/12/09	Scarbrough, Saedell	2/10/09	View
99	Fore, Erynne	Water Reclamation Facility	Complete	11/29/10	12/16/10	Fore, Erynne	12/20/10	View
100	Moulder, Lon	Water Reclamation Facility	Complete	7/29/13	8/27/13	Moulder, Lon	8/27/13	View
101	Utley, Aaron	Water Reclamation Facility	Complete	9/23/13	10/10/13	Utley, Aaron	10/28/13	View

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102	Newberg, Doug	Pilot Butte Campus	Complete	1/23/09	3/31/09	Newberg, Doug	3/31/09	View
103	Howe, Carl	Pilot Butte Campus	Complete	8/26/10	12/4/13	Howe, Carl	12/11/13	View
104	Combs, Ty	Pilot Butte Campus	Complete	12/12/11	12/16/11	Combs, Ty	3/22/12	View
105	Abbas, David	Pilot Butte Campus	Complete	2/13/12	12/26/14	Abbas, David	12/26/14	View
106	Byrd, Daniel	Pilot Butte Campus	Complete	5/2/12	6/7/12	Byrd, Daniel	6/7/12	View
107	Combs, Ken	Pilot Butte Campus	Complete	12/17/12	12/30/12	Combs, Ken	12/30/12	View
108	Oliver, Josh	Pilot Butte Campus	Complete	5/20/13	8/1/13	Oliver, Josh	8/8/13	View
109	Jackson, Dylan	Pilot Butte Campus	Complete	7/8/13	10/9/13	Jackson, Dylan	10/9/13	View
110	Armer, Mike	Pilot Butte Campus	Complete	8/1/14	8/28/14	Armer, Mike	8/28/14	View
111	Baker, Galen	Pilot Butte Campus	Complete	7/1/13	3/20/17	Baker, Galen	3/20/17	View
112	Dennis, Jay	Pilot Butte Campus	Complete	3/28/16	5/19/16	Dennis, Jay	5/19/16	View
113	Hobbs, Eric	Boyd Acres	Complete	1/23/09	1/29/09	Hobbs, Eric	1/29/09	View
114	Wolter, Mark	Boyd Acres	Complete	1/23/09	1/8/09	Wolter, Mark	1/8/09	View
115	Graham, Kelly	Boyd Acres	Complete	1/23/09	1/8/09	Graham, Kelly	1/8/09	View
116	Somers, Robyn	Boyd Acres	Complete	1/23/09	1/8/09	Somers, Robyn	1/8/09	View
117	Lee, Dave	Boyd Acres	Complete	1/23/09	1/16/09	Lee, Dave	1/16/09	View
118	Woods, Rawlin	Boyd Acres	Complete	1/23/09	1/8/09	Woods, Rawlin	1/8/09	View
119	Taylor, Oakley	Boyd Acres	Complete	1/23/09	1/5/09	Taylor, Oakley	1/5/09	View
120	Skaggs, Dan	Boyd Acres	Complete	1/23/09	1/8/09	Skaggs, Dan	1/8/09	View
121	Mosher, Chris	Boyd Acres	Complete	10/22/09	12/11/09	Mosher, Chris	12/11/09	View
122	Patterson, Tyler	Boyd Acres	Complete	5/17/10	5/27/10	Patterson, Tyler	6/3/10	View
123	Richardson, Ty	Boyd Acres	Complete	9/27/10	11/3/10	Richardson, Ty	11/3/10	View
124	Trask, Kris	Boyd Acres	Complete	9/10/15	7/8/16	Trask, Kris	7/8/16	View
125	Nelson, Jeff	Boyd Acres	Complete	12/27/16	1/24/17	Nelson, Jeff	1/25/17	View
126	Burghardt, Joe	Water Reclamation Facility	Complete	1/23/09	1/8/09	Burghardt, Joe	1/8/09	View
127	Roshone, Elmer	Water Reclamation Facility	Complete	1/23/09	1/8/09	Roshone, Elmer	1/8/09	View
128	Carlson, Tim	Water Reclamation Facility	Complete	7/26/10	8/11/10	Carlson, Tim	8/11/10	View

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129	Thomasson, Shanon (John)	Pilot Butte Campus	Complete	1/23/09	12/3/09	Thomasson, Shanon (John)	12/3/09	View
130	Qual, Craig	Pilot Butte Campus	Complete	1/23/09	1/12/09	Qual, Craig	1/12/09	View
131	Volkman, Richard	Pilot Butte Campus	Complete	1/23/09	1/8/09	Volkman, Richard	1/8/09	View
132	Prince, Jeannette	Pilot Butte Campus	Complete	1/23/09	1/8/09	Prince, Jeannette	1/8/09	View
133	Elpi-Trainor, Michelle	Water Reclamation Facility	Complete	11/15/10	11/24/10	Elpi-Trainor, Michelle	12/2/10	View
134	Jones, Shane	Pilot Butte Campus	Complete	1/23/09	1/12/09	Jones, Shane	1/12/09	View
135	Hanson, Hardy	Pilot Butte Campus	Complete	1/23/09	1/8/09	Hanson, Hardy	1/8/09	View
136	Morrison, George	Pilot Butte Campus	Complete	1/23/09	2/12/09	Morrison, George	12/5/09	View
137	Smith, William	Pilot Butte Campus	Complete	9/13/10	11/4/10	Smith, William	3/18/11	View
138	Blake, Christopher	Pilot Butte Campus	Complete	12/19/11	5/15/12	Blake, Christopher	5/17/12	View
139	Cota, Tony	Pilot Butte Campus	Complete	7/9/12	7/30/12	Cota, Tony	8/6/12	View
140	Neiswonger, Paul	Pilot Butte Campus	Complete	1/28/13	2/7/13	Neiswonger, Paul	2/7/13	View
141	Gardner, Lucas	Pilot Butte Campus	Complete	7/7/14	9/22/14	Gardner, Lucas	9/22/14	View
142	Lessar, Joshua	Pilot Butte Campus	Complete	8/4/14	8/21/14	Lessar, Joshua	9/5/14	View
143	McQuillen, Christy	Pilot Butte Campus	Complete	4/13/15	12/30/16	McQuillen, Christy	3/23/17	View
144	LaCasse, Gary	Pilot Butte Campus	Complete	5/26/16	8/3/16	LaCasse, Gary	8/5/16	View
145	Bean, Everett	Pilot Butte Campus	Not Started	4/12/16				
146	Kirkpatrick, Michael	Pilot Butte Campus	Complete	9/6/16	12/20/16	Kirkpatrick, Michael	12/20/16	View
147	Anzalone, Alta	Pilot Butte Campus	Complete	8/10/16	2/24/17	Anzalone, Alta	2/28/17	View

Minutes since last data refresh: 3

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	Assigned					Completed		
Row	To	Location	Progress	Due Date	Start	By	On	View
1	Stenkamp, Skippy	Pilot Butte Campus	Complete	3/31/16	2/29/16	Stenkamp, Skippy	2/29/16	View
2	Newton, Joe	Pilot Butte Campus	Complete	3/31/16	3/1/16	Newton, Joe	3/1/16	View
3	Packebush, Warren	Boyd Acres	Complete	3/31/16	3/3/16	Packebush, Warren	3/3/16	View
4	Hamilton, Grant	Boyd Acres	Complete	3/31/16	2/29/16	Hamilton, Grant	2/29/16	View
5	Gillette, Mike	Boyd Acres	Complete	3/31/16	3/3/16	Gillette, Mike	3/3/16	View
6	Lindsey, James	Pilot Butte Campus	Complete	3/31/16	3/10/16	Lindsey, James	3/10/16	View
7	Wolter, Mark	Boyd Acres	Complete	3/31/16	3/1/16	Wolter, Mark	3/1/16	View
8	Mickey, Marc	Water Reclamation Facility	Complete	3/31/16	3/3/16	Mickey, Marc	3/3/16	View
9	Ristoff, Kelly	Boyd Acres	Complete	3/31/16	3/17/16	Ristoff, Kelly	3/17/16	View
10	Cashwell, Spencer	Boyd Acres	Complete	3/31/16	2/29/16	Cashwell, Spencer	2/29/16	View
11	McCloskey, Marcus	Boyd Acres	Complete	3/31/16	3/3/16	McCloskey, Marcus	3/3/16	View
12	Vaughan, Ken	Boyd Acres	Complete	3/31/16	2/29/16	Vaughan, Ken	2/29/16	View
13	Hopkins, Robert	Boyd Acres	Complete	3/31/16	2/29/16	Hopkins, Robert	2/29/16	View
14	Edde, Wendy	Boyd Acres	Complete	3/31/16	2/29/16	Edde, Wendy	2/29/16	View
15	Burghardt, Joe	Water Reclamation Facility	Complete	3/31/16	2/29/16	Burghardt, Joe	2/29/16	View
16	Lee, Dave	Boyd Acres	Complete	3/31/16	3/11/16	Lee, Dave	3/11/16	View
17	Woods, Rawlin	Boyd Acres	Complete	3/31/16	3/4/16	Woods, Rawlin	3/4/16	View
18	Gardner, Greg "Scott"	Boyd Acres	Complete	3/31/16	8/19/16	Gardner, Greg "Scott"	8/19/16	View
19	Malinowski, Adam	Pilot Butte Campus	Complete	3/31/16	3/31/16	Malinowski, Adam	3/31/16	View
20	Rader, Barbara	Pilot Butte Campus	Complete	3/31/16	3/3/16	Rader, Barbara	3/3/16	View
21	Qual, Craig	Pilot Butte Campus	Complete	3/31/16	3/7/16	Qual, Craig	3/7/16	View
22	Byrd, Steve	Boyd Acres	Complete	3/31/16	2/29/16	Byrd, Steve	2/29/16	View
23	Volkman, Richard	Pilot Butte Campus	Complete	3/31/16	5/5/16	Volkman, Richard	5/5/16	View
24	Jones, Shane	Pilot Butte Campus	Complete	3/31/16	11/16/16	Jones, Shane	11/16/16	View
25	Walsworth, Justin	Boyd Acres	Complete	3/31/16	3/24/16	Walsworth, Justin	3/24/16	View

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26	Roshone, Elmer	Water Reclamation Facility	Complete	3/31/16	2/29/16	Roshone, Elmer	2/29/16	View
27	Buhmann, Donald	Boyd Acres	Complete	3/31/16	3/22/16	Buhmann, Donald	3/22/16	View
28	Skaggs, Dan	Boyd Acres	Complete	3/31/16	3/14/16	Skaggs, Dan	3/14/16	View
29	Kuss, Richard	Boyd Acres	Complete	3/31/16	3/11/16	Kuss, Richard	3/11/16	View
30	Findley, Mike	Boyd Acres	Complete	3/31/16	3/11/16	Findley, Mike	3/15/16	View
31	Borrego, David	Boyd Acres	Complete	3/31/16	3/7/16	Borrego, David	3/7/16	View
32	Patterson, Tyler	Boyd Acres	Complete	3/31/16	2/29/16	Patterson, Tyler	2/29/16	View
33	Oak, David	Boyd Acres	Complete	3/31/16	3/2/16	Oak, David	3/2/16	View
34	Richardson, Ty	Boyd Acres	Complete	3/31/16	6/14/16	Richardson, Ty	6/14/16	View
35	Rounds, Stuart	Boyd Acres	Complete	3/31/16	2/29/16	Rounds, Stuart	2/29/16	View
36	Combs, Ty	Pilot Butte Campus	Complete	3/31/16	3/10/16	Combs, Ty	3/10/16	View
37	Blake, Christopher	Pilot Butte Campus	Complete	3/31/16	5/4/16	Blake, Christopher	5/4/16	View
38	Combs, Ken	Pilot Butte Campus	Complete	3/31/16	2/29/16	Combs, Ken	2/29/16	View
39	Parent, Ethan	Water Reclamation Facility	Complete	3/31/16	4/7/16	Parent, Ethan	4/7/16	View
40	Moulder, Lon	Water Reclamation Facility	Complete	3/31/16	3/3/16	Moulder, Lon	3/3/16	View
41	Follose, Brandon	Boyd Acres	Complete	3/31/16	2/29/16	Follose, Brandon	2/29/16	View
42	Armenta, David	Boyd Acres	Complete	3/31/16	2/29/16	Armenta, David	2/29/16	View
43	Munson, AJ	Pilot Butte Campus	Complete	3/31/16	3/1/16	Munson, AJ	3/1/16	View
44	Armer, Mike	Pilot Butte Campus	Complete	3/31/16	2/29/16	Armer, Mike	2/29/16	View
45	Winter, Scott	Boyd Acres	Complete	3/31/16	2/29/16	Winter, Scott	2/29/16	View
46	Schmidt, Daniel	Pilot Butte Campus	Complete	3/31/16	2/29/16	Schmidt, Daniel	2/29/16	View
47	Goe, Kerry	Pilot Butte Campus	Complete	3/31/16	3/1/16	Goe, Kerry	3/1/16	View
48	Beck, Troy	Boyd Acres	Complete	3/31/16	9/30/16	Beck, Troy	9/30/16	View
49	Konop, Patrick	Wall St Annex	Complete	3/31/16	3/3/16	Konop, Patrick	3/3/16	View
50	Fugate, Lance	Pilot Butte Campus	Complete	6/16/16	2/6/17	Fugate, Lance	2/6/17	View
51	Nichols, Garrett	Boyd Acres	Complete	8/15/16	2/1/17	Nichols, Garrett	2/1/17	View

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52	Marinelli, Tommy	Boyd Acres	Complete	8/29/16	11/4/16	Marinelli, Tommy	11/4/16	View
53	Mulderig, Sean	Boyd Acres	Complete	1/26/17	2/3/17	Mulderig, Sean	2/3/17	View
54	McConnell, George	Water Reclamation Facility	Complete	3/31/16	2/29/16	McConnell, George	2/29/16	View
55	Rogers, William "Ed"	Water Reclamation Facility	Complete	3/31/16	6/9/16	Rogers, William "Ed"	6/9/16	View
56	Carlson, Tim	Water Reclamation Facility	Complete	3/31/16	2/29/16	Carlson, Tim	2/29/16	View
57	Thomasson, Shanon (John)	Pilot Butte Campus	Complete	3/31/16	11/30/16	Thomasson, Shanon (John)	11/30/16	View
58	Schwartz, James	Pilot Butte Campus	Complete	3/31/16	7/7/16	Schwartz, James	7/7/16	View
59	Waldrop, Will	Pilot Butte Campus	Complete	3/31/16	3/3/16	Waldrop, Will	3/3/16	View
60	Scarbrough, Saedell	Pilot Butte Campus	Complete	3/31/16	9/8/16	Scarbrough, Saedell	9/8/16	View
61	Borgognoni, Sam	Water Reclamation Facility	Complete	3/31/16	5/3/16	Borgognoni, Sam	5/3/16	View
62	Smith, William	Pilot Butte Campus	Complete	3/31/16	5/5/16	Smith, William	5/5/16	View
63	Byrd, Daniel	Pilot Butte Campus	Complete	3/31/16	3/9/16	Byrd, Daniel	3/9/16	View
64	Cota, Tony	Pilot Butte Campus	Complete	3/31/16	2/29/16	Cota, Tony	2/29/16	View
65	Neiswonger, Paul	Pilot Butte Campus	Complete	3/31/16	3/3/16	Neiswonger, Paul	3/3/16	View
66	Gardner, Lucas	Pilot Butte Campus	Complete	3/31/16	3/15/16	Gardner, Lucas	3/15/16	View
67	Barnard, Justin	Pilot Butte Campus	Complete	3/31/16	5/18/16	Barnard, Justin	5/18/16	View
68	Kirkpatrick, Michael	Pilot Butte Campus	Complete	9/6/16	11/23/16	Kirkpatrick, Michael	11/23/16	View
69	Vencill, Gary	Boyd Acres	Complete	3/31/16	3/3/16	Vencill, Gary	3/3/16	View
70	Edwards, Mike	Boyd Acres	Complete	3/31/16	3/10/16	Edwards, Mike	3/10/16	View
71	Hobbs, Eric	Boyd Acres	Complete	3/31/16	3/3/16	Hobbs, Eric	3/3/16	View
72	Libolt, Orrin	Boyd Acres	Complete	3/31/16	3/3/16	Libolt, Orrin	3/3/16	View
73	Brick, Paul	Boyd Acres	Complete	3/31/16	8/18/16	Brick, Paul	8/18/16	View
74	Graham, Kelly	Boyd Acres	Complete	3/31/16	3/8/16	Graham, Kelly	3/8/16	View
75	Somers, Travis	Boyd Acres	Complete	3/31/16	2/3/17	Somers, Travis	2/3/17	View
76	Judd, Arthur	Boyd Acres	Complete	3/31/16	3/17/16	Judd, Arthur	3/17/16	View
77	Riley, Steve	Boyd Acres	Complete	3/31/16	4/14/16	Riley, Steve	4/14/16	View

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78	Milligan, Will	Boyd Acres	Complete	3/31/16	3/28/16	Milligan, Will	3/28/16	View
79	Babich, Tyler	Boyd Acres	Complete	3/31/16	3/7/16	Babich, Tyler	3/7/16	View
80	Mastrud, Corey	Boyd Acres	Complete	3/31/16	3/17/16	Mastrud, Corey	3/17/16	View
81	Leath, David	Boyd Acres	Complete	3/31/16	4/28/16	Leath, David	4/28/16	View
82	Gillespie, Rhett	Bend Municipal Airport	Complete	3/31/16	3/8/16	Gillespie, Rhett	3/8/16	View
83	Chamberlain, Eric	Boyd Acres	Complete	5/10/16	5/23/16	Chamberlain, Eric	5/23/16	View
84	Sullivan, Steven	Boyd Acres	Complete	1/10/17	2/24/17	Sullivan, Steven	2/24/17	View
85	Thompson, Scott	Water Reclamation Facility	Complete	3/31/16	8/31/16	Thompson, Scott	8/31/16	View
86	Daniel, Jay	Pilot Butte Campus	Complete	3/31/16	3/11/16	Daniel, Jay	3/11/16	View
87	Lancaster, Quirt	Pilot Butte Campus	Complete	3/31/16	4/14/16	Lancaster, Quirt	4/14/16	View
88	Fore, Erynne	Water Reclamation Facility	Complete	3/31/16	2/29/16	Fore, Erynne	2/29/16	View
89	Finney, Lance	Water Reclamation Facility	Complete	3/31/16	3/21/16	Finney, Lance	3/21/16	View
90	Bradley III, Roy	Water Reclamation Facility	Complete	3/31/16	3/30/16	Bradley III, Roy	3/30/16	View
91	Prince, Jeannette	Pilot Butte Campus	Complete	3/31/16	3/3/16	Prince, Jeannette	3/3/16	View
92	Morrison, George	Pilot Butte Campus	Complete	3/31/16	10/27/16	Morrison, George	10/27/16	View
93	Newberg, Doug	Pilot Butte Campus	Complete	3/31/16	2/29/16	Newberg, Doug	2/29/16	View
94	Hall, Harold "Jimmy"	Pilot Butte Campus	Complete	3/31/16	3/4/16	Hall, Harold "Jimmy"	3/4/16	View
95	Lessar, Joshua	Pilot Butte Campus	Complete	3/31/16	3/2/16	Lessar, Joshua	3/2/16	View
96	Dennis, Jay	Pilot Butte Campus	Complete	3/31/16	5/19/16	Dennis, Jay	5/19/16	View
97	Somers, Robyn	Boyd Acres	Complete	3/31/16	3/3/16	Somers, Robyn	3/3/16	View
98	Mingus, Rod	Boyd Acres	Complete	3/31/16	3/31/16	Mingus, Rod	3/31/16	View
99	Blackwelder, Brice	Boyd Acres	Complete	3/31/16	6/17/16	Blackwelder, Brice	6/17/16	View
100	Taylor, Oakley	Boyd Acres	Complete	3/31/16	3/8/16	Taylor, Oakley	3/8/16	View
101	Buchanan, David	Boyd Acres	Complete	3/31/16	2/29/16	Buchanan, David	2/29/16	View
102	Mosher, Chris	Boyd Acres	Complete	3/31/16	3/22/16	Mosher, Chris	3/22/16	View
103	Klotz, Ian	Boyd Acres	Complete	3/31/16	7/21/16	Klotz, Ian	7/21/16	View

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104	Larson, Ron	Boyd Acres	Complete	3/31/16	2/29/16	Larson, Ron	2/29/16	View
105	Davenport, Christina	Boyd Acres	Complete	3/31/16	4/1/16	Davenport, Christina	4/1/16	View
106	Wood, Chris	Boyd Acres	Complete	3/31/16	2/29/16	Wood, Chris	2/29/16	View
107	Petitmermet, Sean	Boyd Acres	Complete	3/31/16	3/7/16	Petitmermet, Sean	3/7/16	View
108	Hall, Matt	Boyd Acres	Complete	3/31/16	3/4/16	Hall, Matt	3/4/16	View
109	Webster, Jessica	Wall St Annex	Complete	3/31/16	3/22/16	Webster, Jessica	3/22/16	View
110	Homgren, Joseph	Boyd Acres	Complete	7/26/16	2/6/17	Homgren, Joseph	2/6/17	View
111	Denning, Dan	Boyd Acres	Complete	8/8/16	9/8/16	Denning, Dan	9/8/16	View
112	Nelson, Jeff	Boyd Acres	Complete	12/27/16	1/24/17	Nelson, Jeff	1/24/17	View
113	Prentice, Mike	Boyd Acres	Complete	2/13/17	2/24/17	Prentice, Mike	2/24/17	View

Minutes since last data refresh: 6

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Row	Assigned To	Assigned Location	Progress	Due Date	Start	Completed By	Completed On	View
1	Thompson, Scott	Water Reclamation Facility	Complete	1/31/17	3/20/17	Thompson, Scott	3/20/17	View
2	Vencill, Gary	Boyd Acres	Complete	1/31/17	1/7/17	Vencill, Gary	1/7/17	View
3	Stenkamp, Skippy	Pilot Butte Campus	Complete	1/31/17	1/17/17	Stenkamp, Skippy	1/17/17	View
4	Edwards, Mike	Boyd Acres	Complete	1/31/17	1/19/17	Edwards, Mike	1/19/17	View
5	Hobbs, Eric	Boyd Acres	Complete	1/31/17	1/17/17	Hobbs, Eric	1/17/17	View
6	Libolt, Orrin	Boyd Acres	Complete	1/31/17	1/30/17	Libolt, Orrin	1/30/17	View
7	Clarno, Karen	Boyd Acres	Not Started	1/31/17				
8	Lindsey, James	Pilot Butte Campus	Complete	1/31/17	1/26/17	Lindsey, James	1/26/17	View
9	Wolter, Mark	Boyd Acres	Complete	1/31/17	1/17/17	Wolter, Mark	1/17/17	View
10	Daniel, Jay	Pilot Butte Campus	Complete	1/31/17	2/2/17	Daniel, Jay	2/2/17	View
11	Graham, Kelly	Boyd Acres	Complete	1/31/17	1/12/17	Graham, Kelly	1/12/17	View
12	Thomasson, Shanon (John)	Pilot Butte Campus	Complete	1/31/17	2/21/17	Thomasson, Shanon (John)	2/21/17	View
13	Packebush (pka: Kristiansen), Mary	Boyd Acres	Complete	1/31/17	1/6/17	Packebush (pka: Kristiansen), Mary	1/6/17	View
14	Somers, Robyn	Boyd Acres	Complete	1/31/17	1/12/17	Somers, Robyn	1/12/17	View
15	Lancaster, Quirt	Pilot Butte Campus	Complete	1/31/17	2/17/17	Lancaster, Quirt	2/17/17	View
16	Cashwell, Spencer	Boyd Acres	Complete	1/31/17	1/12/17	Cashwell, Spencer	1/12/17	View
17	Wright, Kim	Boyd Acres	Complete	1/31/17	2/2/17	Wright, Kim	2/2/17	View
18	Somers, Travis	Boyd Acres	Complete	1/31/17	2/3/17	Somers, Travis	2/3/17	View
19	Schwartz, James	Pilot Butte Campus	Complete	1/31/17	3/17/17	Schwartz, James	3/17/17	View
20	Waldrop, Will	Pilot Butte Campus	Complete	1/31/17	2/16/17	Waldrop, Will	2/16/17	View
21	Scarbrough, Saedell	Pilot Butte Campus	Complete	1/31/17	2/8/17	Scarbrough, Saedell	2/8/17	View
22	Buystedt, Jeff	Water Reclamation Facility	Complete	1/31/17	1/19/17	Buystedt, Jeff	1/19/17	View
23	Mingus, Rod	Boyd Acres	Complete	1/31/17	3/6/17	Mingus, Rod	3/6/17	View
24	Edde, Wendy	Boyd Acres	Complete	1/31/17	1/30/17	Edde, Wendy	1/30/17	View

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25	Burghardt, Joe	Water Reclamation Facility	Complete	1/31/17	1/12/17	Burghardt, Joe	1/12/17	View
26	Lee, Dave	Boyd Acres	Complete	1/31/17	2/16/17	Lee, Dave	2/16/17	View
27	McConnell, George	Water Reclamation Facility	Complete	1/31/17	1/17/17	McConnell, George	1/17/17	View
28	Woods, Rawlin	Boyd Acres	Complete	1/31/17	1/9/17	Woods, Rawlin	1/9/17	View
29	Gardner, Greg "Scott"	Boyd Acres	Complete	1/31/17	1/12/17	Gardner, Greg "Scott"	1/12/17	View
30	Rader, Barbara	Pilot Butte Campus	Complete	1/31/17	1/18/17	Rader, Barbara	1/18/17	View
31	Volkman, Richard	Pilot Butte Campus	Complete	1/31/17	3/9/17	Volkman, Richard	3/9/17	View
32	Judd, Arthur	Boyd Acres	Complete	1/31/17	2/14/17	Judd, Arthur	2/14/17	View
33	Riley, Steve	Boyd Acres	Complete	1/31/17	1/31/17	Riley, Steve	1/31/17	View
34	Prince, Jeannette	Pilot Butte Campus	Complete	1/31/17	1/10/17	Prince, Jeannette	1/10/17	View
35	Jones, Shane	Pilot Butte Campus	Complete	1/31/17	2/6/17	Jones, Shane	2/6/17	View
36	Alley, Mary Beth	Pilot Butte Campus	Complete	1/31/17	3/7/17	Alley, Mary Beth	3/7/17	View
37	Taylor, Oakley	Boyd Acres	Complete	1/31/17	1/12/17	Taylor, Oakley	1/12/17	View
38	Buchanan, David	Boyd Acres	Complete	1/31/17	1/20/17	Buchanan, David	1/20/17	View
39	Morrison, George	Pilot Butte Campus	Complete	1/31/17	1/9/17	Morrison, George	1/9/17	View
40	Kuss, Richard	Boyd Acres	Complete	1/31/17	1/12/17	Kuss, Richard	1/12/17	View
41	Alexander, Mark	Pilot Butte Campus	Complete	1/31/17	1/12/17	Alexander, Mark	1/12/17	View
42	Borrego, David	Boyd Acres	Complete	1/31/17	1/12/17	Borrego, David	1/12/17	View
43	Judd, Gary	Bend Municipal Airport	Complete	1/31/17	2/10/17	Judd, Gary	2/10/17	View
44	Hansen, Matthew	Water Reclamation Facility	Complete	1/31/17	3/10/17	Hansen, Matthew	3/10/17	View
45	Meistrell, Brenda	Pilot Butte Campus	Complete	1/31/17	1/21/17	Meistrell, Brenda	1/21/17	View
46	Babich, Tyler	Boyd Acres	Complete	1/31/17	3/15/17	Babich, Tyler	3/15/17	View
47	Richardson, Ty	Boyd Acres	Complete	1/31/17	3/9/17	Richardson, Ty	3/9/17	View
48	Elpi-Trainor, Michelle	Water Reclamation Facility	Complete	1/31/17	1/12/17	Elpi-Trainor, Michelle	1/12/17	View
49	Hall, Harold "Jimmy"	Pilot Butte Campus	Complete	1/31/17	3/9/17	Hall, Harold "Jimmy"	3/9/17	View

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50	Combs, Ty	Pilot Butte Campus	Complete	1/31/17	2/16/17	Combs, Ty	2/16/17	View
51	Byrd, Daniel	Pilot Butte Campus	Complete	1/31/17	1/30/17	Byrd, Daniel	1/30/17	View
52	Cota, Tony	Pilot Butte Campus	Complete	1/31/17	2/24/17	Cota, Tony	2/24/17	View
53	Combs, Ken	Pilot Butte Campus	Complete	1/31/17	1/13/17	Combs, Ken	1/13/17	View
54	Neiswonger, Paul	Pilot Butte Campus	Complete	1/31/17	1/26/17	Neiswonger, Paul	1/26/17	View
55	Parent, Ethan	Water Reclamation Facility	Complete	1/31/17	2/9/17	Parent, Ethan	2/9/17	View
56	Walling, Tom	Water Reclamation Facility	Complete	1/31/17	1/24/17	Walling, Tom	1/24/17	View
57	Jackson, Dylan	Pilot Butte Campus	Complete	1/31/17	2/16/17	Jackson, Dylan	2/16/17	View
58	Winter, Kyle	Boyd Acres	Complete	1/31/17	1/19/17	Winter, Kyle	1/19/17	View
59	Larson, Ron	Boyd Acres	Complete	1/31/17	1/24/17	Larson, Ron	1/24/17	View
60	Munson, AJ	Pilot Butte Campus	Complete	1/31/17	1/12/17	Munson, AJ	1/12/17	View
61	Armer, Mike	Pilot Butte Campus	Complete	1/31/17	1/13/17	Armer, Mike	1/13/17	View
62	Winter, Scott	Boyd Acres	Complete	1/31/17	1/9/17	Winter, Scott	1/9/17	View
63	Borgognoni, Sam	Water Reclamation Facility	Complete	1/31/17	1/26/17	Borgognoni, Sam	1/26/17	View
64	Mastrud, Corey	Boyd Acres	Complete	1/31/17	1/19/17	Mastrud, Corey	1/19/17	View
65	Wood, Chris	Boyd Acres	Complete	1/31/17	1/18/17	Wood, Chris	1/18/17	View
66	McQuillen, Christy	Pilot Butte Campus	Complete	1/31/17	3/23/17	McQuillen, Christy	3/23/17	View
67	Finney, Lance	Water Reclamation Facility	Complete	1/31/17	1/24/17	Finney, Lance	1/24/17	View
68	McAteer, Nick	Boyd Acres	Complete	1/31/17	3/17/17	McAteer, Nick	3/17/17	View
69	Bradley III, Roy	Water Reclamation Facility	Complete	1/31/17	1/31/17	Bradley III, Roy	1/31/17	View
70	Dennis, Jay	Pilot Butte Campus	Complete	1/31/17	1/13/17	Dennis, Jay	1/13/17	View
71	Chamberlain, Eric	Boyd Acres	Complete	1/31/17	1/11/17	Chamberlain, Eric	1/11/17	View
72	LaCasse, Gary	Pilot Butte Campus	Complete	1/31/17	1/13/17	LaCasse, Gary	1/13/17	View
73	Denning, Dan	Boyd Acres	Complete	1/31/17	1/19/17	Denning, Dan	1/19/17	View
74	Prentice, Mike	Boyd Acres	Complete	2/13/17	2/23/17	Prentice, Mike	2/23/17	View
75	Packebush, Warren	Boyd Acres	Complete	1/31/17	1/9/17	Packebush, Warren	1/9/17	View

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76	Sweet, Connie	Boyd Acres	Complete	1/31/17	1/12/17	Sweet, Connie	1/12/17	View
77	Hamilton, Grant	Boyd Acres	Complete	1/31/17	1/30/17	Hamilton, Grant	1/30/17	View
78	Brick, Paul	Boyd Acres	Complete	1/31/17	3/20/17	Brick, Paul	3/20/17	View
79	Price, Julie	Boyd Acres	Complete	1/31/17	3/16/17	Price, Julie	3/16/17	View
80	Hopkins, Robert	Boyd Acres	Complete	1/31/17	1/12/17	Hopkins, Robert	1/12/17	View
81	Sanvitale, Spencer	Boyd Acres	Complete	1/31/17	1/12/17	Sanvitale, Spencer	1/12/17	View
82	Prazak, Steve	Boyd Acres	Complete	1/31/17	2/2/17	Prazak, Steve	2/2/17	View
83	Byrd, Steve	Boyd Acres	Complete	1/31/17	1/10/17	Byrd, Steve	1/10/17	View
84	Walsworth, Justin	Boyd Acres	Complete	1/31/17	1/12/17	Walsworth, Justin	1/12/17	View
85	Milligan, Will	Boyd Acres	Complete	1/31/17	2/1/17	Milligan, Will	2/1/17	View
86	Kadow, Gina	Bend Municipal Airport	Complete	1/31/17	1/26/17	Kadow, Gina	1/26/17	View
87	Patterson, Tyler	Boyd Acres	Complete	1/31/17	2/23/17	Patterson, Tyler	2/23/17	View
88	Rounds, Stuart	Boyd Acres	Complete	1/31/17	1/12/17	Rounds, Stuart	1/12/17	View
89	Klotz, Ian	Boyd Acres	Complete	1/31/17	2/2/17	Klotz, Ian	2/2/17	View
90	Ostendorff, Shannon	Boyd Acres	Complete	1/31/17	1/11/17	Ostendorff, Shannon	1/11/17	View
91	Donato, Natalie	Boyd Acres	Complete	1/31/17	1/19/17	Donato, Natalie	1/19/17	View
92	Stensland, David	Boyd Acres	Complete	1/31/17	3/3/17	Stensland, David	3/3/17	View
93	Nichols, Garrett	Boyd Acres	Complete	1/31/17	2/9/17	Nichols, Garrett	2/9/17	View
94	Marinelli, Tommy	Boyd Acres	Complete	1/31/17	1/18/17	Marinelli, Tommy	1/18/17	View
95	Mulderig, Sean	Boyd Acres	Complete	1/31/17	2/3/17	Mulderig, Sean	2/3/17	View
96	Mickey, Marc	Water Reclamation Facility	Complete	1/31/17	1/17/17	Mickey, Marc	1/17/17	View
97	Barnes, Drexell	Water Reclamation Facility	Complete	1/31/17	1/26/17	Barnes, Drexell	1/26/17	View
98	Newton, Joe	Pilot Butte Campus	Complete	1/31/17	1/23/17	Newton, Joe	1/23/17	View
99	Canaday, Diane	Pilot Butte Campus	Complete	1/31/17	1/12/17	Canaday, Diane	1/12/17	View
100	Malinowski, Adam	Pilot Butte Campus	Complete	1/31/17	2/9/17	Malinowski, Adam	2/9/17	View
101	Qual, Craig	Pilot Butte Campus	Complete	1/31/17	1/8/17	Qual, Craig	1/8/17	View

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102	Dorsey, Christine	Pilot Butte Campus	Complete	1/31/17	1/12/17	Dorsey, Christine	1/12/17	View
103	Truax, Tim	Water Reclamation Facility	Complete	1/31/17	3/24/17	Truax, Tim	3/24/17	View
104	Hanson, Hardy	Pilot Butte Campus	Not Started	1/31/17				
105	Newberg, Doug	Pilot Butte Campus	Complete	1/31/17	1/12/17	Newberg, Doug	1/12/17	View
106	Howe, Carl	Pilot Butte Campus	Complete	1/31/17	2/11/17	Howe, Carl	2/11/17	View
107	Smith, William	Pilot Butte Campus	Complete	1/31/17	2/2/17	Smith, William	2/2/17	View
108	Abbas, David	Pilot Butte Campus	Complete	1/31/17	3/27/17	Abbas, David	3/27/17	View
109	Oliver, Josh	Pilot Butte Campus	Complete	1/31/17	1/27/17	Oliver, Josh	1/27/17	View
110	Gardner, Lucas	Pilot Butte Campus	Complete	1/31/17	1/23/17	Gardner, Lucas	1/23/17	View
111	Schmidt, Daniel	Pilot Butte Campus	Complete	1/31/17	1/24/17	Schmidt, Daniel	1/24/17	View
112	Bean, Everett	Pilot Butte Campus	Not Started	1/31/17				
113	Rogers, William "Ed"	Water Reclamation Facility	Complete	1/31/17	3/17/17	Rogers, William "Ed"	3/17/17	View
114	Roshone, Elmer	Water Reclamation Facility	Complete	1/31/17	1/19/17	Roshone, Elmer	1/19/17	View
115	Carlson, Tim	Water Reclamation Facility	Complete	1/31/17	1/12/17	Carlson, Tim	1/12/17	View
116	Cannon, Dennis	Pilot Butte Campus	Not Started	1/31/17				
117	Fore, Erynne	Water Reclamation Facility	Complete	1/31/17	1/9/17	Fore, Erynne	1/9/17	View
118	Moulder, Lon	Water Reclamation Facility	Complete	1/31/17	1/26/17	Moulder, Lon	1/26/17	View
119	Utley, Aaron	Water Reclamation Facility	Complete	1/31/17	2/1/17	Utley, Aaron	2/1/17	View
120	Blake, Christopher	Pilot Butte Campus	Complete	1/31/17	3/23/17	Blake, Christopher	3/23/17	View
121	Lessar, Joshua	Pilot Butte Campus	Complete	1/31/17	1/10/17	Lessar, Joshua	1/10/17	View
122	Goe, Kerry	Pilot Butte Campus	Complete	1/31/17	1/27/17	Goe, Kerry	1/27/17	View
123	Baker, Galen	Pilot Butte Campus	Complete	1/31/17	3/20/17	Baker, Galen	3/20/17	View

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124	Barnard, Justin	Pilot Butte Campus	Not Started	1/31/17				
125	Kirkpatrick, Michael	Pilot Butte Campus	Complete	1/31/17	2/15/17	Kirkpatrick, Michael	2/15/17	View
126	Anzalone, Alta	Pilot Butte Campus	Complete	1/31/17	2/24/17	Anzalone, Alta	2/24/17	View
127	Gillette, Mike	Boyd Acres	Complete	1/31/17	2/10/17	Gillette, Mike	2/10/17	View
128	Ristoff, Kelly	Boyd Acres	Complete	1/31/17	2/2/17	Ristoff, Kelly	2/2/17	View
129	McCloskey, Marcus	Boyd Acres	Complete	1/31/17	1/19/17	McCloskey, Marcus	1/19/17	View
130	Vaughan, Ken	Boyd Acres	Complete	1/31/17	1/11/17	Vaughan, Ken	1/11/17	View
131	Ristoff (AKA: Briggs), Teresa	Boyd Acres	Complete	1/31/17	2/1/17	Ristoff (AKA: Briggs), Teresa	2/1/17	View
132	Blackwelder, Brice	Boyd Acres	Complete	1/31/17	2/9/17	Blackwelder, Brice	2/9/17	View
133	Buhmann, Donald	Boyd Acres	Complete	1/31/17	3/3/17	Buhmann, Donald	3/3/17	View
134	Skaggs, Dan	Boyd Acres	Complete	1/31/17	1/30/17	Skaggs, Dan	1/30/17	View
135	Richmond, Paul "Stu"	Boyd Acres	Complete	1/31/17	1/12/17	Richmond, Paul "Stu"	1/12/17	View
136	Findley, Mike	Boyd Acres	Complete	1/31/17	1/18/17	Findley, Mike	1/18/17	View
137	Mosher, Chris	Boyd Acres	Complete	1/31/17	1/11/17	Mosher, Chris	1/11/17	View
138	Oak, David	Boyd Acres	Complete	1/31/17	1/24/17	Oak, David	1/24/17	View
139	Follose, Brandon	Boyd Acres	Complete	1/31/17	1/13/17	Follose, Brandon	1/13/17	View
140	Armenta, David	Boyd Acres	Complete	1/31/17	1/19/17	Armenta, David	1/19/17	View
141	Davenport, Christina	Boyd Acres	Complete	1/31/17	3/13/17	Davenport, Christina	3/13/17	View
142	Petitmermet, Sean	Boyd Acres	Complete	1/31/17	1/17/17	Petitmermet, Sean	1/17/17	View
143	Hall, Matt	Boyd Acres	Complete	1/31/17	1/30/17	Hall, Matt	1/30/17	View
144	Beck, Troy	Boyd Acres	Complete	1/31/17	1/19/17	Beck, Troy	1/19/17	View
145	Leath, David	Boyd Acres	Complete	1/31/17	2/24/17	Leath, David	2/24/17	View
146	Trask, Kris	Boyd Acres	Complete	1/31/17	2/2/17	Trask, Kris	2/2/17	View
147	Gillespie, Rhett	Bend Municipal Airport	Complete	1/31/17	3/2/17	Gillespie, Rhett	3/2/17	View
148	Nelson, Jeff	Boyd Acres	Complete	1/31/17	1/24/17	Nelson, Jeff	1/24/17	View
149	Sullivan, Steven	Boyd Acres	Complete	1/31/17	2/24/17	Sullivan, Steven	2/24/17	View

Minutes since last data refresh: 7

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Compliance Detail
City of Bend

Filtered by: Training: Winter Road Care

	Assigned					Completed		
Row	To	Location	Progress	Due Date	Start	By	On	View
1	Newton, Joe	Pilot Butte Campus	Complete	10/31/16	10/6/16	Newton, Joe	10/6/16	View
2	Lindsey, James	Pilot Butte Campus	Complete	10/31/16	10/19/16	Lindsey, James	10/19/16	View
3	Thomasson, Shanon (John)	Pilot Butte Campus	Complete	10/31/16	11/30/16	Thomasson, Shanon (John)	11/30/16	View
4	Waldrop, Will	Pilot Butte Campus	Complete	10/31/16	10/6/16	Waldrop, Will	10/6/16	View
5	Rader, Barbara	Pilot Butte Campus	Complete	10/31/16	10/19/16	Rader, Barbara	10/19/16	View
6	Qual, Craig	Pilot Butte Campus	Complete	10/31/16	11/17/16	Qual, Craig	11/17/16	View
7	Volkman, Richard	Pilot Butte Campus	Complete	10/31/16	11/22/16	Volkman, Richard	11/22/16	View
8	Jones, Shane	Pilot Butte Campus	Complete	10/31/16	11/16/16	Jones, Shane	11/16/16	View
9	Combs, Ty	Pilot Butte Campus	Complete	10/31/16	10/6/16	Combs, Ty	10/6/16	View
10	Byrd, Daniel	Pilot Butte Campus	Complete	10/31/16	10/14/16	Byrd, Daniel	10/14/16	View
11	Neiswonger, Paul	Pilot Butte Campus	Complete	10/31/16	11/2/16	Neiswonger, Paul	11/2/16	View
12	Jackson, Dylan	Pilot Butte Campus	Complete	10/31/16	11/8/16	Jackson, Dylan	11/8/16	View
13	Munson, AJ	Pilot Butte Campus	Complete	10/31/16	10/14/16	Munson, AJ	10/14/16	View
14	Lessar, Joshua	Pilot Butte Campus	Complete	10/31/16	10/13/16	Lessar, Joshua	10/13/16	View
15	Armer, Mike	Pilot Butte Campus	Complete	10/31/16	10/3/16	Armer, Mike	10/3/16	View
16	Goe, Kerry	Pilot Butte Campus	Complete	10/31/16	10/19/16	Goe, Kerry	10/19/16	View
17	Kirkpatrick, Michael	Pilot Butte Campus	Complete	10/31/16	11/22/16	Kirkpatrick, Michael	11/22/16	View
18	Malinowski, Adam	Pilot Butte Campus	Complete	10/31/16	10/5/16	Malinowski, Adam	10/5/16	View
19	Prince, Jeannette	Pilot Butte Campus	Complete	10/31/16	10/6/16	Prince, Jeannette	10/6/16	View
20	Smith, William	Pilot Butte Campus	Complete	10/31/16	2/2/17	Smith, William	2/2/17	View
21	Blake, Christopher	Pilot Butte Campus	Complete	10/31/16	12/23/16	Blake, Christopher	12/23/16	View
22	Cota, Tony	Pilot Butte Campus	Complete	10/31/16	10/28/16	Cota, Tony	10/28/16	View
23	Oliver, Josh	Pilot Butte Campus	Complete	10/31/16	12/5/16	Oliver, Josh	12/5/16	View

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Compliance Detail

City of Bend

Filtered by: Training: Winter Road Care

24	Schmidt, Daniel	Pilot Butte Campus	Complete	10/31/16	10/19/16	Schmidt, Daniel	10/19/16	View
25	Stenkamp, Skippy	Pilot Butte Campus	Complete	10/31/16	10/7/16	Stenkamp, Skippy	10/7/16	View
26	Daniel, Jay	Pilot Butte Campus	Complete	10/31/16	2/2/17	Daniel, Jay	2/2/17	View
27	Scarbrough, Saedell	Pilot Butte Campus	Complete	10/31/16	10/12/16	Scarbrough, Saedell	10/12/16	View
28	Morrison, George	Pilot Butte Campus	Complete	10/31/16	10/25/16	Morrison, George	10/27/16	View
29	Hall, Harold "Jimmy"	Pilot Butte Campus	Complete	10/31/16	10/7/16	Hall, Harold "Jimmy"	10/7/16	View
30	Combs, Ken	Pilot Butte Campus	Complete	10/31/16	10/19/16	Combs, Ken	10/19/16	View
31	Gardner, Lucas	Pilot Butte Campus	Complete	10/31/16	11/23/16	Gardner, Lucas	11/23/16	View
32	McQuillen, Christy	Pilot Butte Campus	Complete	10/31/16	3/23/17	McQuillen, Christy	3/23/17	View

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Appendix E

Construction Site Stormwater Activities

UTILITY DEPARTMENT

March 2, 2017

62975 BOYD ACRES RD.
BEND, OR 97701
541-317-3000 opt. 2
Relay Users Dial 7-1-1
541-317-3046 fax
bendoregon.gov

MAYOR
Casey Roats

MAYOR PRO TEM
Sally Russell

CITY COUNCILORS
Justin Livingston
Bill Moseley
Bruce Abernethy
Nathan Boddie
Barb Campbell

CITY MANAGER
Eric King

RE: Clean Water Works Partnership Opportunity

Dear Construction Company Owner:

The City of Bend Stormwater Utility would like to partner with you to help keep our waters clean. If you appreciate clean water *and* business enhancement, please consider this voluntary opportunity. The City of Bend is undertaking an exciting incentive-based watershed campaign entitled Clean Water Works. Please see our website at: bendoregon.gov/cleanwaterworks. Here you can see that we have both educational and partnership aspects to the campaign.

We are seeking to support businesses that are working to keep our waters clean. We have selected Construction Industry businesses within the City of Bend as potential Clean Water Works Partners. Should you choose to participate, the City would like to reward you by providing the following promotional materials:

➢**Promotion** on our "Discounts and Partners" page on our website (bendoregon.gov/cleanwaterworkspartners) and by other electronic media means (e.g., mention on Facebook, Twitter, or radio advertisements). We will actively encourage people to visit this page beginning in April through December, 2017 and likely beyond. The campaign will include: TV, radio, print, events and social media.

➢**Decal—**The City will provide you a Clean Water Works window decal (see image at right) to help advertise your business as one that cares about Clean Water!

➢**Discount Card**—The City will list your business and the discount of your choosing (e.g., 5% off supplies, free estimate, free hat) on our website "Discount and Partner" page, and if you respond by April 9, 2017 we will on a first come/first served basis list your business and discount on the back of our discount cards that we will print and distribute at outreach events during throughout the 2017 campaign and mention your business in a Clean Water Works partner radio advertisement. The discount card will also be available on line for your customers to print. (See example discount card.)

- **Employee Giveaways**—The City will provide you and your employees (should you wish) Clean Water Works Partner logo-ed products for your enjoyment.

- **Display Holder Promotion** for your customer waiting area with a Clean Water Works Partner outreach sheet promoting your participation as a company that cares about clean water to your customers.





The partnership works like this—if you meet the following basic steps for your business category, just fill out the attached certification form and you can take part. The criteria for your business category is as follows:

- ✓ You have registered for a Bend Business license (and if you are receiving this letter, then you already have!),
- ☐ You agree to follow best management practices for keeping construction related pollutants including sediments out of the streets and storm drains (see the attached Sediment Prevention For Businesses fact sheet and "Other Resources" materials therein for guidance);
- ☐ You agree to share the Construction Site Stormwater Guide (http://www.bendoregon.gov/home/showdocument?id=13976 and enclosed) to your staff and subcontractors (we can provide multiple hard copies upon request);
- ☐ You agree to label your business' onsite catch basins with a pollution-prevention message—good news, the City can provide a free "do not dump" storm drain marker for your use if your office drains are not already marked.
- ☐ You agree to honor the discount that you specify through at least Dec. 31, 2017.

Just review the enclosed "Sediment Prevention for Businesses" fact sheet, complete the short partnership form and email it to me at wedde@bendoregon.gov or fax it to 541-317-3046. You may also mail it to my attention at: 62975 Boyd Acres Road, Bend, OR 97701. Please contact me directly at 541-317-3018 should you have any questions. And remember, if you contact me by April 9, 2017, we will do our best to include your business name on the back of the Discount card, and a mention of your business on our fall radio commercial on a first come first served basis.

Remember, this is a voluntary program and a means to appreciate your interest and efforts in keeping our river and drinking waters clean. Should you have any questions or if you wish additional fact sheets or illustrated best management practices guides to distribute to your staff/subcontractors, please do not hesitate to contact me at the phone number or email above.

We look forward to working with you.

Sincerely,

Wendy Edde, CSM, Stormwater Program Manager
City of Bend Utility Department

Att: Sediment Prevention for Businesses, ACWA Construction Guide, Clean Water Works Partnership form

Clean Water Works

2017 Partnership Participation

Yes! I would like my business to be recognized as a Clean Water Works Partner! I certify that I/my business will meet the overall criteria of the Clean Water Works Partnership program to participate.

Name (Please Print) _____ Signature _____

Business Name _____ Business Category _____

# of Employees (optional)
For # of Handouts /CWW giveaways _____

# of Point of Purchase Displays Requested
(5"x7" Tabletop Displays) _____

Discount I Will Offer and Honor _____ Discount End Date (if any) _____

☐ I would like City staff to give a brief presentation to us on clean water best management practices.

So that we may contact you to coordinate on the promotional materials, please provide the following information (please print clearly):

Email Address _____ Phone _____

Business Website _____

Please scan and email to Wendy Edde, Stormwater Program Manager, City of Bend at wedde@bendoregon.gov, fax 541-317-3046, or mail to 62975 Boyd Acres Road, Bend, OR 97701. If you would like to be recognized with your logo, please send that as well either together with this form or as soon as possible thereafter (.jpg, .png, .tiff, High resolution (≥300 dpi). Any questions, please contact Wendy at 541-317-3018.

Accommodation Information for People with Disabilities
To obtain this information in an alternate format such as Braille, large print, or electronic, please contact 541-317-3000 ext. 2 or email utilities@bendoregon.gov.

UTILITY DEPARTMENT

SEDIMENT PREVENTION FOR BUSINESSES

Pollutant of Concern: Sediments

Help Keep Excess Sediment Out of Our Rivers & Stormwater Facilities.

What is sediment?
Sediment is loose soil like sand, clay, small rocks like gravel, or silt that can come as a result of soil erosion, winter traction materials, or plant decomposition.

Soils are Natural, So What's the Problem?
While some sediment is natural in surface water, in urban areas the amount of man-made sediment is high above natural levels. Sediment covers, compacts and clogs.

- Sediment can make water cloudy (turbid) and prevent animals from seeing food. The Deschutes River through Bend is listed for sediment and turbidity as a pollutant of concern.
- Sediment can clog fish gills, cover spawning areas and the habitats where the small organisms that form the basis for the food chain live.
- Nutrients transported by sediment can accelerate algae and plant growth that can ultimately affect oxygen levels in the water. The Deschutes River through Bend are listed for these types of pollutants of concern.
- Sediment deposits in rivers can alter the flow of water and reduce water depth, which makes navigation and recreational use more difficult.

Sediment can clog stormwater facilities and result in flooding problems. If the sediment clogs beyond the drywell cylinder and into the surrounding drainage rock, the entire drywell would need to be replaced, which unnecessarily adds costs. Drill holes clog even more easily

What can you do as a commercial business?

Prevention is key. Use best management practices (BMPs) to keep soils from moving in the first place, and to keep sediments swept up and managed.



All

- Excess sediment is considered an illicit discharge. If you spot excess sediment in the roadway or sediment that could potential reach stormwater facilities (such as picture at right), contact City of Bend at 541-317-3000.

Commercial Business

- Vegetate bare spots in your landscaping.
- Sweep entrances, sidewalks, driveways and parking lots on a regular basis instead of hosing them off. Washing these areas results in sediment and other pollutants running off into streams, rivers and lakes.
- Inspect and clean your onsite stormwater facilities annually.
- Train landscape maintenance staff to blow dirt, dust and grass clippings back into the grass and not onto sidewalks or paved surfaces, or to collect and compost or dispose of properly in a bin.
- Avoid mowing within 10 to 25 feet from the edge of a stream or river. This will create a safe buffer zone that will help minimize erosion and naturally filter stormwater runoff that may contain sediment.

POLLUTANT: SEDIMENT

What Can You Do as a Builder/Contractor?

Builders/Contractors

- Install erosion control BMPs (e.g., catch basin inlet protection, waddles or silt fence) before you begin site clearing/grading.
- Install temporary gravel construction entrance, never use erodible materials (i.e. gavel, dirt or sand) as ramps for protecting existing curbs.
- Never stockpile any material in the roadway. Properly secure stockpiles.
- Sweep up material that gets tracked out onto the roadway daily.



- **Sediment is not allowed to come off any construction site**, whether or not your site is required to have an erosion and sediment control plan or a grading and drainage permit. For additional information, review the Central Oregon Stormwater Manual, Chapter 9 and the "ACWA Construction Site Stormwater Guide" (see Other Resources, below).

Other Resources:

ACWA Construction Guide
www.oracwa.org/documents/ACWASWSiteGuide0313w.pdf

Central Oregon Stormwater Manual, Chapter 9
https://newcoic.files.wordpress.com/2012/09/2010rev-chapter-9-esc.pdf

Bend Code Title 16.10, Clearing Grading, and Erosion Control on Construction Sites
http://www.bend.or.us/Modules/ShowDocument.aspx?documentid=7216
See Sections 16.20 (Illicit Discharge); 16.10.20 (Grading Permits)

Oregon DEQ 1200-C Permits
http://www.deq.state.or.us/wq/stormwater/constappl.htm
For additional information on permitting requirements contact the City of Bend Permit Center at 541-388-5570.

Fines & Penalties
Violating Bend Code Title 16 is a Class-A Civil Infraction, and could result in a maximum civil penalty of $750.00 per day. Each day that a violation remains uncured in effect is a separate violation.

Accomodation Information for People with Disabilities

To obtain this information in an alternate format such as Braille, large print, electronic formats and audio cassette tape please contact Karen Morris at 541-693-2141 or email kmorris@bendoregon.gov.

UTILITY DEPARTMENT

June 30, 2017

[redacted]

UTILITY DEPARTMENT

RE: Compliance Agreement

Dear Mr. [redacted]:

62975 Boyd Acres Rd.
Bend, OR 97701
541-317-3000 opt. 2
Relay Users Dial 7-1-1
541-317-3046 fax
bendoregon.gov

MAYOR
Casey Roats

MAYOR PRO TEM
Sally Russell

CITY COUNCILORS
Justin Livingston
Bill Moseley
Bruce Abernethy
Nathan Boddie
Barb Campbell

CITY MANAGER
Eric King

The [redacted] housing development located on [redacted] has been identified to have one or more deficiencies with Bend Code Title 16. From February 21st 2017 through June 16th 2017, the City of Bend has received multiple complaints regarding sediment in the right-of-way coming from development activities at this site. The City's Stormwater Compliance Specialist issued a Stormwater Violation Letter on June 19th, 2017 outlining compliance deficiencies. On June 26th, 2017 he met with you to discuss the terms of this Voluntary Compliance Agreement which was then outlined in a follow-up email.

In detail, your Stormwater Compliance Agreement shall address compliance concerns noted in your June 16th, 2017 Stormwater Violation Letter.

At a minimum, your best management practice list shall include:

-street sweeping/cleaning

-inlet protection (use of pre-fabricated filter inserts "witches hats")

-use of wood or metal ramps as opposed to dirt ramps

-reduction of sediment tracking onto ROW

-staff in charge of cleaning and inspecting

-equipment and materials used in gaining and maintaining compliance

-weekly inspection logs (excel spreadsheet with checklist)

Your compliance agreement is a 12-month long contract for all current/future projects within the City of Bend limits. Monthly reports shall be submitted by the 1st of every month from July 1st, 2017 – July 1st, 2018. Failure to abide by this contract is a Class A civil infraction carrying a civil penalty of up to $750 per violation per day and/or the potential to issue a stop work order in coordination with the City of Bend Building Division and Code Enforcement Division.

If you agree to the terms listed above, please sign and date and return the signed original to the City's Stormwater Compliance Specialist no later than July 7th, 2017.

Voluntary Compliance Agreement

I [redacted] agree to the terms and conditions outlined above and understand that failure to comply with the terms will result in a citation and/or the potential to stop work.

Signature [redacted] Date: 6/30/17

Sincerely,

Sean Mulderig
City of Bend
Utility Department
Environmental Compliance Division

Att. [redacted]

[redacted]

[redacted]

Friday, June 30, 2017

Re: Violation Notice of City Code 16.10.070 and 16.20.010

To: Mr. Mulderig,
City of Bend Utility Department
Environmental Compliance Division

In accordance with our Voluntary Compliance Agreement this letter is to address the step I will take to remain in compliance with the City of Bend for the following 18 months.

- Clean Up dirt used for ramps and maintain clear
- We will install wood ramps at all job location requiring a ramp for heavy equipment
- Myself or one of my staff will do weekly checks to ensure the job sites remain in compliance
- Utilize an inspection log to ensure weekly checks are completed and all areas are reviewed
- Hire a Street sweeper to ensure clean roads as often as necessary
- Replace fabric filters with Witches Hats

I've also attached a copy of our weekly spread sheet for review

If you have any additional questions please feel free to call me directly at [redacted]

Sincerely

[redacted]

[redacted]

[redacted]

Weekly Check list to maintain Clear Road

Week ending	14-Jul	21-Jul	28-Jul	4-Aug	11-Aug	18-Aug	25-Aug	1-Sep	8-Sep	15-Sep	22-Sep	29-Sep
No Dirt near Drains												
Wood Ramps on site												
Street Sweeping required?												
Name												

Week ending	6-Oct	13-Oct	20-Oct	27-Oct	3-Nov	10-Nov	17-Nov	24-Nov	1-Dec	8-Dec	15-Dec	22-Dec
No Dirt near Drains												
Wood Ramps on site												
Street Sweeping required?												
Name												

June 16, 2017

UTILITY DEPARTMENT

[redacted]

RE: Violation of City of Bend Code 16.10.070 and 16.20.010

Dear Mr. [redacted]:

62975 Boyd Acres Rd.
Bend, OR 97701
541-317-3000 opt. 2
Relay Users Dial 7-1-1
541-317-3046 fax
bendoregon.gov

MAYOR
Casey Roats

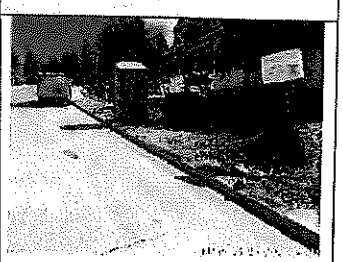
MAYOR PRO TEM
Sally Russell

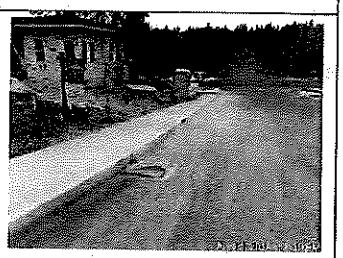
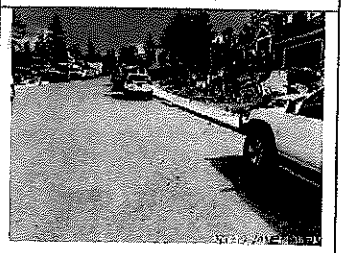
CITY COUNCILORS
Justin Livingston
Bill Moseley
Bruce Abernethy
Nathan Boddie
Barb Campbell

CITY MANAGER
Eric King

The [redacted] housing development located on [redacted] has been identified as having one or more deficiencies with Bend Code Title 16. From February 21st 2017 through June 16th 2017, the City of Bend has received multiple complaints regarding sediment in the right-of-way coming from development activities at this site. The City's Stormwater Compliance Specialist has met with the excavator on-site and spoke with you over the phone, providing guidance on how to reduce sediment tracking and guidance on Inlet Protection Best Management Practices (BMPs).

The following table lists the events that have occurred to evaluate compliance with Bend Code Title 16:

Date	Event	Picture Documentation
2/21/2017	[redacted]	
2/23/2017	[redacted]	
3/23/2017	[redacted]	

Date	Event	Picture Documentation
4/3/2017	[redacted]	
4/4/2017	[redacted]	
4/13/2017	[redacted]	
6/15/2017	[redacted]	See attached photos below

These events demonstrate inconsistent compliance with Bend Code 16.10.070 and 16.20.010 despite educational attempts and verbal warnings. This violation is a Class A civil infraction carrying a civil penalty of up to $750 per violation per day and/or the potential to issue a stop work order in coordination with the City of Bend Building Division and Code Enforcement Division.

The City is willing to discuss a Voluntary Compliance Agreement with you as an alternative to an immediate issuance of a civil infraction citation or a stop work order. Some terms of a Voluntary Compliance Agreement can be subject to discussion, but the City would require that any agreement continue for at least 18 months from the date of execution and that it contain a plan and measures to ensure compliance with Title 16 of the Bend Code for all of your construction sites within the City of Bend. The City would take no further actions based on this infraction during the term of the agreement, so long as compliance is maintained.

Please contact us within seven business days if you are interested in discussing a Voluntary Compliance Agreement. If we do not hear from you within that time, the City will pursue enforcement of this infraction. I can be reached at 541-312-4913 or smulderig@bendoregon.gov.

Sincerely,

Sean Mulderig
City of Bend
Utility Department
Environmental Compliance Division

CC: Ian Leithelser, James Goff, Brad Mandal, Wendy Edde
Att: Photographs


June 15, 2017 at 1:23 PM


June 15, 2017 at 1:24 PM


June 15, 2017 at 1:24 PM


June 15, 2017 at 1:25 PM

City of Bend (FY2016-17)
Erosion and Sediment Control Inspection Tracking Log

Date	Site ID #	Site Name (Location)	Type of Action	Status	Drainage	Education Info Provided	Enforcement Taken	Case Progress/Comments
2/10/2017	1	20856 Rorick Dr	Compliant Investigation	Open	UIC	Yes	Verbal Warning	Snow melt and sediment flowing from the undeveloped lots into the neighboring developed lot; Also noticed topsoil and sediment stored near unprotected catch-basins; spoke with project manager with Monte Vista Homes; Catch basins are to be protected and sediment tracking and storage of materials is not allowed in ROW
2/17/2017	3	2305 NW Awbrey Rd	Compliant Investigation	Open	River/Surface Waters	Yes	Verbal Warning	SFR development; Lacking ESC BMPs, spoke with on-site contractor; Showed him the plans; Requested that he install sed-fencing and develop daily sweeping procedure for ROW
2/21/2017	4	2941 NW Chardonnay Ln	Compliant Investigation	Open	UIC	Yes	Verbal Warning	Site Visit; No staff present on site; a better construction entrance has been installed; installed untrenched straw waddles at front edge of site; sediment still tracking onto ROW
2/21/2017	3	2305 NW Awbrey Rd	Follow-up	In Progress	River/Surface Waters	No	None	SFR development; Lacking ESC BMPs; Oil and sediment flowing into catch basin; Talked to the on-site contractor, notified him that he cant have sediment tracking into the ROW and that inlet protection is needed; Told him that I would be back later in the week
2/23/2017	5	61549-61551 Alstrup Rd	Compliant Investigation	Open	UIC	Yes	Verbal Warning	Subdivision esc complaint; Spoke with on-site manager; lacking BMPs; notified him that he cant have sediment tracking into the ROW and that inlet protection is needed; told him that I will check back within the next couple weeks; handed out contact info
2/23/2017	6	20343 Lois Way	Compliant Investigation	Open	UIC	Yes	Verbal Warning	Subdivision esc complaint; lacking BMPs; notified him that he cant have sediment tracking into the ROW and that inlet protection is needed; Storage of soil in the ROW is prohibited and that wood should be used for construction ramps
2/23/2017	3	2305 NW Awbrey Rd	Follow-up	In Progress	River/Surface Waters	Yes	Verbal Warning	Sediment has been cleaned up from the ROW though it is still an issue; Inlet protect is still needed; spoke with same on-site contractor, he has filter fabric and will install inlet protection today; recommended he use wood ramps instead of sediment; will be checking back in with him the next couple of weeks; handed out contact info
2/23/2017	4	2941 NW Chardonnay Ln	Follow-up Inspection	In Progress	UIC	Yes	Verbal Warning	Site Visit; Spoke with on-site mechanic (only available staff); explained to him that the waddling is installed incorrectly and sediment tracking/erosion is still an ongoing problem; handed out my contact inform and requested that the GC call me asap
2/24/2017	5	61549-61551 Alstrup Rd	Follow-up	In Progress	UIC	No	None	Drive-by with DEQ, Inlet protect was present but installed incorrectly; issues still present; will check back within the next couple weeks
2/24/2017	11	2360-2418 NE Moonlight Dr	Phone Call	NA	UIC	Yes	None	Drive-by with DEQ, Inlet protect was present but installed incorrectly; issues still present; will check back within the next couple weeks; stockpiles in the ROW have been reduced
2/24/2017	10	1418 NW Elgin Ave	Referral	Open	River/Surface Waters	Yes	Verbal Warning	Drive-by with DEQ, Inlet protect was present but installed incorrectly/broken; will check back within the next couple weeks
2/24/2017	7	2163 NW Lemhi Pass Dr	Routine	Open	UIC	No	None	Drive-by with DEQ, Inlet protect was present; sediment tracking into the ROW is a main concern; will check back within the next couple weeks
2/24/2017	8	649 NW Compass Ln	Routine	Open	UIC	No	None	Drive-by with DEQ, Inlet protect was present; sediment tracking into the ROW is a main concern; will check back within the next couple weeks

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Date	Site ID #	Site Name (Location)	Type of Action	Status	Drainage	Education Info Provided	Enforcement Taken	Case Progress/Comments
2/24/2017	13	2001 NE Linnea Dr	Routine	Open	UIC	No	None	Drive-by with DEQ; sediment tracking into the ROW is a main concern; not high enough of a priority to trigger a follow-up
2/24/2017	9	2724 NW Shields Dr	Routine	NA	UIC	No	None	John (PED) forwarded this case; he had an on-site meeting today with a contractor regarding some upcoming ROW work for this SFD. I informed the site foreman for Woodhill Homes that they must remove the pile of material and snow mix located in the ROW. He stated that he would get in touch with his excavation contractor and get it removed or relocated; Will make site visit next week
2/24/2017	6	20343 Lois Way	Routine Inspection	In Progress	UIC	No	None	Phone call received from Donnie (excavator) that they hit drain rock of public drywell and would like to be red tagged; GC was pushing them to continue work. Forwarded case to Kyle Thomas; he halted work in the area till further inspection.
3/1/2017	11	2360-2418 NE Moonlight Dr	Routine	NA	UIC	Yes	Verbal Warning	Site visit with Darren (PDE) to inspect the sed fencing and meet the onsite contractors; Sed fencing not completely installed; will finish this weekend and Darren to check back next week
3/1/2017	13	2001 NE Linnea Dr	Routine	Closed	UIC	Yes	Verbal Warning	Site visit with Darren (PDE) to inspect the sed fencing and tracking into the ROW; Trent (Builder) has recently installed sed fencing around perimeter of site but not installed correctly (need trenching and sewn-in pocket fencing installed backwards); site drains back in towards itself making the sed fencing not a high priority to be fixed; Notified Trent to avoid tracking into ROW and that a routine street sweeping procedure is needed; Follow-up not needed
3/1/2017	14	20798 NE High Desert Ln	Routine	Open	UIC	Yes	Verbal Warning	Site visit with Darren (PDE) to inspect the sed fencing and tracking into the ROW; most work has been completed and sediment in the ROW has been swept up; inlet protection is new and properly installed
3/1/2017	12	1810 NE Neff Rd	Routine Inspection	NA	UIC	Yes	None	Site visit with Darren (PDE) to inspect the sed fencing and slope erosion issue
3/2/2017	10	1418 NW Elgin Ave	Compliant Investigation	Open	River/Surface Waters	Yes	Verbal Warning	Met with Cory (Builder) and discussed the importance of slope stabilization especially on the top edge of the slope; Darren had mistakenly told Cory to install sed fence on the top corner of the slope instead of the toe of the slope; Recommended that he install one of the forms of slope stabilization; stabilization BMPs should have been required for on-site plans but they were not shown; Cory will fix/remove sed fencing and fill in scoured areas along slope. Construction is near completion on the eastern building and roof runoff will now be collected in gutter system; Darren is going to check back with him next week
3/2/2017	14	20798 NE High Desert Ln	Follow-up	Closed	UIC	Yes	Verbal Warning	Met Mike Sippila (Builder); explained to him why he cant have large stockpile of soil/snow in ROW and how this area is especially important due the fact that it drains to the river; recommended that he remove the soil and push the snow back on to his property. He says that he will have it completed by Friday and/or Saturday; I will follow-up next week.

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Date	Site ID #	Site Name (Location)	Type of Action	Status	Drainage	Education Info Provided	Enforcement Taken	Case Progress/Comments
3/2/2017	15	62782 NW Imbler Dr	Referral	Open	UIC	Yes	Verbal Warning	Referral from John (PDE); SFR development by Simplicity Homes by Hayden Homes; Inlet protection concerns, sediment tracking concerns, and large stockpile of soil/snow in ROW; Spoke with Jeremy Nied (Project Manger) and requested that he complete work and develop a routine maintenance procedure; will remove stockpile next week.
3/3/2017	10	1418 NW Elgin Ave	Phone Call	Open	River/Surface Waters	No	None	Received phone call from Mike stating that work is in progress; will verify next week
3/3/2017	15	62782 NW Imbler Dr	Phone Call	In Progress	UIC	No	None	Left voicemail for Jeremy checking up on how the stockpile removal is going
3/6/2017	10	1418 NW Elgin Ave	Follow-up Inspection	Open	River/Surface Waters	No	None	spoke with Jeremy; he has installed inlet protection in all catch basins, swept streets, and has removed 75% of the stockpile; reminded to stay on top of his maintenance; will make site visit this week
3/6/2017	15	62782 NW Imbler Dr	Phone Call	In Progress	UIC	Yes	None	Received phone call on the morning of 3/6/17 from Mike as he stated that the excavator did not do as he asked; will make site visit tomorrow
3/7/2017	10	1418 NW Elgin Ave	Follow-up Inspection	Open	River/Surface Waters	No	Verbal Warning	Met with Mike on site; the stockpile was slightly smaller and moved on to the property, slope is still not stabilized and not contained; mike will get his excavator back out tomorrow to remove the debris and provide perimeter protection to the stockpile; warned him that if this does not get taken care of promptly that an NOV will be given out.
3/7/2017	15	62782 NW Imbler Dr	Follow-up Inspection	In Progress	UIC	Yes	None	made a site visit; stockpile is completely removed; street still needs to be swept up when dry; all catch basins have inlet protection; Jeremy states that he will be very active in ensuring that sediment stays off ROW and that BMPs are in place; I will check back with him next week to see how the site is doing.
3/8/2017	10	1418 NW Elgin Ave	Follow-up Inspection	Open	River/Surface Waters	No	Verbal Warning	John (PDE) and I drove by the site and spoke with Mike; excavator is onsite and are going to push the pile back to property line; spoke with him about the potential melting of the pile to result in sediment laden runoff into the ROW. 2:30pm update: Wendy noticed that the stockpile got pushed further back onto the property and the base has been trenched out to prevent sediment escaping onto the ROW.
3/8/2017	10	1418 NW Elgin Ave	Phone Call	Open	River/Surface Waters	No	None	ROW Precon meeting; went over inlet protection and my potential site visit later this month
3/8/2017	11	2360-2418 NE Moonlight Dr	Pre-Con Meeting	NA	UIC	Yes	None	Received phone call from Mike at 4:30pm saying that he has finished the work and would like me to make a site visit to approve his work.
3/9/2017	10	1418 NW Elgin Ave	Follow-up Inspection	Closed	River/Surface Waters	No	None	Stock pile has been reduced and pushed back to property; Sed fence has been installed around the perimeter of the stock pile; case is closed
3/9/2017	17	63027 Lower Meadow Dr	Pre-Con Meeting	Open	UIC	Yes	None	Precon meeting discussed the need for inlet protect on the downstream catch basins and proper management of any stockpiles created from excavation.
3/10/2017	11	2360-2418 NE Moonlight Dr	Compliant Investigation	Closed	UIC	Yes	None	Dust complaint from Kyle; Crews were sweeping the ROW in the morning; told Donnie and Trent about being aware of the dust and be mindful of the surrounding community. They are doing a good job at managing the tracking into the ROW.

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Date	Site ID #	Site Name (Location)	Type of Action	Status	Drainage	Education Info Provided	Enforcement Taken	Case Progress/Comments
3/14/2017	18	471 SE Glengarry pl	Compliant Investigation	Closed	UIC	Yes	Verbal Warning	Compliant from David Oak; Sediment tracking into the ROW; Spoke with Tony Johns (Builder) and he has already resolved the majority of the issue; Explained the reasons why the city is enforcing sediment and erosion control; follow-up inspection not necessary
3/14/2017	19	2025-2085 NE 6th St	Routine Inspection	Open	UIC	Yes	Verbal Warning	Sediment tracking and storage of materials in the ROW; spoke with Rob March (Builder) and explained that he needs to prevent soil from going into the ROW; will follow-up next week
3/16/2017	1	20856 Rorick Dr	Email	Closed	UIC	No	None	Tracking and storage of materials in ROW has improved; Topsoil storage in one particular area is still present; talked to Ken (Landscaper for development); He will remove the pile shortly and notify me.
3/16/2017	1	20856 Rorick Dr	Follow-up Inspection	In Progress	UIC	Yes	Verbal Warning	Private street is impacted with a lot of sediment; damaged biobags holding back sediment around catch basin; spoke with Jade Mare (Brooks resource) to have street swept and inlet protection replaced.
3/16/2017	8	649 NW Compass Ln	Follow-up Inspection	In Progress	UIC	Yes	Verbal Warning	Ken emailed me a picture of the topsoil removed off the ROW.
3/17/2017	16	1050 SW Yates Dr	Pre-Con Meeting	NA	UIC	Yes	None	Met Chris Henningson and John Umbarger at the site with the gc, excavator, and engineer. We went over the ESC on the grading plans. Asked the excavator to give me a call when they are installing the sed fencing
3/22/2017	16	1050 SW Yates Dr	Routine Inspection	NA	UIC	Yes	None	Met Luke Mclain (excavation sup for Lathom) onsite to check on the installation of the sed fence and other ESCs. Sed fence installation looks good. He also discussed the need for a second construction entrance. I told him to check with Kyle for Traffic control reasons before laying drain rock over both entrances. I was fine with two entrances as long as the const entrances were built to spec.
3/23/2017	3	2305 NW Awbrey Rd	Email	In Progress	River/Surface Waters	No	None	Emailed John (PDE) to get main contact with project site; I had spoken to the lead before but lost his #
3/23/2017	4	2941 NW Chardonnay Ln	Follow-up Inspection	In Progress	UIC	Yes	Verbal Warning	Street is clean but there is still sediment on the sidewalk and piled up to the curb; The inlet protection needs to be maintained; excavator is no longer working on site; left a message with Ryan Duble (RD Building) and spoke with George onsite (RD Building employee)
3/23/2017	8	649 NW Compass Ln	Follow-up Inspection	Closed	UIC	Yes	None	Street has been swept and inlet protection has been maintained; spoke with on-site builders about keeping sediment and debris off the ROW; follow-up not needed
3/23/2017	19	2025-2085 NE 6th St	Follow-up Inspection	In Progress	UIC	Yes	Verbal Warning	Compliance attempt has been made; A stock pile of sediment has been removed at the corner of 7th and isabella; street has been swept but sediment is still unstabilized and has spilled over into the ROW; spoke to Rob March and he is going to take care of it asap; will check back with him next
3/23/2017	15	62782 NW Imbler Dr	Follow-up Inspection	In Progress	UIC	No	None	Street has been swept; tracking is still an issue with some of the lots; some of the inlet protection has failed or needs to be maintained; left a voicemail for Jeremy
3/23/2017	15	62782 NW Imbler Dr	Phone Call	In Progress	UIC	No	Verbal Warning	Spoke with Jeremy and he is going to resolve the issues asap; I recommended him to do a weekly inspection; I told him that I will make a surprise visit when I happen to be in the area and that I wont mark the site closed until stormwater compliance meets my satisfaction

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Date	Site ID #	Site Name (Location)	Type of Action	Status	Drainage	Education Info Provided	Enforcement Taken	Case Progress/Comments
4/3/2017	3	2305 NW Awbrey Rd	Follow-up Inspection	In Progress	River/Surface Waters	No	None	Referral follow-up (from Troy) with sediment washing out on to the ROW from Friday; Currently no sign of sediment on ROW; street and sidewalk looks to be freshly swept and cleaned. No further investigation necessary
4/3/2017	7	2163 NW Lemhi Pass Dr	Follow-up Inspection	In Progress	UIC	No	Verbal Warning	Site Visit; Issues have not been resolved
4/3/2017	4	2941 NW Chardonnay Ln	Phone Call	In Progress	UIC	No	None	Spoke with Ryan (RD Building); He has been sweeping the street regularly; I informed him on replacing the inlet protection and to push the sediment back a few feet from the curb on that corner lot. I told him to please contact me when he gets that work complete so I can make a site visit to verify that the work is complete and that I can close it out.
4/3/2017	3	2305 NW Awbrey Rd	Phone Call	In Progress	River/Surface Waters	No	None	Spoke with Rob (excavator Taylor NW) and informed him of sediment tracking onto the ROW; inlet protection needs to be repaired and construction entrance needs to be refreshed. I also gave his boss (Scott) a call and left a message to give me a call back.
4/3/2017	8	649 NW Compass Ln	Referral	NA	UIC	No	None	Spoke with John (latham) about keeping the sidewalk free of sediment and debris; He will get a man on it and notify me asap; Work has not been done on-site for the past 4 weeks; work starts up again in a few weeks the perimeter controls and const entrance will need to be refreshed. John will notify me.
4/4/2017	20	2974 NE Oakley Ct	Compliant Investigation	Open	UIC	Yes	Verbal Warning	Returned Scott's call, He will get the street swept, construction entrance refreshed, and inlet protection replaced. He will give me a call tomorrow when he gets that fixed.
4/4/2017	4	2941 NW Chardonnay Ln	Follow-up Inspection	In Progress	UIC	No	None	Referral from Jason (CC) about sediment pile from room addition excavation
4/4/2017	15	62782 NW Imbler Dr	Follow-up Inspection	In Progress	UIC	No	None	Ryan has cleared sidewalk and street; He still needs to replace inlet protection; I left him a voicemail message
4/4/2017	7	2163 NW Lemhi Pass Dr	Phone Call	In Progress	UIC	Yes	Verbal Warning	Inlet protection still needs to be replaced and street needs to be swept; I left a voice mail with Jeremy; NOV needs to be issued if compliance cannot be met.
4/4/2017	20	2975 ME Oakley Ct	Referral	Open	UIC	No	None	Spoke with home owner Shelley Babcock; She will have excavator remove sediment pile by the end of the day. Will make follow-up site visit tomorrow.
4/5/2017	20	2975 NE Oakley Ct	Follow-up Inspection	In Progress	UIC	Yes	None	Sediment pile has been removed but street needs to be swept; I left a voicemail on Shelley's phone.
4/6/2017	7	2163 NW Lemhi Pass Dr	Follow-up Inspection	Closed	UIC	Yes	None	Spoke with Homeowner (Darren Babcock) and he sent me a picture of the swept up ROW; he states that he has swept up twice and this is the best he can do; I explained the potential impacts of sediments in the stormdrain conveyance; this case no longer needs a follow-up inspection.
4/6/2017	20	2976 NE Oakley Ct	Phone Call	Closed	UIC	Yes	None	ROW Precon meeting; discussed ESC and the need for sed fencing if the site drains back in towards itself. Jason (BRPD) is going to schedule a walk around with Darren (PDE) and to determine where ESCs need to be placed.
4/6/2017	21	20791 EGYPT DR	Pre-Con Meeting	NA	UIC	Yes	None	construction entrances have been refreshed with new drain rock, tracking has been reduced, and inlet protection has been replaced; Left a voicemail with Scott explaining that I will for now mark his case closed since he is meeting compliance standards.

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Date	Site ID #	Site Name (Location)	Type of Action	Status	Drainage	Education Info Provided	Enforcement Taken	Case Progress/Comments
4/12/2017	21	20791 EGYPT DR	Routine Inspection	NA	UIC	Yes	None	Met with Jason and Lauren to discuss ESCs; ROW plans shows sed fencing along the entire edge of Egypt; which is not necessary since the site drains back into itself; I told them that I would prefer to see sed fencing along a small section of the site, Witches Hats for inlet protection, and a consistent refreshing of drain rocks of construction entrances.
4/13/2017	15	62782 NW Imbler Dr	Follow-up Inspection	In Progress	UIC	No	None	Street has been swept and some of the inlet protection has been refreshed; tracking into the ROW has been lessened and material storage is kept onsite; spoke with Jeremy and he is going to immediately finish the remaining inlet protections; I told him that is site is good but due to the size of the project I would like for him to create a signed document stating his plan for ESCs. Once I receive and approve the document the site will be deemed closed.
4/13/2017	3	2305 NW Awbrey Rd	Follow-up Inspection	In Progress	River/Surface Waters	No	Verbal Warning	Sidewalk is still covered in sediments; Called John about getting it cleaned and warned him that I will have to issue an NOV in a week if it doesn't get resolved; He claims that he will have someone out to fix it. If compliance is not achieved by 4/19/17 NOV will be issued.
4/13/2017	4	2941 NW Chardonnay Ln	Follow-up Inspection	Closed	UIC	Yes	None	Site visit; street is cleaned and inlet protection has been refreshed; left voicemail to Ryan explaining to leave extra fabric along edges to provide a place to hold saturated fabric when lifting the grate; Site meets satisfactory compliance standards.
4/13/2017	19	2025-2085 NE 6th St	Follow-up Inspection	Closed	UIC	Yes	None	Satisfactory performance standards have been achieved; sediment stock piles have been pushed away from the curb line and back on to the property, tracking from lots have been greatly reduced, and street has been routinely swept. Site is closed.
4/14/2017	15	62782 NW Imbler Dr	Email	Closed	UIC	No	None	Jeremy sent me a Stormwater Compliance Agreement stating his ESC plans going forward. The letter is saved on working internal documents on SharePoint.
4/14/2017	22	500 SW Bond St	Pre-Con Meeting	NA	UIC	Yes	None	Onsite precon meeting with Latham and other various people involved; discussed ESCs such as sed fencing, construction entrance, concrete washout, and inlet protection on the street. I told Gabe that I expect to see the manufactured curb filter inserts for the one inlet on Bond. He will give me a call when he is finished installing the sed fencing onsite.
4/19/2017	23	1420 NW Ogden	Compliant Investigation	Open	UIC	Yes	Verbal Warning	Evidence of sediment running off property into nearby catch basin; spoke with property owner Brian Shelk; His onsite drywell failed scouring his front yard. In attempt to repair the problem he dug his drywell deeper and re-hammered the rock. He cleaned the street to the "best of his ability". His landscaper is going to revegetate the hillside asap. In the meantime I need to see sed fencing at the toe of unstabilized slope along with inlet protection at the drain. I will check back next Thursday.
4/19/2017	3	2305 NW Awbrey Rd	Follow-up Inspection	Closed	River/Surface Waters	No	None	Sidewalks have been cleaned; I will check back with them once construction starts back up.

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Date	Site ID #	Site Name (Location)	Type of Action	Status	Drainage	Education Info Provided	Enforcement Taken	Case Progress/Comments
4/19/2017	5	61549-61551 Alstrup Rd	Follow-up Inspection	In Progress	UIC	Yes	Verbal Warning	ROW tracking issues; Spoke with Abe Kats (Sup) and he is going to sweep street and draft a signed compliance agreement stating his esc plans top prevent tracking and protect the storm drains. Check Back next Friday.
4/19/2017	6	20343 Lois Way	Follow-up Inspection	In Progress	UIC	No	None	Tracking issues; sed ramps being used and inlet protection needs maintenance; spoke with Jordan (Sup) and discussed what is needed to get into compliance. He will draft a compliance agreement stating his sweeping procedure, tracking issues and inlet protection. Will check back with him next Friday.
4/19/2017	24	Basecamp (15 SW Colorado Ave)	Routine Inspection	Open	River/Surface Waters	No	None	1200c site that is completely stabilized with sed fencing surrounding the perimeter; spoke with Krista (DEQ) to see if the sed fence can be removed; she gave me the approval to let Thomas know. I called Thomas and let him know that Sed fence can be removed since its serving no purchase and looks bad in the public eye.
4/19/2017	25	SE Cameron Ave	Routine Inspection	Open	UIC	No	Verbal Warning	Minor sediment tracking, sed ramps, sed on the sidewalk, stockpiling in the ROW, inlet protection needed for some of the site; spoke with company owner and sup to get a compliance letter drafted and deficiencies resolved.
4/19/2017	26	Reed Ln and Parrell Rd	Routine Inspection	Closed	UIC	No	None	Routine Inspection; Sewn pocket fence is installed backwards for most of the site; grading slope is not steep where sed fence is much concern; tracking is not an issue; no follow-up necessary.
4/20/2017	23	1420 NW Ogden	Email	Closed	UIC	No	None	Brian sent photos of inlet protection and sed fencing at toe of slope; I requested that he extended the sed fence along the driveway apron.
4/20/2017	27	750 NE Kearny Ave	Pre-Con Meeting	NA	UIC	Yes	None	ROW Precon meeting; gravel ally way construction; construction entrance was the only ESC discussed
4/20/2017	28	NW Crossing Phase 27	Pre-Con Meeting	NA	UIC	Yes	None	ROW Precon meeting; NWX Phase 27, discussed inlet protection; sed fencing, construction entrances, watering, and street sweeping plans; I requested that
4/20/2017	29	Daly Estates	Referral	Open	UIC	No	None	Darren (PDE) referral; stockpile storage, sediment tracking, impacted stormdrains
4/20/2017	29	Daly Estates	Routine Inspection	In Progress	UIC	No	None	Site Visit; loader was removing sediment from cul-de-sac at corner of Daly and Thomas and also moved dropbox; met with Cody to discuss ESCs; He is going to remove all sediment off the ROW, clean street and catch basins, and create a signed letter addressing street sweeping, tracking, inlet protection, and stockpiling going forward. Will get inlet protection and sed removed by Tuesday and check back with me.
4/25/2017	29	Daly Estates	Follow-up Inspection	In Progress	UIC	Yes	Verbal Warning	met with Ross on site and inspected newly installed ESCs; construction entrance, inlet protection, and perimeter sed fencing looks good; suggested that he adds a section of sed fence on the southwest corner of project site.
4/25/2017	28	NW Crossing Phase 27	Routine Inspection	Open	UIC	Yes	None	met with Cody onsite; street and catch basins are 90% cleaned; will be back on Friday for a final ESC inspection and to pick up signed compliance letter addressing ESC concerns.
4/25/2017	30	Pettigrew Place	Routine Inspection	Open	UIC	Yes	Verbal Warning	Sed fencing along western perimeter of site is in working condition but needs to be replaced; spoke with Wade and he says that section will be graded below sidewalk by Thursday; told him that I would be stopping by on Friday to check the changes.

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4/26/2017	32	20950 NE Talus Pl	Compliant Investigation	Open	UIC	Yes	Verbal Warning	Pre-grading meeting; Met with Evan (CDD), Chris Chambers, and Justin (TNW) and discussed ESCs. Reviewed placement of sed fence, inlet protection, water trucks, and slope stabilization (tackifier and hydroseed) will most likely get applied around June/July.
4/26/2017	31	Hidden Hills	Pre-Con Meeting	NA	UIC	Yes	None	Drive by check up; corner lot has stock piles of sediment on the sidewalk and a little bit on the ROW; called Tony Johns to take care of it and to be more proactive about ESC issues. He agrees and will notify me when street and sidewalk gets swept.
4/26/2017	33	529 SE Glenwood Dr	Pre-Con Meeting	NA	UIC	Yes	None	Compliant from David Oak about concrete in the public swale; David B and I made a site visit; I noticed a large stock pile near a catch basin; Spoke with Jesse and he will relocate/remove the stockpile with the next couple of days; will notify me when work is complete.
4/26/2017	18	471 SE Glengarry pl	Routine Inspection	Closed	UIC	Yes	Verbal Warning	Pre-grading meeting; Met with Parker and Evan (CDD); discussed sed fencing and construction entrance; his construction plans are vague, Evan wants to see updated plans for any deviation from the current plans.
4/27/2017	5	61549-61551 Alstrup Rd	Email	In Progress	UIC	Yes	Verbal Warning	Email Conversation with Scott Wolf; He sent an email with compliance agreement addressing ESC concerns; will have site visit tomorrow to verify compliance.
4/27/2017	29	Daly Estates	Email	In Progress	UIC	Yes	Verbal Warning	Cody will finalize street cleaning and get letter written by Friday; NOV will be issued if compliance is not achieved by Monday.
4/27/2017	29	Daly Estates	Phone Call	In Progress	UIC	Yes	Verbal Warning	Sed fence has been removed as site is now graded below sidewalk; Inlet protection along Daly Estates needs to be replaced and street needs to be swept; spoke to Wade; he will coordinate with Cody next door to sweep street, remove sediment piles, and replace inlet protection.
4/27/2017	30	Pettigrew Place	Phone Call	In Progress	UIC	Yes	Verbal Warning	Cody emailed Stormwater Compliance Letter including his action place to address stormwater deficiencies; will check site on Monday 5/1 to verify compliance.
4/28/2017	12	1810 NE Neff Rd	Compliant Investigation	NA	UIC	Yes	None	Jesse emailed me a picture of the removed sediment pile and newly replaced inlet protection; he has also removed the hardened concrete from the public swale across the cul-de-sac.
4/28/2017	32	20950 NE Talus Pl	Email	Closed	UIC	Yes	None	Sed fence has been removed and ground is stabilized.
4/28/2017	6	20343 Lois Way	Email	In Progress	UIC	No	None	Email received with Compliance Agreement Letter; will make site visit later today to verify compliance.
4/28/2017	6	20343 Lois Way	Follow-up Inspection	Closed	UIC	Yes	None	Minimum compliance standards have been met; sediment piles have been removed off the ROW and inlet protection is in place; warned Jordan that if non-compliance is noted again then NOV will be issued.
4/28/2017	5	61549-61551 Alstrup Rd	Follow-up Inspection	Closed	UIC	Yes	Verbal Warning	Minimum compliance standards have been met; sediment piles have been removed off the ROW and inlet protection is in place.
4/28/2017	25	SE Cameron Ave	Follow-up Inspection	Closed	UIC	No	Verbal Warning	Roads have been swept; inlet protection in place; and tracking has been reduced by the addition of drain rock and better sweeping protocol.
4/28/2017	12	1810 NE Neff Rd	Phone Call	NA	UIC	Yes	None	Dust Compliant referral from Chris (EIPD)
4/28/2017	12	1810 NE Neff Rd	Referral	NA	UIC	Yes	None	Left voicemail with Wade; no response; will reach him on Monday

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4/28/2017	24	Basecamp (15 SW Colorado Ave)	Routine Inspection	Closed	River/Surface Waters	No	None	Site Visit; water trucks onsite and dust doesn't seem to be an issue, tracking onto Neff needs to be addressed, trucks are bypassing construction entrance.
5/1/2017	12	1810 NE Neff Rd	Email	NA	UIC	Yes	None	Sent Wade an email discussing dust, construction entrances, and tracking.
5/1/2017	30	Pettigrew Place	Email	In Progress	UIC	Yes	Verbal Warning	Received call from Wade addressing all ESC issues discussed in email; A permanent water truck has been placed onsite; trucks will be required to use construction entrance if they want to continue to work.
5/1/2017	12	1810 NE Neff Rd	Phone Call	NA	UIC	Yes	Verbal Warning	Reviewed plans; Inlet protection is required on Daly Estates; Although Wade has already agreed to replace inlet protection and clean street an email was sent to show him that it is required since its stated on ESC plan.
5/1/2017	29	Daly Estates	Phone Call	In Progress	UIC	No	None	Received text from Cody stating that the regional supervisor and director of construction has made a site visit and that it looks good; follow-up inspection to confirm compliance is scheduled for tomorrow afternoon.
5/2/2017	34	Rosengarth Estates	Compliant Investigation	In Progress	UIC	Yes	Verbal Warning	Referral from Paul Neiswonger and Kyle Thomas
5/2/2017	29	Daly Estates	Follow-up Inspection	Closed	UIC	No	None	site visit; met Project Manager Riley McCoy (Hayden Homes); we walked the site and addressed ESC and BMP deficiencies; we discussed tracking and storage of materials on ROW, inlet protection and preventative measures such as watering, construction entrances. I notified Riley that I'll be back on Friday for a recheck inspection. He will send me his compliance letter in the next couple of days.
5/2/2017	30	Pettigrew Place	Follow-up Inspection	In Progress	UIC	No	None	site visit; minimum compliance standards have been met for the time being.
5/2/2017	34	Rosengarth Estates	Referral	Open	UIC	No	None	Inlet protection still needs to be replaced/removed; street has been swept and grading is near completion; spoke with Wade and notified him of the inlet protection deficiencies; Rickabaugh has ordered 30 Witches Hats for all projects that are arriving tomorrow; Wade will notify me when inlet protection has been replaced.
5/2/2017	36	Columbia and Theater	Referral	Open	River/Surface Waters	No	None	Wendy and David mentioned that Sed fencing along river facing section of the site is improperly installed with air gap below fence.
5/3/2017	36	Columbia and Theater	Compliant Investigation	Open	River/Surface Waters	No	None	Riley sent me pictures of progress made in cleaning the ROW and obtain a water truck; he will send me the compliance letter within the next couple of days.
5/3/2017	34	Rosengarth Estates	Email	In Progress	UIC	Yes	None	Pregrading meeting with Evan (CDD), project engineer, developer, excavator and property owners; discussed ESCs; we agreed upon putting emphasis on the river facing slope by laying two rows of staked down straw waddles and using drain rock for construction entrance; we all agreed that perimeter control along the North, South, and East Side were not necessary. Excavator or builder will give me a call when ESCs get installed.
5/3/2017	35	Lakeside Place	Pre-Con Meeting	NA	River/Surface Waters	Yes	None	Site visit; left voicemail with project manager to address ESC concerns and improperly installed sed fence, backwards and not trenched.
5/4/2017	36	Columbia and Theater	Compliant Investigation	In Progress	River/Surface Waters	Yes	None	Precon meeting; reviewed ESCs, met Kevin (Taylor NW) and discussed a time later this month to arrange and site visit.

City of Bend (FY2016-17)
Erosion and Sediment Control Inspection Tracking Log

Date	Site ID #	Site Name (Location)	Type of Action	Status	Drainage	Education Info Provided	Enforcement Taken	Case Progress/Comments
5/4/2017	37	Stone Creek	Pre-Con Meeting	NA	UIC	Yes	None	Met Bart and Ryan onsite to have plan to fix sed fencing along water front facing side; In the short term I would like to see straw waddling staked in in front of sed fence, once excavation onsite starts ~July I want to see fence properly installed; we also addressed a few stockpiling issues in the street; inlet protection was also addressed.
5/5/2017	1	20856 Rorick Dr	Compliant Investigation	Closed	UIC	Yes	None	Pre-grading meeting; met Chris (PDE), Latham, and Engineers; reviewed ESCs with sed fencing, waddling, inlet protection and construction entrance.
5/5/2017	38	Boneyard Brewing (Division St)	Pre-Con Meeting	NA	UIC	Yes	None	Site visit; doubled-up straw waddles are placed properly and construction entrance is going to be installed tomorrow.
5/5/2017	35	Lakeside Place	Routine Inspection	NA	River/Surface Waters	Yes	None	Compliant from Mike Edwards; spoke to 3 different landscapers hired by homeowners that were storing materials in the ROW. Piles were actively being removed and street was to be swept after removal; I explained to all landscapers that materials in the ROW was not allowed.
5/5/2017	39	Corner of Rorick and 18th	Routine Inspection	NA	UIC	Yes	None	Spoke with excavators that were grading onsite; expressed concerns about sediment tracking since materials are being exported offsite; Contractor noted that they sweep the road at the end of every day.
5/9/2017	38	Boneyard Brewing (Division St)	Routine Inspection	NA	UIC	No	None	Routine Inspection to check perimeter controls; waddling and sed fence installed correctly
5/11/2017	34	Rosengarth Estates	Follow-up Inspection	In Progress	UIC	Yes	None	Referral from Kyle Thomas to investigate driveway and drainage issue; spoke with owners Gary and Suzanne, and agreed that pavers are allowed to replace the planned concrete driveway and walkway.
5/11/2017	40	461 NE Emerson Ave	Referral	NA	UIC	Yes	None	Referral from Dan Danning for saw cutting in the street without containment of dust suppression water; Spoke with Peter Hagan and discussed inlet protection, wet vacuuming when cutting is performed for the rest of the job, and storage of materials on curb line. He texted me a picture of newly installed inlet protection.
5/11/2017	41	Federal and Galveston	Referral	Open	River/Surface Waters	Yes	Verbal Warning	Significant progress has been made; streets have been cleaned and inlet protection has been installed; dozer needs to be removed off ROW and gravel entrance needs to be replaced with drain rock; Riley will email me the compliance letter by tomorrow at the latest
5/11/2017	19	2025-2085 NE 6th St	Referral	Open	UIC	Yes	Verbal Warning	Referral from Scott Winter; sediment ramps, tracking onto road and lacking inlet protection; spoke with Rob and would like to see compliance achieved by next week.
5/12/2017	34	Rosengarth Estates	Email	In Progress	UIC	Yes	None	Riley emailed his compliance letter; still waiting on a few minor compliance issues to be resolved before closing the case.
5/17/2017	41	Federal and Galveston	Follow-up Inspection	Closed	River/Surface Waters	No	None	Pre-grading meeting with Evan (EIPD), Engineer, Builder, and Excavator. Discussed ESCs; Construction Entrances, manufactured inlet protection, dust control, and sed fence in areas that are needed (site is subgrade or flat. Excavators will give me a call when ESCs are installed.
5/17/2017	19	2025-2085 NE 6th St	Follow-up Inspection	Closed	UIC	No	None	Spoke with Justin; he had a question regarding sed fence alternative on top of rock, approved double row of straw waddling flush to ground.

City of Bend (FY2016-17)
Erosion and Sediment Control Inspection Tracking Log

Date	Site ID #	Site Name (Location)	Type of Action	Status	Drainage	Education Info Provided	Enforcement Taken	Case Progress/Comments
5/17/2017	31	Hidden Hills	Phone Call	NA	UIC	Yes	None	Site Visit; Inlet protection taken care of and saw cutting was conducted without runoff, sediment stockpile was pushed back from curb.
5/17/2017	42	American Lane Industrial Park	Pre-Con Meeting	NA	UIC	Yes	None	street has been cleaned and all stockpiles have been push away from ROW.
5/18/2017	24	Basecamp (15 SW Colorado Ave)	Pre-Con Meeting	NA	River/Surface Waters	Yes	None	ROW precon; Bio-bag curb cut inlet protection for the existing catch basins; catch basins drain to drywells.
5/31/2017	34	Rosengarth Estates	Follow-up Inspection	Closed	UIC	No	None	Follow-up inspection; tractor and porta-potties removed off road
5/31/2017	43	Mt Bachelor Court	Referral	Open	River/Surface Waters	Yes	Verbal Warning	Referral from Mike Gillette; erosion from newly landscaped hillside, erosion most likely from overwatering and destabilization; spoke with Drew Van Nest and he is going to check the irrigation and see if its easily fixed and get back to me asap.
6/6/2017	45	19576 Century Dr	Compliant Investigation	In Progress	UIC	Yes	None	Discussed ESCs in ROW; Gabe said that he had the Gatorguard available but it still needs to be installed
6/6/2017	43	Mt Bachelor Court	Follow-up Inspection	In Progress	River/Surface Waters	Yes	None	Discusses inlet protection and sed fence location
6/6/2017	22	500 SW Bond St	Pre-Con Meeting	NA	UIC	Yes	None	Made a site visit; street cleanup was attempted; called Drew and he said that they have installed a pressure regulator on the irrigation line and that they are going to install more waddling and hydroseed to slope; also called Diane Wilcox (Mt Bachelor GM) and notified her of the situation, she emailed me stating that they have turned off the irrigation lines.
6/6/2017	44	Shevlin Bluffs	Pre-Con Meeting	NA	UIC	Yes	None	Received compliant from Kyle (PDE) of dust issues from neighbor; made site visit but no active construction was being performed; contacted builder and notified him of the compliant and told him that he needs to water of materials are being moved around.
6/6/2017	25	SE Cameron Ave	Routine Inspection	NA	UIC	No	Verbal Warning	Compliant investigation of stored landscape materials in the ROW; called Ken and left a voicemail notifying him of the non-compliance issue.
6/6/2017	46	SE Byron Ave	Routine Inspection	Open	UIC	Yes	None	drive by inspection; noticed tracking issues and sediment ramps onto lots; need to determine the project manager
6/6/2017	42	American Lane Industrial Park	Routine Inspection	In Progress	UIC	Yes	Verbal Warning	Drive by inspection; minor tracking issues coming off the site; attributed to improperly sized cobble for construction entrance; left voicemail with Matt.
6/7/2017	43	Mt Bachelor Court	Email	In Progress	River/Surface Waters	Yes	Verbal Warning	Emailed Diane and Botanical Dev. And confirmed the actions and timeline I expect to see; will make a follow-up site visit early next week.
6/7/2017	43	Mt Bachelor Court	Phone Call	In Progress	River/Surface Waters	Yes	None	Spoke with Diane; she says that Botanical Dev wont be able to work on it this week due to staffing issues with other projects. More waddling will be added to the slope, the street will be cleaned, and irrigation is shut off for the time being.
6/8/2017	3	2305 NW Awbrey Rd	Routine Inspection	Closed	River/Surface Waters	No	None	Driveway has been paved; and erosion and sediment no longer an issue.
6/9/2017	47	1928 NW Trenton Ave	Routine Inspection	NA	UIC	Yes	None	Met with Loren and excavator; we discussed placement of sed fencing along with some waddling. Loren will give me a call next week to verify correct installation.
6/14/2017	24	Basecamp (15 SW Colorado Ave)	Phone Call	Open	River/Surface Waters	No	None	Left voicemail for Scott to address incorrectly installed sed fence; returned call on 6/15/17 saying that the sed fence installation has been fixed; I will swing by today to take a look and address if needed.

City of Bend (FY2016-17)
Erosion and Sediment Control Inspection Tracking Log

Date	Site ID #	Site Name (Location)	Type of Action	Status	Drainage	Education Info Provided	Enforcement Taken	Case Progress/Comments
6/14/2017	47	1928 NW Trenton Ave	Phone Call	NA	UIC	No	None	Spoke with Loren about scheduling an inspection of the ESCs; planning on it tomorrow.
6/15/2017	49	20666 Patriot Ln	Compliant Investigation	Closed	UIC	No	None	ROW pre-con; Inlet Protection on plans calls out pre-fab inserts that need to be installed asap; construction entrance needs to be repaired.
6/15/2017	4	2941 NW Chardonnay Ln	Compliant Investigation	In Progress	UIC	Yes	NOV Issued	ROW pre-con; pre-fab insert inlet protection for all grated inlets; addition of second construction entrance is ok'd but needs to meet spec; current construction entrance needs to be repaired.
6/15/2017	43	Mt Bachelor Court	Follow-up Inspection	In Progress	River/Surface Waters	No	None	Landscape materials stored on the road; reported from Christopher Blake; materials were removed by the time I got out there
6/15/2017	48	BLS Transportation Facility	Pre-Con Meeting	NA	UIC	Yes	None	Irrigation has been shut off; sediment has been cleaned off the road and bio-bags have been installed for inlet protection
6/15/2017	16	1050 SW Yates Dr	Pre-Con Meeting	NA	UIC	Yes	None	Complaint investigation; sediment in the road and filter fabric is completely saturated with sediment; some inlets are not protected; tracking onto the road and catch basins; NOV issued on 6/19/2017; response deadline of a seven business days
6/20/2017	25	SE Cameron Ave	Phone Call	Open	UIC	No	Verbal Warning	complaint Investigation; called Ken and left a voicemail to clean up his street and replace inlet protection by the end of the day; NOV to be issued if issues arise again; Ken called back and said that he will address the sediment issue asap; Builder named Phil is working at adjacent property
6/22/2017	43	Mt Bachelor Court	Email	In Progress	River/Surface Waters	No	None	Email from Diane; Hydroseeding to be done by the end of next week; irrigation has been shut off and to be inspected
6/23/2017	47	1928 NW Trenton Ave	Follow-up Inspection	NA	UIC	No	None	Site Visit; ECSs have been put up but sed fence is not installed properly; I emailed Loren to inform him to fix it
6/23/2017	24	Basecamp (15 SW Colorado Ave)	Follow-up Inspection	Open	River/Surface Waters	No	None	Tracking onto Trenton Ave; No construction entrance; Spoke with Chris and Derick and requested that they have a const entrance installed by Monday. He stated that they were washing tires before hauling, but that would cause more tracking if there was no rock entrance. will check back with them early next week.
6/23/2017	52	1239 NE 11th st	Follow-up Inspection	Open	UIC	Yes	Verbal Warning	Tracking onto ROW; spoke with Chris Byers CTL Const; he is going to get drain rock and sweep the road; will check back on Monday
6/23/2017	50	2050 NW 12th St	Routine Inspection	Open	UIC	Yes	Verbal Warning	Follow-up site visit; Sed fence needs to be properly trenched and backfilled, construction entrance needs to be improved to prevent tracking, and inlet protection needs to be installed on ROW; email to be sent to Abe and Scott
6/23/2017	51	SFD at 2210-2256 NW Eastes St	Routine Inspection	Open	UIC	Yes	Verbal Warning	David performed original complaint response on 6/21; Follow-up response, stockpile has been removed but materials and debris are still in street; spoke to project manager and told him that materials cant be stored in ROW and I will check back next week.

City of Bend (FY2016-17)
Erosion and Sediment Control Inspection Tracking Log

Date	Site ID #	Site Name (Location)	Type of Action	Status	Drainage	Education Info Provided	Enforcement Taken	Case Progress/Comments
6/26/2017	4	2941 NW Chardonnay Ln	Compliant Investigation	In Progress	UIC	Yes	None	Site visit w/ Ryan to discuss terms of the voluntary compliance agreement; Inlet protection has been replaced with new filter fabric street has been swept; I emailed the details of what I expect out of the compliance agreement; he has till 7/1 to email it to me then every month thereafter.
6/26/2017	24	Basecamp (15 SW Colorado Ave)	Phone Call	Open	River/Surface Waters	No	None	Email received from Abe and Scott; Called Abe to address his confusion on what needs to be corrected; no return call.
6/27/2017	53	The Pointe	Pre-Con Meeting	NA	River/Surface Waters	Yes	None	discussed flushing water discharge area; chlorine and scouring was a concern; told them that discharging to the river was not going to be an option; double row of sed fence is to be installed along with const entrance next week; foreman is going to give a call to come out and inspect
6/27/2017	54	Sportsplex	Pre-Con Meeting	NA	UIC	Yes	None	Inlet protection not called out on plans; discussed with Foreman Cory Wilcox that bio-bags are going to be needed for curb cut inlets and pre-fab filter inserts for the grated inlets; work should be done after July 4th





UTILITY DEPARTMENT

FREE WORKSHOP

Contractors, developers, engineers, municipal inspection and construction staff…

If you are not completely familiar with latest local or the state erosion and sediment control requirements and best management practices, you do not want to miss this! The City of Bend Stormwater utility is hosting a DOE Certified Erosion & Sediment Control Lead (CESCL) workshop acceptable to DEQ to meet state 1200C stormwater construction permit requirements. Come learn practices to keep your soil resources where you want them, avoiding costly project delays and costs. Presenters will include Clean Water Technologies, LLC, Oregon DEQ and City staff. **A $300 value, free to you this year**! But hurry to register as space is limited. Workshop includes an active field component. Partial attendance may be considered, but priority will be given to full participants.

The registration deadline is Monday February 17, 2017 at Noon.

Please register by contacting David Buchanan (City of Bend), at dbuchanan@bendoregon.gov or 541-693-2176 with your name, agency/company and contact information. In order to receive the CESCL certification, attendees must participate in both days of the workshop and pass a written exam.

Accommodation Information for People with Disabilities
To obtain this information in an alternate format such as Braille, large print, electronic formats and audio cassette tape please contact the Utilities Department at (Utilities@bendoregon.gov, 541-317-3000 Opt. #2).

CERTIFIED EROSION & SEDIMENT CONTROL LEAD (CESCL) WORKSHOP

Monday & Tuesday, February 27 & 28, 2017

8:00 am to 5:00 pm

Lunch will be provided!

LOCATION:
62975 Boyd Acres Rd
Bend, Oregon

CLEAN WATER WORKS
We work for clean water

CESCL Certification Day 2

2/27/2017

James	Anderson	Anderson's Erosion Control Inc.	
Kevin	Madsen	Anderson's Erosion Control Inc.	
Dustin	Revel	Ashley & Vance Engineering	
Ian	Feltis	Ashley & Vance Engineering	
Jim	Lord	Ashley & Vance Engineering	
Bret	Dalrymple	City of Bend	
Chad	Towell	City of Bend	
Chris	Henningsen	City of Bend	
Christopher	Struck	City of Bend	
Garrett	Sabourin	City of Bend	
Jessica	MacClanahan	City of Bend	
Pat	Konop	City of Bend	
Scott	Winter	City of Bend	
Sean	Mulderig	City of Bend	
Steve	Sullivan	City of Bend	
Stuart	Rounds	City of Bend	
Travis	Somers	City of Bend	
Chris	Chambers	DevTech Engineering Inc.	
Casey	Huettl	Taylor NW	
Chad	Swindle	Taylor NW	
Justin	Barden	Taylor NW	
Kevin	Isley	Taylor NW	
Paul	MacClanahan	Taylor NW	
Steve	Riley	City of Bend	
Mike	Gillette	City of Bend	
mike	Prentice	City of Bend	
David	Zarate	City of Bend	
David	Buchen	COB	
Wendy	Edde	COB	

CESCL Certification Day 2

2/28/2017

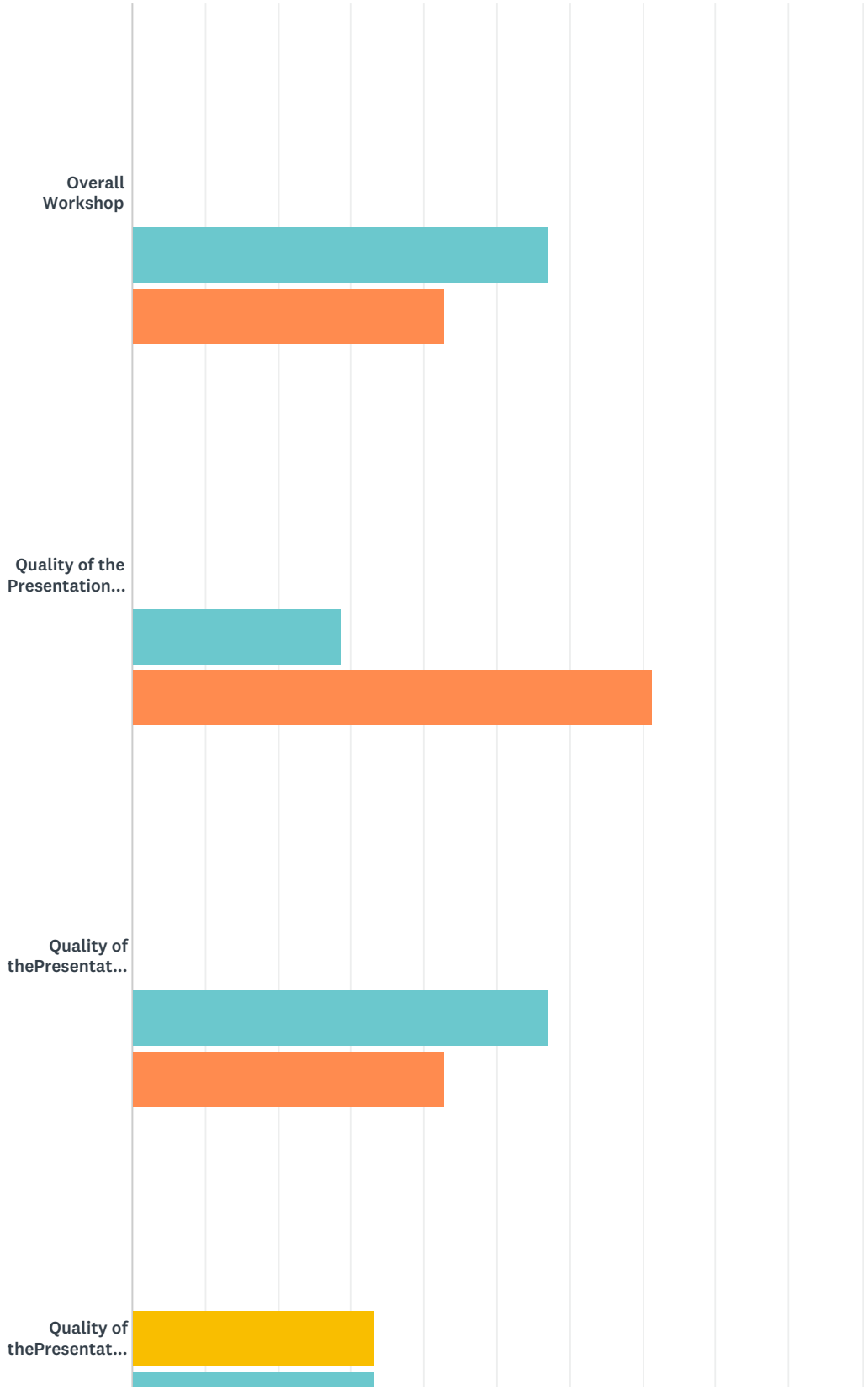
James	Anderson	Anderson's Erosion Control Inc.	
Kevin	Madsen	Anderson's Erosion Control Inc.	
Dustin	Revel	Ashley & Vance Engineering	
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Chris	Chambers	DevTech Engineering Inc.	
Casey	Huettl	Taylor NW	
Chad	Swindle	Taylor NW	
Justin	Barden	Taylor NW	
Kevin	Isley	Taylor NW	
Paul	MacClanahan	Taylor NW	
Steve	Riley	City of Bend	
Mike	Gillette	City of Bend	
David	Zarate Jr.	City of Bend	

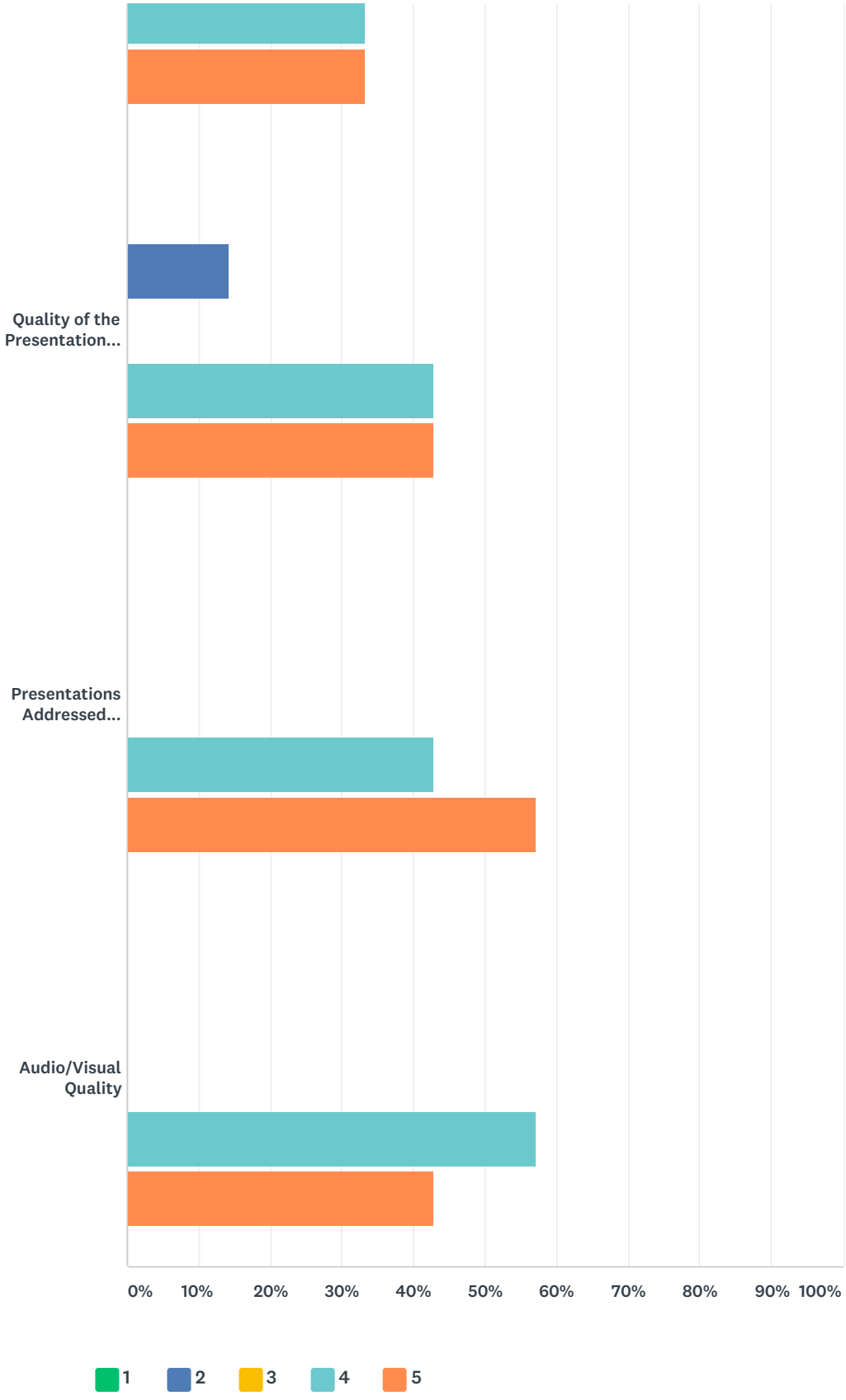
mike Prentice City of Bend

Morgan Crowell City of Redmond

Q1 Please evaluate the presentation (1 being poor, 3 average, 5 excellent)

Answered: 7 Skipped: 0



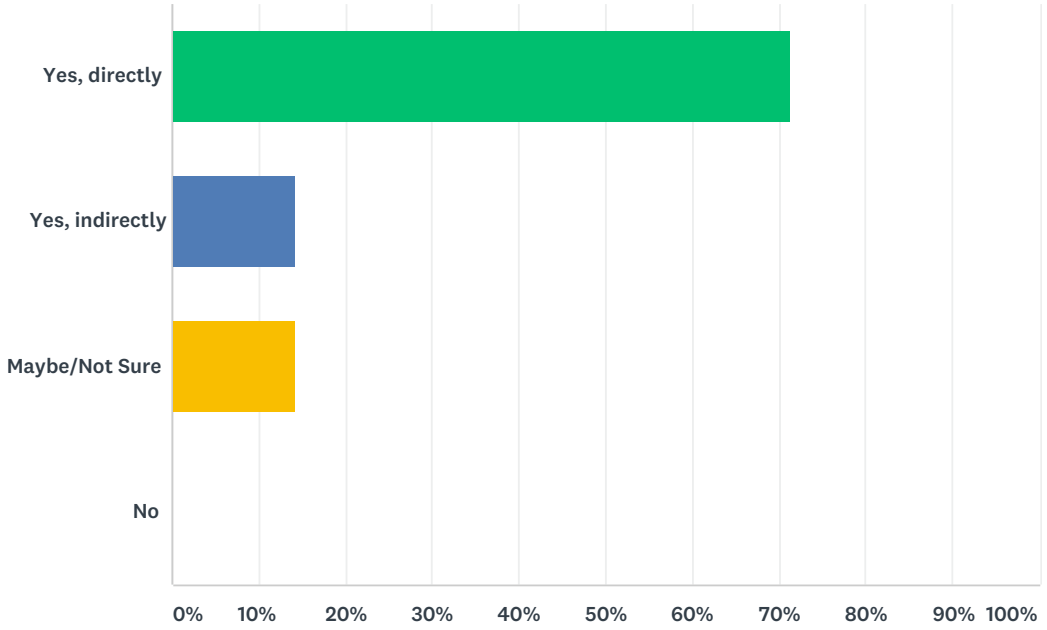


	1	2	3	4	5	TOTAL
Overall Workshop	0.00% 0	0.00% 0	0.00% 0	57.14% 4	42.86% 3	7

Quality of the Presentation(s) Provided by: Nathan Hardebeck	0.00% 0	0.00% 0	0.00% 0	28.57% 2	71.43% 5	7
Quality of thePresentation(s) Provided by: Krista Ratliff	0.00% 0	0.00% 0	0.00% 0	57.14% 4	42.86% 3	7
Quality of thePresentation(s) Provided by: Wendy Edde	0.00% 0	0.00% 0	33.33% 2	33.33% 2	33.33% 2	6
Quality of the Presentation(s) Provided by: Kyle Thomas	0.00% 0	14.29% 1	0.00% 0	42.86% 3	42.86% 3	7
Presentations Addressed Topics as Advertised	0.00% 0	0.00% 0	0.00% 0	42.86% 3	57.14% 4	7
Audio/Visual Quality	0.00% 0	0.00% 0	0.00% 0	57.14% 4	42.86% 3	7

Q2 Have you/will you be able to use the information that you gained from the workshop in your work?

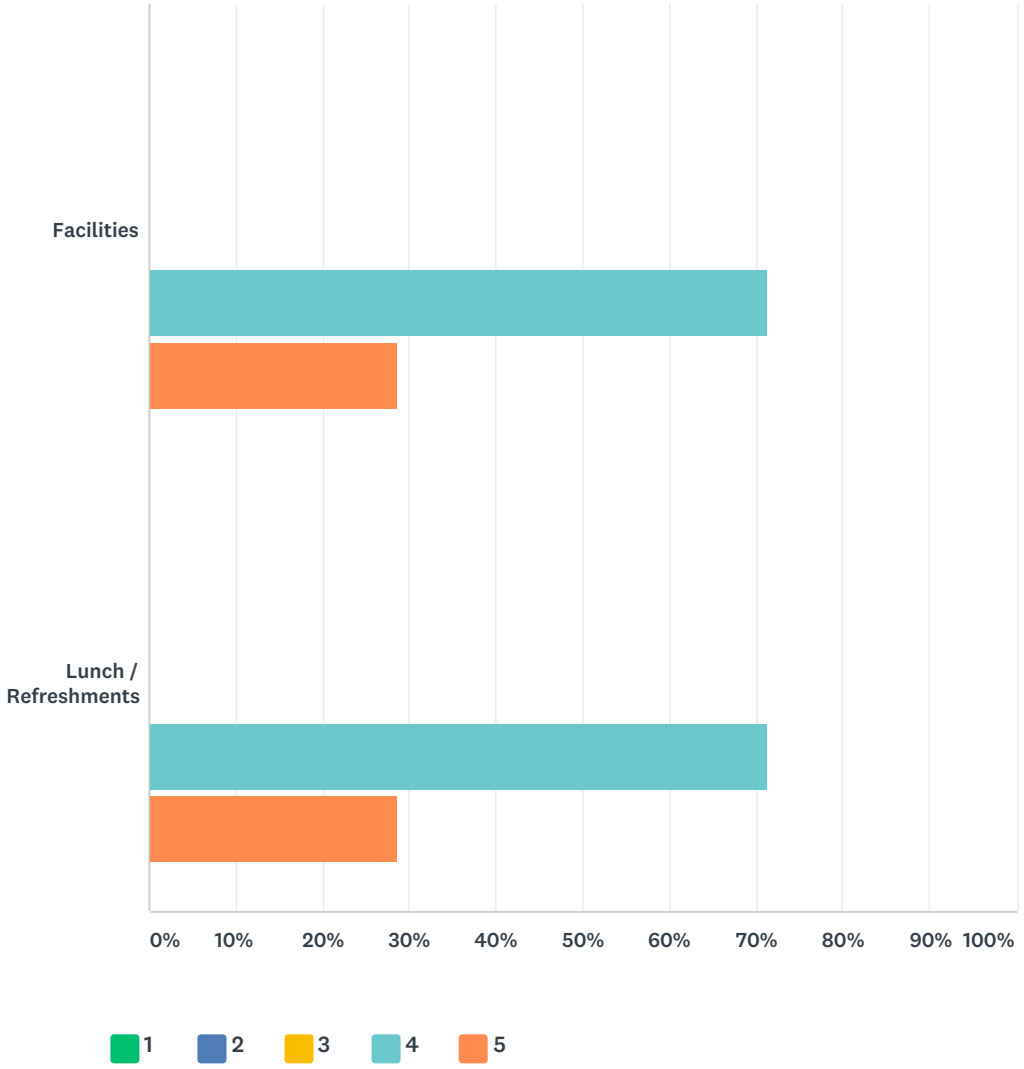
Answered: 7 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes, directly	71.43%	5
Yes, indirectly	14.29%	1
Maybe/Not Sure	14.29%	1
No	0.00%	0
TOTAL		7

Q3 Please rank the facility and refreshments (1 being poor, 3 being average, 5 being excellent).

Answered: 7 Skipped: 0



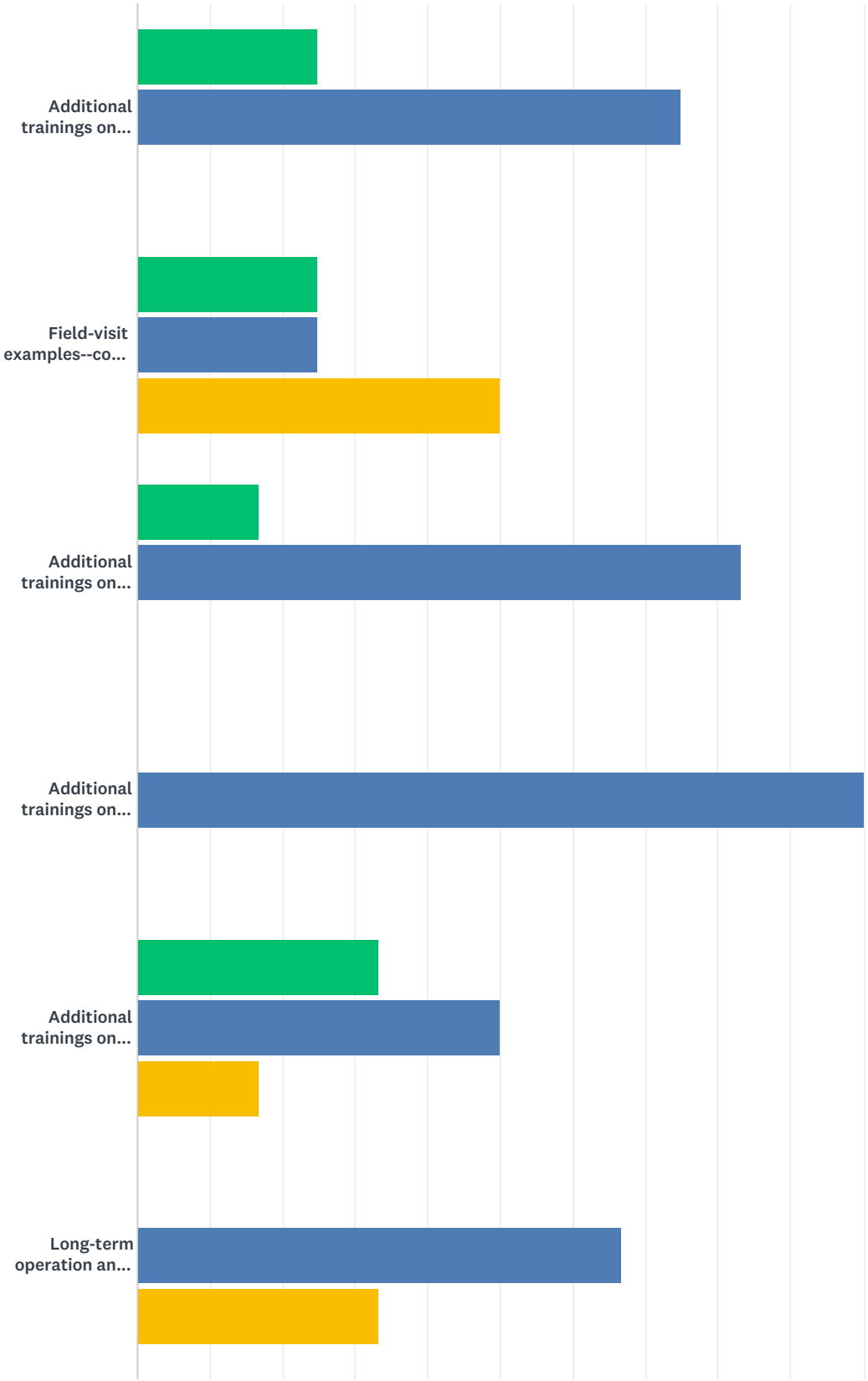
	1	2	3	4	5	TOTAL
Facilities	0.00% 0	0.00% 0	0.00% 0	71.43% 5	28.57% 2	7
Lunch / Refreshments	0.00% 0	0.00% 0	0.00% 0	71.43% 5	28.57% 2	7

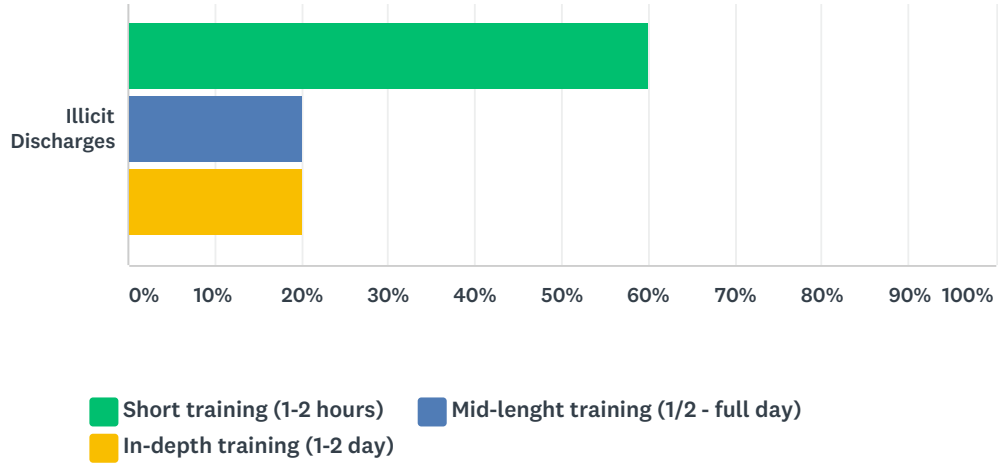
Q4 Please list one or more new things that you learned as part of the presentation(s).

Answered: 4 Skipped: 3

Q5 What additional stormwater training(s) would you feel would be useful (mark all that apply)?

Answered: 7 Skipped: 0





	SHORT TRAINING (1-2 HOURS)	MID-LENGHT TRAINING (1/2 - FULL DAY)	IN-DEPTH TRAINING (1-2 DAY)	TOTAL RESPONDENTS
Additional trainings on construction site management (erosion control and pollution prevention)	25.00% 1	75.00% 3	0.00% 0	4
Field-visit examples--construction site management	25.00% 1	25.00% 1	50.00% 2	4
Additional trainings on site design, and low impact development	16.67% 1	83.33% 5	0.00% 0	6
Additional trainings on facility sizing	0.00% 0	100.00% 3	0.00% 0	3
Additional trainings on Central Oregon Stormwater Manual	33.33% 2	50.00% 3	16.67% 1	6
Long-term operation and maintenance	0.00% 0	66.67% 2	33.33% 1	3
Illicit Discharges	60.00% 3	20.00% 1	20.00% 1	5

Q6 Please provide any additional comments/suggestions for improvement.

Answered: 1 Skipped: 6

#1

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Wednesday, March 01, 2017 1:57:48 PM
Last Modified: Wednesday, March 01, 2017 2:06:22 PM
Time Spent: 00:08:34
IP Address: 98.142.36.35

Page 1: Welcome!

Q1 Please evaluate the presentation (1 being poor, 3 average, 5 excellent)

Overall Workshop
5
Quality of the Presentation(s) Provided by: Nathan Hardebeck
5
Quality of thePresentation(s) Provided by: Krista Ratliff
5
Quality of the Presentation(s) Provided by: Kyle Thomas
5
Presentations Addressed Topics as Advertised
5
Audio/Visual Quality
5

Q2 Have you/will you be able to use the information that you gained from the workshop in your work? **Yes, directly**

Q3 Please rank the facility and refreshments (1 being poor, 3 being average, 5 being excellent).

Facilities
5
Lunch / Refreshments
4
Comments/Suggestions for Improvements (please specify)
Combining Washington and Oregon regulations were confusing. Would be nice to have a side b side fact sheet to be able to keep the facts and levels straight.

Q4 Please list one or more new things that you learned as part of the presentation(s).

Small construction sites release 20-150 tons/acre/ear of sediment per the USEPA
--Need to put geotextile base down first on construction site entrances to reduce the soil coming up into a muddy mess.
--compost tea will occur

Q5 What additional stormwater training(s) would you feel would be useful (mark all that apply)?

Additional trainings on site design, and low impact development	**Mid-lenght training (1/2 - full day)**

Q6 Please provide any additional comments/suggestions for improvement. **Respondent skipped this question**

#2

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Wednesday, March 01, 2017 3:26:35 PM
Last Modified: Wednesday, March 01, 2017 3:35:59 PM
Time Spent: 00:09:24
IP Address: 98.142.36.35

Page 1: Welcome!

Q1 Please evaluate the presentation (1 being poor, 3 average, 5 excellent)

Overall Workshop
5
Quality of the Presentation(s) Provided by: Nathan Hardebeck
5
Quality of thePresentation(s) Provided by: Krista Ratliff
5
Quality of thePresentation(s) Provided by: Wendy Edde
5
Quality of the Presentation(s) Provided by: Kyle Thomas
5
Presentations Addressed Topics as Advertised
5
Audio/Visual Quality
4
Please provide any comments/suggestions for improvement (please specify)
Nathan could not use the Audio on some things.

Q2 Have you/will you be able to use the information that you gained from the workshop in your work? **Yes, directly**

Q3 Please rank the facility and refreshments (1 being poor, 3 being average, 5 being excellent).

Facilities
4
Lunch / Refreshments
5
Comments/Suggestions for Improvements (please specify)
The meeting room could have been bigger for that many attendees.

Q4 Please list one or more new things that you learned as part of the presentation(s).

Several to many to list.

Q5 What additional stormwater training(s) would you feel would be useful (mark all that apply)?

Additional trainings on construction site management (erosion control and pollution prevention)	**Mid-lenght training (1/2 - full day)**
Field-visit examples--construction site management	**In-depth training (1-2 day)**
Additional trainings on site design, and low impact development	**Mid-lenght training (1/2 - full day)**
Additional trainings on facility sizing	**Mid-lenght training (1/2 - full day)**
Additional trainings on Central Oregon Stormwater Manual	**Mid-lenght training (1/2 - full day)**
Long-term operation and maintenance	**Mid-lenght training (1/2 - full day)**
Illicit Discharges	**In-depth training (1-2 day)**

Q6 Please provide any additional comments/suggestions for improvement. **Respondent skipped this question**

#3

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Wednesday, March 01, 2017 3:41:35 PM
Last Modified: Wednesday, March 01, 2017 3:42:38 PM
Time Spent: 00:01:02
IP Address: 67.59.72.62

Page 1: Welcome!

Q1 Please evaluate the presentation (1 being poor, 3 average, 5 excellent)

Overall Workshop
4
Quality of the Presentation(s) Provided by: Nathan Hardebeck
5
Quality of thePresentation(s) Provided by: Krista Ratliff
4
Quality of thePresentation(s) Provided by: Wendy Edde
3
Quality of the Presentation(s) Provided by: Kyle Thomas
2
Presentations Addressed Topics as Advertised
4
Audio/Visual Quality
5

Q2 Have you/will you be able to use the information that you gained from the workshop in your work?

Maybe/Not Sure

Q3 Please rank the facility and refreshments (1 being poor, 3 being average, 5 being excellent).

Facilities
4
Lunch / Refreshments
4

Q4 Please list one or more new things that you learned as part of the presentation(s).

Respondent skipped this question

Q5 What additional stormwater training(s) would you feel would be useful (mark all that apply)?

Additional trainings on construction site management (erosion control and pollution prevention)	**Mid-lenght training (1/2 - full day)**
Field-visit examples--construction site management	**Mid-lenght training (1/2 - full day)**
Additional trainings on site design, and low impact development	**Mid-lenght training (1/2 - full day)**
Additional trainings on facility sizing	**Mid-lenght training (1/2 - full day)**
Additional trainings on Central Oregon Stormwater Manual	**In-depth training (1-2 day)**
Long-term operation and maintenance	**Mid-lenght training (1/2 - full day)**
Illicit Discharges	**Short training (1-2 hours)**

Q6 Please provide any additional comments/suggestions for improvement. **Respondent skipped this question**

#4

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Wednesday, March 01, 2017 4:20:16 PM
Last Modified: Wednesday, March 01, 2017 4:22:23 PM
Time Spent: 00:02:06
IP Address: 199.7.135.186

Page 1: Welcome!

Q1 Please evaluate the presentation (1 being poor, 3 average, 5 excellent)

Overall Workshop
4
Quality of the Presentation(s) Provided by: Nathan Hardebeck
4
Quality of thePresentation(s) Provided by: Krista Ratliff
4
Quality of thePresentation(s) Provided by: Wendy Edde
3
Quality of the Presentation(s) Provided by: Kyle Thomas
4
Presentations Addressed Topics as Advertised
4
Audio/Visual Quality
4

Q2 Have you/will you be able to use the information that you gained from the workshop in your work? **Yes, directly**

Q3 Please rank the facility and refreshments (1 being poor, 3 being average, 5 being excellent).

Facilities
4
Lunch / Refreshments
4

Q4 Please list one or more new things that you learned as part of the presentation(s).

requirements for 1200 permit and requirements of a CESCL

Q5 What additional stormwater training(s) would you feel would be useful (mark all that apply)?

Additional trainings on construction site management (erosion control and pollution prevention)	**Short training (1-2 hours)**
Field-visit examples--construction site management	**Short training (1-2 hours)**
Additional trainings on site design, and low impact development	**Short training (1-2 hours)**
Additional trainings on Central Oregon Stormwater Manual	**Short training (1-2 hours)**
Illicit Discharges	**Short training (1-2 hours)**

Q6 Please provide any additional comments/suggestions for improvement. **Respondent skipped this question**

#5

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Thursday, March 02, 2017 7:37:36 AM
Last Modified: Thursday, March 02, 2017 7:41:13 AM
Time Spent: 00:03:36
IP Address: 98.142.36.35

Page 1: Welcome!

Q1 Please evaluate the presentation (1 being poor, 3 average, 5 excellent)

Overall Workshop
5
Quality of the Presentation(s) Provided by: Nathan Hardebeck
5
Quality of thePresentation(s) Provided by: Krista Ratliff
5
Quality of thePresentation(s) Provided by: Wendy Edde
5
Quality of the Presentation(s) Provided by: Kyle Thomas
5
Presentations Addressed Topics as Advertised
5
Audio/Visual Quality
5

Q2 Have you/will you be able to use the information that you gained from the workshop in your work? **Yes, directly**

Q3 Please rank the facility and refreshments (1 being poor, 3 being average, 5 being excellent).

Facilities
5
Lunch / Refreshments
5

Q4 Please list one or more new things that you learned as part of the presentation(s). **Respondent skipped this question**

Q5 What additional stormwater training(s) would you feel would be useful (mark all that apply)?

Additional trainings on construction site management (erosion control and pollution prevention)	**Mid-lenght training (1/2 - full day)**
Field-visit examples--construction site management	**In-depth training (1-2 day)**
Additional trainings on site design, and low impact development	**Mid-lenght training (1/2 - full day)**
Additional trainings on facility sizing	**Mid-lenght training (1/2 - full day)**
Additional trainings on Central Oregon Stormwater Manual	**Mid-lenght training (1/2 - full day)**
Long-term operation and maintenance	**In-depth training (1-2 day)**
Illicit Discharges	**Mid-lenght training (1/2 - full day)**

Q6 Please provide any additional comments/suggestions for improvement. **Respondent skipped this question**

#6

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Thursday, March 02, 2017 8:01:34 AM
Last Modified: Thursday, March 02, 2017 8:08:52 AM
Time Spent: 00:07:17
IP Address: 98.142.36.35

Page 1: Welcome!

Q1 Please evaluate the presentation (1 being poor, 3 average, 5 excellent)

Overall Workshop
4
Quality of the Presentation(s) Provided by: Nathan Hardebeck
4
Quality of thePresentation(s) Provided by: Krista Ratliff
4
Quality of thePresentation(s) Provided by: Wendy Edde
4
Quality of the Presentation(s) Provided by: Kyle Thomas
4
Presentations Addressed Topics as Advertised
5
Audio/Visual Quality
4

Q2 Have you/will you be able to use the information that you gained from the workshop in your work? **Yes, directly**

Q3 Please rank the facility and refreshments (1 being poor, 3 being average, 5 being excellent).

Facilities
4
Lunch / Refreshments
4

Q4 Please list one or more new things that you learned as part of the presentation(s).

I learned that a witches hat in a storm drain is not the first and last line of defense. Proper BMPs should prevent most sediment from ever reaching the storm drain.

Q5 What additional stormwater training(s) would you feel would be useful (mark all that apply)?

Additional trainings on site design, and low impact development	**Mid-lenght training (1/2 - full day)**
Additional trainings on Central Oregon Stormwater Manual	**Short training (1-2 hours)**
Illicit Discharges	**Short training (1-2 hours)**

Q6 Please provide any additional comments/suggestions for improvement. **Respondent skipped this question**

#7

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Thursday, March 02, 2017 9:06:47 AM
Last Modified: Thursday, March 02, 2017 9:10:14 AM
Time Spent: 00:03:27
IP Address: 67.204.161.222

Page 1: Welcome!

Q1 Please evaluate the presentation (1 being poor, 3 average, 5 excellent)

Overall Workshop
4
Quality of the Presentation(s) Provided by: Nathan Hardebeck
5
Quality of thePresentation(s) Provided by: Krista Ratliff
4
Quality of thePresentation(s) Provided by: Wendy Edde
4
Quality of the Presentation(s) Provided by: Kyle Thomas
4
Presentations Addressed Topics as Advertised
4
Audio/Visual Quality
4
Please provide any comments/suggestions for improvement
(please specify)
Presenter was very knowledgeable and well-spoken.

Q2 Have you/will you be able to use the information that you gained from the workshop in your work?

Yes, indirectly

Q3 Please rank the facility and refreshments (1 being poor, 3 being average, 5 being excellent).

Facilities
4
Lunch / Refreshments
4

Q4 Please list one or more new things that you learned as part of the presentation(s).

Respondent skipped this question

Q5 What additional stormwater training(s) would you feel would be useful (mark all that apply)?

Additional trainings on Central Oregon Stormwater Manual **Mid-lenght training (1/2 - full day)**

Other (please specify)
Anything more tailored to the Central Oregon climate & conditions would be helpful.

Q6 Please provide any additional comments/suggestions for improvement.

Great class but more relevant for Washington State and the western Oregon areas and not practical/applicable to our region.

Stormwater Quality Webinars
Winter 2016

The City of Bend Stormwater Utility is sponsoring the following upcoming American Society of Civil Engineers (ASCE) on demand webinars. Attendance is free, each session is 1-hour. The City will provide certificates of attendance to those who pre-register.

Date: Tuesday, December 20, 2016

Location: Eisenhower Training Room (City of Bend Utilities, 62975 Boyd Acres Rd.)

SESSION 1 (Time:10:00 am to 11:00 am)

Permeable Pavement - Design Considerations & Tips for Avoiding Failures

Purpose and Background from ASCE Website:

This webinar discusses various permeable pavement types, site considerations common to all permeable pavements their benefits, and tips for avoiding clogging failures.

In spite of the environmental advantages of permeable pavements, in North America, they have typically remained outside the ordinary conventions of urban design and construction. Very few state and local agencies have standards or guidelines that can be used by practicing engineers for the design of these systems. In response to these issues, the ASCE-EWRI UWRRC LID Task Committee on Permeable Pavement developed a Committee Report entitled Permeable Pavements. This webinar highlights specific content from the manual which contains individual design chapters on porous asphalt, pervious concrete, permeable interlocking concrete pavement, and other types of permeable pavement. Design considerations that are common to all permeable pavement systems are emphasized. In addition, common myths surrounding the practice are addressed, including perceptions about practice strength, durability, clogging, cold climate usage, use in clay soils, and long-term performance. Attendees gain an introduction to permeable pavement technology and capability and will be directed to the upcoming comprehensive Committee Report for more in-depth information and resources.

Instructor: Bethany Eisenberg LEED AP, A.M.ASCE & Kelly A. Lindow, PE, A.M.ASCE

SESSION 2 (Time:1:00 pm to 2:00 pm)

Construction Stormwater BMPs

Purpose and Background from ASCE Website:

Many construction projects include excavation and fill. These soil disturbing activities create the potential for erosion and necessitate the use of Best Management Practices (BMPs). A wide variety of BMPs have been developed, but some designers and contractors use only a few of them. Sometimes this is due to unfamiliarity with other options and sometimes it is due to the mistaken impression that one BMP can be used for all situations. BMPs for slopes include silt fence, slope roughening and erosion control blankets. BMPs for small drainages include sedimentation basins, sediment traps, check dams, fiber rolls and straw bales. BMPs for inlets include silt fence, straw bales, fiber rolls and inlet covers.

Instructor: Mark Peterson, P.E., M.ASCE

Stormwater Quality Webinars
Winter 2016

SESSION 3 (Time: 2:15 pm to 3:15 pm)

A New Approach to Applications of Sediment Transportation

Purpose and Background from ASCE Website:

Sediment transport analysis frameworks are valuable tools for jurisdictional determinations in arid systems. These frameworks reduce project cost and time, and add to project value for jurisdictional determinations in arid systems. Regulatory guidance under the Clean Water Act (CWA) for southwestern, arid, ephemeral streams (ERDC 2008) directs regulators to examine moderate events with sufficient sediment transport to result in channel widening and vegetation removal for forming the ordinary high water mark (OHWM). At least four distinct tracts of current research have the potential to modify or compliment this regulatory guidance. The webinar examines research in these areas that provide a framework for assessing jurisdiction in arid systems with sediment transport toolsets. Additionally, the webinar explores how these tools can be used to assess system habitat function in otherwise challenging stream evaluation settings.

Instructor: David A. Jaffe, Ph.D., P.E., D.WRE

INTENDED AUDIENCE

Civil engineers, contractors and inspectors involved in designing, installing or inspecting stormwater BMPs for construction projects will benefit from this webinar.

TO REGISTER

For the webinars, please register by emailing or calling David Buchanan, City of Bend, dbuchanan@bendoregon.gov or (541) 693-2176 with your name, agency/company, and contact information, and which session you would like to attend. **Register today—seating is limited.**

THANK YOU FOR ATTENDING!

American Society of Civil Engineers
Construction Stormwater BMPs
Date: *December 20, 2016* ***Time:*** *1:00 pm to 2:00 pm*

UTILITY DEPARTMENT

PLEASE SIGN IN

	Name (Please Initial)	Affiliation	Notes/Comments
1	David Buchanan	City of Bend	
2	Matt Williams	C.A. Rowels Engineering	
3	Kristin Georgeton		
4	Corey Charon	The Green Consultant	
5	Wendy Edde	City of Bend	
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ASCE

Construction Stormwater Best Management Practices (BMPs)

Mark Peterson, PE
E-mail: mkjsredfox@gmail.com

Purpose of BMPs

- Often required to meet regulations
- Real purpose is to protect water quality
- Most common pollutant of concern is sediment
- Other pollutants include oil and grease

Overview

- BMPs for slopes
- BMPs for channels and drainages
- BMPs around inlets
- BMPs for general site conditions
- BMP failures

BMPs for Slopes

- Options include:
  - Slope roughening
  - Silt fence
  - Mulch
  - Straw Logs/Fiber Rolls
  - Erosion control blankets

Slope Roughening

- Uses heavy equipment to create ridges or furrows perpendicular to slope (tractor and disk or tracks of a dozer)
- At least 2 inches high
- Spacing equal to approximately 2 times the height
- Can be used on slopes steeper than 3H:1V and greater than 5 feet high

Silt Fence on Slopes

- Must be anchored at least 6 inches into the ground
- Post spacing 4'-8'
- Usually backed by wire fence
- Used for sheet flows
- Effective on flat slopes (<10%)
- Ineffective on steep slopes
- Can be effective at the toe of steep slopes

Slope Roughening



Mulch

- Mulch is a mixture of fibers, stabilizing emulsion and tackifiers. Can include temporary or permanent seed mixture.
- Slopes should be roughened before application
- On slopes, typically sprayed onto ground
- Should be reapplied after significant rain events and additional construction disturbance

Hydroseeding & Outlet Protection



Fiber Rolls on Slope



Straw Logs/Fiber Rolls

- Straw logs or wattles are straw wrapped with a biodegradable, photodegradable or burlap netting
- Fiber roll is erosion control material prefabricated in a tubular roll.
- Used on slopes to shorten slope length

Erosion Control Blankets/Mats

- Probably most effective measure on slopes
- Many different types and manufacturers – plastics, jute, coconut
- Usually part of permanent erosion control, rather than temporary
- Usually seed underneath and have enough open spaces to allow plants to grow through – improves erosion control and roots anchor mat

Erosion Control Blankets/Mats

- Usually biodegradable, but time period varies
- Must be anchored at the top of the slope
- Must be extended to the toe of the slope

Erosion Control Blankets



Erosion Control Blankets



Erosion Control Blankets



BMPs for Channels and Drainages

- Options include:
  - Silt fence
  - Erosion control blankets
  - Check dams/gravel berms
  - Straw bales
  - Vegetated buffers

Silt Fence and Vegetated Buffer



Silt Fence

- Can be effective when placed adjacent to channel or drainage
- Very ineffective when placed across channel or drainage (not permeable)

Silt Fence



Silt Fence



Erosion Control Blankets

- Can be used in the bottom of the channel as well as along the slopes
- Must be well anchored throughout the length
- Type is a function of slope, volume of water and velocity
- Manufacturers provide good recommendations for appropriate selection

Silt Fence



Straw Logs/Erosion Blankets



Straw Logs/Erosion Blankets



Straw Logs/Erosion Blankets



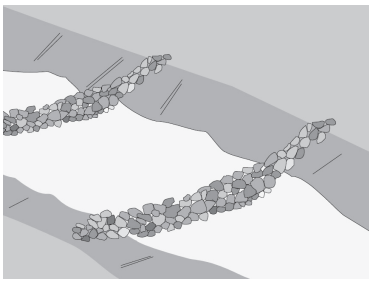
Straw Logs/Erosion Blankets



Check Dams/Gravel Berms

- Constructed of gravel, sand bags or fiber rolls
- Generally only in small channels (drainage areas < 10 acres)
- Can be used in steep channels
- Not used in live streams
- Use clean gravel
- Low spot needs to be in center of dam

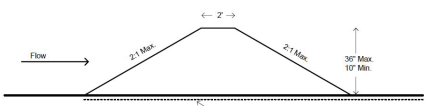
Gravel Berm



Gravel Berm



Gravel Berm



Straw Logs



Straw Logs



Straw Bale Barriers



Note location of low spot

Straw Bale Barriers

- Straw bales can be staked down to create a sediment barrier.
- Bales should be at least 18 inches high and set at least 4 inches below grade
- Must have the low spot over the straw bales, not around the edge

BMPs around Inlets

- Options include:
  - Silt fence
  - Straw bales
  - Straw logs
  - Inlet inserts

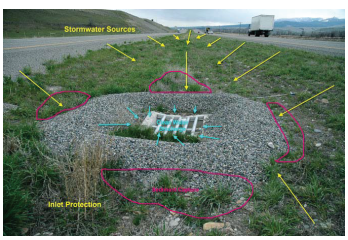
BMPs around Inlets

- Silt fence, straw bales and straw logs can be effective. However, essentially no water goes through any of these BMPs
- Gravel berm can be more effective – water can go through

Curb Inlet Filter



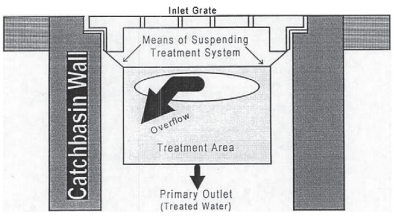
Gravel Berm around Inlet



Inlet Inserts

- Wide variety of manufacturers make many different types of inserts
- Require frequent maintenance
- Typically expensive for construction sites, but may be necessary depending on regulatory environment and quality of receiving water

Inlet Inserts



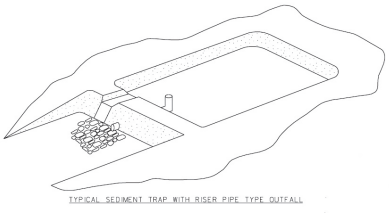
BMPs for General Site Conditions

- Options include:
  - Sediment traps
  - Gravel entrances
  - Truck Washing

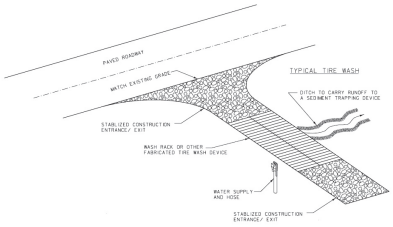
Inlet Protection



Sediment Trap



Gravel Entrance/Truck Washing



BMP Failures

- Failures are usually a result of one of three possibilities:
  - Inappropriate selection of BMP
  - Poor installation or maintenance of BMP
  - Extreme rainfall event

Gravel Entrance



Silt Fence around Inlet



Silt Fence in Channel



Silt Fence



Fiber Rolls around Inlet



Straw Logs - Wrapped



Sediment Tracking–Lack of BMPs



Normal Condition



Lack of BMPs



Extreme Event



THANK YOU FOR ATTENDING!

American Society of Civil Engineers

A New Approach to Applications of Sediment Transportation

Date: *December 20, 2016* ***Time:*** *2:15 pm to 3:15 pm*

BEND UTILITY DEPARTMENT

PLEASE SIGN IN

	Name (Please Initial)	Affiliation	Notes/Comments
1	Corey Charon (cc)	The Green Consultant	
2	David Buchanan	City of Bend	
3	Dustin Revel	Ashley & Vance Engineering	
4	Kristin Georgeton KG	LANDSCAPE ARCHITECT	
5	Matt Williams	C.A. Rowels Engineering	
6	Terry Angle TA	ANGLE CONSULTING ENGINEERING	
7	Wendy Edde	City of Bend	
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A New Approach to Application of Sediment Transport for Jurisdictional Assessment in the Arid Southwest

December 4, 2013

David A. Jaffe, PhD, PE, D.WRE
Project Manager, AECOM

ASCE | KNOWLEDGE & LEARNING

AECOM

Introduction: Semi-arid Southwestern Streams

- Streams in semi-arid Southwestern US are frequently ephemeral or intermittent (>66% in California).
- The high flow events that shape these systems are not typically "ordinary." T_{return} >> 2 yrs.
- Variability in flood magnitudes in dryland streams is much greater, and the discharge of their larger floods tends to be significantly greater than the mean annual flow.



CDFG (2010) Dryland Stream Processes and Forms

AECOM 2

Introduction: Semi-arid Southwestern Streams

- The present study examines four distinctly different approaches to sediment transport analysis and draws attention to their similarities.
- The similarities noted in the literature review are considered in light of ACOE regulatory guidance for jurisdictional determinations in arid southwestern streams.
- How to assess impacts to semi-arid systems is considered in parallel focusing on physical and temporal scale, as well as indicators of water and sediment discharge.



CDFG (2010) Dryland Stream Processes and Forms

AECOM 3

Concepts: Inman and Jenkins (1999)

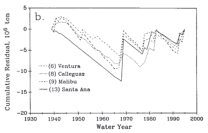
- The authors examined ENSO-scale climate fluctuations and the impact on sediment flux.
- Focus on 20 largest streams from Monterey to Tijuana, including those with dams.
- Stream flow (m^3/yr) and suspended sediment flux (ton/yr) taken from historical USGS records or rating curves.
- Rating curve taken as $Q_s = aQ_w^b$ was used to develop correlation.



AECOM 4

Concepts: Inman and Jenkins (1999)

- Cumulative residuals used to delineate ENSO cycles [$Q_0^n = \sum(Q_n - \bar{Q})$].
- ENSO-related climate fluctuations generally agree with sediment flux trends (e.g. periods of low sediment flux, and dry climate, are shown as decreasing residuals). See 1969.
- Mean sediment flux of rivers during wet periods exceeds that during the dry periods by a factor of about five.



AECOM 5

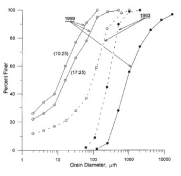
Takeaway: Inman and Jenkins (1999)

- During dry climates, valley fill exceeds stream cutting. During wet climates, stream cutting exceeds valley fill. In the long term, valley fill and stream cutting balance (excluding other factors).
- Larger events or periods of events yield more sediment than smaller periods or events by a factor of five and 27, respectively.

AECOM 7

Concepts: Inman and Jenkins (1999)

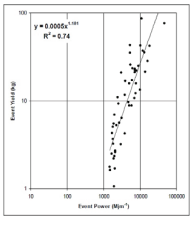
- Suspended sediment flux caused by the three largest wet period events is 27 times greater than during the preceding dry period.
- Suspended sediment flux in 1969 is 25 times greater compared to the entire proceeding dry period combined.
- Flux during first ENSO-related events has finer particles than later in the period since fines scoured during earlier events leave a higher percentage of coarse material in the bed.



AECOM 6

Concepts: Sear (2002)

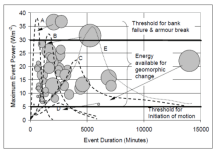
- The author studied how duration and magnitude of events in streams alter bedload transport.
- Examined measured transport over 4 years, 75 events, largest being T_R=50 yrs.
- Bedload dominated by range CS (~70 mm) to MG (~16 mm).
- Author compared power above bedload threshold to transport. Variation appears to be a function of bank erosion or limitation of upstream sediment supply.



AECOM 8

Concepts: Sear (2002)

- Historically assumed that events with high Q and long T were the most geomorphologically active.
- High Q events are effective sediment transporters since they can break up armor layers and entrain deep sediment.
- Long T events are effective sediment transporters because of the continuity between up- and down-stream sediment sources.



AECOM

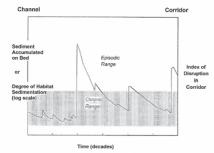
Takeaway: Sear (2002)

- The dominance of discrete upstream sources of bedload is more closely associated with the duration of event above the threshold for transport than event magnitude.
- The magnitude of the event is still significant, because it determines not only the power available to initiate transport, but also conditions duration, hence access to vertically segregated sediment sources.

AECOM

Concepts: Hecht (1993)

- Episodic change is a hallmark of semi-arid riparian systems.
- Disturbance intervals on the order of the maturation of riparian woodland.
- Reset events will experience velocities that exceed root ball strength.
- Following-event debris is stored in channel; some debris is reduced by subsequent flows. Event-generated sediment passes through system O(2-5) years.



AECOM

Concepts & Takeaway: Hecht (1993)

- Reset events cause less-than-complete disruption to local geomorphology and habitat.
- Post-event increases in sediment transport help to accelerate habitat reestablishment, particularly in riparian systems.
- Larger events may fundamentally alter system. Channel widening and location shifts may occur.

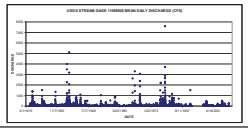


Aerial photography of Santa Clara River bed changes resulting from the January, 2005 event.

AECOM

Concepts: Jaffe (2009)

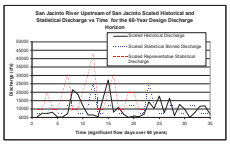
- There is significant lack of historic flow data in semi-arid southwestern streams. Many design standards require analysis of long-term bed changes.
- Some standards discuss statistical procedures to represent long-term trends (i.e., ACOE TD-13, FEMA REHA).
- It is unclear if statistically-generated, long-term hydrographs will produce a bed response similar to that produced using historic data in one-dimensional sediment transport models.



AECOM

Concepts: Jaffe (2009)

- Three types of data were considered: historical derived data, representative statistical data, and purely probabilistic data.
- The latter represents a different statistical distribution.

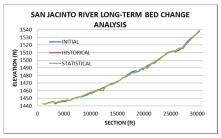


Lower Class Limit	Value	# Members	Lower Class Q	% Events per 60 years (neglect years with no data)	% Events per 60 years
A	0.00	300	5000	0.01	499.75
B	0.75	27	5000	0.53	19.76
C	4.00	14	10000	0.22	10.37
D	4.50	5	20000	0.04	2.00
E	4.75	0	50000	0.00	0.00
F	5.00	0	100000	0.00	0.00

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Concepts: Jaffe (2009)

- Total water volume discharged during extended periods is the controlling factor with respect to bedload transport.
- A series of flashy events with high hydrograph peaks and short duration resulted in less long-term bed change than longer durations but lower peaks.
- When total hydrograph volume was equal, long-term bed change was equal.



COMPARISON OF RESULTS BY METHOD			
METHOD	AVERAGE BED CHANGE (FT)	VOLUME (CFS*DAY)	AVERAGE Q (CFS)
HISTORICAL	4.0	341769	9959
BINNED	4.0	356000	10171
REPRESENTATIVE	**4.5**	366594	**16663**

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Takeaway: Jaffe (2009)

- Results suggest that reset is observable in long-term model output for aggrading systems, and that reset is a function of the intermittent nature of semi-arid southwest hydrology – no bedload transport for low discharge events.
- Results suggest that reset is a function of total runoff volume and average discharge, not peak discharge, in aggrading systems.
- Results suggest that statistical modeling is an acceptable technique in aggrading systems in the absence of historical data if the volumes and average discharges are appropriately estimated.

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Guidance: ACOE (2008)

- OHWM (33CFR328.3) is a defining element for the later limits of non-wetland waters.
- Similarities between the bankfull zone of perennial channels and low-flow features of E/I channels.
- Low-flow zone of E/I is transitory during moderate (5-10 yr) events, and low-flow features are dynamic.
- Moderate events are capable of carrying the largest proportion of sediment over time, making them dominant or effective discharges.



ACOE (2008) ERDC/CRREL TR-08-12

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Guidance: ACOE (2008)

- OHW zone in E/I channel in Arid West is the active floodplain.
- The active floodplain functions in the same manner as a bankfull channel in perennial systems.
- Effective discharges in arid channels align well with the boundary of an active floodplain.
- Because of systemic dynamism changes in equilibrium can result in problematic or complex boundaries.



ACOE (2008) ERDC/CRREL TR-08-12

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Implications

- Arid systems with long reset intervals will have greater jurisdictional areas than similar systems with short reset intervals.
- As arid systems tend toward perennial behavior, the jurisdictional area should approach that defined by the Channel Forming Discharge.
- The reset event is expected to occur at intervals greater than the initiation of significant sediment transport.
- The variability in reset event intervals as a function of watershed or stream size is presently not well understood.



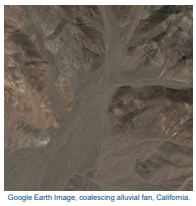
CDFG (2010) Dryland Stream Processes and Forms

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Implications Takeaway

- Jurisdiction should strongly correlate with the initiation of significant bedload transport.



Google Earth Image, coalescing alluvial fan, California.

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The Need for Jurisdictional & Related Assessments

- Why do we need to assess?
- What are we trying to assess?
- What tools do we have to assess?



Google Earth Image, Borrego Canyon Wash, CA

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Sediment Transport & Assessment

- How can we assess effects to these systems over the different spatial, temporal and DISCHARGE scales?
- To address this question several concepts should be stressed about assessment in E/I streams:
  - Need to assess a wider spatial scale than in perennial streams;
  - Need to monitor and assess over longer time periods;
  - Need to consider indicators of flow and sediment;
  - Need to consider a range of discharges.
- One of the big challenges with semi-arid systems is that once the system is out of equilibrium (e.g., sediment deficit) relatively modest increases in runoff can have dramatic effects.

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Assessment Challenges and Considerations (SCCWRP 2013)

- E/I streams are highly variable systems over space and time (episodic).
- Difficult to discern anthropogenic impacts from patterns of natural disturbance.
- Subtle field indicators.
- "Biological" assessment tools and indicators may not be appropriate proxies.



SCCWRP (2013) Improving Assessment Tools for California's Episodic Streams

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Metric Development Model (SCCWRP 2013)

- One possibility is to follow the CRAM model.
- There are metrics where existing CRAM metrics are appropriate (i.e., hydromod assessment) (green).
- There are situations where CRAM metrics can be used, but modification is needed (yellow).
- There are situations where conceptual foundation of metric does not apply to episodic channels and a new metric needs to be developed (i.e., channel stability).



SCCWRP (2013) CRAM-based assessment matrix example.

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Considerations for Assessment Metric Development (SCCWRP 2013)

- Conducting baseline evaluations on ranges of values for key indicators of interest (field) should consider overall planform structure vs. floodplain/in-channel features.
- Identify the semi-stable field indicators or macro-structures, which are less variable over time.
- Identify indicators of repeating patterns of flow or sediment movement, and their prevalence across active floodplain.
- Focus on features that provide a basis of habitat formation to enforce a diversity of substrate types and physical features.
- Assessment metric development is the next step for several utilities.

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- SCCWRP (2013) Improving Assessment Tools for California's Episodic Streams, Solek & Stein. California Aquatic Bio-assessment Workgroup, October.
- Sear (2002) Bedload transport rates and the stream hydrograph: results from a new type of load cell bedload trap. Erosion and Sediment Transport Measures in Rivers: Technological and Methodological Advances, Proc. Oslo Workshop, June, IAHS 283.2003.

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Thank you.

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Appendix F

Post-Construction Stormwater Management in New and Redevelopment

Inspection and Maintenance Checklist

Catch Basin Inserts

Facility ID: _____ Date of Inspection: _____ Type of Inspection: □Routine □Re-Inspection[1]

Inspector(s): _____ Maintenance Rating: _____[2]

Question	Yes	No	NA	Comments
1. Is the facility accessible for inspection? Yes, if the inspector is able to do a visual inspection.				
2. Is the facility free of damage? Yes, if there is no structural damage from post installation activities that would hinder the facility's performance (holes/tears in fabric, broken metal frame, missing components, etc.).				
3. Is the facility free of significant trash and debris accumulation? Yes, if the facility is less than 50% full of trash or debris (green waste, weeds, etc.).				
4. Is the facility free of excessive sediment? Yes, if the facility is less than 50% full of sediment. Note that if sediment is clogging the fabric and is preventing adequate drainage, it is appropriate to check No and include a note.				
5. Is the facility free of other visual pollutants? Yes, if there are no signs of non-sediment pollutants like oil, grease, fertilizers, pesticides, etc.				
6. Is the facility free of unpleasant odors? Yes, if there are no foul smelling odors.				

Inspection and Maintenance Checklist

7. Is the facility free of standing water? Yes, if the BMP is free of standing water.				
8. Is the irrigation system working correctly?			X	
9. Is the facility free of erosion/scouring?			X	
10. Is the facility well vegetated?			X	
11. Is the facility free of excessive vegetation?			X	
12. Is the “rip-rap” associated with the facility in adequate condition?			X	
13. Are the facility inlets/outlets free of obstructions? Yes, if the inlets and outlets are free of objects that could prevent flow in or out of the facility.				
14. Is the filter media in an acceptable condition? Yes, if oil absorbent material is present and still in functioning condition.				

[1] Re-inspection of a previously-noted maintenance issue

[2] Refer to Stormwater Facility Maintenance Rating Criteria Attachment

Inspection and Maintenance Checklist

Conveyance System

Facility ID:_____ Date of Inspection:_____ Type of Inspection: □Routine □Re-Inspection[1]

Inspector(s): _____ Maintenance Rating:_____[2]

Question	Yes	No	NA	Comments
1. Is the facility accessible for inspection? Yes, if the inspector is able to do a visual inspection.				
2. Is the facility free of damage? Yes, if there is no structural damage from post installation activities that would hinder the conveyance of water.				
3. Is the facility free of significant trash and debris accumulation? Yes, if the facility contains no trash or debris.				
4. Is the facility free of excessive sediment? Yes, if sediment on the bottom of the conveyance system is not altering the flow of water or higher than 20% of the design depth.				
5. Is the facility free of other visual pollutants? Yes, if there are no signs of non-sediment pollutants like oil, grease, fertilizers, pesticides, etc.				
6. Is the facility free of unpleasant odors? Yes, if there are no foul smelling odors.				

Inspection and Maintenance Checklist

7. Is the facility free of standing water? Yes, if the BMP is free of standing water.				
8. Is the irrigation system working correctly?			X	
9. Is the facility free of erosion/scouring?			X	
10. Is the facility well vegetated?			X	
11. Is the facility free of excessive vegetation? Yes, if no vegetation is observed growing through the conveyance system.				
12. Is the “rip-rap” associated with the facility in adequate condition?			X	
13. Are the facility inlets/outlets free of obstructions? Yes, if the inlets and outlets are free of objects that could prevent flow in or out of the facility.				
14. Is the filter media in an acceptable condition?			X	

[1] Re-inspection of a previously-noted maintenance issue

[2] Refer to Stormwater Facility Maintenance Rating Criteria Attachment

Inspection and Maintenance Checklist

Drywell

Facility ID:_____ Date of Inspection:_____ Type of Inspection: □Routine □Re-Inspection[1]

Inspector(s): _____ Maintenance Rating:_____[2]

Question	Yes	No	NA	Comments
1. Is the facility accessible for inspection? Yes, if the inspector is able to do a visual inspection.				
2. Is the facility free of damage? Yes, if there is no structural damage from post installation activities that would hinder the facilities performance (e.g., holes/tears in filter fabric, warped or broken inlet).				
3. Is the facility free of significant trash and debris accumulation? Yes, if there is less than 2 feet of accumulated debris, sediment, and trash.				
4. Is the facility free of excessive sediment? Yes, if there is less than 2 feet of accumulated debris, sediment, and trash.				
5. Is the facility free of other visual pollutants? Yes, if there are no signs of non-sediment pollutants like oil, grease, fertilizers, pesticides, etc.				
6. Is the facility free of unpleasant odors? Yes, if there are no foul smelling odors.				
7. Is the facility free of standing water?				

Inspection and Maintenance Checklist

Yes, if the facility is free of standing water at least 72 hours after a rain event.				
8. Is the irrigation system working correctly?			X	
9. Is the facility free of erosion/scouring?			X	
10. Is the facility well vegetated?			X	
11. Is the facility free of excessive vegetation? Yes, if no vegetation is observed growing in the facility.				
12. Is the “rip-rap” associated with the facility in adequate condition?			X	
13. Are the facility inlets/outlets free of obstructions? Yes, if the inlets are free of objects that could prevent flow in to the facility.				
14. Is the filter media in an acceptable condition?			X	

[1] Re-inspection of a previously-noted maintenance issue

[2] Refer to Stormwater Facility Maintenance Rating Criteria Attachment

Inspection and Maintenance Checklist

Vegetated Filter Strip

Facility ID:_____ Date of Inspection:_____ Type of Inspection: □Routine □Re-Inspection[1]

Inspector(s): _____ Maintenance Rating:_____[2]

Question	Yes	No	NA	Comments
1. Is the facility accessible for inspection? Yes, if the inspector is able to do a visual inspection.				
2. Is the facility free of damage? Yes, if there is no structural damage from post installation activities that would hinder the facility's performance (e.g., rodent holes, trampling).				
3. Is the facility free of significant trash and debris accumulation? Yes, if the facility does not contain significant amounts of trash or debris.				
4. Is the facility free of excessive sediment? Yes, if sediment depth does not exceed 2 inches or more than 10% of the vegetated area, or if sediment in any area is not above the height of the vegetation.				
5. Is the facility free of other visual pollutants? Yes, if there are no signs of non-sediment pollutants like oil, grease, fertilizers, pesticides, etc.				
6. Is the facility free of unpleasant odors? Yes, if there are no foul smelling odors.				

Inspection and Maintenance Checklist

7. Is the facility free of standing water? Yes, if the BMP is free of standing water.				
8. Is the irrigation system working correctly? Yes, if the sprinklers are in good condition (i.e. not broken), and there are no signs of over-watering, and the vegetation is healthy.				
9. Is the facility free of erosion/scouring? Yes, if the facility is free of eroded or scoured areas due to high flows, wind, or flow channelization.				
10. Is the facility well vegetated? Yes, if vegetated cover does not contain sparse, bare, or eroded patches in significant areas of the facility. Yes, if vegetation is sparse, but is installed per plans.				
11. Is the facility free of excessive vegetation? Yes, if planted vegetation is not excessively tall, and there are no nuisance weeds present that appear to be overgrowing planted vegetation.				
12. Is the “rip-rap” associated with the facility in adequate condition? Yes, if the rip-rap is present, functional, and not full of sediment.				
13. Are the facility inlets/outlets free of obstructions? Yes, if flow is spread evenly over the entire filter strip width.				
14. Is the filter media in an acceptable condition?			X	

[1] Re-inspection of a previously-noted maintenance issue

[2] Refer to Stormwater Facility Maintenance Rating Criteria Attachment

Inspection and Maintenance Checklist

Additional Inspection Notes: When assessing a vegetated filter strip, it is important to see if water will flow in an evenly spread manner over the entire width of the facility. This will allow for a slow and continuous infiltration rate. If the filter strip is observed to have poorly graded areas that cause water to runoff the facility at a high velocity or become ponded, this is most likely a design or installation deficiency. Include a note about the problem that is observed in the Facility Notes and mark it as ineffective. If grading issues observed appear to be something that can easily be fixed, this still may be considered a maintenance issue. If vegetation is lacking, but still appears to effectively treat runoff, then it may be marked as lacking vegetation and given a lower maintenance rating.

Inspection and Maintenance Checklist

Vegetated Swale (Non-Infiltration)

Facility ID:_____ Date of Inspection:_____ Type of Inspection: □Routine □Re-Inspection[1]

Inspector(s): _____ Maintenance Rating:_____[2]

Question	Yes	No	NA	Comments
1. Is the facility accessible for inspection? Yes, if the inspector is able to do a visual inspection.				
2. Is the facility free of damage? Yes, if there is no structural damage from post installation activities that would hinder the facility's performance (e.g., rodent holes, trampling).				
3. Is the facility free of significant trash and debris accumulation? Yes, if the facility does not contain significant amounts of trash or debris.				
4. Is the facility free of excessive sediment? Yes, if sediment depth does not exceed 2 inches or more than 10% of the vegetated area, or if sediment in any area is not above the height of the vegetation.				
5. Is the facility free of other visual pollutants? Yes, if there are no signs of non-sediment pollutants like oil, grease, fertilizers, pesticides, etc.				
6. Is the facility free of unpleasant odors? Yes, if there are no foul smelling odors.				

Inspection and Maintenance Checklist

7. Is the facility free of standing water? Yes, if the BMP is free of standing water.				
8. Is the irrigation system working correctly? Yes, if the sprinklers are in good condition (i.e. not broken), and there are no signs of over-watering, and the vegetation is healthy.				
9. Is the facility free of erosion/scouring? Yes, if the facility is free of eroded or scoured areas due to high flows, wind, or flow channelization.				
10. Is the facility well vegetated? Yes, if vegetated cover does not contain sparse, bare, or eroded patches in significant areas of the facility. Yes, if vegetation is sparse, but is installed per plans.				
11. Is the facility free of excessive vegetation? Yes, if planted vegetation is not excessively tall, and there are no nuisance weeds present that appear to be overgrowing planted vegetation.				
12. Is the “rip-rap” associated with the facility in adequate condition? Yes, if the rip-rap is present, functional, and not full of sediment.				
13. Are the facility inlets/outlets free of obstructions? Yes, if the inlets and outlets are free of objects that could prevent flow in or out of the facility, excluding energy dissipation devices located at the inlet/outlet.				
14. Is the filter media in an acceptable condition?			X	

[1] Re-inspection of a previously-noted maintenance issue

[2] Refer to Stormwater Facility Maintenance Rating Criteria Attachment

Inspection and Maintenance Checklist

Additional Inspection Notes: When assessing a vegetated swale, it is important to see if the swale will conduct flow in a functional manner which will allow for a slow and continuous conveyance of water before discharge. If the swale is observed to have poorly graded areas that cause water to runoff the facility at a high velocity or become ponded, this is most likely a design or installation deficiency. Include a note about the problem that is observed in the Facility Notes and mark it as ineffective. If grading issues observed appear to be something that can easily be fixed, this still may be considered a maintenance issue. If vegetation is lacking, but still appears to effectively treat runoff, then it may be marked as lacking vegetation and given a lower maintenance rating.

Inspection and Maintenance Checklist

Green Roof

Facility ID:_____ Date of Inspection:_____ Type of Inspection: □Routine □Re-Inspection[1]

Inspector(s): _____ Maintenance Rating:_____[2]

Question	Yes	No	NA	Comments
1. Is the facility accessible for inspection? Yes, if the inspector is able to do a visual inspection.				
2. Is the facility free of damage? Yes, if there is no structural damage from post installation activities that would hinder the facility's performance (e.g., rodent holes, trampling).				
3. Is the facility free of significant trash and debris accumulation? Yes, if the facility does not contain significant amounts of trash or debris.				
4. Is the facility free of excessive sediment? Yes, if there are no signs of excessive sediment added to the facility.				
5. Is the facility free of other visual pollutants? Yes, if there are no signs of non-sediment pollutants like oil, grease, fertilizers, pesticides, etc.				
6. Is the facility free of unpleasant odors? Yes, if there are no foul smelling odors.				

Inspection and Maintenance Checklist

7. Is the facility free of standing water? Yes, if the BMP is free of standing water.				
8. Is the irrigation system working correctly? Yes, if the sprinklers are in good condition (i.e. not broken), and there are no signs of over-watering, and the vegetation is healthy.				
9. Is the facility free of erosion/scouring? Yes, if the facility is free of eroded or scoured areas due to high flows, wind, or flow channelization.				
10. Is the facility well vegetated? Yes, if vegetation covers over 90% of facility and does not contain sparse, bare, or eroded patches.				
11. Is the facility free of excessive vegetation? Yes, if planted vegetation is not excessively tall, and nuisance weeds cover no more than 20% of the facility.				
12. Is the “rip-rap” associated with the facility in adequate condition?			X	
13. Are the facility inlets/outlets free of obstructions? Yes, if flow is spread evenly over the entire surface of the green roof.				
14. Is the filter media in an acceptable condition?			X	

[1] Re-inspection of a previously-noted maintenance issue

[2] Refer to Stormwater Facility Maintenance Rating Criteria Attachment

Inspection and Maintenance Checklist

Bio-Infiltration Swale/Bio-Infiltration Basin

Facility ID: _____ Date of Inspection: _____ Type of Inspection: □Routine □Re-Inspection[1]

Inspector(s): _____ Maintenance Rating: _____[2]

Question	Yes	No	NA	Comments
1. Is the facility accessible for inspection? Yes, if the inspector is able to do a visual inspection.				
2. Is the facility free of damage? Yes, if there is no structural damage from post installation activities that would hinder the facility's performance (e.g., rodent holes, trampling).				
3. Is the facility free of significant trash and debris accumulation? Yes, if the facility does not contain significant amounts of trash or debris.				
4. Is the facility free of excessive sediment? Yes, if sediment depth does not exceed 2 inches or more than 10% of the vegetated area, or if sediment in any area is not above the height of the vegetation.				
5. Is the facility free of other visual pollutants? Yes, if there are no signs of non-sediment pollutants like oil, grease, fertilizers, pesticides, etc.				

Inspection and Maintenance Checklist

6. Is the facility free of unpleasant odors? Yes, if there are no foul smelling odors.				
7. Is the facility free of standing water? Yes, if the facility is free of standing water at least 72 hours after a rain event.				
8. Is the irrigation system working correctly? Yes, if the sprinklers are in good condition (i.e. not broken), and there are no signs of over-watering, and the vegetation is healthy.				
9. Is the facility free of erosion/scouring? Yes, if the facility is free of eroded or scoured areas due to high flows, wind, or flow channelization.				
10. Is the facility well vegetated? Yes, if vegetated cover does not contain sparse, bare, or eroded patches in significant areas of the facility. Yes, if vegetation is sparse, but is installed per plans.				
11. Is the facility free of excessive vegetation? Yes, if planted vegetation is not excessively tall, and there are no nuisance weeds present that appear to be overgrowing planted vegetation.				
12. Is the “rip-rap” associated with the facility in adequate condition? Yes, if the rip-rap is present, functional, and not full of sediment.				
13. Are the facility inlets/outlets free of obstructions? Yes, if the inlets/outlets/bypass are free of objects, sediment build up, or excessive vegetation, which could prevent flow in or out of the facility, excluding energy dissipation devices located at the inlet/outlet. Yes, if f runoff sheet flows evenly into the facility.				

Inspection and Maintenance Checklist

14. Is the filter media in an acceptable condition?			X	

[1] Re-inspection of a previously-noted maintenance issue

[2] Refer to Stormwater Facility Maintenance Rating Criteria Attachment

Inspection and Maintenance Checklist

Infiltration Trench

Facility ID: _____ Date of Inspection: _____ Type of Inspection: □Routine □Re-Inspection[1]

Inspector(s): _____ Maintenance Rating: _____[2]

Question	Yes	No	NA	Comments
1. Is the facility accessible for inspection? Yes, if the inspector is able to do a visual inspection.				
2. Is the facility free of damage? Yes, if there is no structural damage from post installation activities that would hinder the facility's performance (low gravel, eroding sidewalls, etc.).				
3. Is the facility free of significant trash and debris accumulation? Yes, if the facility does not contain significant amounts of trash or debris (green waste, weeds, rocks, etc.).				
4. Is the facility free of excessive sediment? Yes, if sediment depth does not exceed 2 inches or more than 10% of the surface treatment area.				
5. Is the facility free of other visual pollutants? Yes, if there are no signs of non-sediment pollutants like oil, grease, fertilizers, pesticides, etc.				
6. Is the facility free of unpleasant odors? Yes, if there are no foul smelling odors.				

Inspection and Maintenance Checklist

7. Is the facility free of standing water? Yes, if the facility is free of standing water at least 72 hours after a rain event.				
8. Is the irrigation system working correctly?			X	
9. Is the facility free of erosion/scouring? Yes, if the facility is free of eroded or scoured areas due to high flows, wind, or flow channelization.				
10. Is the facility well vegetated?			X	
11. Is the facility free of excessive vegetation? Yes, if vegetation does not cover 10% of the surface or more.				
12. Is the “rip-rap” associated with the facility in adequate condition?				
13. Are the facility inlets/outlets free of obstructions? Yes, if the inlets and outlets are free of objects that could prevent flow in or out of the facility.				
14. Is the filter media in an acceptable condition?			X	

[1] Re-inspection of a previously-noted maintenance issue

[2] Refer to Stormwater Facility Maintenance Rating Criteria Attachment

Inspection and Maintenance Checklist

Media Filter (e.g., Stormfilter)

Facility ID: _____ Date of Inspection: _____ Type of Inspection: □Routine □Re-Inspection[1]

Inspector(s): _____ Maintenance Rating: _____[2]

Question	Yes	No	NA	Comments
1. Is the facility accessible for inspection? Yes, if the inspector is able to do a visual inspection.				
2. Is the facility free of damage? Yes, if there is no structural damage from post installation activities that would hinder the facility's performance (broken filters, warped or broken inlet, damaged forebay, etc.).				
3. Is the facility free of significant trash and debris accumulation? Yes, if the trash, debris, and sediment levels are below 6" in the forebay, below 0.25" on top of the cartridges, below 4" at the bottom of the vault, or below the manufacturer's recommended maintenance levels.				
4. Is the facility free of excessive sediment? Yes, if the trash, debris, and sediment levels are below 6" in the forebay, below 0.25" on top of the cartridges, below 4" at the bottom of the vault, or below the manufacturer's recommended maintenance levels.				
5. Is the facility free of other visual pollutants? Yes, if there are no signs of non-sediment pollutants like oil, grease, fertilizers, pesticides, etc.				

Inspection and Maintenance Checklist

6. Is the facility free of unpleasant odors? Yes, if there are no foul smelling odors.				
7. Is the facility free of standing water? Yes, if the facility is free of standing water at least 72 hours after a rain event.				
8. Is the irrigation system working correctly?			X	
9. Is the facility free of erosion/scouring?			X	
10. Is the facility well vegetated?			X	
11. Is the facility free of excessive vegetation?			X	
12. Is the “rip-rap” associated with the facility in adequate condition?			X	
13. Are the facility inlets/outlets free of obstructions? Yes, if the inlets and outlets are free of objects that could prevent flow in or out of the facility.				
14. Is the filter media in an acceptable condition? Yes, if the cartridge media is in functioning condition per maintenance specifications.				

[1] Re-inspection of a previously-noted maintenance issue

[2] Refer to Stormwater Facility Maintenance Rating Criteria Attachment

Inspection and Maintenance Checklist

Oil/Water Separator

Facility ID:_____ Date of Inspection:_____ Type of Inspection: □Routine □Re-Inspection[1]

Inspector(s): _____ Maintenance Rating:_____[2]

Question	Yes	No	NA	Comments
1. Is the facility accessible for inspection? Yes, if the inspector is able to do a visual inspection.				
2. Is the facility free of damage? Yes, if there is no structural damage from post installation activities that would hinder the facility's performance (broken filters, warped or broken inlet, damaged forebay, etc.).				
3. Is the facility free of significant trash and debris accumulation? Yes, if the trash, debris, and sediment levels are below 6 inches at the bottom of the vault, or below the manufacturer's recommended maintenance levels.				
4. Is the facility free of excessive sediment? Yes, if the trash, debris, and sediment levels are below 6 inches at the bottom of the vault, or below the manufacturer's recommended maintenance levels.				
5. Is the facility free of other visual pollutants? Yes, if there is less than 1 inch of oil or grease accumulation at the surface of the water. Yes, if no evidence of fertilizers, pesticides, vector breeding habitat, etc.				
6. Is the facility free of unpleasant odors? Yes, if there are no foul smelling odors.				

Inspection and Maintenance Checklist

7. Is the facility free of standing water?			X	
8. Is the irrigation system working correctly?			X	
9. Is the facility free of erosion/scouring?			X	
10. Is the facility well vegetated?			X	
11. Is the facility free of excessive vegetation?			X	
12. Is the “rip-rap” associated with the facility in adequate condition?			X	
13. Are the facility inlets/outlets free of obstructions? Yes, if the inlets and outlets are free of objects that could prevent flow in or out of the facility.				
14. Is the filter media in an acceptable condition?			X	

[1] Re-inspection of a previously-noted maintenance issue

[2] Refer to Stormwater Facility Maintenance Rating Criteria Attachment

Inspection and Maintenance Checklist

Detention System (Closed/Open)

Facility ID:_____ Date of Inspection:_____ Type of Inspection: □Routine □Re-Inspection[1]

Inspector(s): _____ Maintenance Rating:_____[2]

Question	Yes	No	NA	Comments
1. Is the facility accessible for inspection? Yes, if the inspector is able to do a visual inspection.				
2. Is the facility free of damage? Yes, if there is no structural damage from post installation activities that would hinder the facility's performance (e.g., rodent holes, trampling).				
3. Is the facility free of significant trash and debris accumulation? Yes, if the facility does not contain significant amounts of trash or debris.				
4. Is the facility free of excessive sediment? Yes, if sediment does not exceed 15% total capacity in any given area.				
5. Is the facility free of other visual pollutants? Yes, if there are no signs of non-sediment pollutants like oil, grease, fertilizers, pesticides, etc.				
6. Is the facility free of unpleasant odors? Yes, if there are no foul smelling odors.				

Inspection and Maintenance Checklist

7. Is the facility free of standing water?			X	
8. Is the irrigation system working correctly? Yes, if the sprinklers are in good condition (i.e. not broken), and there are no signs of over-watering, and the vegetation is healthy.				
9. Is the facility free of erosion/scouring? Yes, if the facility is free of eroded or scoured areas due to high flows, wind, or flow channelization.				
10. Is the facility well vegetated? Yes, if vegetated cover does not contain sparse, bare, or eroded patches in significant areas of the facility. Yes, if vegetation is sparse, but is installed per plans.				
11. Is the facility free of excessive vegetation? Yes, if planted vegetation is not excessively tall, and there are no nuisance weeds present that appear to be overgrowing planted vegetation.				
12. Is the “rip-rap” associated with the facility in adequate condition? Yes, if the rip-rap is present, functional, and not full of sediment.				
13. Are the facility inlets/outlets free of obstructions? Yes, if the inlets/outlets/bypass are free of objects, sediment build up, or excessive vegetation, which could prevent flow in or out of the facility, excluding energy dissipation devices located at the inlet/outlet. Yes, if f runoff sheet flows evenly into the facility.				
14. Is the filter media in an acceptable condition?			X	

_____

Inspection and Maintenance Checklist

[1] Re-inspection of a previously-noted maintenance issue

[2] Refer to Stormwater Facility Maintenance Rating Criteria Attachment

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Inspection and Maintenance Checklist

Porous Pavement/Pavers

Facility ID: _____ Date of Inspection: _____ Type of Inspection: □Routine □Re-Inspection[1]

Inspector(s): _____ Maintenance Rating: _____[2]

Question	Yes	No	NA	Comments
1. Is the facility accessible for inspection? Yes, if the inspector is able to do a visual inspection.				
2. Is the facility free of damage? Yes, if there is no structural damage from post installation activities that would hinder the facility's performance (degraded pavement, broken pavers, cracks, etc.).				
3. Is the facility free of significant trash and debris accumulation? Yes, if the facility does not contain significant amounts of trash or debris.				
4. Is the facility free of excessive sediment? Yes, if sediment is not preventing/altering the infiltration of stormwater.				
5. Is the facility free of other visual pollutants? Yes, if there are no signs of non-sediment pollutants like oil, grease, fertilizers, pesticides, etc.				
6. Is the facility free of unpleasant odors? Yes, if there are no foul smelling odors.				

Inspection and Maintenance Checklist

7. Is the facility free of standing water? Yes, if the facility is free of standing water at least 72 hours after a rain event.				
8. Is the irrigation system working correctly?			X	
9. Is the facility free of erosion/scouring?			X	
10. Is the facility well vegetated?			X	
11. Is the facility free of excessive vegetation? Yes, if vegetation does not cover 10% of the surface or more.				
12. Is the “rip-rap” associated with the facility in adequate condition?			X	
13. Are the facility inlets/outlets free of obstructions?			X	
14. Is the filter media in an acceptable condition?			X	

[1] Re-inspection of a previously-noted maintenance issue

[2] Refer to Stormwater Facility Maintenance Rating Criteria Attachment

Inspection and Maintenance Checklist

Sedimentation Manhole

Facility ID: _____ Date of Inspection: _____ Type of Inspection: □ Routine □ Re-Inspection[1]

Inspector(s): _____ Maintenance Rating: _____[2]

Question	Yes	No	NA	Comments
1. Is the facility accessible for inspection? Yes, if the inspector is able to do a visual inspection.				
2. Is the facility free of damage? Yes, if there is no structural damage from post installation activities that would hinder the facility's performance (broken tee/snout, warped or broken inlet, etc.).				
3. Is the facility free of significant trash and debris accumulation? Yes, if the trash, debris, and sediment levels are below 50% of sump depth or one foot below the tee/snout/outlet.				
4. Is the facility free of excessive sediment? Yes, if the trash, debris, and sediment levels are below 50% of sump depth or one foot below the tee/snout/outlet.				
5. Is the facility free of other visual pollutants? Yes, if there are no signs of non-sediment pollutants like oil, grease, fertilizers, pesticides, etc.				
6. Is the facility free of unpleasant odors? Yes, if there are no foul smelling odors.				

Inspection and Maintenance Checklist

7. Is the facility free of standing water?			X	
8. Is the irrigation system working correctly?			X	
9. Is the facility free of erosion/scouring?			X	
10. Is the facility well vegetated?			X	
11. Is the facility free of excessive vegetation?			X	
12. Is the “rip-rap” associated with the facility in adequate condition?			X	
13. Are the facility inlets/outlets free of obstructions? Yes, if the inlets and outlets are free of objects that could prevent flow in or out of the facility.				
14. Is the filter media in an acceptable condition?			X	

[1] Re-inspection of a previously-noted maintenance issue

[2] Refer to Stormwater Facility Maintenance Rating Criteria Attachment

Inspection and Maintenance Checklist

Wet Pond

Facility ID:_____ Date of Inspection:_____ Type of Inspection: □Routine □Re-Inspection[1]

Inspector(s): _____ Maintenance Rating:_____[2]

Question	Yes	No	NA	Comments
1. Is the facility accessible for inspection? Yes, if the inspector is able to do a visual inspection.				
2. Is the facility free of damage? Yes, if there is no structural damage from post installation activities that would hinder the facility's performance.				
3. Is the facility free of significant trash and debris accumulation? Yes, if the facility does not contain significant amounts of trash or debris.				
4. Is the facility free of excessive sediment? Yes, if sediment build up is not affecting the flow of water into the pond or its storage capacity.				
5. Is the facility free of other visual pollutants? Yes, if there are no signs of non-sediment pollutants like oil, grease, fertilizers, pesticides, etc.				
6. Is the facility free of unpleasant odors? Yes, if there are no foul smelling odors.				

Inspection and Maintenance Checklist

7. Is the facility free of standing water?			X	
8. Is the irrigation system working correctly?			X	
9. Is the facility free of erosion/scouring? Yes, if the facility is free of eroded or scoured areas due to high flows, wind, or flow channelization.				
10. Is the facility well vegetated? Yes, if vegetated cover does not contain sparse, bare, or eroded patches along the shoreline.				
11. Is the facility free of excessive vegetation? Yes, if planted vegetation is not excessively tall, and there are no nuisance weeds present that appear to be overgrowing planted vegetation.				
12. Is the “rip-rap” associated with the facility in adequate condition? Yes, if the rip-rap is present, functional, and not full of sediment.				
13. Are the facility inlets/outlets free of obstructions? Yes, if the inlets/outlets/bypass are free of objects, sediment build up, or excessive vegetation, which could prevent flow in or out of the facility, excluding energy dissipation devices located at the inlet/outlet. Yes, if f runoff sheet flows evenly into the facility.				
14. Is the filter media in an acceptable condition?			X	

[1] Re-inspection of a previously-noted maintenance issue

[2] Refer to Stormwater Facility Maintenance Rating Criteria Attachment

Inspection and Maintenance Checklist

Catch Basin

Facility ID: _____ Date of Inspection: _____ Type of Inspection: □Routine □Re-Inspection[1]

Inspector(s): _____ Maintenance Rating: _____[2]

Question	Yes	No	NA	Comments
1. Is the facility accessible for inspection? Yes, if the inspector is able to do a visual inspection.				
2. Is the facility free of damage? Yes, if there is no structural damage from post installation activities that would hinder the facility's performance (broken tee/snout, warped or broken inlet, etc.).				
3. Is the facility free of significant trash and debris accumulation? Yes, if the trash, debris, and sediment levels are below 50% of sump depth or one foot below the tee/snout/outlet.				
4. Is the facility free of excessive sediment? Yes, if the trash, debris, and sediment levels are below 50% of sump depth or one foot below the tee/snout/outlet.				
5. Is the facility free of other visual pollutants? Yes, if there are no signs of non-sediment pollutants like oil, grease, fertilizers, pesticides, etc.				
6. Is the facility free of unpleasant odors? Yes, if there are no foul smelling odors.				

Inspection and Maintenance Checklist

7. Is the facility free of standing water?			X	
8. Is the irrigation system working correctly?			X	
9. Is the facility free of erosion/scouring?			X	
10. Is the facility well vegetated?			X	
11. Is the facility free of excessive vegetation?			X	
12. Is the “rip-rap” associated with the facility in adequate condition?			X	
13. Are the facility inlets/outlets free of obstructions? Yes, if the inlets and outlets are free of objects that could prevent flow in or out of the facility.				
14. Is the filter media in an acceptable condition?			X	

[1] Re-inspection of a previously-noted maintenance issue

[2] Refer to Stormwater Facility Maintenance Rating Criteria Attachment

City of Bend (FY2016-17)
Stormwater Facilities Inspection Tracking Log

Facility ID	Date of Inspection	Type of Inspection	Drainage	Comments	Maintenance Rating Following Inspection	Last Rain Event
DSWL00038	4/21/2017	Routine	Infiltrates (No Overflow)	Marmots creating erosion and adding fecal matter to the infiltration Swale; some bare patches of dirt most likely due to high amounts shade and no watering system; upstream catch basins are impacted with sediments clogging outlet; needs to be serviced.	5	>72hrs ago
DSWL00193	4/21/2017	Routine	Infiltrates (No Overflow)	Small amount of water ponding at the bottom (minor infiltration issue); small amount of leaf litter obstructing inlet into bioretention.	2	>72hrs ago
DSWL00133	4/21/2017	Routine	Infiltrates (No Overflow)	A few pieces of trash; grass landscaping w/ low amount of original landscaping	3	>72hrs ago
DSWL00132	4/21/2017	Routine	Infiltrates (No Overflow)	A few pieces of trash; Bare patch near inlet; grass landscaping w/ low amount of original vegetation; riprap has minor sediment build-up and needs maintenance	3	>72hrs ago
DSWL00131	4/21/2017	Routine	Infiltrates (No Overflow)	Bare patches of dirt; grass landscaping w/ low amount of original vegetation	3	>72hrs ago
DSWL00016	6/8/2017	Routine	Infiltrates (No Overflow)	Majority weed coverage with patches of sagebrush; some erosion; not crucial	3	<72hrs ago
DSWL00017	6/8/2017	Routine	Infiltrates (No Overflow)	Majority weed coverage with patches of sagebrush; no erosion visible	3	<72hrs ago
DSWL00001	6/8/2017	Routine	Infiltrates (No Overflow)	Majority weed coverage with patches of sagebrush; no erosion visible	3	<72hrs ago
DSWL00002	6/8/2017	Routine	Overflow to UIC	Majority weed coverage with little original landscaping; no erosion visible; imagery and details not accurate on BOOM	3	<72hrs ago
DSWL00006	6/8/2017	Routine	Overflow to UIC	Majority weed coverage with little original landscaping; no erosion visible; imagery and details not accurate on BOOM; should be merged with DSWL00002	3	<72hrs ago
DSWL00003	6/8/2017	Routine	Overflow to UIC	Healthy vegetation; minor weed issue; imagery and details not accurate on BOOM; curb inlet near overflow	2	<72hrs ago
DSWL00004	6/8/2017	Routine	Overflow to UIC	Majority weed coverage with little original landscaping; no erosion visible; imagery and details not accurate on BOOM; curb inlet near overflow; overflow not high enough	2	<72hrs ago
DSWL00005	6/8/2017	Routine	Overflow to UIC	Healthy vegetation; minor weed issue; imagery and details not accurate on BOOM; curb inlet near overflow	2	<72hrs ago
DSWL00028	6/12/2017	Routine	Overflow to UIC	Healthy vegetation; imagery and details not accurate on BOOM; curb inlet near overflow; needs to be merged with DSWL00027	2	<72hrs ago

City of Bend (FY2016-17)
Stormwater Facilities Inspection Tracking Log

Facility ID	Date of Inspection	Type of Inspection	Drainage	Comments	Maintenance Rating Following Inspection	Last Rain Event
DSWL00027	6/12/2017	Routine	Overflow to UIC	Healthy vegetation; imagery and details not accurate on BOOM; curb inlet near overflow	2	<72hrs ago
DSWL00010	6/12/2017	Routine	Overflow to UIC	Healthy vegetation; imagery and details not accurate on BOOM; curb inlet near overflow	2	<72hrs ago
DSWL00009	6/9/2017	Routine	Overflow to UIC	Healthy vegetation; minor weed issue; imagery and details not accurate on BOOM; curb inlet near overflow	2	<72hrs ago
DSWL00008	6/9/2017	Routine	Overflow to UIC	Healthy vegetation; minor weed issue; imagery and details not accurate on BOOM; curb inlet near overflow	2	<72hrs ago
DSWL00090	6/13/2017	Routine	Infiltrates (No Overflow)	Sparse original veg with mostly weeds; in stable condition; rip-rap from street sheet flow is in adequate condition; private connection from next door not on plans	3	>72hrs ago
DSWL00147	6/13/2017	Routine	Infiltrates (No Overflow)	Sparse original veg with mostly weeds; in stable condition with minor trash issue; minor sediment deposits in and around inlet pipes; this "swale" should be broken up into 4 different swales or extended to connect all the different separated sections.	4	>72hrs ago
DSWL00158	6/20/2017	Routine	Infiltrates (No Overflow)	Sparse original veg with mostly weeds; bare patches of dirt; rip-rap for curb cut inlets are in adequate condition; minor trash issue; inlet pipe at end of swale is not visible	4	>72hrs ago
DSWL00157	6/20/2017	Routine	Overflow to UIC	Sparse original veg with mostly weeds; some bare patches of dirt; rip-rap for curb cut inlets are in adequate condition; swale depth is too shallow; overflow riser is not at 0.61' height per plan	3	>72hrs ago
DSWL00156	6/20/2017	Routine	Overflow to UIC	Sparse original veg with mostly weeds; some bare patches of dirt; rip-rap for curb cut inlets are in adequate condition; swale depth is too shallow; overflow riser is not at 0.61' height per plan	3	>72hrs ago
DSWL00155	6/20/2017	Routine	Overflow to UIC	Sparse original veg with mostly weeds; some bare patches of dirt; rip-rap for curb cut inlets are in adequate condition; swale depth is too shallow; overflow riser is not at 0.61' height per plan	3	>72hrs ago

WaterWiseTips.org
LANDSCAPE GUIDE

CITY OF BEND













INTRODUCTION









The WaterWise Transformation Starts Here

Nestled at the eastern base of the Cascade Mountains in Central Oregon, Bend is surrounded by a beautiful high desert environment. You don't have to go far to hike Tumalo Falls, mountain bike down a tree studded forest trail, or raft down the Deschutes River. In fact, the abundant outdoor recreation opportunities and diverse natural environments are some of the primary reasons people choose to call Bend home.

What a beautiful place to live!

Local landscapes of trees, shrubs, lawn and perennials often provide some of the same benefits of these other, more natural areas in and around Bend. These areas also provide a breath of fresh air, a space to recreate, and a place to gather with family and friends. And they, too, are dependent upon our most precious natural resource – water.

Water is essential to life. In Central Oregon it arrives as precipitation in the form of rain or mountain snow and makes its way through porous, volcanic earth and into the Deschutes Regional Aquifer. Only occasionally throughout this journey does water reveal itself as a natural spring, creek or river. Ultimately, it is our responsibility to be stewards of this water, regardless of whether you're camping along the shores of a Cascadian lake or preparing to transform your home's landscape into something new or more water conscious.

The Bend WaterWise Landscape Guide was created for this purpose – to help Bend landscape owners understand and implement the keys to a WaterWise landscape. Proper planning, appropriately amending soils, considering the role of stormwater, and understanding irrigation system operation and maintenance are all part of a WaterWise landscape. But water isn't all you save! A WaterWise landscape can also reduce the amount of time you spend mowing, fertilizing, pruning and weeding, not to mention reducing green waste and energy use. Perhaps best of all, a WaterWise Landscape can free you up to explore more of what Central Oregon has to offer.

Transform your home's yard into a WaterWise Landscape!

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Utilize Low Water Plants



PLAN & DESIGN

Planning for the Future

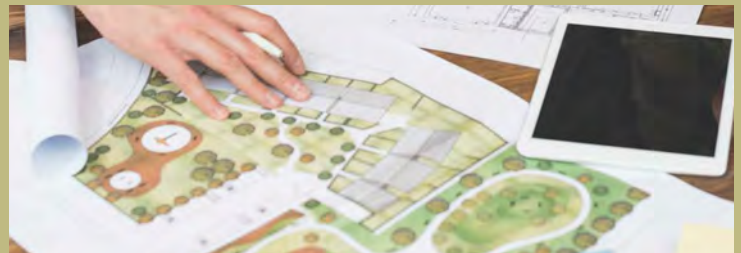
A Bend WaterWise landscape begins with a well thought out plan. Plans can almost always be tailored to meet your needs and budget. While budgets can sometimes limit the scope of a landscape transformation, a good plan will allow the project to be phased in over years, while still yielding wonderful results.

Think long-term. Consider functional uses for the landscape, like outside entertainment, storage, play and gardening. The property also needs to be evaluated for slope, sun exposure, wind, views (desirable and undesirable) and drainage to determine areas that are suitable for the intended landscape. Keep in mind that rain runoff must be kept on site per state and local rules. Working with the natural drainage on your site and choosing permeable materials can reduce potential drainage issues and project costs when considered early in the project. Determine where berms and contours in the landscaping may help retain rainwater and direct it to plants, potentially reducing your irrigation needs.

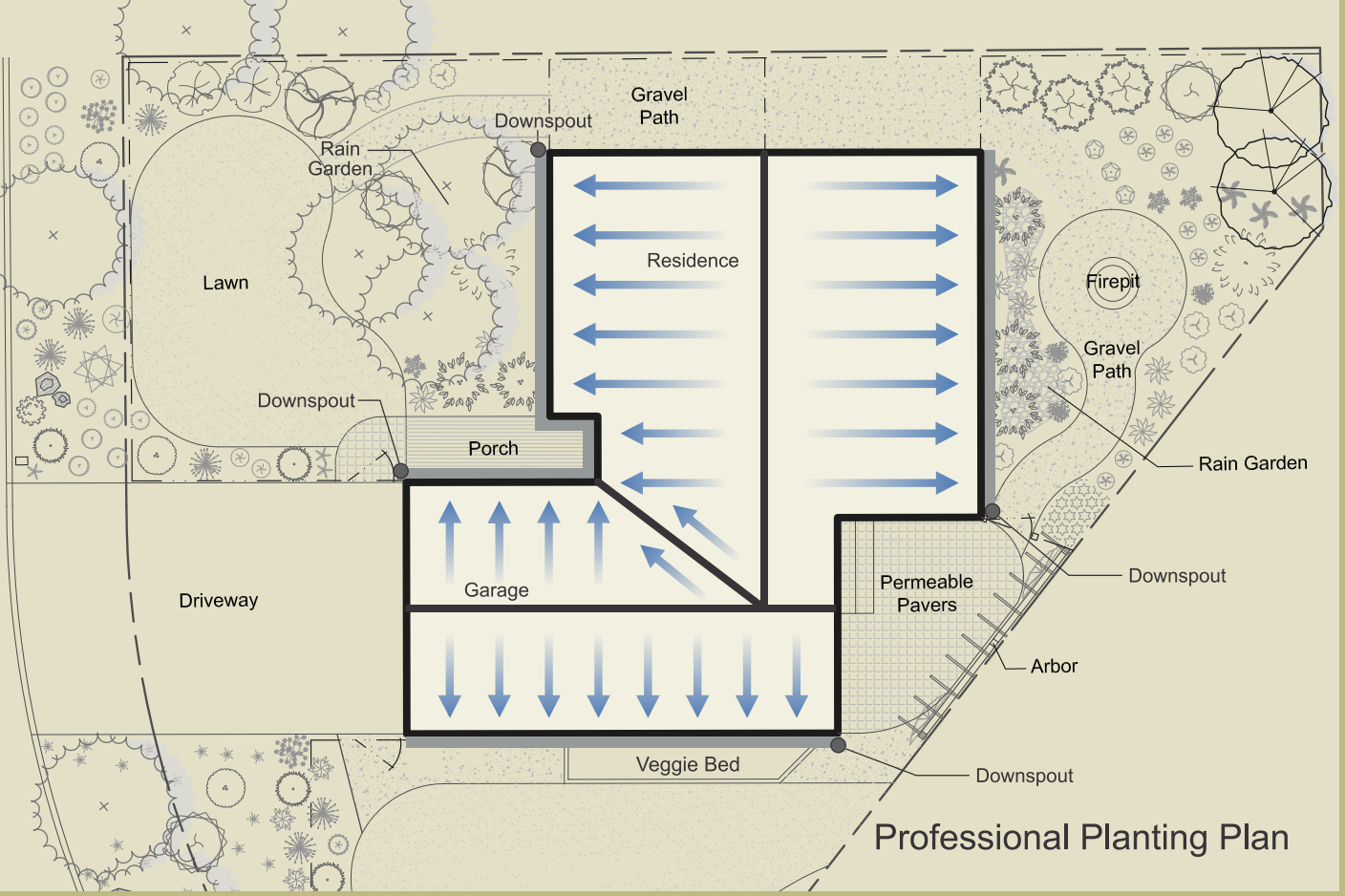
If possible, spend some time observing your property to better understand and appreciate the site's specific attributes and constraints. While you are getting to know your property, think about your lifestyle and how much time you want to spend maintaining your landscape. This is also the time to see if there are any neighborhood or homeowner association landscape requirements that need to be followed.

Consider hiring a professional landscape designer. It may be a wise investment in creating a scaled plan that you or your landscape contractor can work from to make the vision a reality. Professional landscape designers often have a good understanding of what plants work best in our unique environment, where to source materials and what local ordinances the landscape may need to adhere to.

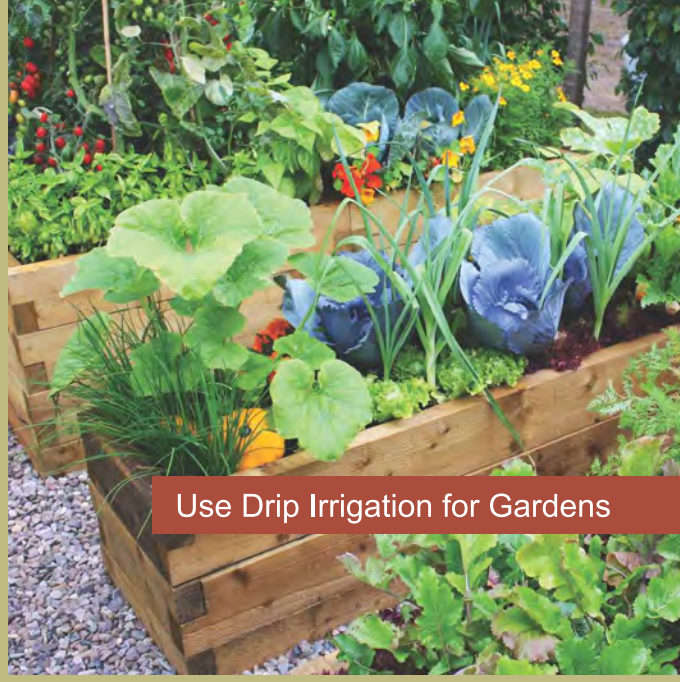








Professional Planting Plan



Use Drip Irrigation for Gardens



Use Efficient Sprinklers

TRANSFORMATION TIPS
PLAN & DESIGN CONSIDERATIONS

- Think about your overall landscape needs and how you will use your landscape
- Consider how much water your landscape will require
- Evaluate the site for drainage, sun exposure and other site specific conditions
- Visit waterwisetips.org for tips on how to choose a contractor



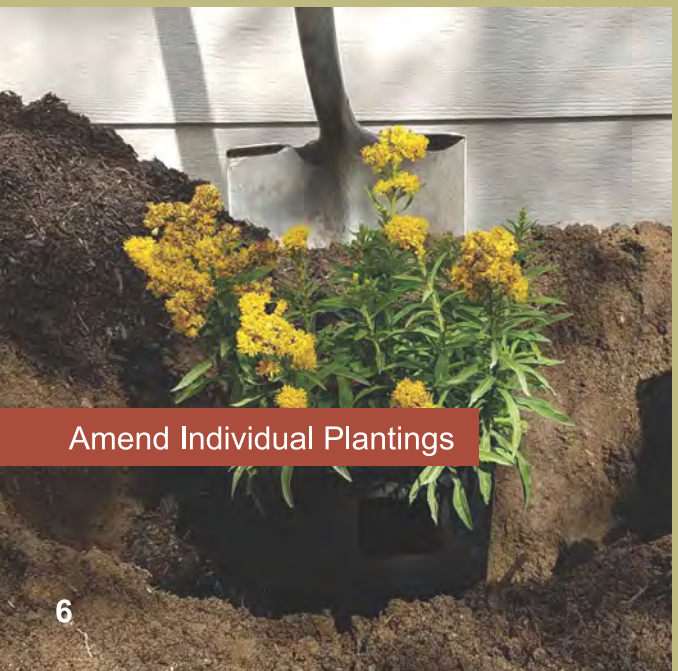
Plan for Seasonal Color



Typical Soil in Bend

Amended Soil

SOIL



Amend Individual Plantings



Soil Probe Test

Soil – A Landscape's Fuel Tank

Soil is a critical component when it comes to the success of a thriving, healthy Bend WaterWise landscape. Most of us take for granted that soil is actually a living and dynamic ecosystem. It holds water and nutrients plants need to flourish. Your soil composition will dictate how often you need to water, as well as how much supplemental nutrients/fertilizers you need to apply to your landscape. Central Oregon soil is primarily comprised of volcanic ash, pumice dust, and very little or no organic material. Our native soils in Bend have a pH of 7.0 or higher.

Think of the soil as the "fuel tank" for your landscape. You can increase the size of the "fuel tank" if you amend the soil with organic material, such as compost, aged manure or mulch. The organic material needs to be thoroughly mixed into the native soil either manually or mechanically with a rototiller. It is highly recommended to amend your soil with organic matter prior to planting both lawns and ornamentals. However, if you're transforming an existing landscape, amending the soil can be accomplished in stages and over a period of time. The best way to incorporate organic material into an existing lawn is to spread a 1/4" to 1/2" layer of compost over the lawn after a thorough aeration. This is often done at the end of a growing season so that the aeration cores and compost have the winter to breakdown and make their way back into the soil.

The application of organic material will not only increase your soil's holding capacity for water and nutrients "fuel tank"; it will start to build a community of soil microbes that are an essential part of soil functions. Soil microbes break down vital nutrients and convert them to forms that are suitable for plant roots to absorb; this can lessen the amount of fertilizer needed in the landscape. The lifespan and overall performance of landscape plants can struggle without these important microbes and available nutrients.

Plants native to Central Oregon are generally happy with our native soils and prefer them to be unaltered. However, native soils disturbed through construction or other activities may have had their ecosystem disturbed to a point where they also need attention. Getting a soil test done and checking for overly compacted soils may help in these situations.

TRANSFORMATION TIPS
FILLING THE SOIL FUEL TANK

- Native plantings rarely require soil amendments and prefer to be undisturbed
- Lawn areas need about 3” of soil amendment tilled to depth of 6” or more
- Existing lawns can benefit from a regular topdress layer of 1/4” to 1/2” soil amendment after a late season aeration
- Amend landscape plants with soil amendment equal to 1/3 the size of the planting hole



Rototill Soil Amendents with Native Soil



Spread Soil Amendments Evenly in Planting Area



Aerate Small Areas with a Pitch Fork





Core Aerator with Hollow Tines



Stormwater Swale Collecting Rain

STORMWATER

Managing Stormwater is Everyone's Responsibility

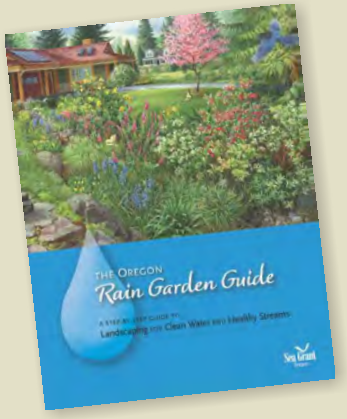
Bend's annual precipitation is approximately 12" per year – most of which falls November through February, and often as snow. Brief thunderstorms provide a small amount of moisture in the warmer months, but it usually isn't enough to sustain a non-native landscape on its own. Rain, snow, or any other form of precipitation that collects and runs off a property, is considered to be stormwater.

Managing our stormwater is not only the right thing to do in a Bend WaterWise landscape, it is also required by federal, state, county and city laws. This helps prevent localized flooding and protects our surface and ground water sources. When stormwater runs across impervious surfaces (streets, sidewalks, roofs, patios, etc.) it picks up contaminants and sediment that can pollute our rivers and groundwater, and pose serious issues for fish and wildlife habitat. The keys to preventing this pollution are collecting stormwater before it runs off the landscape, letting it filter naturally through on-site swales, and ultimately absorption into the soil.

Rain gardens are a great way collect stormwater in a landscape. Not only are you capturing stormwater and letting it filter naturally into the soil, you are also creating a micro-climate within your landscape that can be host to different types, colors and textures of plants. Most, if not all, of these plants need to be able to withstand frequent dry spells and periodic inundation of water. Plants suitable for rain garden use in Central Oregon can be found in the OSU WaterWise Gardening Guide or through **waterwisetips.org**.

How Much Water Do You Need to Be Able to Maintain?

The amount of stormwater that needs to be retained will depend on the amount of impervious surface you have. Impervious surfaces like roofs, sidewalks and driveways don't allow water to soak through and create runoff. Multiply the total square footage of impervious surfaces by 0.2' (the quantity of water we receive during a 25-year storm). This is the approximate quantity of water you need to be able to retain on-site.



Oregon Rain Garden Guide

One of the best ways to retain stormwater is through a rain garden. Visit **waterwisetips.org** to download your free copy of *The Oregon Rain Garden Guide: A Step By Step Guide to Landscaping for Clean Water and Healthy Streams*.



Shady Rain Garden in Wet Season



Permeable Pavers/Dry Stream Beds

TRANSFORMATION TIPS
STORMWATER MANAGEMENT

- Work with the natural topography of your site
- Reduce the amount of impervious surfaces, if possible
- Calculate the quantity of water you need to retain
- Ensure all stormwater is retained on site
- Use landscape plants recommended for rain gardens



Full Sun Dry Stream Bed



Stormwater Swale and Dry Creek

TRANSFORMATION TIPS
SLOWING THE FLOW

- Utilize drip, micro sprays and matching high efficiency sprinkler nozzles
- Upgrade to an EPA WaterSense labeled smart irrigation controller
- Install pressure-regulating sprinkler bodies if pressure is above 50 psi
- Make regular schedule adjustments as temperatures change
- Conduct regular inspections to identitfy leaks, runoff and overspray

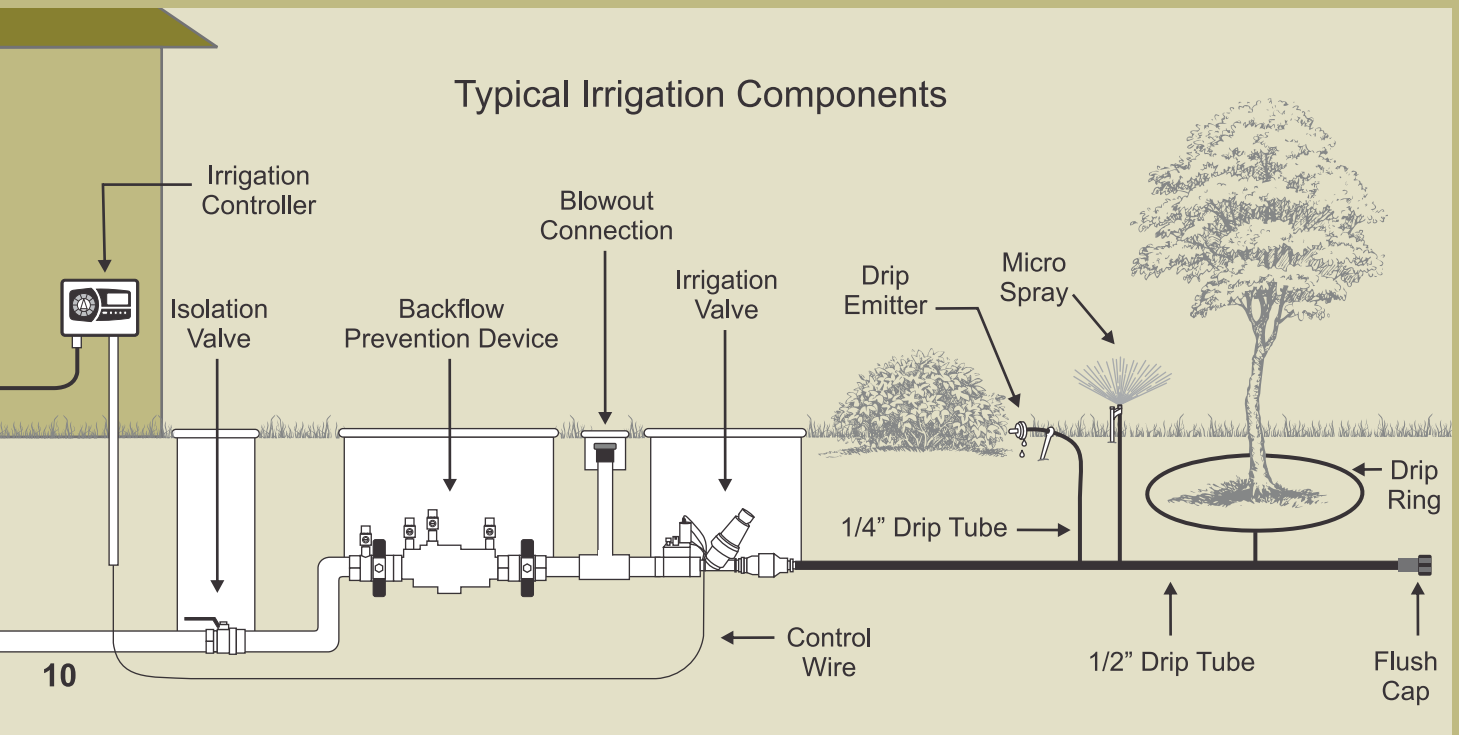


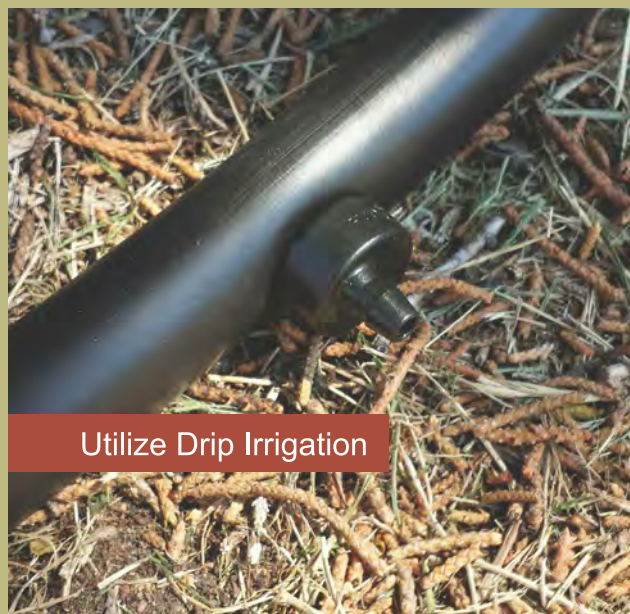
Make Regular Inspections



Even Distribution is Key

EFFICIENT IRRIGATION





Utilize Drip Irrigation

Using Water Wisely in the Landscape

Most people underestimate the amount of water they use in the landscape. It can be difficult to know when a majority of the system resides underground, schedules are programmed to run at night, and our porous soils quickly soak up leaks. On average, 60 percent of the annual water use of residential homes in Bend is used for irrigation. That's a lot of water. It can be even more if the irrigation system is poorly designed, installed or maintained.

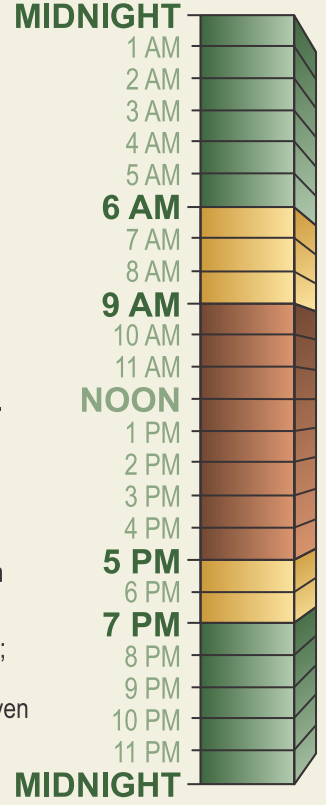
Bend WaterWise landscapes can use considerably less water than the average landscape. That's partly because they utilize the most efficient irrigation components and incorporate routine system inspections. An EPA WaterSense labeled smart irrigation controller adjusts irrigation run times based on environmental conditions. Be advised – a smart irrigation controller alone will not repair a leaking, poorly designed or poorly maintained irrigation system, and will highlight the inefficiencies in your system. When combined with a good management plan, however, it will provide a greater level of control over your irrigation schedule, which can save a lot of water.

In a water efficient landscape, trees and large shrubs are irrigated through a drip irrigation system, planting beds and gardens use micro sprays, and lawn areas are irrigated through pressure-regulating sprinklers equipped with high efficiency nozzles. Trees, shrubs, lawn and perennials are all irrigated through separate irrigation zones, as their water requirements are different and will require different runtimes. Seasonal irrigation schedule adjustments should be made regularly to apply water as it is needed by the plant material.

Irrigation runoff and overspray are two particularly common issues that should not be overlooked, as they are a violations of Bend Code (14.20) and waste more than water. They also impact our local stormwater quality, street maintenance and pedestrian traffic.

IRRIGATION RULES & HOURS

- No irrigation between 9:00 a.m. and 5 p.m.
- No irrigation water running off your property onto other sidewalks, streets or neighboring properties.
- No overspray of irrigation onto impervious surfaces.



Best time to irrigate; low system demand

Avoid irrigation if possible; high system demand

High system demand; hot, windy, high evap rate; rule variance given for new sod, seed, plantings

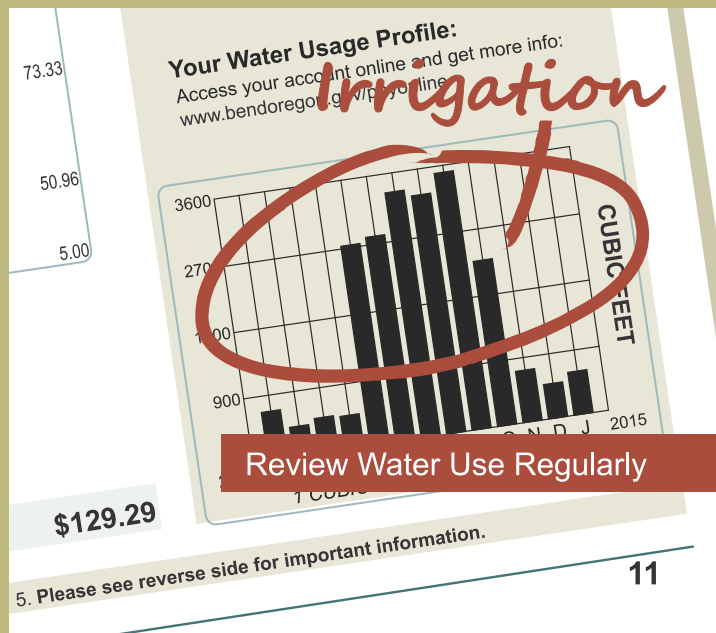
4 STEPS TO EFFICIENT LAWN IRRIGATION

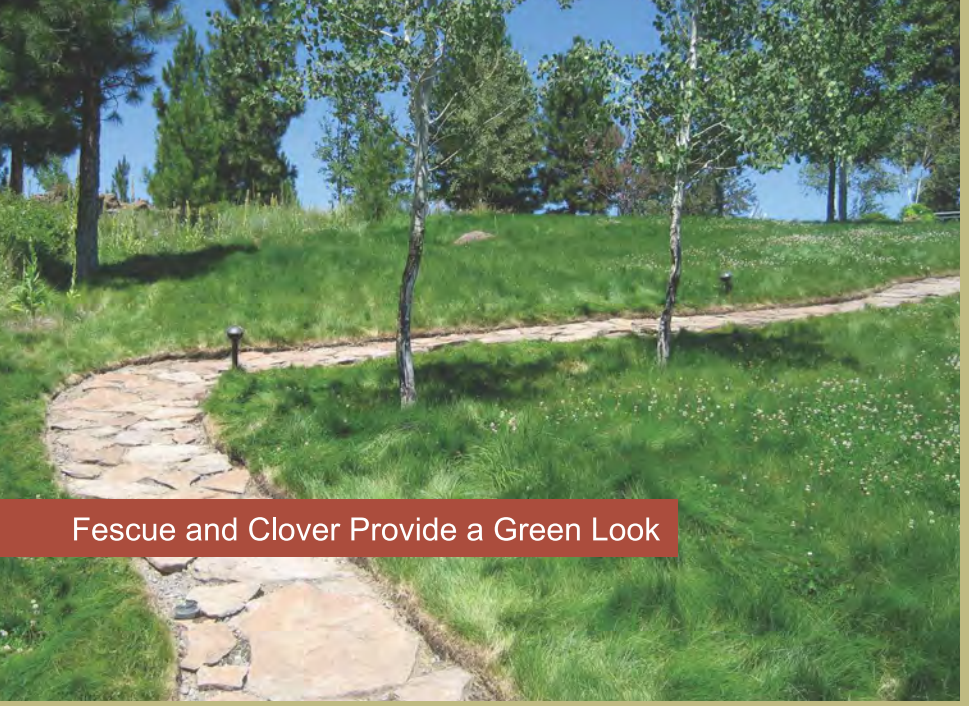
Follow these four steps to increase your lawn water efficiency using an irrigation gauge.



1. Place irrigation gauge in an irrigated area making sure that it is at least 24" away from the closest sprinkler.
2. Run sprinklers for exactly 10 minutes.
3. Measure the water in the irrigation gauge.
4. Program irrigation controller to deliver the approximate weekly water quantity in the chart provided to the right.

WEEKLY WATER NEEDS	
APRIL	0.75" / week
MAY	1.00" / week
JUNE	1.25" / week
JULY	1.50" / week
AUG	1.25" / week
SEPT	1.00" / week



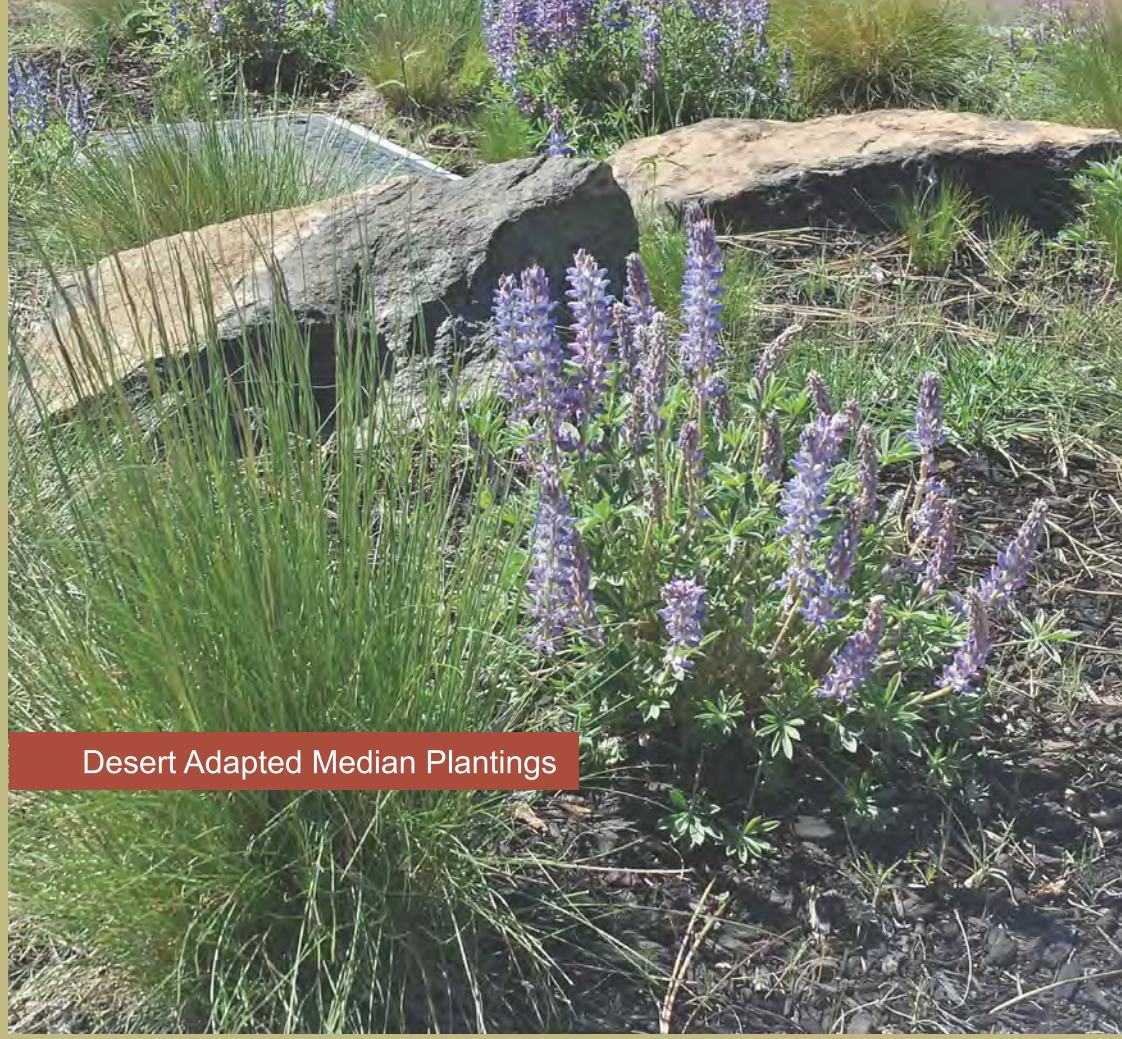


Fescue and Clover Provide a Green Look

LAWN & ALTERNATIVES



Mass Planting of Blue Fescue Grasses



Desert Adapted Median Plantings

TRANSFORMATION TIPS
RETHINKING THE STANDARD

- Size lawn areas for the intended use
- Consider alternatives like grasses, perennials and other low water options
- Amend the soil as appropriate for the plant choice
- Ensure lawns are irrigated evenly and efficiently



Low Maintenance Streetscape

Making Green Easy & Functional

Bend lawns require a great deal of water, soil amendments, fertilization and maintenance to be healthy. That doesn't mean that they should be left out of the landscape plan or design. It does, however, mean that you should think about how large they really need to be, how often they need to be tended to, and how much more water they require than a potential lawn alternative. These functional areas of lawn are often incorporated into a Bend WaterWise landscape to accommodate specific uses such as entertaining, recreation and active pets.

Avoid installing lawns on steep slopes, in shady areas, in small or highly fragmented areas (like narrow strips), along hard surfaces (like sidewalks or curbs), and in high traffic routes. It is virtually impossible to irrigate some of these areas without having water over spraying or running off onto nearby sidewalks and streets. Avoid planting trees or other plants in a lawn or lawn alternative area, as their water needs are different.

Some Bend WaterWise landscape owners are opting out of a traditional lawn installation in favor of a lawn alternative that provides a similar function or look. Low growing or creeping perennials, native grasses and eco-lawn type seed mixes are gaining in popularity. Each of these offers different and specific benefits, but they all reduce the amount of irrigation, mowing, fertilizer and general maintenance required of traditional lawn areas.

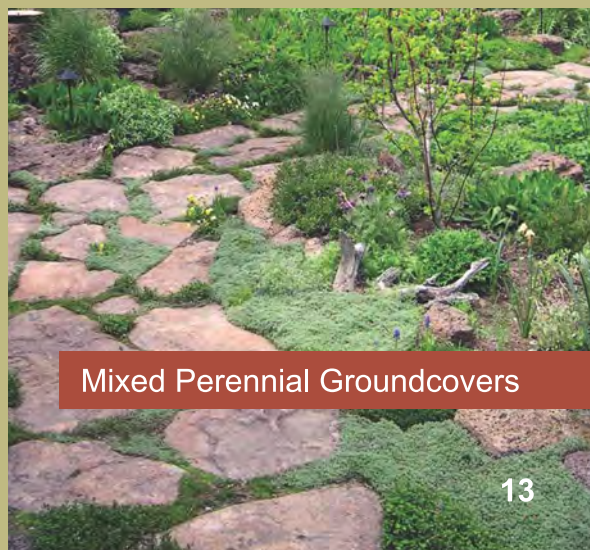
Regardless of whether or not a lawn area becomes part of your Bend WaterWise landscape, know that what's in the underlying soil is what really matters. A properly amended soil will help act as that "fuel tank" and provide those much needed nutrients. It will also increase the water holding capacity of the soil in and around the plant root zone.



Traditional Lawn



Flowering Eco-Lawn



Mixed Perennial Groundcovers



Fall Foliage

PLANT SELECTION



Winter Interest

Green Choices for the High Desert

There are many native and acclimated plant species that will thrive in a Bend WaterWise landscape. These plants vary greatly in form, texture, color and fragrance, and can provide interest and beauty throughout the year. These native and high desert adapted plants will withstand drought, wildlife damage and are more water efficient .

Take time to research how plants may appear in the spring, summer, fall and winter months, and how that may impact the look and function of your landscape. For example, evergreens hold their leaves throughout the year and are excellent for privacy and winter color. Other plants, such as Forsythia, may have colorful flowers during the early spring months, but not much afterwards. Visit **waterwisetips.org** for additional information on specific plants.

Make sure the plants you've selected are acclimated for this area. Plants that thrive in Bend typically fall within USDA Zones 3-5. Plant selection throughout the yard will vary by its exposure. Rhododendrons or Burning Bush prefer less intense north, east side exposures, whereas Russian Sage or Yarrow will take the intense south, west placement. The diverse geography within Bend has several natural microclimates that can also influence a plant's health. For example, areas around the base of Pilot Butte, near the banks of the Deschutes River, and those protected by cliffs or lava rock outcroppings may have unique sets of conditions and allow for more diverse plant selection. Structures like homes, garages, fences and walls can offer additional microclimates within your landscape.

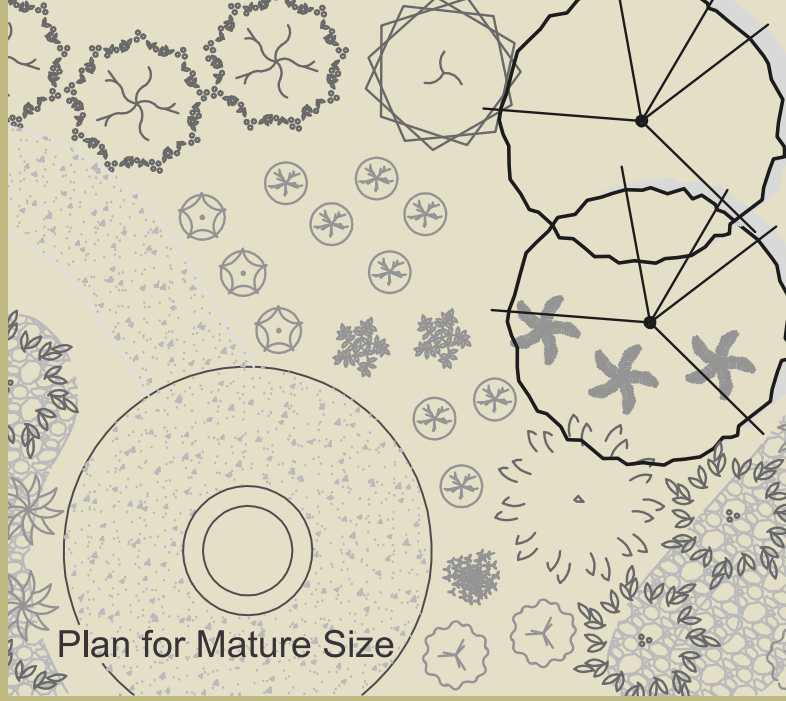
This is also the time to think about a plant's size at full maturity and maintenance requirements. Will this plant eventually impede traffic or touch the house? Is it deciduous or does it keep its leaves? Will it need to be pruned annually? Will a plant's fruit attract the type of wildlife you're looking for? These are the types of questions that should be asked and answered before selecting plants for your Bend WaterWise landscape. The good news is that the choice is up to you! The OSU *Water-wise Gardening in Central Oregon* includes a wide selection of plants that can thrive in Bend.



Summer Blossoms



Choose Plants for Our Climate





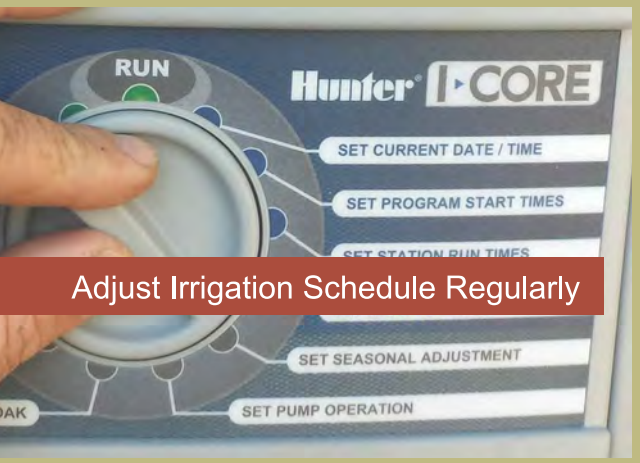
TRANSFORMATION TIPS
RIGHT PLANT – RIGHT PLACE

- Know how plants look and perform throughout the seasons
- Make sure plants are USDA Zones 3-5
- Review your site to determine if any microclimates exist
- Ensure plants will have adequate space at maturity



Spring Flowers

MAINTENANCE



Adjust Irrigation Schedule Regularly



Repair Broken Equipment

Maintaining Your Landscape Investment

A properly designed, installed and maintained Bend WaterWise landscape saves more than just water, it also saves time by reducing maintenance needs. Generally, the average landscape requires weekly maintenance of some combination of mowing, edging, weeding or more to keep it healthy and looking good. Bend WaterWise landscapes are different. They require more seasonal selective pruning, raking, adjusting of sprinklers or drip emitters, and checking for irrigation leaks. Ultimately, a landscape's maintenance requirement is determined by the landscape owner, but largely dependent on plant selection and landscape design.

Lawns bring another set of maintenance requirements. These can include mowing, edging, fertilizing, aeration or dethatching. Routine additions of compost are also likely necessary for those lawns that didn't get established on a properly amended soil. Although their water need is considerably higher than most shrubs, lawns can also be a part of a Bend WaterWise landscape when their size is designed for the intended use, the soil is amended properly and high efficiency irrigation components are used.

Regular irrigation maintenance is often overlooked. In addition to activating your irrigation system in the spring and winterizing it in the fall, there are regular steps you can take to ensure that you're using water wisely throughout the year. Conduct biweekly inspections of the irrigation system during the growing season, to ensure that there are no leaks and that water is going where it is supposed to go – the plant roots! You may find that the occasional drip emitter or sprinkler nozzle needs to be cleaned out or replaced. Make sure you're replacing like-for-like, as many of these look the same, but have different flow or precipitation rates. Mixing sprinkler types can result in dry or wet areas and make programming difficult. Regular irrigation schedule adjustments are necessary, too, if you don't have a smart irrigation controller that automatically adjusts in response to conditions like heat, rain and wind.

Mulch is one of the most important components of a Bend WaterWise landscape. A 2" to 3" layer of mulch covers the soil to minimize evaporation, reduce weed growth, cool root zone, and slow erosion and provides a nice, finished look. There are many mulch choices in various sizes and colors of bark or rock. Bark mulches are organic and will improve soil texture as they deteriorate. However, bark mulches require a thin layer of fresh mulch every few years. Shredded mulches tend to settle and stay in place better than bark nuggets which blow or wash away and need to be replaced fairly often. Rock mulches don't need replenishment very often, but they can radiate heat.



Fertilizing



Using a Thick Layer of Mulch Can Prevent Weeds

TRANSFORMATION TIPS
MAINTENANCE CONSIDERATIONS

- Maintenance is largely dependent upon plant choice and landscape design
- Lawns bring several additional maintenance requirements
- Regular irrigation inspections and adjustments are necessary
- Mulching has multiple benefits to the landscape



Clogged Nozzle



Keep Tools Sharp and Oiled



Mow Lawn High in Summer



Freshly Mulched Planting Bed



Structural Pruning

REFERENCES & RESOURCES

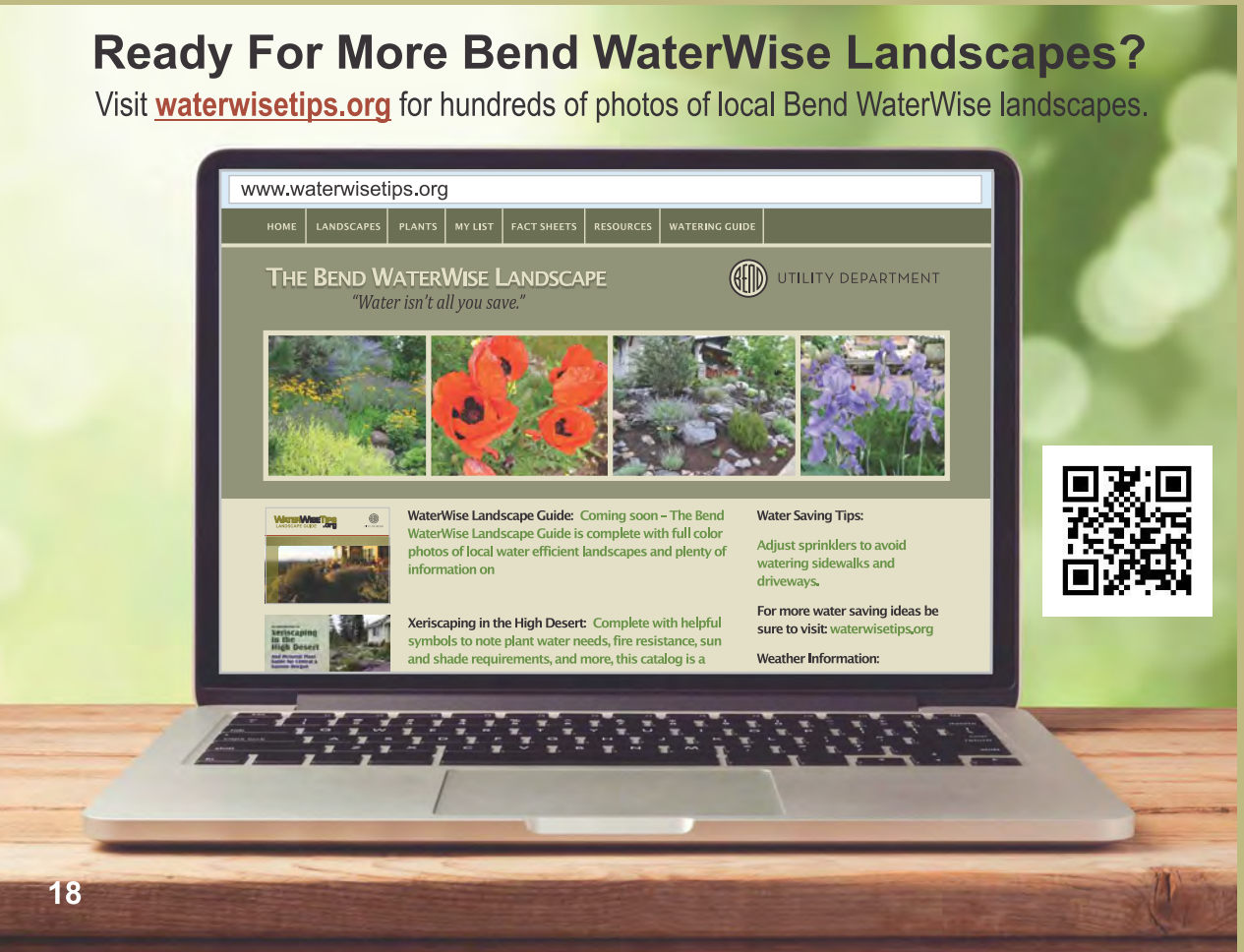
Additional information on water efficient landscape methods can be found in the references and resources below:

City of Bend WaterWise Program	**waterwisetips.org**
City of Bend Stormwater Program	**bendoregon.gov/cleanwaterworks**
Oregon State University Extension	**extension.oregonstate.edu**
EPA WaterSense	**epa.gov/watersense**
Irrigation Association	**irrigation.org**
Alliance for Water Efficiency	**allianceforwaterefficiency.org**
U.S. Bureau of Reclamation	**usbr.gov/pn/agrimet/**



Ready For More Bend WaterWise Landscapes?

Visit **waterwisetips.org** for hundreds of photos of local Bend WaterWise landscapes.







Credits & Acknowledgements

Angie Snell – North of South Landscapes
Landscape Designer and Construction Professional

Molly McDowell Dunston – North of South Landscapes
Landscape Designer and Irrigation Specialist

Michael Buettner – City of Bend
Water Conservation Program Manager

Wendy Edde – City of Bend
Stormwater Program Manager

Patrick Griffiths – City of Bend
Water Resources Manager

Technical Advisor

Amy Jo Detweiler – OSU Extension Service

Photo Credits

Chris Hart Henderson – Heart Springs Design
Rick Martinson – Winter Creek Restorations
Angie Snell – North of South Landscapes
Molly McDowell Dunston – North of South Landscapes
Gerry Kiffe – Gardensoft
Pete Alport & Cog Wild Bicycle Tours
Dustin Mitsch / Alpen Exposure
Pro Time Lawn Seed
Hunter Industries
High Desert River Outfitters

Special thanks to:
Lori Pintok – Snyder & Sons Unlimited

EPA WaterSense PARTNER

Alliance for Water Efficiency MEMBER

Irrigation ASSOCIATION™ Member

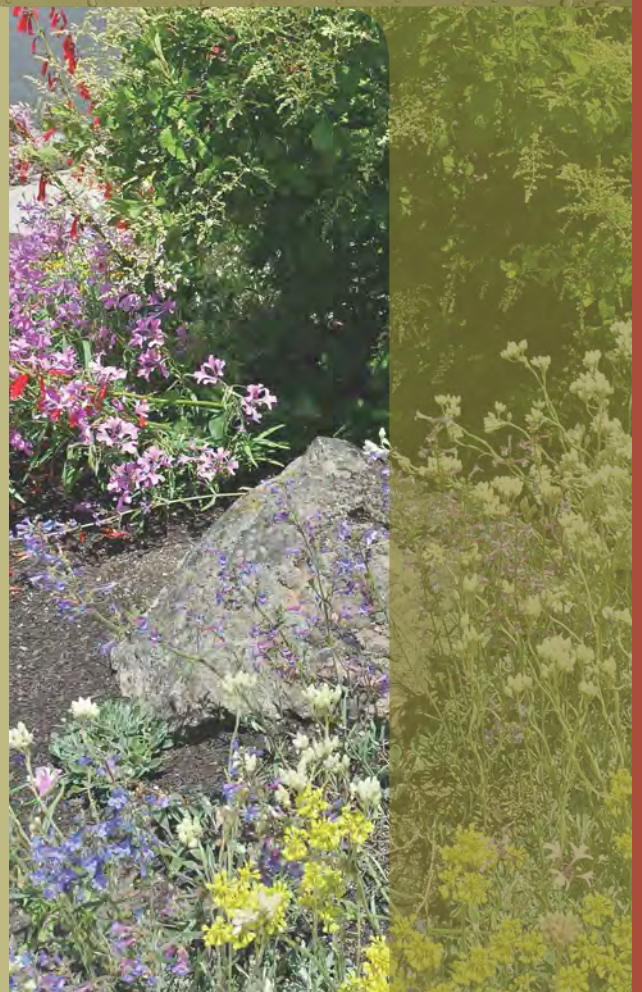
Accommodation Information for People with Disabilities
To obtain this information in an alternate format such as Braille, large print, or electronic, please contact 541-317-3000 opt. 2 or email utilities@bendoregon.gov.

CITY OF BEND

541-317-3000 option 2
waterwisetips.org
conservation@bendoregon.gov









CERTIFICATE OF PARTICIPATION

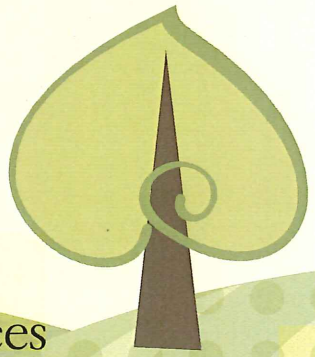
AWARDED TO

Sean Mulderig

FOR ATTENDING

VEGETATED PRIVATE WATER QUALITY MANAGEMENT TRAINING

June 21 & 22, 2017



Clean Water Services

Tony Gilbertson

Portland Community College

David Sandrock

Stormwater Quality Webinars
Winter 2016

The City of Bend Stormwater Utility is sponsoring the following upcoming American Society of Civil Engineers (ASCE) on demand webinars. Attendance is free, each session is 1-hour. The City will provide certificates of attendance to those who pre-register.

Date: Tuesday, December 20, 2016

Location: Eisenhower Training Room (City of Bend Utilities, 62975 Boyd Acres Rd.)

SESSION 1 (Time:10:00 am to 11:00 am)

Permeable Pavement - Design Considerations & Tips for Avoiding Failures

Purpose and Background from ASCE Website:

This webinar discusses various permeable pavement types, site considerations common to all permeable pavements their benefits, and tips for avoiding clogging failures.

In spite of the environmental advantages of permeable pavements, in North America, they have typically remained outside the ordinary conventions of urban design and construction. Very few state and local agencies have standards or guidelines that can be used by practicing engineers for the design of these systems. In response to these issues, the ASCE-EWRI UWRRC LID Task Committee on Permeable Pavement developed a Committee Report entitled Permeable Pavements. This webinar highlights specific content from the manual which contains individual design chapters on porous asphalt, pervious concrete, permeable interlocking concrete pavement, and other types of permeable pavement. Design considerations that are common to all permeable pavement systems are emphasized. In addition, common myths surrounding the practice are addressed, including perceptions about practice strength, durability, clogging, cold climate usage, use in clay soils, and long-term performance. Attendees gain an introduction to permeable pavement technology and capability and will be directed to the upcoming comprehensive Committee Report for more in-depth information and resources.

Instructor: Bethany Eisenberg LEED AP, A.M.ASCE & Kelly A. Lindow, PE, A.M.ASCE

SESSION 2 (Time:1:00 pm to 2:00 pm)

Construction Stormwater BMPs

Purpose and Background from ASCE Website:

Many construction projects include excavation and fill. These soil disturbing activities create the potential for erosion and necessitate the use of Best Management Practices (BMPs). A wide variety of BMPs have been developed, but some designers and contractors use only a few of them. Sometimes this is due to unfamiliarity with other options and sometimes it is due to the mistaken impression that one BMP can be used for all situations. BMPs for slopes include silt fence, slope roughening and erosion control blankets. BMPs for small drainages include sedimentation basins, sediment traps, check dams, fiber rolls and straw bales. BMPs for inlets include silt fence, straw bales, fiber rolls and inlet covers.

Instructor: Mark Peterson, P.E., M.ASCE

Stormwater Quality Webinars
Winter 2016

SESSION 3 (Time: 2:15 pm to 3:15 pm)

A New Approach to Applications of Sediment Transportation

Purpose and Background from ASCE Website:

Sediment transport analysis frameworks are valuable tools for jurisdictional determinations in arid systems. These frameworks reduce project cost and time, and add to project value for jurisdictional determinations in arid systems. Regulatory guidance under the Clean Water Act (CWA) for southwestern, arid, ephemeral streams (ERDC 2008) directs regulators to examine moderate events with sufficient sediment transport to result in channel widening and vegetation removal for forming the ordinary high water mark (OHWM). At least four distinct tracts of current research have the potential to modify or compliment this regulatory guidance. The webinar examines research in these areas that provide a framework for assessing jurisdiction in arid systems with sediment transport toolsets. Additionally, the webinar explores how these tools can be used to assess system habitat function in otherwise challenging stream evaluation settings.

Instructor: David A. Jaffe, Ph.D., P.E., D.WRE

INTENDED AUDIENCE

Civil engineers, contractors and inspectors involved in designing, installing or inspecting stormwater BMPs for construction projects will benefit from this webinar.

TO REGISTER

For the webinars, please register by emailing or calling David Buchanan, City of Bend, dbuchanan@bendoregon.gov or (541) 693-2176 with your name, agency/company, and contact information, and which session you would like to attend. **Register today—seating is limited.**

THANK YOU FOR ATTENDING

American Society of Civil Engineers
Permeable Pavement Design
Date: *December 20, 2016* ***Time:*** *10:00 am to 11:00 am*

BEND
UTILITY DEPARTMENT

PLEASE SIGN IN

	Name (Please Initial)	Affiliation	Notes/Comments
1	Corey Charon	The Green Consultant	
2	David Buchanan	City of Bend	
3	Dustin Revel	Ashley & Vance Engineering	
4	Kristin Georgeton		
5	Matt Williams	C.A. Rowels Engineering	
6	Terry Angle	ANGLE CONSULTING ENGINEERING	
7	Wendy Edde	City of Bend	
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Permeable Pavement

Design Considerations and Tips for Avoiding Failures



AN INTRODUCTORY SEMINAR

Bethany Eisenberg, LEED AP | VHB | beisenberg@vhb.com

Kelly Lindow, PE | CityScape Engineering | kelly@baltimorecityscape.com

ASCE | KNOWLEDGE & LEARNING

Distribution of the webinar materials outside of your site is prohibited. Reproduction of the materials and pictures without a written permission of the copyright holder is a violation of the U.S. law.

About the Instructors

Kelly Lindow, PE is the principal and owner of CityScape Engineering in Baltimore, MD. Kelly is co-chair of the Permeable Pavement Technical Committee of the ASCE/EWRI and has over 9 years of experience designing, monitoring, and developing specifications for several types of stormwater management practices, including permeable pavement.



About the Instructors

Bethany Eisenberg, LEED AP is the Director of Stormwater Services at VHB inc. in Watertown, MA. She is co-chair of the Permeable Pavement Technical Committee of the ASCE/EWRI. She has more than 30 years of experience in hydrology, hydraulics, stormwater management. She currently specializes in low impact design (LID) site engineering, flood control, green streets/green highway engineering and permeable pavement design.



Webinar Objectives

- Learn about the different types of permeable pavement **surfaces, systems, hydrologic and structural design and applications**
- Introduce design, construction, and maintenance **strategies to avoid failures**
- Introduce **design modifications** to enhance performance
- Find out about the new **ASCE Publication** ***Permeable Pavements***



Source: VHB
Vanasse Hangen Brustlin, Inc. 2015

1

2

Permeable Pavements

- Provide structural support while allowing water to infiltrate through pavement surface and subbase
- History
  - **1940s:** First used in US
  - **1970s:** EPA researched - runoff control
  - **1980s:** Advances in technology design and use



Source: Century West Engineering

Permeable Pavement Applications

- Common for low traffic applications:
  - Parking lots, driveways, parking strips, walkways, recreation
- Evolved to low traffic roadways, residential streets, alleys, emergency access roads.
  - Speeds <35mph
  - Light truck traffic
  - Limited turning operations
- Some agencies/municipalities exploring use on highway shoulders
  - NCHRP 25-25/Task 82 *Permeable Shoulders with Stone Reservoirs*



Source: VHB Inc.



Source: ICPI



Source: SvR Design Co.



Source: Amy Rowe



Source: Kelly Lindow

Why Permeable Pavement?

Environmental Benefits

- **Stormwater Quality control** – reduce stormwater runoff/pollutant loads
- **Stormwater Quantity Control** – reduce flooding, stream erosion, CSOs
- **Groundwater Recharge**- baseflow, tree roots, water table
- **Reduce thermal impacts**- cools via filtering in ground
- **No water on surface**- reduce ponding, spray, hydroplaning, ice
- **Reduce salt use and ice build up**
- **Preserve land in developments** instead of surface stormwater BMPs

Regulatory Drivers

Economic ($$) Factors

- **Reduced stormwater utility fees**
- **Reduced drainage infrastructure cost** Capital and maintenance
- **Eliminate/reduce irrigation costs**
- **Reduce cost for deicing/salt use**
- **Market Value for LID "green" sites**
- **Preserve surface land in development**



Source: CH2MHILL

Permeable Pavements & Pavement Systems

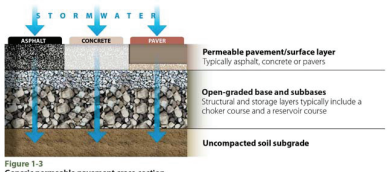


Figure 1-3
Generic permeable pavement cross-section
Source: © Vanasse Hangen Brustlin, Inc. (VHB)

3

4

Types of Permeable Pavement Surfaces


Porous asphalt (PA)


Permeable interlocking concrete pavement (PICP)


Pervious concrete (PC)


Grid pavement (plastic or concrete)

And other types…

Porous Asphalt (PA)

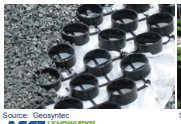
- Asphalt with reduced fines
- Greater void space than standard asphalt (18% – 25% typ.)
- Additives and high grade binders may be used to increase durability and strength
- Variable thickness depending on anticipated traffic load
- Poured in place application on open-graded base
- Min. 48 hrs. curing time, 7 days preferred for vehicle traffic areas


Source: Amy Rowe


Source: Bethany Eisenberg, VHB

Grid Pavement

- Concrete or plastic material
- Modular surface grid system with large voids
- Needs bedding course
- Voids are filled with permeable material
  - Typically small aggregate (ASTM No. 8 or 89 stone) or topsoil and grass
- Mechanical or hand installation
- Typically over sand bedding and aggregate layer


Source: Geosyntec


Source: Hastings Pavement Company

Other Types of Permeable Pavement

- Pervious Pavers
  - Pavers themselves are comprised of permeable composite material
- Rubber Overlay Pavement
  - Mix of recycled rubber granules, dry aggregate and proprietary binder
  - Poured in place application
- Rubber Composite Pavers
  - Pavers made of light-weight composite rubber, usually recycled
  - Open joints between pavers allow for infiltration
  - Pavers themselves are not permeable


Source: Bayshore Concrete


Source: PorousPave, Inc.


Source: AZEK® Pavers

Pervious Concrete (PC)

- Concrete with added open-graded aggregate and greater void space (15 % – 25% typ.)
- Additives may be added to increase strength
- Variable thickness depending on anticipated traffic load
- Poured in place application or precast panels
- 7 to 10 days curing time
- Salt application is a concern


Source: Amy Rowe


Source: John Kevern

Permeable Interlocking Concrete Pavement (PICP)

- Interlocking pavers with open joints between the pavers (typ. 5% – 15% of paver surface) - Pavers not permeable
- Needs bedding layer (ASTM No.8)
- Joints are filled with small aggregate, (ASTM No. 8, 9 or 89)
- Standard paver thickness for all applications
- Mechanical or hand installation
- Pre-cast no curing time
- Surface infiltration rates: ~300 to 800 in./hr per


Source: Amy Rowe


Source: ICPI

Common System Design Components

- Choker Course - Used to level out the surface material
  - PICP & Grid - Required
  - PA – ATPB or choker course
  - PC - Optional
- Reservoir Course
  - Provides temporary storage of infiltrated water
  - Provides structural support to surface layers
- Underdrains (optional)
  - Promotes drainage of the reservoir

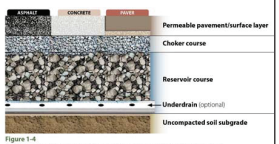


Figure 1-4
Typical permeable pavement base/subbase layers and underdrain design

Common Designs & Design Considerations

Many design considerations are common to all systems

Three Typical Permeable System Configurations

1. **Full-infiltration**
2. **Partial-infiltration**
3. **No-infiltration**

"Full-infiltration" System Design

- Generally used when underlying soils are highly permeable
- All captured water infiltrates into the soil beneath the pavement

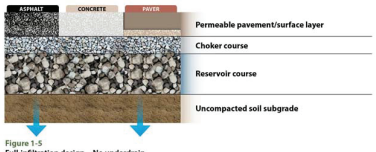


Figure 1-5
Full-infiltration design—No underdrain
Source: © Vanasse Hangen Brustlin, Inc. (VHB)

"Partial-infiltration" System Design

- Used when underlying soils are less permeable, generally not allowing infiltration of captured water within 48 – 72 hours
- Some water infiltrates into underlying soils
- Underdrains are utilized to drain excess filtered water

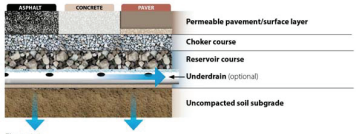


Figure 1-6
Partial-infiltration design—Underdrain, no liner
Source: © Vanasse Hangen Brustlin, Inc. (VHB)

"No-infiltration" System Design

- An impermeable liner (geomembrane) is used to prevent any infiltration into underlying soils
- Filtered water exits the system via underdrain
- Discharge control and water quality improvements
  - Little volume reduction



Figure 1-8
No-infiltration design—Underdrain and impermeable liner
Source: © Vanasse Hangen Brustlin, Inc. (VHB)

"No-infiltration" System Design

- "No-Infiltration" designs generally recommended for systems:
  - In close proximity to building foundations, basements, water supply wells
  - Within 2' of high groundwater table
  - Located in karst topography
  - Over expansive soils or poorly compacted fills soils that have unacceptable stability when exposed to infiltrating water



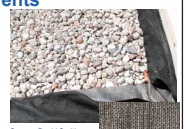
Source: Permaloc



Source: VHB

Common System Components

- Use of Geotextiles
  - Typ. on sides of pavement subbase to prevent intrusion of native soils into system
  - Generally not recommended above open-graded pavement layers due to concerns over clogging
  - Use along bottom of system not required, but may be warranted based on evaluation by geotechnical engineer



Source: David Smith, ICPI

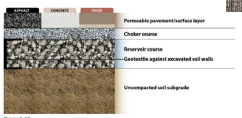


Figure 1-10
Graphic of vertical geotextile
Source: © Vanasse Hangen Brustlin, Inc. (VHB)

Permeable Pavement System Design

- System design for site considerations
- System design for hydrologic requirements
- System design for structural requirements
- System design modifications for specific performance goals
  - Volume reduction
  - Water quality



Source: VHB, Inc.



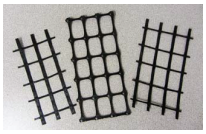
Source: MN Pollution Control Agency



Source: Kelly Lindow.

Common System Components

- Geogrids
  - May be used to improve the structural integrity of the underlying soils
  - Reinforces and confines fill materials and distributes loads
- Geomembranes
  - Necessary if you do not want infiltration into underlying soils
  - May use if you want treatment and/or storage with release





Site Design Considerations

- Underlying soils
- Slope
- Groundwater
- Contributing area run-on and surrounding land use
- Edge/perimeter design
- Other constraints
  - Utilities
  - Foundations
  - Private wells
  - Septic systems



Source: CH2MHILL

Underlying Soils

- Successful in most soil types and variable infiltration rates
  - Underlying soil types will influence base design and system outflow configuration
  - Geotechnical investigations and infiltration testing required
- Can be installed over clay or low permeability soils
  - Underdrain typically utilized
  - Volume benefits still realized through slow infiltration
- Use "No-Infiltration" designs in areas of:
  - Karst topography
  - Expansive soils or poorly compacted fills soils with poor stability
  - Contaminated subsoils



Source: Center for Watershed Protection

Groundwater

- Bottom of system should not intersect with groundwater
- Separation should satisfy local or state requirements
- Generally, a minimum 2' separation recommended
  - Otherwise consider use of impermeable liner

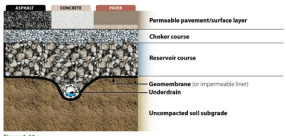


Figure 1-12
Graphic of geomembrane

Slope

- Ideally installed on flat or low sloping areas
- Permeable pavements can be used on moderately sloped sites
  - Bottom of the permeable pavement system should be level to promote uniform infiltration
  - Terracing, checkdams, baffles or berms can be used to create a level bottom

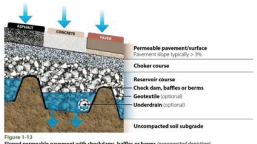


Figure 1-13
Sloped permeable pavement with checkdams, baffles or berms (exaggerated depiction)

Contributing Area Run-on

- Permeable pavements may be designed to accept runoff from adjacent area that is **free from sediment**
- If accepting stormwater from more than surface area - a ratio of 2-5 times the pavement surface may be acceptable
  - Ratio may increase or decrease depending on site-specific conditions and anticipated sediment loads



Source: David Smith, ICPI



Source: Center for Watershed Protection

Contributing Area Run-on

- Ensure adjacent drainage areas are stabilized to prevent excessive surface clogging via runoff, wind, or vehicle tracking
- Berm or curb along permeable pavement can prevent run-on



Source: SvR Design Company

Permeable Pavement – Standard Pavement Transition Edge Design

- Use impermeable restraint or liner to prevent migration of water horizontally beneath standard pavement section



Source: John Kevern



Source: David Smith, ICPI

Permeable Pavement Edge Design

- Recommend rigid edge restraints to prevent fracturing or unravelling

Inadequate Edge Restraints



Source: Eban Bean, ECU



Source: Eban Bean, ECU



Source: Eban Bean, ECU

Effective Edge Restraints



Source: Center for Watershed Protection



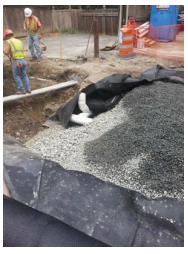
Source: Eban Bean, ECU



Source: David Smith, ICPI

Other Site Design Considerations

- Additional Site Factors:
  - Utility locations
  - Foundations/Basements
  - Private wells
  - Septic systems
- Consult local requirements for necessary setbacks
- Design modifications may be acceptable



Source: VHB

Permeable Pavement System Design

- Geotechnical Investigations
- Hydrologic Design Considerations
- Structural Design Considerations

Hydrologic Design Considerations

- Consideration given to the following variables
  - Design storm, rainfall depth
  - Run-on from surrounding areas
  - Underlying soil infiltration rate
  - Base thickness and storage capacity
  - Pavement outflow
    - Presence or lack of underdrains

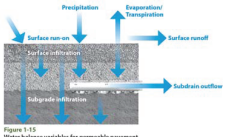


Figure 1-15
Water balance variables for permeable pavement
Source: © Vanasse Hangen Brustlin, Inc. (VHB)

Geotechnical Investigations

- **Soil Borings/Classification**
  - Determine USCS soil classification
    - Estimate soil bearing capacity (CBR, resilient modulus, modulus of subgrade reaction, or R-value test)
  - Compaction requirements
  - Depth to water table
  - In brownfields or highly urbanized areas, may be appropriate to test for contaminants
- **Soil Subgrade Infiltration Rate**
  - ASTM D3385 recommended (double ring infiltrometer)
  - Multiple tests recommended to account for site variability
  - Tests should be conducted at proposed system bottom elevation (typ. 1-2 feet below grade)
  - Often apply safety of factor (0.5) to account for infiltration rate reduction due to subgrade compaction during construction

Structural Design Considerations

- Structural design often based on 1993 AASHTO Guide for Design of Pavement Structures (Flexible Pavement Design)
- Calculate the design structural number (SN)
  - **Anticipated traffic loads**
  - **Underlying soil properties**
  - **Environmental/climate factors**
- Determine materials/thickness needed to meet or exceed SN
  - **Surface, bedding, and reservoir layers**
    - Strength coefficients vary for materials used
    - Layer thickness
- Designers should consult manufacturer references for structural design requirements



Source: David Smith, ICPI

Structural Design Considerations

- Permeable pavements must be adequately designed to support anticipated structural loads
- Avoid use in areas with repetitive turning, such as entranceways and intersections
- Traffic load bearing capacity of permeable pavement systems can be increased
  - Increase base thickness
  - Increase surface thickness (PC and PA)
  - Use Fiber additives in PC and PA surface mixtures to increase strength

Design Loads Exceeded



Source: Kevin Earley

Excessive Turning



Source: UNH Stormwater Center

Permeable Pavement Performance
Volume Reductions

- Enhancing Volume Reduction
  - Storage chambers located w/in reservoir layer
  - Subgrade techniques:
    - Boreholes
    - Ripping
    - Trenching of underlying soils
  - Use of an upturned or elevated underdrain to increase infiltration in slowly draining soils



Source: VHB, Inc.

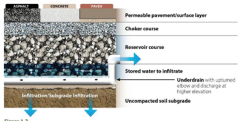


Figure 1-7
Partial infiltration with inverted underdrain
Source: © Vanasse Hangen Brustlin, Inc. (VHB)

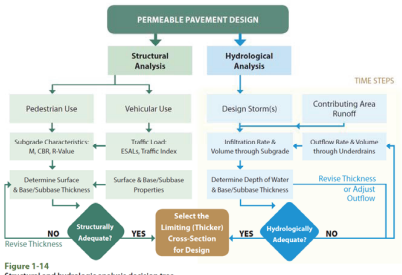
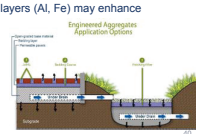


Figure 1-14
Structural and hydrologic analysis decision tree
Source: ICPI

Permeable Pavement Performance
Nutrient Reductions

- Permeable pavements are effective at TSS, heavy metal and particulate pollutant removal
- Phosphorus (TP)
  - TP generally removed through filtration, attachment to trapped sediment in surface
  - Measured TP removal rates ~40%–45%
  - Use of admixtures within pavement layers (Al, Fe) may enhance removal of dissolved P



Source: Scott Perry, Imbrium Systems Corp.

Permeable Pavement Performance
Nutrient Reductions

- Nitrogen (TN)
  - Measured TN removal rates vary widely
  - TN can be reduced through creation of anaerobic zones within pavement reservoir

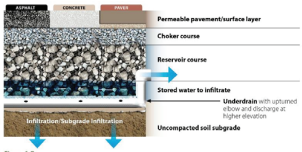


Figure 1-7
Partial-infiltration with inverted underdrain
Source: © Vanasse Hangen Brustlin, Inc. (VHB)

Additional Considerations to Ensure Proper Performance

- **Construction Tips**
- **Use in Cold Climates**
- **Maintenance**

Pavement Construction

- Sediment Management
  - Keep surface area clear of sediment during and after construction

Poor Erosion and Sediment Control



Source: Bill Hunt, NCSU

Proper Erosion and Sediment Control



Source: VHB, Inc.

Pavement Construction

- Excavation/Subgrade Preparation
  - Utility location/marking prior to excavation
  - Limit vehicle traffic over excavated subgrade
  - Ensure proper compaction of base and surface layers (consult specifications)



Source: David Smith, ICPI



Source: David Smith, ICPI

Pavement Construction

- Open Graded Aggregate
  - Install stone base course aggregate in 8-12 inch maximum lifts
- Compact Aggregate Layers:
  - Do not crush stone
  - 10 ton vibratory roller (2 passes in vibratory mode, then 2 in static mode until no visible stone movement), OR
  - Plate compactor with compaction indicator– (13,500 lbf, min. 2 passes)
- Stiffness Testing
  - ASTM D 6758 (Stiffness Gauge), or ASTM D 2835 (Lightweight Deflectometer)



Source: David Smith, ICPI



Source: David Smith, ICPI

Porous Asphalt Construction

- Curing time
  - 48 hrs minimum
  - 7 days preferred for vehicle traffic areas
- Porous Asphalt Specifications/ Construction Resources
  - National Asphalt Pavement Association (NAPA)
  - University of New Hampshire Stormwater Center



Source: CH2M HILL



Source: CH2M HILL

Porous Asphalt Construction

- Mixture Properties
  - Higher grade binder recommended (PG 70-22 or 76-22)
  - Lower grade binder may be acceptable for light traffic/loading uses
  - Binder content ~6%
  - Draindown <0.3%
- Surface Thickness 2.5-6 inches, typ.
  - Installed in 1-2 lifts
- Compact surface with 1-2 passes with 8-10 ton static steel wheel roller
  - 18-22% air voids, not density
  - Additional rolling with small roller to smooth seams and marks

Table 2-3 Typical Porous Asphalt Material Characteristics

AGGREGATES	
SIEVE SIZE, mm (in.)	PERCENT PASSING (%)
19 (0.75)	100
12.5 (0.50)	85–100
9.5 (0.375)	55–75
4.75 (No. 4)	10–25
2.36 (No. 8)	5–10
0.075 (No.200)	2–4
BINDER AND MIX ADDITIVES	
Binder Content (AASHTO T164)	6–6.5
Fiber Content By Total Mixture Mass	0.3 cellulose or 0.4 mineral
Rubber Solids (SBR) Content By Weight of the Bitumen	1.5–3 or TBD
PHYSICAL CHARACTERISTICS/TESTING	
Air Void Content (ASTM D6752/AASHTO T275)	18.0–22.0
Draindown (ASTM D6390)	≤ 0.3
Retained Tensile Strength (AASHTO 283)*	≥ 80
Cantabro Abrasion Test on Unaged Samples (ASTM D7064-04)**	≤ 20
Cantabro Abrasion Test (ASTM D7064-04) on 7 Day Aged Samples***	≥ 30

* AASHTO 283 is sometimes difficult to run on porous mixes – see NAPA guidance (NAPA 2000) for more information.
** As described in ASTM D7064-08
Source: Hossain, K. M., Bulkeshem, T. F., Briggs, J. C., and Pinchilla, J. (2004). "NHSSC Design Specifications for Porous Asphalt Pavement and Infiltration Beds." University of New Hampshire Stormwater Center, Durham, NH.

Source: Permeable Pavements, ASCE Publication

Pervious Concrete Construction

- Admixture:
  - Air voids: 18-20%
  - Water to cement ratio 0.27-0.34
  - Polypropylene or cellulose fibers may be added to improve durability and workability
  - Test pour highly recommended for quality control
- Surface thickness 4-8 inches, typ.
- Installation
  - Place within 30-60 minutes of mix time
  - Install over moist base layers
  - Install formwork, hand place PC, then use roller screed to level
- Curing
  - Cover pavement with heavy duty polyethylene sheeting to retain moisture
  - Curing time 7-14 days



Source: Puget Sound Concrete Specification Council



Source: SvR Design Company

Pervious Concrete Construction

- Ensure proper mixtures and curing times for PA and PC
  - Errors can lead to raveling and low durability

Improper Mix/Curing



Source: Eban Bean, ECU



Source: Eban Bean, ECU

Pervious Concrete Construction

- Pervious Concrete Specifications/ Construction Resources
  - American Concrete Institute (ACI)
  - National Ready Mix Concrete Association (NRMCA)

Pervious Concrete Construction

Poor Mix **Good Mix**



Source: Eban Bean, ECU



Source: Andy Potts, CH2MHILL



Source: Eban Bean, ECU



Source: Eban Bean, ECU

PICP Construction

- Bedding layer (No. 8 stone)
  - Use screed rails to level
  - Do not compact this layer
- Paver Installation
  - Placed by hand or machine
  - Compact using low-amplitude compactor (min. 5,000 lbf plate compactor), before and after sweeping void stones
  - Anticipate ¾" downward movement during compaction
  - No cure time required
- Permeable Interlocking Concrete Pavement (PICP) Specifications/ Construction Resources
  - Interlocking Concrete Pavement Institute (ICPI)



Source: David Smith, ICPI



Source: David Smith, ICPI

Pavement Design/Construction

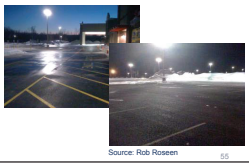
- Porous pavements are an filtration/infiltration system as well as a transportation surface.
- Because of dual functionality:
  - ✓ Greater site evaluation and design effort
  - ✓ Strict engineering oversight and skilled personnel through all phases of the project
  - ✓ Requires a comprehensive maintenance schedule

Cold Climates

- Numerous success stories in cold climates
  - Porosity of base materials allow accommodate expansion of water without cracking
  - Infiltration of snowmelt during warm days. No ponding and refreezing on surface
  - Less surface ice cover, increased skid resistance
  - Potential winter maintenance cost benefits



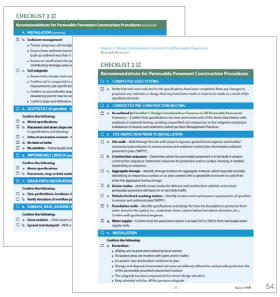
Source: John Kevern



Source: Rob Roseen

Pavement Construction

- Design and Construction Checklists- *Permeable Pavements*



Cold Climates

- Cold climate recommendations
  - Avoid use of sand on pavement surface
    - If sanding occurs, **maintain pavement** afterwards
  - May need to limit use of deicers on pervious concrete (particularly during first year)
  - Limit placement of PC/PA during cold or hot weather
- Detailed publications and fact sheets available from the University of New Hampshire Stormwater Center : http://www.unh.edu/unhsc/

Maintenance

- As pavement surface traps sediment and fines, surface clogging **will** occur over time
- Factors affecting clogging rate include
  - Traffic load
  - Proximity to sediment
  - Surrounding land use
  - Pavement age
- Rate of clogging will vary among different applications



Source: Eban Bean, ECU

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Maintenance

- Without maintenance, in most cases infiltration rates in permeable pavements remain (>5 in/hr) (Bean, 2007)[1]
- Pavements that were 99% clogged, still had infiltration rate >10 in/hr (UNHSC, 2012)[2]
- Maintenance can restore higher infiltration rates
- **Properly installed and maintained systems should not clog to complete failure**

[1] Bean, E.Z., Hunt, W.F., and Bidelspach, D.A. Field survey of permeable pavement surface infiltration rates. Journal of Irrigation and Drainage Engineering. 133 (3): 247-255.

[2] Univ. New Hampshire Stormwater Center 2012 Biennial Report



Source: Bill Hunt, NCSU

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Typical Sediment Sources

Wind Deposition



Source: Eban Bean, ECU

Adjacent Land Use



Source: Eban Bean, ECU

Vehicular Traffic



Source: Eban Bean, ECU

Construction Activities



Source: ICPI

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Maintenance

- Routine maintenance typically required 1 to 2 times/year for routine cleaning
  - Site inspections recommended to increase or decrease frequency
  - Can also perform infiltration testing of pavement surface (ASTM C1701)



Source: Bill Hunt, NCSU



Source: Bill Hunt, NCSU



Source: VHB Inc.

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Maintenance



Source: ELGIN Sweeper Company

Regenerative air vacuum sweeper

- Use 1 to 2 times/year for **routine** cleaning



Source: David Smith, ICPI

True vacuum sweeper

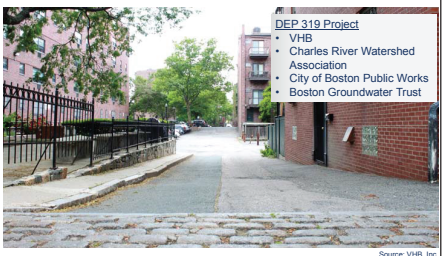
- Very powerful
- For **restoring** highly clogged surfaces

Many municipalities are already incorporating or expanding pavement sweeping operations

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Boston Porous Alley
Permeable Pavement Demonstration Project



DEP 319 Project
- VHB
- Charles River Watershed Association
- City of Boston Public Works
- Boston Groundwater Trust

Source: VHB, Inc.

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Cost

- System materials typically more expensive than traditional concrete or asphalt
  - Typ Costs for 2" Asphalt ($2-4/sf), Concrete ($3-5/sf)

Table B-5 Permeable Pavements Surface Cost Comparison

POROUS PAVEMENT TYPE	TYPICAL INSTALLED COST ($/SF)	TYPICAL COST RANGE ($/SF)
Porous Asphalt (5 cm [2 in.] surface course, 7.62 cm (3 in.] ATPB)	$6.00	$4.00 – $8.00
Pervious Concrete (6 in.)	$8.00*	$6.00 – $10.00
Interlocking Permeable Pavers & Rigid Open Cell Pavers (including 5 cm [2 in.] bedding layer)	(small hand installation) $13.00	$10.00 – $20.00
	(large mechanical installation) $6.50	$5.00 – $10.00
Open Cell/Grid Paving Systems	$7.00	$5.00 – $9.00
Proprietary Porous Pavement Products	Vary by manufacturer	

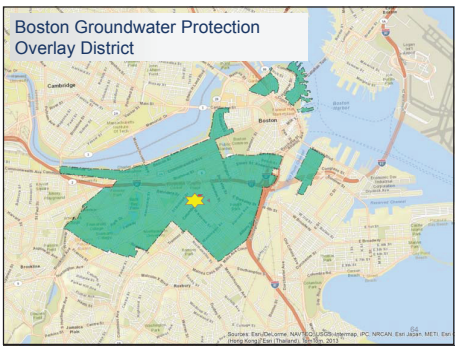
Note: Based on 17 actual bids with unit materials costs for permeable pavements (excluding open celled/grid lattice) from projects 2011–2013. General Estimates for installed permeable pavement surfaces with no sub-surface storage. Prices vary greatly with pavement depth, base/subbase and drainage variations.
*Estimate provided by National Ready Mix Concrete Association 2013
Source: CH2M Hill, 2013

- Cost benefits may be realized through stormwater management savings

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Boston Groundwater Protection Overlay District



Sources: Esri,DeLorme, NAVTEQ, USGS,Intermap, iPC, NRCAN, Esri Japan, METI, Esri (Hong Kong), Esri (Thailand), MapmyIndia, 2013

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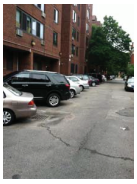
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BGwT Wells



Site Selection







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Source: VHB, Inc.

Poor Existing Pavement



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Source: VHB, Inc.

Public Alley #543



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68
Source: VHB, Inc.

Public Alley #543



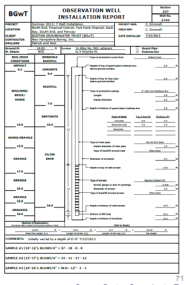
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Source: VHB, Inc.

Geotechnical Information

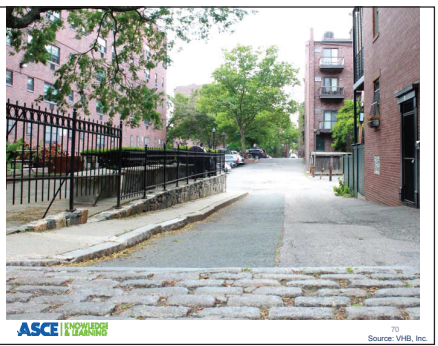






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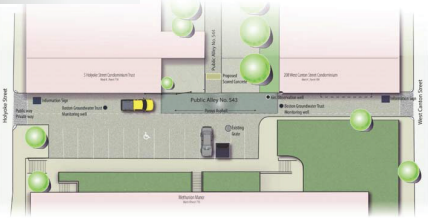
71
Source: Boston Groundwater Trust



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70
Source: VHB, Inc.

Alley Design



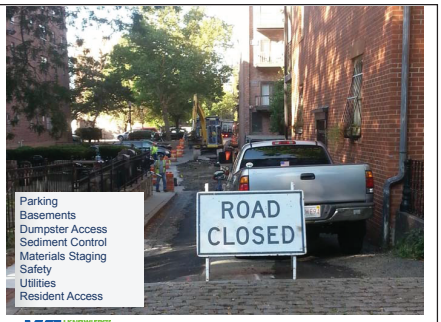
ASCE KNOWLEDGE & LEARNING

72
Source: VHB, Inc.

Cross-Section of Porous Alley No. 543, Boston MA



Source: VHB, Inc.



- Parking
- Basements
- Dumpster Access
- Sediment Control
- Materials Staging
- Safety
- Utilities
- Resident Access

Source: VHB, Inc.

Reservoir Compaction



Source: VHB, Inc.

Protection



Source: VHB, Inc.

Transitional Edge

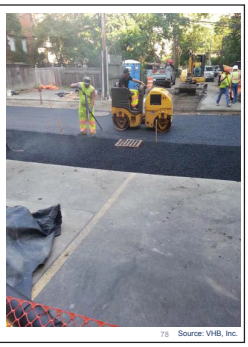


Source: VHB, Inc.

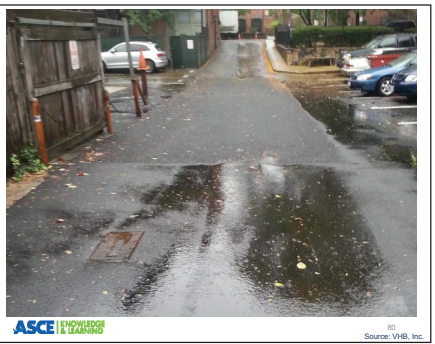


Source: VHB, Inc.

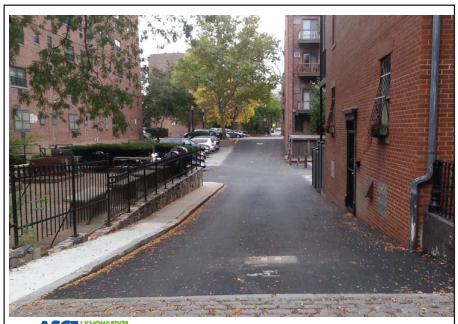
First Lift



Source: VHB, Inc.



Source: VHB, Inc.



Source: VHB, Inc.

Design and Use of the Manual

- Functionality
- Easily navigate
- Hyperlink between chapters and Tables of Contents
- Graphics and Figures to Simplify Design Concepts



Figure 1-7
No infiltration design—Underdrain and impermeable liner

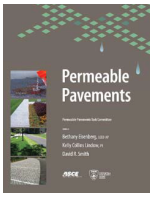
Source: VHB/Vanasse Hangen Brustlin, Inc. 2013



Source: VHB
Vanasse Hangen Brustlin, Inc. 2014

Permeable Pavements Book Project Overview

- ASCE LID Committee Formed in 2007 (William Hunt, NCSU)
- No Central Clearing House – Hurdles to acceptance
- Rapidly changing technologies
- 31 Authors & Reviewers
- Objectives
  - Document current data
  - Define terms, practices
  - Fact Sheets, Checklists, Outlines of best practices
  - Provide guidance, resources and references
  - Identify needs for more information



Source: ASCE 2015

Chapter 1: Introduction and Design Considerations Common to All Permeable Pavements

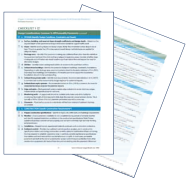
- Regulatory requirements
- Site conditions
- Hydrologic and structural design
- Sustainable design credits
- Installation and maintenance overview
- Summary checklist



Source: VHB/Vanasse Hangen Brustlin, Inc. 2014

Chapter 1: Site Design Checklists





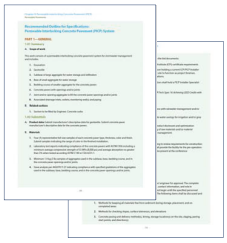
Source: VHB
Vanasse Hangen Brustlin, Inc. 2014

Pavements - Chapters 2, 3, 4, 5, and 6

- Chapter 2 -Porous asphalt
- Chapter 3 - Pervious concrete
- Chapter 4 - PICP
- Chapter 5 - Grid pavers
- Chapter 6 – Other

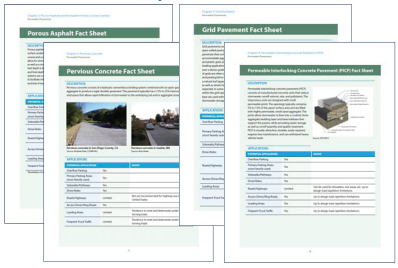
All have:

- Fact sheets
- Unique design considerations
- Recommended outline for specifications



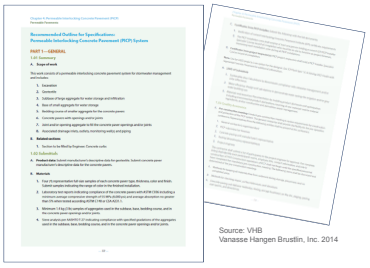
Source: VHB
Vanasse Hangen Brustlin, Inc. 2014

Fact Sheet Examples



Source: VHB
Vanasse Hangen Brustlin, Inc. 2014

Chapters 2 to 6: Outlines for Specifications



Source: VHB
Vanasse Hangen Brustlin, Inc. 2014

Chapter 7: Achieving Success and Avoiding Failures with Permeable Pavements

- Planning and site selection
- Design
- Construction
- Operation and maintenance



Source: CH2MHILL

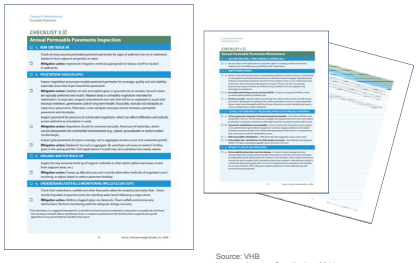
Chapter 8: Maintenance

- Primary inspection and maintenance tools
- Checklist: Regular inspection and maintenance guidance for permeable pavements
- Annual inspection checklist
- Annual maintenance checklist



Source: Bill Hunt, NCSU

Chapter 8: Maintenance Checklists



Source: VHB
Vanasse Hangen Brustlin, Inc. 2014

Chapter 9: Hydrological and Hydraulic Method Resources

- Hydrology and hydraulics
- Water quality
- Modeling tools
- Agency modeling requirements

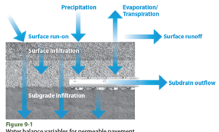


Figure 9-1
Water balance variables for permeable pavement
Source: © Vanasse Hangen Brustlin, Inc. (VHB)

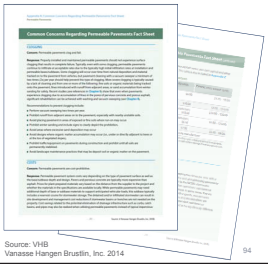
Source: VHB/Vanasse Hangen Brustlin, Inc. 2014

Chapter 10: Permeable Pavements Research Needs

- Engineering specifications
- Modeling techniques
- Structural design procedures
- Installation and maintenance requirements
- Initial cost, life cycle costs
- Long-term evaluations
- Cold weather climate data
- Clogging/rehabilitation data

Appendix A: Common Concerns Regarding Permeable Pavements Fact Sheet

- Clogging
- Costs
- Maintenance
- Cold climate
- Durability
- Soil constraints
- Groundwater constraints
- Spills
- Slopes



Source: VHB
Vanasse Hangen Brustlin, Inc. 2014

Appendix B: Design and Performance Summary Tables

- Overview
- Summary tables
  - Pavement applications
  - General pavement properties
  - Installation and material specifications
  - Permeable pavements surface cost comparison
  - Water quality performance summary
  - Hydrologic performance summary

Table B-1 Pavement Applications

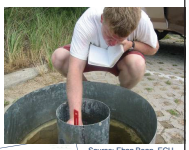
TYPES OF APPLICATIONS	POROUS ASPHALT	PERVIOUS CONCRETE	PICP	GRID PAVERS
Overflow Parking	Yes	Yes	Yes	Yes
Primary Parking	Yes	Yes	Yes	Yes w/ aggregates Limited w/ grass
Sidewalks and Pathways	Yes	Yes	Yes	Limited
Road/Highways	Limited	Limited	Limited	Limited
Access Drives/Ring Roads	No (for heavy traffic)	Yes	Yes	Yes
Loading Areas	No	Yes	Yes	No
Frequent Truck Traffic	Limited	Yes	Yes	Limited
Cold Climates	Yes, should avoid the use of abrasives on pavement surface	Yes, should avoid the use of deicers, especially during first year following installation	Yes, require only standard snow removal procedures	Yes, special snow removal procedures required for grass filled applications

Appendix C: Standards, Specifications, Testing Methods, Resources, and References

- Standards, specifications and testing methods
  - Pervious concrete
  - Porous asphalt
  - Permeable pavers

Appendix D: Glossary of Terms

- Acronyms
- Key words, terms, and phrases



Source: Eban Bean, ECU



Wrap Up

- Permeable pavement technology is changing
- Systems can be effectively implemented on a variety of sites
- Require careful site evaluation, design, construction oversight, and maintenance
- ASCE *Permeable Pavements* Document:
  - Recommended design steps
  - Checklists for general information
  - Outlines for specifications
  - Links to key resources
  - Areas for further study

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Permeable Pavement

Design Considerations and Tips for Avoiding Failures



AN INTRODUCTORY SEMINAR

Bethany Eisenberg, LEED AP | VHB | beisenberg@vhb.com

Kelly Lindow, PE | CityScape Engineering | kelly@baltimorecityscape.com

ASCE | KNOWLEDGE & LEARNING

Webinar Evaluation Summary

UTILITY DEPARTMENT

American Society of Civil Engineers

Session 1: Permeable Pavement – Design Considerations & Tips for Avoiding Failures.

Session 2: Construction Stormwater BMPs

Session 3: A New Approach to Applications of Sediment Transpiration

Date: December 20, 2016

The webinar had 8 attendees, 6 of which completed an evaluation form that is summarized below.

Session 1:

1. Please Rate the presentation (1 being poor, 3 average, 5 Excellent)				
1	**2**	**3**	**4**	**5**
		1	2	

Comments:

Session 2:

2. Please Rate the presentation (1 being poor, 3 average, 5 Excellent)				
1	**2**	**3**	**4**	**5**
1				

Comments:

Session 3:

2. Please Rate the presentation (1 being poor, 3 average, 5 Excellent)				
1	**2**	**3**	**4**	**5**
	1			

Comments:

3a. Please Rate the Facility (1 being poor, 3 average, 5 Excellent)				
1	**2**	**3**	**4**	**5**
		1	1	1

3b. Please Rate the Refreshments (1 being poor, 3 average, 5 Excellent)				
1	**2**	**3**	**4**	**5**
		1	2	

Comments: Thank you for the Coffee and Doughnuts.

4. Please list one thing you learned:

Session 1

- Only two passes for compaction is need for pervious AC.
- Lots of Reminders – Permeable concrete and road salts are not a good mix.
- UIC permitted with underdrain systems.

Session 2

- Flatting slopes on check dams where used in roadway clear zones, to permit traversing.

Session 3

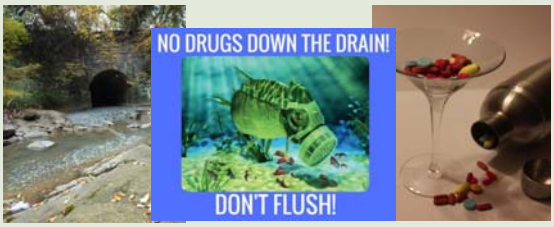
No Comments Provided.

5. Please provide any additional comments/ suggestions for improvements, or for other training that you find useful:

No Comments Provided.

Center for Watershed Protection
Webinar
Pollutants of Emerging Concern
3/24/17

Name	Dept
1. Wendy Edde	Utility
2. Sean Mulderig	utility
3. [illegible]	Utility
4. David Zarate	utility.



Contaminants of Emerging Concern

Cary Institute of Ecosystem Studies

Images courtesy of E. Rosi and from http://www.scwd.org/

Watershed & Stormwater Management • Webcast Series

Welcome to the Webcast

- **Continuing Education Credits** – We are offering PDHs for our watershed and stormwater management webcast series. A registered attendee must watch the entire webcast to be eligible to earn the CEU. A pdf Certificate of Completion will be sent out after webcast to the person who registered for the webcast. The varying nature of certification requirements for each state means we cannot guarantee that CEU's will be awarded and it is up to the individual to determine if CEU's or PDH's will be awarded based on the policies of their local certifying board. Email webcast@cwp.org with questions.
- **Resources** – After the webcast, we will email a resources sheet, speaker contact information, and the presentation.

Watershed & Stormwater Management • Webcast Series

To Adjust How the Slides Appear on Your Screen – To make the slide area larger, go to Full Screen under the Meeting Tab.

To Answer a Poll Question – Polling questions appear during the webcast. To answer a poll question, click on the radio button to the left of your answer and click submit. Do not type your answer in the chat box.

To Ask a Question – The right corner of the screen contains a Q&A chat box. Type your question in the box and click on the send question icon to submit it. We will try to answer as many questions as possible during and after the webcast.



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Webcast Team



Emma Rosi, PhD
Aquatic Biologist
Cary Institute for Environmental Studies



Neely L. Law, PhD
Senior Research Analyst
Center for Watershed Protection



Bill Stack, P.E.
Deputy Directory of Programs
Center for Watershed Protection



Laurel Williamson
Stormwater & Watershed Planner
Center for Watershed Protection

Watershed & Stormwater Management • Webcast Series

POLL QUESTION #1

How many people are participating in the webcast today at your location?

a) Just me
b) 2 to 5
c) 6 to 10
d) More than 10

Watershed & Stormwater Management • Webcast Series

POLL QUESTION #2

Who are you representing today?

- Municipality/Local Government
- State government
- Federal government
- Private consultant
- Nonprofit organization
- University
- Other (tell us in the chat box)

Watershed & Stormwater Management • Webcast Series

Webcast Outline

- Overview of Contaminants of Emerging Concern (Neely Law)
- Our Rivers on Drugs: Part 1 (Emma Rosi)
  - Q & A
- Our Rivers on Drugs: Part 2 (Emma Rosi)
  - Q & A
- Keeping Emerging Contaminants Out of Our Waters (Laurel Williamson)
  - Q&A
- Wrap Up

Watershed & Stormwater Management • Webcast Series

Contaminants of Emerging Concern (CEC)

Term used by EPA and others to

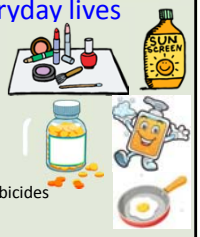
" identify chemicals and other substances that have no regulatory standard, have been recently "discovered" in natural streams… and potentially cause deleterious effects in aquatic life at environmentally relevant concentrations."

https://www.epa.gov/sites/production/files/2015-08/documents/white_paper_aquatic_life_criteria_for_contaminants_of_emerging_concern_part_i_general_challenges_and_recommendations_1.pdf

Watershed & Stormwater Management • Webcast Series

CECs are a part of our everyday lives

- Pharmaceuticals
- Personal care products
- Flame retardants
- Stain resistant fabrics
- Non-stick cookware
- Fragrances
- Formaldehyde
- Plasticizers
- Nanomaterials
- Pesticides and Herbicides





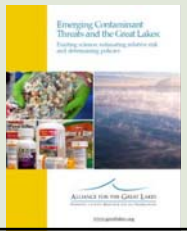


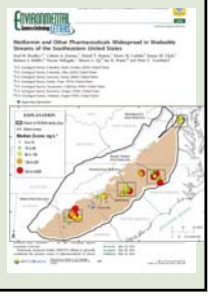


Watershed & Stormwater Management • Webcast Series

From West Coast to East Coast CECs are in our Nation's waters







Watershed & Stormwater Management • Webcast Series

CECs making an impact on the ecosystem

Pesticide atrazine can turn male frogs into females
A potential explanation for declining amphibian populations worldwide

Metaformin and Other Pharmaceuticals Widespread in Wadeable Streams....
1 pharmaceutical found in every stream sampled from 59 small Piedmont streams

FISH ARE ON ANTIDEPRESSANTS, ALLERGY MEDS AND A HOST OF OTHER PHARMACEUTICALS

TOXIC CHEMICALS IN PUGET SOUND
96 of 172 analytes of PCPs detected in at least one sample

As more male bass switch sex, a strange fish story expands

EMERGING CONTAMINANT THREATS AND THE GREAT LAKES
Potential health risk to more than 40M people who rely on Great Lakes for drinking water



Our Rivers on Drugs

Funding
National Science Foundation
Australian Research Council
Wallace Genetic Foundation
Cornell Douglas Foundation
Anonymous donor
Millbrook Garden Club

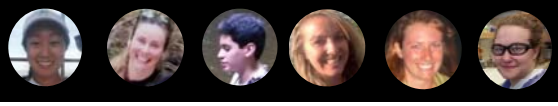
Collaborators
John Kelly
Michael Grace
David Walters

Postdocs
Sylvia Lee
Alexander Reisinger

Graduate Students
Alexis Paspalof
Erinn Richmond
Brad Drury
Miguel Rojas
Amanda McCormick

Undergraduates
Hayley Lemoine
Dillon McQuade
Amanda Herzog
Yashoma Boodna

High School Students
Jason Aguirre
Nikita Morrison
Kaveri Gowda

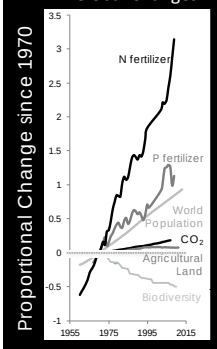


"The chemicals to which life is asked to make its adjustment are no longer merely the calcium and silica and copper and all of the rest of the minerals washed out of the rocks and carried in rivers to the sea; they are the synthetic creations of man's inventive mind, brewed in his laboratories, and having no counterparts in nature."

Rachel Carson, Silent Spring, 1962



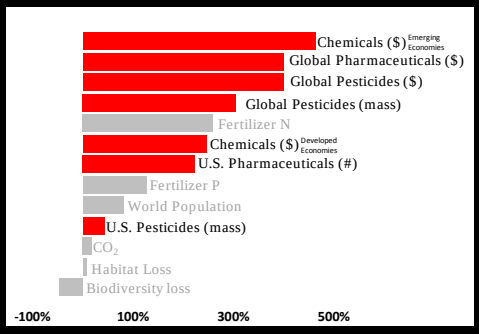
Global Changes*



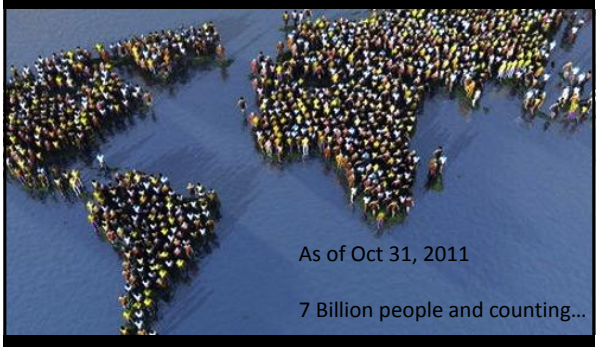
*defined by Millenium Ecosystem Assessment

Bernhardt, Rosi and Gessner, 2017

Rapid Global Increases in Chemical Pollution



% Change since 1970



Pharmaceuticals and personal care products are now a part of river ecosystems



Antibiotics
Antihistamines
Antidepressants
Painkillers
Anticonvulsants
Antimicrobials
Hormones
Fragrances

Insect repellents
Sunscreen
Detergents
Illicit drugs
Cosmetics
Other?

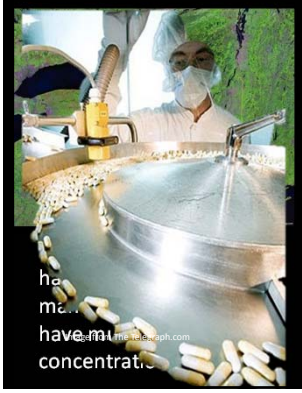
1467 Pharmaceuticals in US

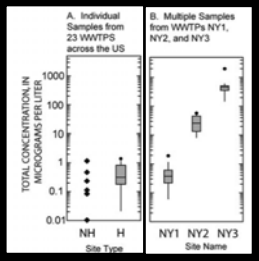
$80 Billion global industry

How do drugs get into rivers?



Manufacturing facilities





Philips et al. 2010

Manufacturing facilities





~90 Pharmaceutical Manufacturing Plants release waste into 1 wastewater treatment plant

Ciprofloxacin Concentration= 32 mg/L
Typical dose= 250-750 mg
~13% of a dose in 1 L of river water
(Larsson et al. 2007)

How do drugs get into rivers?

Use and metabolism

In the US, 3.5 Billion prescriptions filled/year

or 11.9/person (Musson and Townsend 2009)

Non-prescription drugs and personal care products





Metabolism varies by compound and individual

How do drugs get into rivers?

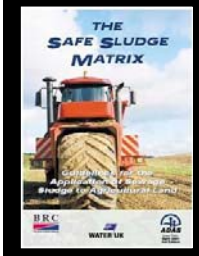
Wastewater treatment plants





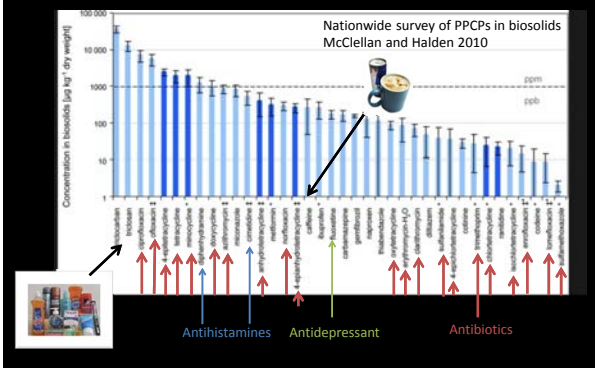
Biosolids

~50% of US Biosolids are land applied (US EPA)





PPCPs in Biosolids



Solid Waste

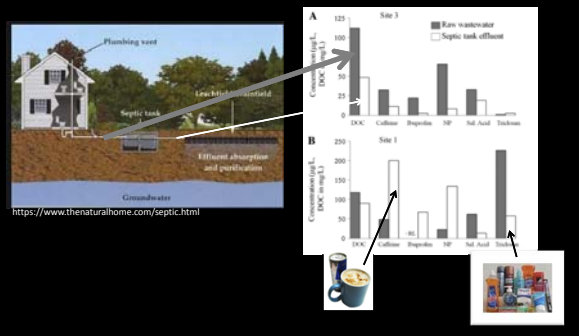
- Disposal of unused PPCPs in US landfills
  - 1388 – 8432 tons of PPCPS/ year*





*Musson and Townsend 2009

Septic tanks



Conn et al. 2010

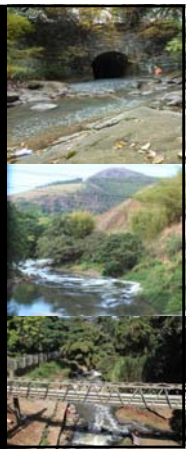
Failing infrastructure in the US

- Each day 32 billion gallons of this wastewater flows through 700,000 miles of underground pipes
- 900 billion gallons of sewage is released into the nation's rivers and streams each year
- American Society of Civil Engineers recently gave the US sewage infrastructure a "D"
- $300 billion needed to upgrade the sewage systems



Global Wastewater Treatment

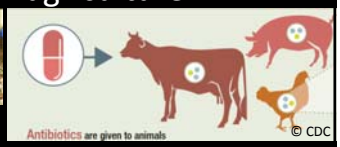
- UN estimates that only 10% of the world's wastewater is treated
- 40% of global population resides in coastal areas and 80-90% of sewage discharge in coastal zones is raw and untreated
- Estimated 200 million farmers grow crops in human wastes (Report from IWMI) and the WHO estimates that 10% of the world relies on this source of food



Drugs in agriculture



By Larry Rana (USDA) [Public domain], via Wikimedia Commons



Over half of antibiotics used in this country are for livestock (Lipsitch et al. 2002)

Links between antibiotic use and antibiotic resistance are of growing concern

Wastes contribute PPCPs in the environment

More than half the hogs and chickens in the US are raised in large facilities (USDA Census 2012)

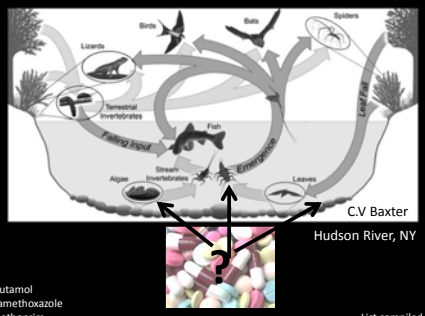
Watershed & Stormwater Management • Webcast Series

Questions?



What do drugs do in rivers?

1,7 Dimethylxanthine
Antipyrine
Benzoylechomine
Acetamninophen
Caffeine
Carbamazepine
Cimetidine
Cocaine
Codeine
Cotinine
Diphenhydramine
Ditiazem
EDDP
Fluoxetine
Hydrocodone
MDA
MDEA
MDMA
Metformin
Methadone
Methamphetamine
Morphine
Nicotine
Norcocain
Paraxanthine
Ranitidine
Salbutamol
Sulfamethoxazole
Trimethoprim
Thiabendazole



Hudson River, NY

List compiled by Paspalof, A. M.S. Thesis

Algae in streams



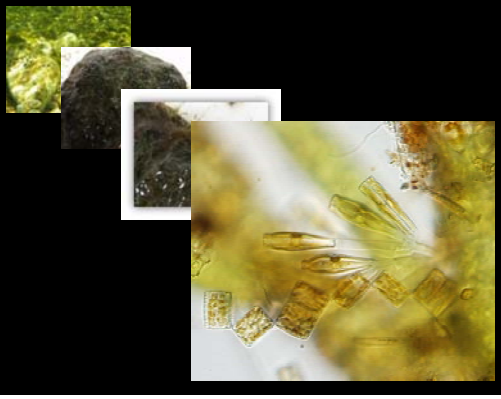
Algae in streams



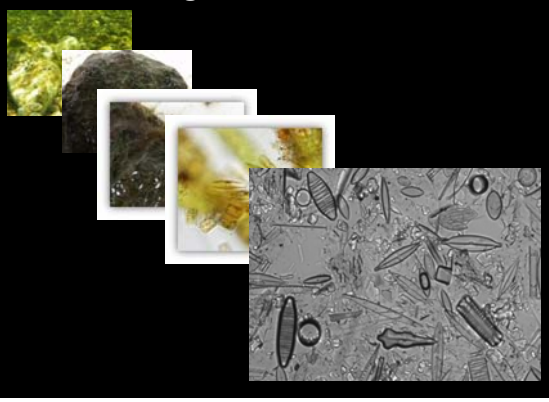
Algae in streams



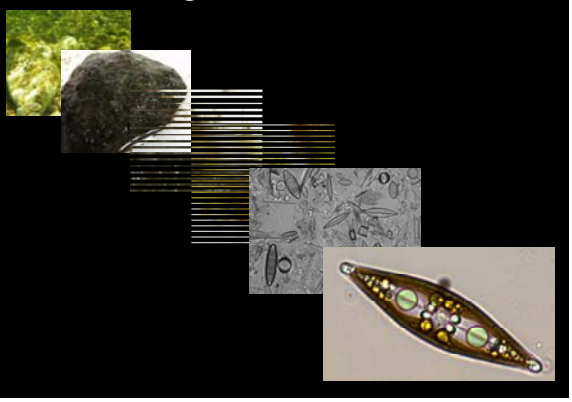
Algae in streams



Algae in streams



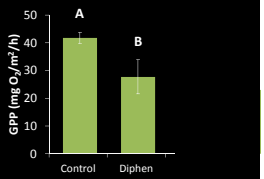
Algae in streams



Algae on drugs

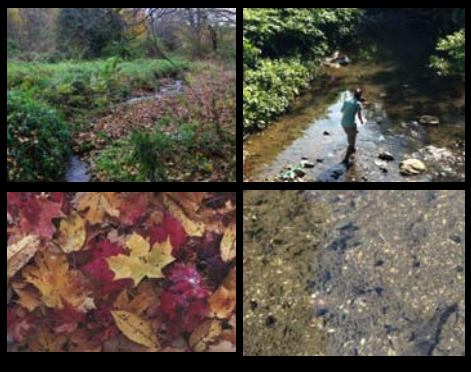
PPCPs that suppress algae:

Triclosan
Diphenhydramine
Amphetamines
Antidepressents (SSRIs)
Combinations of drugs

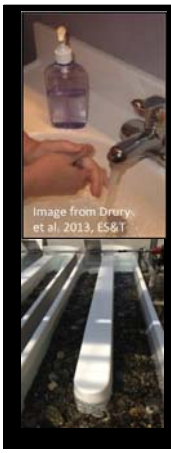


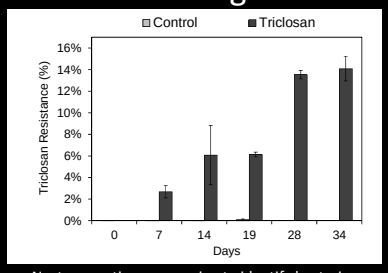


Bacteria in streams



Bacteria on drugs

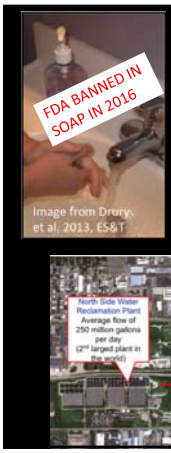


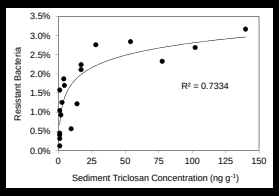


- Next generation sequencing to identify bacteria
- Triclosan altered the composition of bacterial communities

Drury et al. 2013 ES&T

Bacteria on drugs

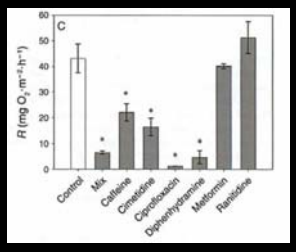






Bacteria on drugs





Suppressed activity of bacteria

Changed species composition
(diphenhydramine, but not caffeine)

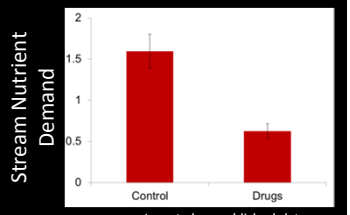
Rosi-Marshall et al. 2013, Eco Apps

Algae and bacteria on drugs





- Mimicked Baltimore stream water, which contains numerous urban chemical stressors
- Also found that more stressed streams were not as affected by PPCPs – 'tougher' microbial community?



Lee et al. unpublished data

Bugs in streams





Photos courtesy of Society for Freshwater Science

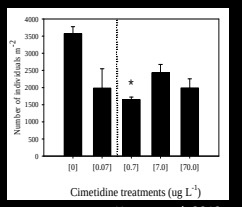
Bugs on drugs







- Tagamet® - **H_2 histamine antagonist** that prevents secretion of stomach acid
- Cimetidine was approved 1977 and first drug to reach more than 1 billion dollars in sales/y.
- Invertebrates use histamines as neurotransmitters
- At concentrations detected in US rivers, cimetidine reduced populations of invertebrates



Hoppe et al. 2013

Bugs on drugs



- Antidepressants (SSRIs such as Prozac and Celebrex) and Amphetamine
- Invertebrate response
  - Increased size of caddisflies
  - Increased emergence of chironomids

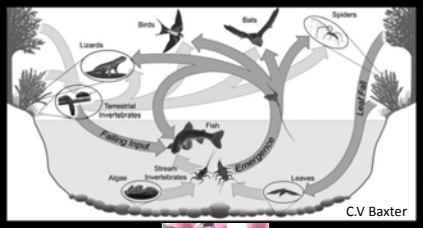






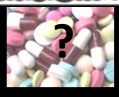
Richmond et al. 2016, Lee et al. 2016

What do drugs do in rivers? A work in progress…



C.V Baxter

Mortality/Growth
Behavior modification
Community structure



Movement of PPCPs through food webs
Ecosystem function
Biogeochemical transformations

A holistic view is needed to understand the effects on aquatic ecosystems

Rivers have a mix of drug "cocktails"

1,7 Dimethylxanthine
Antipyrine
Benzoylechomine
Acetamninophen
Caffeine
Carbamazepine
Cimetidine
Cocaine
Codeine
Cotinine
Diphenhydramine
Ditiazem
EDDP
Fluoxetine
Hydrocodone
MDA
MDEA
MDMA
Metformin
Methadone
Methamphetamine
Morphine
Nicotine
Norcocain
Paraxanthine
Ranitidine
Salbutamol
Sulfamethoxazole
Trimethoprim
Thiabendazole



1467 Pharmaceuticals in US
Plus other stressors…

Aren't PPCPs Regulated?

- EPA regulates the release of sewage, but not PPCPs specifically
- PPCPs are not listed aquatic contaminants
- FDA regulates safety of drugs

The effects of PPCPs on the environment are not well understood and currently not well regulated



What can you do?

- Reduce use of pharmaceuticals and personal care products when possible
- Properly dispose of unwanted medications
  - "Take back" programs
  - Dispose of as solid waste as recommended by EPA
- Urge lawmakers (local, state and national) to maintain and upgrade sewage infrastructure and WWTPs



http://www.ct.gov/deep/

Support this type of research-currently under funded



Questions?



Keeping Emerging Contaminants Out of Our Waters

Laurel Williamson
Center for Watershed Protection
Webcast: March 24, 2017

Options to Reduce CECs

1. **Stop making them**
2. **Stop using & releasing them to the environment**
3. **Remove them from the environment**

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#1: Stop Making Them



Source Control

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Green Industry/Chemistry

- **EPA Definition:**

The design of chemical products and processes that reduce or eliminate the use or generation of hazardous substances. Applies across the life cycle of a chemical product, including its design, manufacture, use, and ultimate disposal.

https://www.epa.gov/greenchemistry/basics-green-chemistry#definition

- Making products "benign by design"
- Consumers can't be expected to understand implications of all ingredients…
- Who is accountable in absence of regulatory framework?
  - Onus on manufacturer or gov't?

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Product Bans / Product Substitution

- Regulatory approach

Examples

- In 2016, FDA Bans 19 Chemicals Used In Antibacterial Soaps
- Microbead-Free Waters Act of 2015



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#2: Stop Releasing Them



Pollution Prevention

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Manufacturing Stewardship

- Pharmaceuticals, personal care products, plastics, chemical factories
- How to contain & treat high concentrations?
- CEC levels not regulated in United States
- Permit to discharge (past industries):
  - Pre-treatment of industrial waste prior to discharge to WWTP
  - Or pay surcharge
- Eventually, same approach may apply to CECs?



Terne 2/Flickr: Source

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Agricultural Stewardship

- Reduce use of antibiotics & growth hormones
- Application of biosolids, poultry litter on crop fields



Espregao2/Flickr: Source



Ravenz Shadow/Flickr: Source

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Consumer Stewardship

- Stay informed
  - *Environmental Working Group*
- Don't use antibacterial soaps
- Purchase biodegradable detergents
- Organic & natural products
- Hazardous waste drop-offs
- Don't flush old meds (septic & sanitary sewer)
- Drug take-back programs



Flickr/Tim Dickinson

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Consumer Stewardship

- Drug database: *FASS* (Sweden)
  - toxicity
  - persistence
  - bioaccumulation

www.FASS.se



Jamie/Flickr: Source

Environmental Health News, Feb 4, 2009:
http://www.environmentalhealthnews.org/ehs/news/benign-drugs-by-design

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Septic Systems: Maintain Infrastructure

- Septic effluent is pervasive, diffuse source of CECs
- Research being done on better septic designs for CEC removal
- **Zimmerman, et al:** USGS study of septic system design & impact on CECs

Pump out septic tank every few years



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Sanitary Sewer: Advanced Treatment

- Intersex in rainbow darter fish went from 70% ***down to <10% in one year, then 0% after 3 years***
- WWTP changed the aeration tank to reduce toxic ammonia
- Microorganisms reduced endocrine disruptors while reducing nitrogen



Photo: Chesapeake Bay Program

Reduction of Intersex in a Wild Fish Population in Response to Major Municipal Wastewater Treatment Plant Upgrades
Keagan A. Hicks, Meghan L. M. Fuzzen, Emily K. McCann, Maricor J. Arlos, Leslie M. Bragg, Sonya Kleywegt, Gerald R. Tetreault, Mark E. McMaster, and Mark R. Servos
Environmental Science & Technology **2017** 52 (3), 1811-1819
DOI: 10.1021/acs.est.6b05370

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Sanitary Sewer Network: It's Leaky

- Allowable leakage: 1,650 gallons per mile of standard sewer pipe (ASTM, 2009)
- Infiltration *and* exfiltration
- Major culprits
  - Old pipes
  - Exposed pipes near streams
  - Sewer pipes above stormwater pipes

Sewage pipe leak



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Illicit Discharges - Sewage

Sewage Examples

1. Overflowing sanitary sewer overflow (SSOs)
2. Combined sewer overflows (CSOs)
3. Sewage cross-connected to storm drain system
4. Broken sewer lines
5. Failing septic systems

Sewer overflow



Illicit Discharges

Other Examples

6. Laundry pipes cross-connected to the storm drain system
7. Car washing
8. Paint, oil, concrete dumping
9. Trash dumping
10. Many more!

Persistent laundry discharge



Illicit Discharges

Potential CECs:

- Pharmaceuticals
- Birth control hormones
- Synthetic fragrances
- Detergents
- Disinfectants
- Preservatives
- Caustic chemicals

Illicit Discharges = widespread source of CECs

Persistent sewage discharge



#3: "Remove" Them



Remediation

CECs Pathways: Urban Stormwater

Beyond septic systems and wastewater treatment plants…

- Pesticides & herbicides
- Fuel additives
- Car washing
- Open dumpsters, trash trucks, old trash dumps
- Construction sites, building materials
- WWTP biosolids used for fertilizer

Removal & Role of Stormwater BMPs

Stormwater BMPs

- Sequestration & breakdown (?) of CECs
- Settle in sediments
- Must take sediment to hazmat landfill
- Potential for phytoremediation?



- *See upcoming Watershed Science Bulletin article*
- Chesapeake Stormwater Network reports:

http://chesapeakestormwater.net/2016/03/urban-toxic-contaminants-in-the-chesapeake-bay/



Paula J.C. Favas, João Pratas, Mayank Varun, Rohan D'Souza and Manoj S. Paul (2014). Phytoremediation of Soils Contaminated with Metals and Metaloids at Mining Areas: Potential of Native Flora, Environmental Risk Assessment of Soil Contamination, Dr. Maria C. Hernandez Soriano (Ed.), InTech, DOI: 10.5772/57469.

The Stormwater/Watershed Manager

- Other things on the mind! (e.g., bacteria, nutrients, sediment)
- CECs are not usual bailiwick

BUT…

What are SW and WS managers *already doing* that could relate to contaminants of emerging concern?

The Stormwater/Watershed Manager

MS4 Program

- Illicit Discharge Detection & Elimination (IDDE)
- Addresses a potentially major pathway of CECs into urban waters
- Chesapeake Bay communities can get Bay TMDL credit for eliminating high-nutrient illicit discharges



See http://chesapeakestormwater.net/bmp-resources/illicit-discharge-detection/

The Stormwater/Watershed Manager

Other MS4 Program activities:

- Good housekeeping of municipal sites
- NPDES inspections – construction sites, industrial sites
- Public education & outreach activities
- Storm drain cleaning
- Trash capture
- Stormwater BMP inspections & maintenance

Watershed Approach to CECs

- San Francisco Bay: *Contaminants of Emerging Concern Strategy*
- Regional Monitoring Program (San Francisco Estuary Institute)
- CEC risk to wildlife
- Tiers I (possible concern) to IV (high concern)

Four CECs of *moderate* concern:

1. a stain and water repellent (PFOS)
2. a widely used insecticide (fipronil)
3. a class of detergent ingredients (nonylphenols and nonylphenol ethoxylates)
4. a once-common class of flame retardants (PBDEs)

Questions?



Summary

- CECs are in our environment with ecosystem-scale effects
- Worldwide & daily use of products discharged to local streams
  - Wastewater treatment plants, septic systems, illicit discharges, biosolids, solid waste, antibiotics/hormone use in agriculture
- Cross-sector issue of wastewater /stormwater/ public health
- Stormwater programs can have an impact (measurable or not) using currently available tools such as IDDE, Education & Outreach
- Research to further develop tools for detection & advance source control and treatment measures

Upcoming Webcasts

2017 National Watershed& Stormwater Conference

April 4th, 2017 Online or In person

http://www.cwp.org/2017-national-conference/

Registration closes March 29th!

The 2017 Webcast Series

- Webcast 2: Nutrient Trading, May 17
- Webcast 3: Making Urban Trees Count, June 21
- Webcast 4: Stream Restoration: Where Are We Now?, September 13
- Webcast 5: Bringing Better Site Design into The 21st Century, October 18
- Webcast 6: Modeling for Water Quality, November 15

Register at: http://www.cwp.org/webcasts

Questions, please email webcast@cwp.org

Post-Webcast Information

- Participation Certificate – Participation certificates are also available. If you have multiple attendees, please save the certificate to your computer. You can type the attendees name in the name field and then print the certificate.



The Center for Watershed Protection Association (CWPA)

- *A forum for sharing ideas, resources, and expertise*
- *Training, education, collaboration, and professional development*

Benefits include:

- *Webcast discounts – save hundreds*
- *Watershed Science Bulletin online articles*
- *Free access to Online Watershed Library*
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- *Exclusive training for members*

Visit us at **www.cwp.org/benefits** for more information

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Stormwater & Watershed Planner
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Thanks for Attending Contaminants of Emerging Concern

Cary Institute of Ecosystem Studies

Images courtesy of E. Rosi and from http://www.scwd.org/

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Making Urban Trees Count

AMERICAN FORESTS

Montgomery Associates

Watershed & Stormwater Management • Webcast Series

Welcome to the Webcast

- **Continuing Education Credits** – We are offering PDHs for our watershed and stormwater management webcast series. A registered attendee must watch the entire webcast to be eligible to earn the CEU. A pdf Certificate of Completion will be sent out after webcast to the person who registered for the webcast. The varying nature of certification requirements for each state means we cannot guarantee that CEU's will be awarded and it is up to the individual to determine if CEU's or PDH's will be awarded based on the policies of their local certifying board. Email webcast@cwp.org with questions.
- **Resources** – After the webcast, we will email a resources sheet, speaker contact information, and the presentation.

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To Adjust How the Slides Appear on Your Screen – To make the slide area larger, go to Full Screen under the Meeting Tab.

To Answer a Poll Question – Polling questions appear during the webcast. To answer a poll question, click on the radio button to the left of your answer and click submit. Do not type your answer in the chat box.

To Ask a Question – The right corner of the screen contains a Q&A chat box. Type your question in the box and click on the send question icon to submit it. We will try to answer as many questions as possible during and after the webcast.



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Webcast Team



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POLL QUESTION #1

How many people are participating in the webcast today at your location?

a) Just me
b) 2 to 5
c) 6 to 10
d) More than 10

Watershed & Stormwater Management • Webcast Series

POLL QUESTION #2

Who are you representing today?

- Municipality/Local Government
- State government
- Federal government
- Private consultant
- Nonprofit organization
- University
- Other (tell us in the chat box)

Watershed & Stormwater Management • Webcast Series

Webcast Outline

- Overview of Crediting Trees for Stormwater Management (Karen Cappiella)
  - Existing and Current National Framework
- Water Balance Modeling Approach to Derive Credit (Justin Hynicka)
  - Q & A
- National Credit Framework Application (Karen Cappiella)
  - Q & A
- Integrating Tree Canopy Interception into a Stormwater Design Model Requirements (Steve Gaffield & Dane Wudel)
  - Q&A
- Wrap Up

Making Urban Trees Count

Karen Cappiella, Center for Watershed Protection

June 21, 2017

Trees and Stormwater

i-Tree Tools for Assessing and Managing Forests & Community Trees





TREES STORMWATER

www.treesandstormwater.org



Regulatory Context

- Stormwater management requirements
- MS4 permits
- TMDLs
- CSOs



Stormwater BMP "Credits"

- Simple calculation using accepted engineering methods/models
- Credit calculation based on studies of pollutant removal performance
- BMP specification
- Qualifying conditions/verification

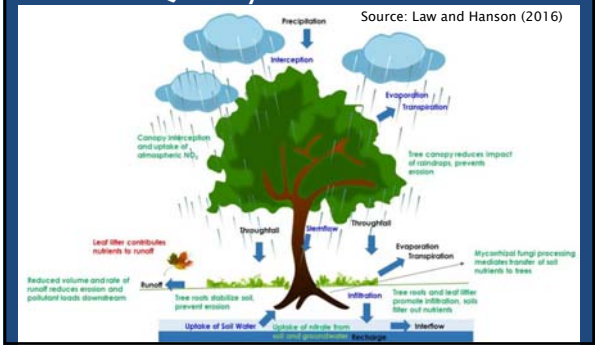
Urban Trees are Different





- No defined drainage area
- Large number of variables affect performance
- Benefits INCREASE over time
- Harsh urban conditions
- Concerns about maintenance

Water Quality Benefits of Trees



Literature Review and Synthesis

- Review of 159 publications, completed in 2016
- Limited studies that directly measure WQ
- Research reports with different metrics and timescales
- Number of factors affect tree growth and performance
- Emerging issue of how to address leaf litter

Review of Existing Credit Systems

- Existing versus new trees
- Individual tree versus forest
- Evergreen versus deciduous
- Impervious cover or volume based
- Qualifying conditions

Tree Planting Credit Summary

Community	Type of Credit	Credit for a Deciduous Tree
Sacramento, San Jose and Santa Clara Valley, CA; Portland, OR; Indianapolis, IN; Philadelphia, PA	IC	100ft^2
Seattle, WA	IC	20ft^2
Pine Lake, GA	Volume	<12" DBH: 10 gallons/in; >12" DBH: 20 gallons/in
Washington, DC	Volume	10ft^3
Vermont	Volume	5ft^3
Minnesota	Volume and P load	Depends on soil volume and other factors
Chesapeake Bay Program	N, P and S load	Conversion of 144ft^2 to tree canopy land use

National Credit Framework

- Provide science-based credit to encourage use of trees to meet stormwater management requirements
- U.S. Forest Service grant
- Variables:
  - Location
  - Regulatory context
  - Currency

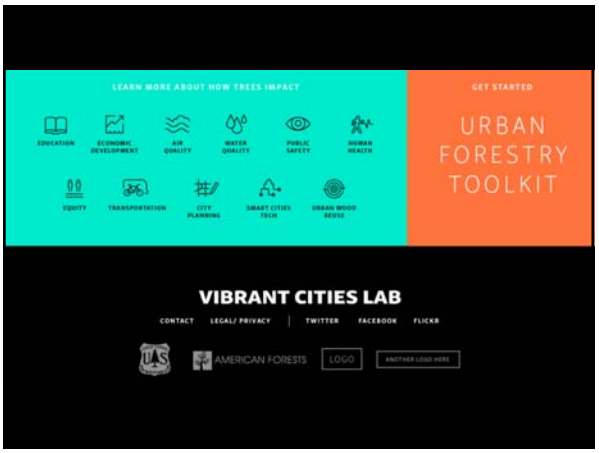
Tree Crediting Framework

- DRAFT, review comments being incorporated
- Applies to trees planted in the urban environment
- Two credits:
  - Pollutant Load Reduction Credit for Tree Planting (TMDL)
  - Volume Reduction Credit for Stormwater Performance

Relative Reductions in Annual Water Yield and Non-Point Source Pollutant Loads by Urban Trees

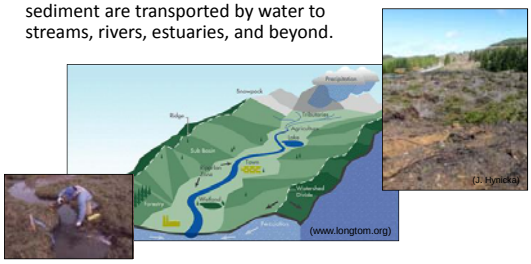
Justin Hynicka, American Forests





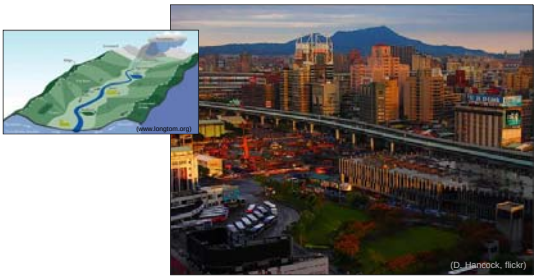
Why water balance, and what does it look like?

- Water balance is a mathematical framework that accounts for all additions and losses of water from a drainage area.
- Regardless of the source, nutrients and sediment are transported by water to streams, rivers, estuaries, and beyond.

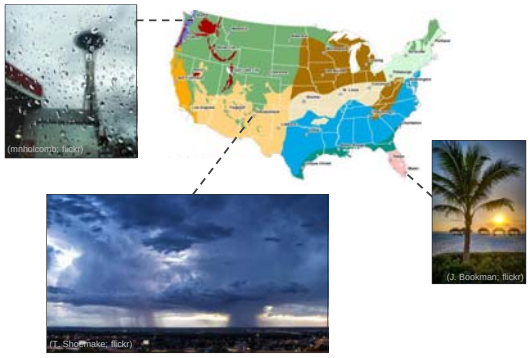


Water outputs are difficult to measure at the site scale

- Water balance modelling is the best approach for estimating the impacts of long-term practices in complex watersheds.



Challenges at the national scale: location matters



Challenges at the national scale: location matters

- Daily climate data from 31 cities across the continental U.S. and Hawaii.
- NCDC– Local Quality Controlled Climate Data
- NSRD– Physical Solar Model



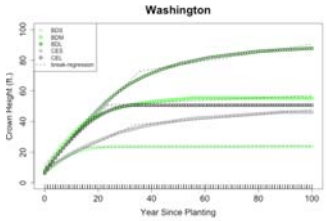
Challenges at the national scale: tree selection

- For each city, we identified 5 native tree species with a wide range of physical characteristics



Challenges at the national scale: tree selection

- For each city, we identified 5 native tree species with a wide range of physical characteristics
- Obtained key physical attributes near maturity for those trees using i-Tree Forecast (U.S. Forest Service).



~~Challenges at the national scale: soils~~

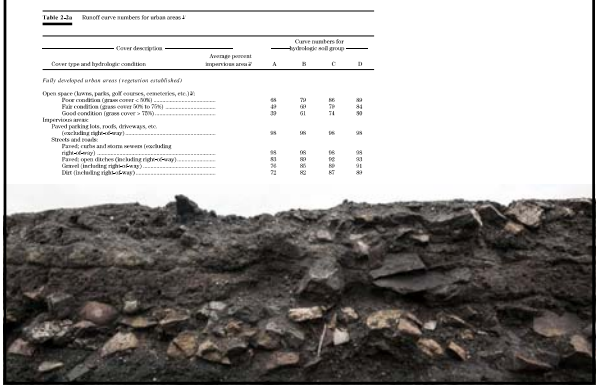
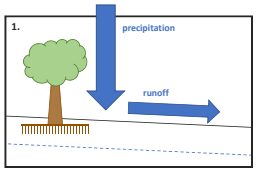


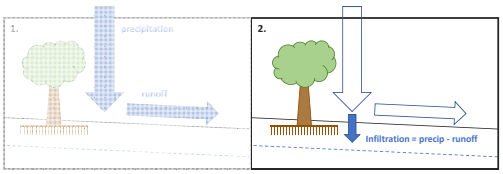
Table 2-2a Runoff curve numbers for urban areas 1/

Cover description		Curve numbers for hydrologic soil group			
Cover type and hydrologic condition	Average percent impervious area 2/	A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.)3/:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89

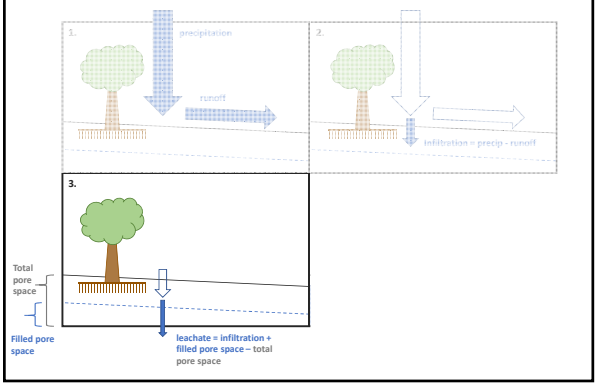
Step-wise water balance calculations: runoff



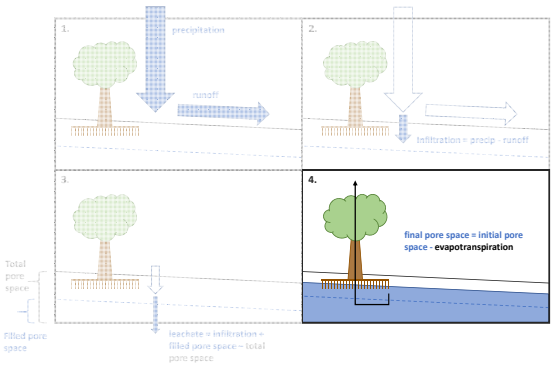
Step-wise water balance calculations: infiltration



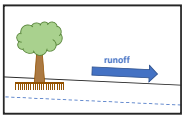
Step-wise water balance calculations: vertical soil leaching



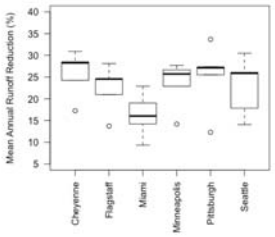
Step-wise water balance calculations : soil storage



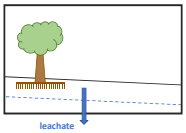
Relative runoff reduction by trees for soil group C



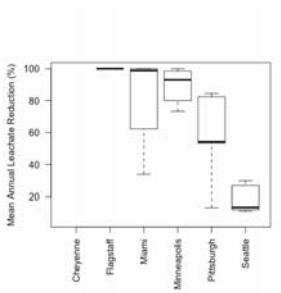
- Non-point source pollutant concentrations display low variability
- Reduction in runoff volume causes an equivalent reduction in total nitrogen, phosphorus and suspended sediment loads



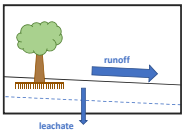
Relative leaching reduction by trees for soil group C



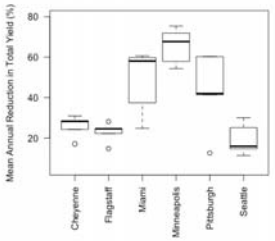
- Leachate reductions apply only to soluble forms of nitrogen and not phosphorus, which tends to be immobile in soils.



Relative reduction in total water yield by trees for soil group C



- Total reductions apply only to soluble forms of nitrogen and not phosphorus, which tends to be immobile in soils.



Summary

- Used a relative water balance approach to evaluate the impact of urban trees on water yield and non-point source pollution loads compared to turf grass.
- Calculated for 31 cities representing 11 broad climate regions with five tree species and five soil groups
- Relative runoff results are area normalized, which masks the water reduction benefits of larger tree species





Questions?



Pollutant Load Reduction Credit for Tree Planting

- Relative (%) TN, TP and TSS loading rate reductions
- Annual basis
- For annual TMDL credit
- Does not apply to trees planted in BMPs, riparian zones or reforestation projects

Assumptions/Caveats

- Values represent average annual results (e.g., tree species, climate zone)
- Tree has no upstream drainage area
- Credit for trees over IC does not account for underlying soil conditions
- Reduction of TP and TSS = relative runoff reduction
- TN relative load reduction based on combined effects of runoff reduction and infiltration/leachate

Pollution Load Reduction Credit Tool


Pollutant Load Reduction Credit Tool for Urban Tree Planting

CENTER FOR WATERSHED PROTECTION

Welcome to the Pollutant Load Reduction Credit Tool for Urban Tree Planting. This credit was developed by the Center for Watershed Protection with funding from the U.S. Forest Service's National Urban and Community Forestry Advisory Council grant program.

Background

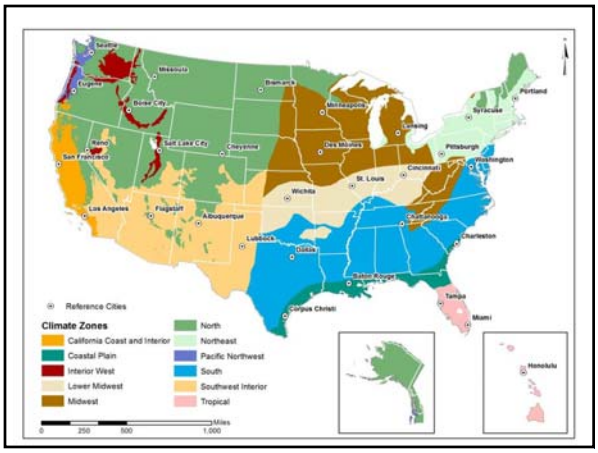
This national credit can be adopted by regulatory entities who wish to offer a scientifically defensible credit that encourages greater use of trees for meeting total maximum daily load (TMDL) requirements. The credit quantifies an annual reduction in nutrient and sediment loads relative to the pollutant loading rate of the underlying land cover (i.e., turf or impervious cover). The credit applies to trees planted in the urban environment, but generally does not apply to riparian buffers, large-scale reforestation projects or trees planted in engineered soils, such as bioretention or structural soils.

The Pollutant Load Reduction Credit for Urban Tree Planting was developed using a water balance model to estimate the mean annual water yield (rainfall that leaves the site through runoff or leaching) for a single tree at maturity planted over turf or impervious cover, compared to water yields for those same sites without trees. The model was run for the four hydrologic soil groups (HSG) for five tree types at 31 locations in 11 climate regions. The modeling results were used to calculate relative reductions of total nitrogen (TN), total phosphorus (TP) and total suspended sediment (TSS). The credit also incorporates i-Tree Forecast modeling results to allow credit users to easily translate the number of trees planted into an acreage of urban tree canopy that will provide pollutant reduction benefits at maturity. Documentation of the model and process used to develop the credit is provided in Hynicka (2017).

Instructions

The Climate Zone Map worksheet provides a map of the 11 climate zones in the water balance model used to develop the Pollutant Load Reduction Credit for Tree Planting. Model results are presented in the form of lookup tables for each climate

Instructions | Climate Zone Map | Lookup Tables | Credit Calculator | Lookup2(background)(hide)



Credit Lookup Tables

Broadleaf Deciduous large (BDL)		Loading Rate Reduction (%)	
Soil Type/Land Cover	Pollutant	Optimal Credit	Reduced (30%) Credit
HSG-A, pervious	TP, TSS	27.8	19.4
HSG-A, pervious	TN	46.3	32.4
HSG-BCD, pervious	TP, TSS	22.4	15.7
HSG-B, pervious	TN	38.7	27.1
HSG-C, pervious	TN	33.8	23.7
HSG-D, pervious	TN	31.2	21.8
Unknown soil type, pervious	TP, TSS	22.4	15.7
Unknown soil type, pervious	TN	33.8	23.7
Impervious cover	TP, TSS, TN	2.7	1.9

Credit Calculation Inputs

- Climate region
- Tree type
- Soil type
- Land cover
- # trees planted
- Qualifying conditions met?
- Pollutant loading rates

Credit Calculation

*Tree canopy (acres) * relative pollutant loading rate reduction * pollutant loading rate (lbs/ac/yr) = annual pollutant load reduction associated with tree planting (lbs/yr)*

*Number of trees planted * canopy area of the tree planted at maturity = tree canopy (acres)*

Next Steps

- Credit documentation, lookup tables and calculator will be available soon
- Regulatory entities can incorporate into crediting systems
- Volume Reduction Credit for Stormwater Performance

Questions?



Integrating Tree Canopy Interception into a Stormwater Design Model

Center for Watershed Protection Webcast
June 21, 2017
Steve Gaffield & Dane Wudel

Project Overview

- Stormwater study for future redevelopment at University of Wisconsin-Madison
- Volume control driven by lake flooding
  - Maintain native vegetation runoff
- TSS control driven by MS4 permit & TMDL



Green Infrastructure Approach



Chicago Center for Green Technology

- Bioretention
- Permeable pavement
- Green roofs
- Rainfall harvesting & reuse
- Native landscaping
- Trees

Wisconsin Regulations

- Continuous analysis for stormwater volume and water quality
- 1981 specified as typical year
- Only use non-frozen precipitation period (March 12 – December 2 in Madison area)
- No policy on trees and runoff reduction

WinSLAMM Design Model

- Rainfall-runoff-pollutant loading model
- Chosen for compatibility with other campus work
- Widespread use & regulatory acceptance in Wisconsin
- Doesn't simulate trees

SLAMM for Windows
Source Loading and Management Model
WinSLAMM Version 10.2

PV & Associates

Winslamm.com

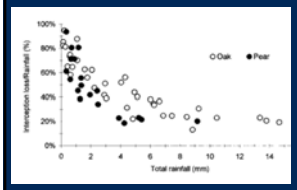
Tree Modeling Approach

- Proof-of-concept
- Integrate with SLAMM
- Modify rainfall input to simulate interception
- Change in soil & runoff generation not simulated



(USEPA, 2016)

Tree Canopy Interception

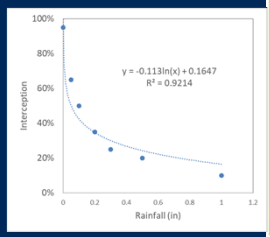


(Xiao et al., 2000)

- Literature indicates interception increases with rainfall
- Approx. 0.1 inch max.
- Monitoring data from California study
- No Wisconsin data

Modeling Interception

- Regression based on Xiao data
- Similar relationship in Belgian study (Staelens et al. 2007)
- Seasonal weighting for leaf growth



Some Limitations

- Based on limited data (but could easily refine with more / local data)
- Only considers areas with full canopy coverage
- Does not consider antecedent moisture in the canopy

Interception Simulation

- Applied regression to 1981 rainfall series
- Reduced rainfall accordingly
- Interception reduced annual rainfall by 12%

April 12, 1981 example

% Interception = -0.113 ln(0.13")+0.1647 = 39.5%

Leaf growth adjustment for April = 0.5

Interception depth = (0.13")(39.5%)(0.5) = 0.026"

Adjusted precipitation = 0.13" – 0.026" = 0.10"

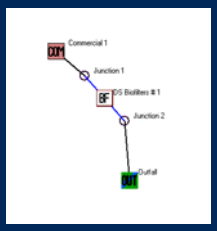
Spreadsheet Model

Standard WinSLAMM rain file | Modification for tree interception

Rain Start		Rain Stop		Daily Depth (in)	Interception % No seasonal adjustment	Interception (in) No seasonal adjustment	Seasonal Multiplier	Interception (in)	Adjusted Daily Precip (in)
1/1/1981	5:00	1/1/1981	8:00	0.03	56%	0.017	0	0.000	0.030
1/6/1981	4:00	1/6/1981	12:00	0.06	48%	0.029	0	0.000	0.060
1/6/1981	19:00	1/6/1981	20:00	0.01	69%	0.007	0	0.000	0.010
1/15/1981	23:00	1/16/1981	0:00	0.01	69%	0.007	0	0.000	0.010
1/31/1981	23:00	2/1/1981	5:00	0.11	41%	0.046	0	0.000	0.110
2/5/1981	17:00	2/5/1981	23:00	0.05	50%	0.025	0	0.000	0.050
2/6/1981	22:00	2/7/1981	3:00	0.06	48%	0.029	0	0.000	0.060
2/8/1981	3:00	2/8/1981	4:00	0.01	69%	0.007	0	0.000	0.010
2/9/1981	5:00	2/9/1981	6:00	0.01	69%	0.007	0	0.000	0.010
2/10/1981	2:00	2/10/1981	22:00	0.38	27%	0.100	0	0.000	0.380
2/21/1981	22:00	2/22/1981	17:00	1.58	11%	0.100	0	0.000	1.580
2/23/1981	4:00	2/23/1981	19:00	0.06	48%	0.029	0	0.000	0.060
2/27/1981	3:00	2/27/1981	16:00	0.24	33%	0.078	0	0.000	0.240
3/10/1981	19:00	3/10/1981	21:00	0.08	45%	0.036	0	0.000	0.080
3/25/1981	21:00	3/26/1981	1:00	0.07	47%	0.033	0	0.000	0.070
3/29/1981	2:00	3/29/1981	5:00	0.05	50%	0.025	0	0.000	0.050
3/29/1981	11:00	3/29/1981	13:00	0.06	48%	0.029	0	0.000	0.060
3/29/1981	20:00	3/30/1981	5:00	0.07	47%	0.033	0	0.000	0.070
4/3/1981	8:00	4/3/1981	9:00	0.02	61%	0.012	0.5	0.006	0.014
4/3/1981	23:00	4/4/1981	3:00	0.26	32%	0.082	0.5	0.041	0.219
4/7/1981	20:00	4/8/1981	8:00	0.71	20%	0.100	0.5	0.050	0.660
4/8/1981	15:00	4/8/1981	21:00	0.41	27%	0.100	0.5	0.050	0.360
4/10/1981	20:00	4/10/1981	23:00	1.06	16%	0.100	0.5	0.050	1.010
4/12/1981	3:00	4/12/1981	4:00	0.13	40%	0.051	0.5	0.026	0.104
4/13/1981	19:00	4/14/1981	1:00	0.32	29%	0.094	0.5	0.047	0.273
4/16/1981	14:00	4/16/1981	15:00	0.01	69%	0.007	0.5	0.003	0.007

Runoff Simulation

- Used edited rain file in WinSLAMM
- Simulated parking lot
- Annual runoff volume & TSS load reduced by 11% with tree cover
- Significantly improved "downstream" biofiltration performance



Next Steps?

Wisconsin

- Regulatory interest?
- Local data (runoff & water quality)
- Refine interception modeling
- Include effect on soil infiltration

Elsewhere

- Canopy interception method could be applied to precipitation input to other stormwater models

Questions?



Trees and Stormwater Research

- CWP/University of MD/Virginia Tech/The Conservation Fund/US Forest Service/Chesapeake Bay Trust
- Washington State University
- WE&RF
- University of Tennessee at Knoxville

Watershed & Stormwater Management • Webcast Series

Upcoming Webcasts

- Webcast 4: Stream Restoration: Where Are We Now?, September 13
- Webcast 5: Bringing Better Site Design into The 21st Century, October 18
- Webcast 6: Modeling for Water Quality, November 15

Register at: http://www.cwp.org/webcasts
Questions, please email webcast@cwp.org

Watershed & Stormwater Management • Webcast Series

Post-Webcast Information

- Participation Certificate – Participation certificates are also available. If you have multiple attendees, please save the certificate to your computer. You can type the attendees name in the name field and then print the certificate.



Watershed & Stormwater Management • Webcast Series

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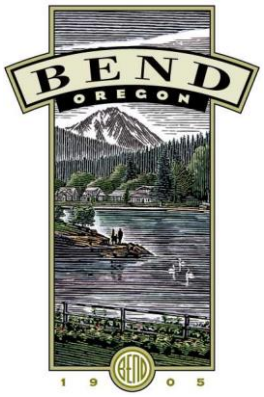
Thanks for attending
Making Urban Trees Count

AMERICAN FORESTS

Montgomery Associates

Appendix G

Municipal Operations and Maintenance Activities



Sweeping Operations Plan

1/24/2011

Purpose

The City of Bend's Sweeping Operations Plan is designed to organize reasonable, cost effective maintenance efforts for keeping City streets and bike lanes clear of debris and hazardous materials. In this plan, streets are divided into major arterials, collectors and residential areas. The objective is to have a comprehensive plan that allows for systematic cleaning of first major arterials, collectors, residential streets and then bike Lanes.

This plan will define how the level of services meets the needs and goals of the community. Based on information gathered from an annual City Customer Survey, as well as oral and written feedback received by Public Works staff, the community's needs are identified. The sweeping operations plan is organized around that data, incorporating staff and equipment availability.

Operations

Scheduling

Scheduling is based on community needs as well as weather conditions. The Street Division operates three street sweepers 40 hours a week. Sweepers do not operate on Saturday and Sunday unless it is an emergency situation. The 4am sweeper operation is assigned to sweep collectors and arterials on a daily basis. The downtown core is swept in the early morning hours once a week. The community has agknowledged bike lanes as seasonal priority, arterials are swept at least twelve times per year. All City streets are swept a minimum of four times per year. Weather is a major component in scheduling during the winter months. Throughout the winter season, when temperatures allow, sweepers are mobilized in order to collect any traction materials that have been used. As soon as the winter weather conditions cease, six street sweepers are used to collect traction aids (sand/cinders) left on the streets.

Routes

The City is broken down into 8 geographical sweeping areas. Each area requires various hours to complete. Each sweeping vehicle contains a notebook size map of the sections with identified boundaries. Sweeper operators are assigned sections on a daily/weekly basis. Large area maps are used by Streets Supervisors to define and refine areas based on community needs. These maps are located in the Streets and Operation crew room. Routes are assessed for accuracy and edited as needed once per year.

Environmental Concerns

Regular sweeping reduces the amount of dust in the air, contributing to a healthier environment. The City of Bend sweepers have been upgraded and continue to be upgraded to provide the most effective,

environmentally conscious removal of debris. Flushing of City streets is not done in the City of Bend due to the stormwater system currently in place and the possibility of contamination.

Leaf, Debris, Litter Collection

Sweepers are used both for street debris and leaf collection. Property owners are responsible for collection and removal of leaves on their property, but the City sweepers will pick up leaves in the street. Litter is collected in median strips and right-of-ways when the landscape maintenance crews go through areas in need of pruning and weeding. The City also operates an Adopt-A-Road program whereby volunteer groups collect trash and litter throughout the year. The City currently has street-side receptacles located in the downtown core area as well as an additional two located at the Troy Field parking area. The receptacles located in the downtown area are emptied by the local garbage/recycling company three times per week in the winter season and four times per week in the summer season.

Dead Animal Pickup

Dead animals are removed as needed from City right-of-ways as well as wild game from private properties when requested. The Street Division is responsible for dead wild game, while the Police Department is responsible for removal of dead domestic animals. Records are maintained through a data management system for reference and tracking of areas with frequent animal crossings. Employees responding to requests for dead animal removal are provided gloves to minimize contact with carcasses. Animals removed by the Street Division are disposed of on City owned property, west of the City limits abutting US Forest service lands. The carcasses are quickly devoured by scavengers, thus completing the cycle of life.

Emergency Operations

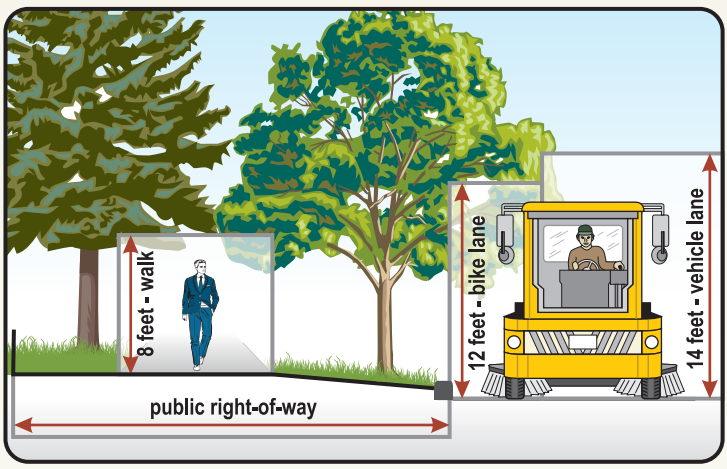
The sweeping operations plan is designed to be flexible to respond to emergencies as needed. All sweepers are equipped with radios allowing immediate communication between operators and supervisors. Sweepers are on-call to the Police Department to respond to vehicle accidents that necessitate the clearing of glass and debris, or to complaint calls about commercial trucks dropping debris from uncovered loads onto the roadway. To the best of our ability, the Streets Division will obtain the company name of vehicles dropping debris so that they can be billed for the labor and equipment costs associated with the removal.

Inspections

There is a plan in place to have curbs and gutters inspected by the sweeping crew during routine sweeping.

STREET CLEANING NOTICE

The street sweeping and storm drain cleaning programs remove dirt and debris from City streets. This helps provide safe conditions for all using the roads, and a healthful and attractive environment for the citizens of Bend.



The City is scheduled to sweep / clean drains in your neighborhood during the time of _____ between 6am - 4pm. *(Note: Schedule may change due to many factors, including weather and equipment break downs)*

We need your help! Before or during this time please:

- ☐ Trim low hanging street tree branches and/or shrubs that extend past the curb to allow access for our cleaning vehicles (see figure above).
- ☐ Keep the curb line clear by relocating basketball hoops, trash cans and other items that may prevent the street sweeper from reaching the curb.
- ☐ For the cleaning window, move vehicles and trailers parked on the street to an on-site location. If you must park on the street, park on the even side of the street Monday thru Wednesday at noon; park on the odd side of the street the rest of the week.
- ☐ Avoid parking over a storm drain inlet.

For more information please visit **bendoregon.gov/streets**; or to sign up for street cleaning notifications, please call 541-317-3000.

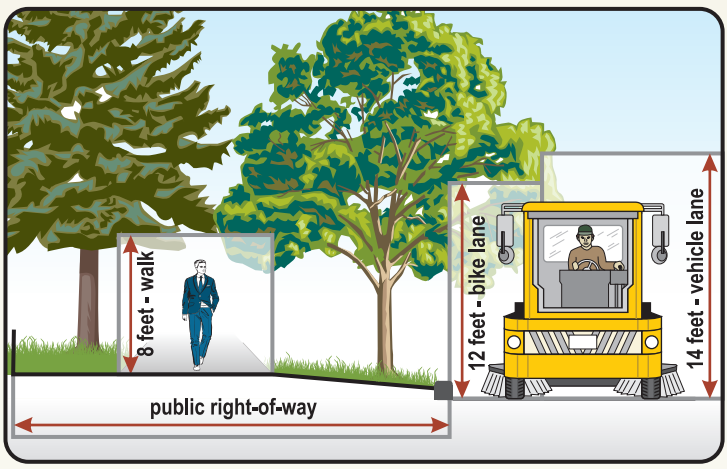
CITY OF BEND

CLEAN WATER WORKS
We work for clean water

Clean Water Works
Street Cleaning Notice

STREET CLEANING NOTICE

The street sweeping and storm drain cleaning programs remove dirt and debris from City streets. This helps provide safe conditions for all using the roads, and a healthful and attractive environment for the citizens of Bend.



The City is scheduled to sweep / clean drains in your neighborhood during the time of _____ between 6am - 4pm. *(Note: Schedule may change due to many factors, including weather and equipment break downs)*

We need your help! Before or during this time please:

- ☐ Trim low hanging street tree branches and/or shrubs that extend past the curb to allow access for our cleaning vehicles (see figure above).
- ☐ Keep the curb line clear by relocating basketball hoops, trash cans and other items that may prevent the street sweeper from reaching the curb.
- ☐ For the cleaning window, move vehicles and trailers parked on the street to an on-site location.
- ☐ Avoid parking over a storm drain inlet.

For more information please visit **bendoregon.gov/streets**; or to sign up for street cleaning notifications, please call 541-317-3000.

CITY OF BEND

CLEAN WATER WORKS
We work for clean water

Address: _____

Date: _____ Time: _____

Delivered By: _____

Dept./Div.: _____ Zone: _____

CITY OF BEND

A Newsletter for Bend Citizens

PUBLISHED BY THE CITY OF BEND

JANUARY 2017

CONTENTS:

City Budget

Bicycle Friendly Community

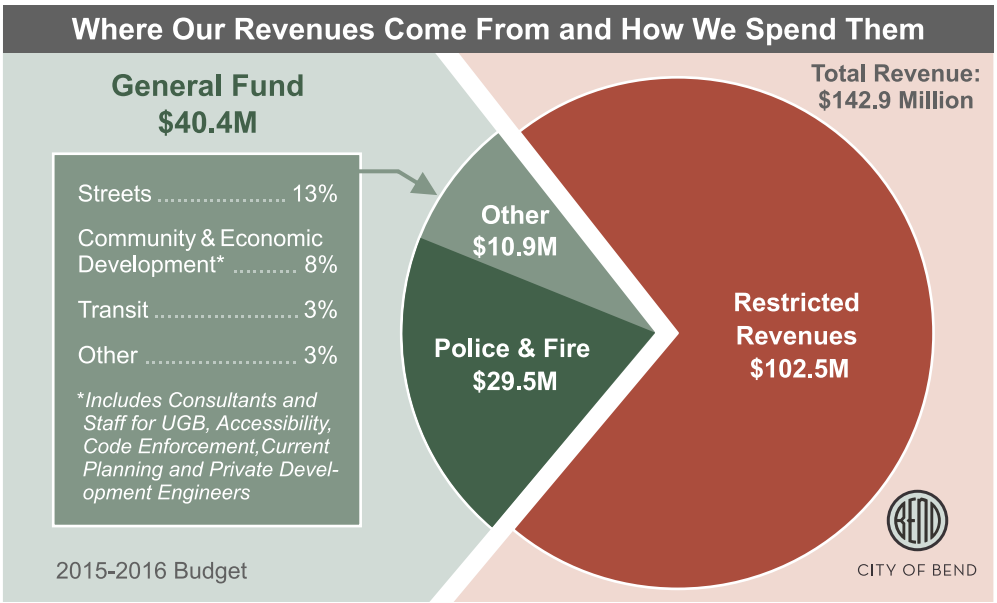
HOW THE CITY BUDGET WORKS

The City provides many crucial programs and services to the citizens of Bend, including: police, fire and emergency medical services, sewer, water, street maintenance, planning, building inspections, and the administrative support needed to make it all happen. These services are paid for primarily through taxes, fees and charges.

More than 2/3 of the annual revenue the City receives is restricted for a specific purpose. For example, money from the monthly utility bills (water, sewer, storm-water) you pay must be used to maintain and operate those systems. Revenue received from system development charges (also known as impact fees) that a builder or developer pays when acquiring a permit for new construction can only be used to build projects that are needed for growth associated with the project; those funds can't be used for maintenance.

The other approximately 1/3 of the annual revenue makes up what's called the General Fund. A significant portion of the General Fund comes from property taxes. The City Council has the most discretion over spending in the General Fund. Over 2/3 of the General Fund is dedicated to police and fire services.

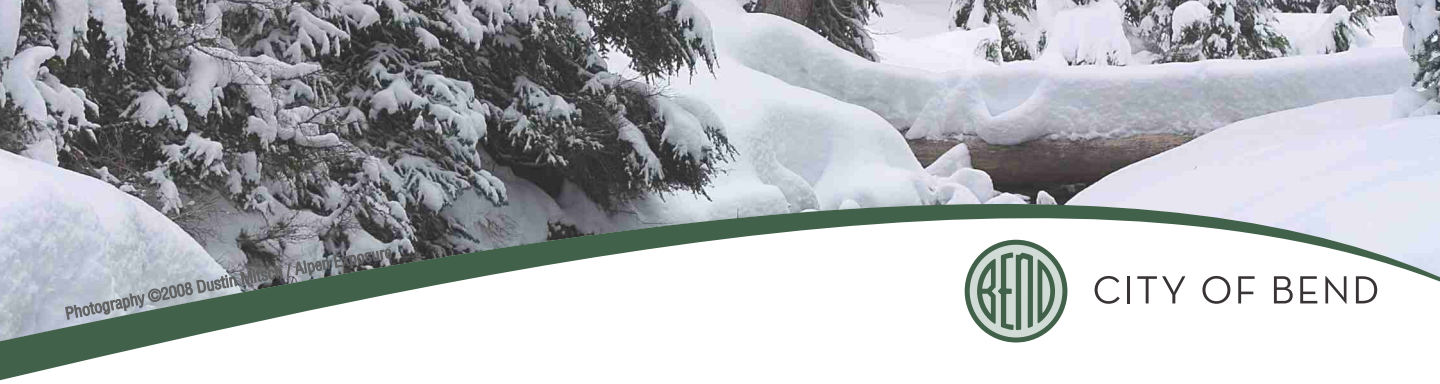
The new City Council will develop its goals this spring, which will be incorporated into the budget process for the next biennial budget that will be adopted in June 2017.



(continued on back)

CITY COUNCIL

The Bend City Council meets the first and third Wednesdays of each month. For upcoming meeting dates, agendas and more information, visit www.bendoregon.gov.



CITY OF BEND

(How the City Budget Works, continued)

Property taxes make up the largest revenue source in the General Fund. But in the 1990s, state Measures 5 and 50 established limits on Oregon's property taxes. The City's permanent tax rate of $2.80 per $1,000 of taxable assessed property value cannot be increased. Also, the taxable assessed value upon which that rate is applied can go up no more than 3 percent per year.

For each dollar you pay in property taxes, about 21 cents goes to the City of Bend to pay for City services. But there are other separate taxing districts that provide other services such as schools, parks, health and human services and library services.

Each property tax dollar you spend is allocated to the various taxing districts within the city limits, and is divided into many segments as illustrated by this chart. More information: **www.bendoregon.gov/budget**



BEND IS A BIKE FRIENDLY COMMUNITY

The League of American Bicyclists recently named the City of Bend as a Bicycle Friendly Community. Bend's efforts to build a safe, biking-friendly community include a:

BICYCLE FRIENDLY COMMUNITY

- Collaborative, intergovernmental approach
- Comprehensive Plan for sustainable, compact urban development, over sprawl
- New bike facilities, such as the Colorado Avenue trail undercrossing, more than 10 miles of new bike lanes, buffered bike lanes and parking protected bike lanes
- Plan to build Neighborhood Greenways on existing residential streets so that everyone can walk and bike without being on busy roads

Bend is one of only 73 cities in the country with this designation.

To obtain this information in an alternate format such as Braille, large print, or electronic, please contact Karin Morris at 541-693-2141 or email kmorris@bendoregon.gov.

We'd like your feedback:

City of Bend, City Manager's Office • P.O. Box 431, Bend, OR 97709 • communications@bendoregon.gov • **www.bendoregon.gov**

CITY OF BEND

A Newsletter for Bend Citizens

PUBLISHED BY THE CITY OF BEND

JULY 2017

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Keeping Streets and Water Clean

Utility Rate Increases

Solar Eclipse Preparedness

Water Quality Report

CITY COUNCIL

The Bend City Council meets the first and third Wednesdays of each month. For upcoming meeting dates, agendas and more information, visit www.bendoregon.gov.

STAY INFORMED! SIGN UP FOR CITY eNEWS

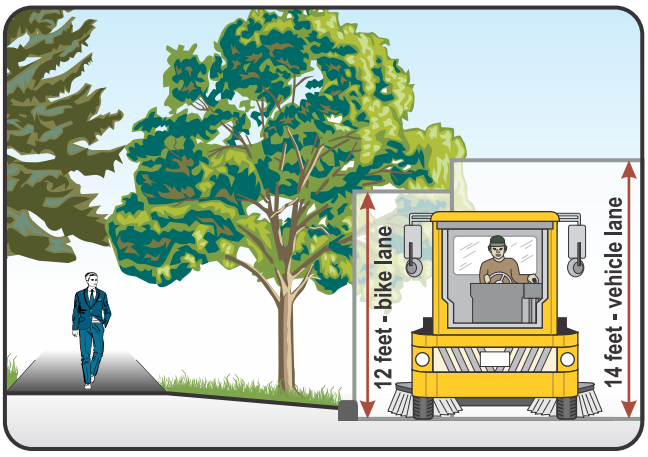
This newsletter that you're reading will be the City's final printed newsletter that we insert into utility bills. The City is moving away from paper newsletters and preparing to bring you information electronically. This helps reduce paper use and saves the City money on printing costs.



We want to provide you with regular and timely information about City projects, operations and Council policies. To keep getting local government news, sign up for eNews at www.bendoregon.gov/enews.

KEEPING OUR STREETS AND WATERS CLEAN

Our Streets and Stormwater crews ask your help in keeping trees and shrubs near your curb trimmed for sweepers and vacuum trucks so they can properly clean the streets. It helps us clean your street if you trim low-hanging branches to provide 14 feet of vertical clearance and clip shrubs that extend past the curb into the road. Also, please relocate basketball hoops and other items out of the street.



Don't forget: leaves and grass clippings should be collected and properly composted or disposed of instead of blown into the street. This reduces pollutants and flooding in the storm drain system.

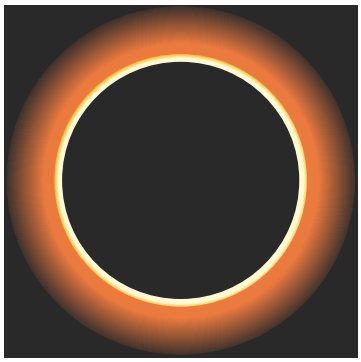
CITY OF BEND

UTILITY RATE INCREASES

Providing sewer, stormwater and award-winning drinking water services isn't cheap. As the costs for providing these services increase, so do the fees that support those operations. The City has calculated revenue increases to cover changes in costs for providing water, sewer and stormwater utilities in fiscal year 2017-2018.

Increases impact individuals' accounts differently, depending on the type of account - single family, multi-family or commercial - and the amount of water used. Changes in rates take effect July 1, 2017 and are reflected in utility bills in August and September, 2017. For information on rates, visit the City's web page at **www.bendoregon.gov/utilityrates**. Contact Utility Billing and Customer Service at 541-388-5515 with questions about your bill.

SOLAR ECLIPSE INFORMATION

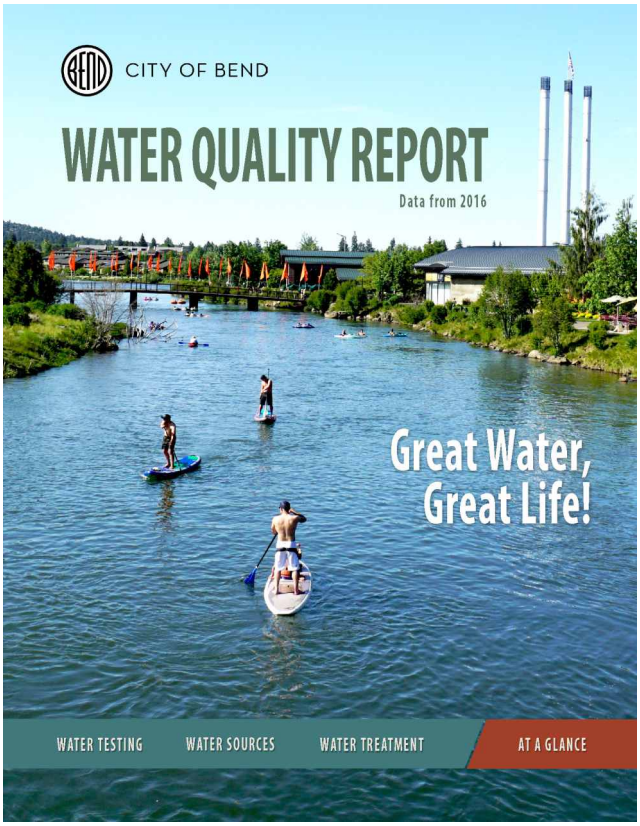


The City of Bend has been working with agencies and organizations from around the region preparing for the eclipse on August 21 and the anticipated influx of visitors coming to our region.

Bend is part of the Central Oregon Emergency Information Network, which is distributing preparedness tips now and will provide informational updates during the event. Connect with Central Oregon Emergency Information Network on Facebook or Twitter to stay informed. Info: **coemergencyinfo.blogspot.com**.

ANNUAL WATER QUALITY REPORT

Where does your drinking water come from, and what do lab tests on your drinking water show? The City's Annual Water Quality Report is available online at **www.bendoregon.gov/waterreport**. Call 541-317-3000 ext. 2 to receive a paper version, or request a copy online at **www.bendoregon.gov/reportrequest**.



To obtain this information in an alternate format such as Braille, large print, or electronic, please contact Karin Morris at 541-693-2141 or email kmorris@bendoregon.gov.

We'd like your feedback:
City of Bend, City Manager's Office • P.O. Box 431, Bend, OR 97709 • communications@bendoregon.gov • **www.bendoregon.gov**

Dry Weather Visual Observation Form

If possible, complete this form in conjunction with the annual facility inspection.

Date: 6-28-2017 Inspector: Buchholz

Time: 12:30 PM Facility ID: 15th

Non-Stormwater Discharges *(Check all that apply)*

☐ Wash Water

☐ Vehicle Washing ☐ Equipment Washing ☐ Painting Operation

☐ Container Washing ☐ Parking Area ☐ Other: _____

☐ Spills

☐ Paint ☐ Motor Oil ☐ Hydraulic Oil ☐ Axle Oil ☐ Gasoline

☐ Diesel ☐ Used Motor Oil ☐ Used Engine Fluids ☐ Solvents

☐ Disinfectants ☐ Soap ☐ Pesticides ☐ Other: _____

Evidence of Non-Stormwater Water Discharges *(Check all that apply)*

☑ Stains

Description: Stain near axle trailer

☑ Wet Spots

Description: Leaking Mag Chloride tank

☐ Residual material

Description: _____

Are BMP`s Effective? ☐ Yes ☐ No

Follow up: _____

Dry Weather Visual Observation Form

If possible, complete this form in conjunction with the annual facility inspection.

Date: 6/12/17 Inspector: Buchanan

Time: 9:20 AM Facility ID: Boyd Acres

Non-Stormwater Discharges *(Check all that apply)*

☐ Wash Water

☐ Vehicle Washing ☐ Equipment Washing ☐ Painting Operation

☐ Container Washing ☐ Parking Area ☐ Other: _____

☐ Spills

☐ Paint ☐ Motor Oil ☐ Hydraulic Oil ☐ Axle Oil ☐ Gasoline

☐ Diesel ☐ Used Motor Oil ☐ Used Engine Fluids ☐ Solvents

☐ Disinfectants ☐ Soap ☐ Pesticides ☐ Other: _____

Evidence of Non-Stormwater Water Discharges *(Check all that apply)*

☑ Stains

Description: Just a couple small stains

☐ Wet Spots

Description: None

☐ Residual material

Description: None

Are BMP's Effective? ☑ Yes ☐ No

Follow up: Need to put cover on cold patch stock pile.

Dry Weather Visual Observation Form

If possible, complete this form in conjunction with the annual facility inspection.

Date: 3/28/17 Inspector: Bucker

Time: 8:08 am Facility ID: 15 K

Non-Stormwater Discharges *(Check all that apply)*

☑ Wash Water @ Veeder Dump Area.

☐ Vehicle Washing ☑ Equipment Washing ☐ Painting Operation

☐ Container Washing ☐ Parking Area ☐ Other: _____

☐ Spills

☐ Paint ☐ Motor Oil ☐ Hydraulic Oil ☐ Axle Oil ☐ Gasoline

☐ Diesel ☐ Used Motor Oil ☐ Used Engine Fluids ☐ Solvents

☐ Disinfectants ☐ Soap ☐ Pesticides ☐ Other: _____

Evidence of Non-Stormwater Water Discharges *(Check all that apply)*

☐ Stains

Description: _____

☐ Wet Spots

Description: _____

☐ Residual material

Description: _____

Are BMP's Effective? ☐ Yes ☑ No

Follow up: Need longer tarp for cold patch stock - pile!

Dry Weather Visual Observation Form

If possible, complete this form in conjunction with the annual facility inspection.

Date: 11/17/16 Inspector: Buchanan

Time: 1:00 pm Facility ID: Boyd

Non-Stormwater Discharges *(Check all that apply)*

☐ Wash Water

☐ Vehicle Washing ☐ Equipment Washing ☐ Painting Operation

☐ Container Washing ☐ Parking Area ☐ Other: _____

☑ Spills

☐ Paint ☐ Motor Oil ☐ Hydraulic Oil ☐ Axle Oil ☐ Gasoline

☐ Diesel ☐ Used Motor Oil ☐ Used Engine Fluids ☐ Solvents

☐ Disinfectants ☐ Soap ☐ Pesticides ☐ Other: Hydrant water

Evidence of Non-Stormwater Water Discharges *(Check all that apply)*

☐ Stains

Description: potable water from hydrant. No follow-up needed.

☐ Wet Spots

Description: _____

☑ Residual material

Description: clean dirt up near back catch basin.

Are BMP`s Effective? ☑ Yes ☐ No

Follow up: Like the New tarp on the AC pile.

@ Relocate Dumpster away from CB

Transportation Demand Management Program (TDM)
FY2016-17 Program Summary Tables

User Travel Data	Jul-Sept 2016	Oct-Dec 2016	Jan-Mar 2017	Apr-June 2017	Fiscal Year 2016-17
Number of Users Joined Network	381	290	147	128	946
Total Number of Users	3,459	4,219	3,642	3763	
Total Active Users	1,395	1,515	931	974	N/A
Total Inactive Users	2,064	2,704	2,711	2790	N/A
Non SOV Miles Logged	340,144	492,656	307,248	295533	1,435,581
Total Trips	43,603	50,115	37,403	42028	173,149
Bike trips	21,883	16,961	6,883	18063	63,790
Bus trips	638	2,001	2,097	1197	5,933
Carpool trips	12,403	18,456	17,349	13726	61,934
Compressed Work Week trips	735	732	516	537	2,520
Other trips	38	156	82	127	403
Telework trips	1,336	2,164	1,609	1302	6,411
Vanpool trips	174	194	180	122	670
Walk trips	6,396	9,451	8,687	6954	31,488
Savings					
Carbon Dioxide (lbs)	212,657	320,311	173,749	181631	888,348
Gasoline (gal)	10,510	15,890	8,591	8974	43,965
Monetary savings ($)	$80,373	$ 121,211	$ 65,856	$ 68,656	$ 336,096
Ridematch Statistics					
Ridematch search performed	1692	2,233	1,782	1845	1845
Ridematch search with no result	1136	1,562	1,229	1283	1283
Ridematch requests sent	183	272	189	190	190

User Travel Data	Jul-Sept 2016	Oct-Dec 2016	Jan-Mar 2017	Apr-June 2017	Fiscal Year 2016-17 Totals
Number of Users Joined Network	8	2	6	11	27
Total Number of Users	226	230	237	247	N/A
Total Active Users	130	113	107	118	N/A
Total Inactive Users	96	117	130	129	N/A
Non SOV Miles Logged	29,985	7,921	30739	30,004	98,649
Total Trips	4,342	1,122	3771	4,830	14,065
Bike trips	2,555	135	504	1,984	5,178
Bus trips	38	23	83	53	197
Carpool trips	1,061	516	1681	1,160	4,418
Compressed Work Week trips	98	26	80	91	295
Other trips	0	4	2	8	14
Telework trips	56	30	87	66	239
Vanpool trips	0	-	0	-	0
Walk trips	534	388	1334	1,468	3724
Savings					
Carbon Dioxide (lbs)	18,979	4,279	16907	18,604	58,769
Gasoline (gal)	935	210	829	918	2892
Monetary savings ($)	$7,153	$1,614	6376	$ 7,014	$22,157
Ridematch Statistics					
Ridematch search performed	97	100	104	104	104
Ridematch search with no result	71	74	78	78	78
Ridematch requests sent	13	13	13	13	13

Mode	# Of Users	# Of Trips	Percent Distribution (Miles)	Miles Traveled	SOV Miles Saved	CO2 Emissions Saved (LBS)	Gasoline Saved (Gallons)	Dollars Saved
Bike	56	1984	17%	5475.84	5475.84	5383.19	267.58	$ 2,025
Compressed Work Week	11	91	1%	324.09	324.09	318.55	15.95	$ 120
Bus	2	53	1%	232.9	232.9	75.06	4.91	$ 35
Carpool	37	1160	66%	21821.91	21821.91	10714.62	523.68	$ 4,038
Walk	27	1468	4%	1205.17	1205.17	1184.38	59.22	$ 447
Telework	7	66	3%	930.64	930.64	914.75	45.65	$ 344
Other	2	8	0%	13.84	13.84	13.6	0.66	$ 5

Appendix H

Monitoring

Stormwater/UIC Monitoring Data for 7/1/2016 to 6/30/2017

TABLE 1 – Action Levels for Pollutants	
Monitoring Parameter	**Action Level at Injection Point (µg/L)**
Benzo(a)pyrene	2
Pentachlorophenol	10
Di(2-ethylhexyl)phthalate	300
Lead (Total)	500
Zinc (Total)	50,000
Copper (Total)	1,300

Sample Location	1. 10/14/16 C6J1403	2. 3/30/17 C7C3002	3. 6/11/17 C7F1203	4.	5.	6.
1. Airport	x	x				
2. Century Drive	x	x				
3. Boyd Acres	x	x				
4. Empire Ave	x	x				
5. Brookswood	x	x				
6. Ladera Rd	x		x			
7. Dup	x	x				
8. Field Blank	x	x				

Date Sampled	Sample Location	UIC Number	COB Sample #	URC Sample #	*Benzo(a)pyrene	*Bis2-(ethylhexyl)phthalate	*Pentachlorophenol	*Copper	*Lead	*Zinc
Units					ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
Analytical Method					EPA 625	EPA 625	EPA 625	EPA 200.7	EPA 200.7	EPA 200.7
Reporting Limit (RDL)					1.00	3.00	10.0	1.00	1.00	50.0
Method Detection Limit (MDL)					0.340	0.709	0.313	0.270	0.260	9.55
Effluent Discharge Action Level at Injection Point (ug/l)					2.00	300	10.0	1300	500	50,000
1. C6J1403	1. Airport	DDW009628	C6J1403-01	L866644-01	Not	Not Detected(ND)	Not Detected(ND)	23.6	Not	708
Samplers:	2. Century Drive	DDW003323	C6J1403-02 **	L866644-02	Not	Not Detected(ND)	Not Detected(ND)	73.6	Not	384
Jeff Buystedt	**3. Boyd Acres**	**DDW003354**	**C6J1403-03**	**L866644-03**	Not	Not Detected(ND)	Not Detected(ND)	20.0	Not	244
Dave Buchanan	4. Empire Ave	DDW008884	C6J1403-04**	L866644-04	Not	Not Detected(ND)	Not Detected(ND)	67.2	5.35	539
Sean Mulderig	5. Brookswood	DDW003312	C6J1403-05**	L866644-05	Not	Not Detected(ND)	Not Detected(ND)	68.8	Not	172
	6. Ladera Rd	DDW003252	C6J1403-06	L866644-06	Not	Not Detected(ND)	Not Detected(ND)	20.7	Not	190
	7. Duplicate	**DDW003354**	**C6J1403-07**	**L866644-07**	Not	Not Detected(ND)	Not Detected(ND)	20.4	Not	320
	8. Field Blank	-	C6J1403-08	L866644-08	Not	Not Detected(ND)	Not Detected(ND)	Not	Not	Not

* Analysis was performed by ESC Lab Sciences

** For EPA 625, samples C6J1403-02,04,05 were diluted 5x due to matrix interference, therefore; the RDL's and MDL's are 5x greater.

Date Sampled	Sample Location	UIC Number	COB Sample #	URC Sample #	*Benzo(a)pyrene	*Bis2-(ethylhexyl)phthalate	*Pentachlorophenol	*Copper	*Lead	*Zinc
Units					ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
Analytical Method					EPA 625	EPA 625	EPA 625	EPA 200.8	EPA 200.8	EPA 200.8
Reporting Limit (RDL)					1.00	3.00	10.0	1.00	1.00	50.0
Method Detection Limit (MDL)					0.340	0.709	0.313	0.270	0.260	9.55
Effluent Discharge Action Level at Injection Point (ug/l)					2.00	300	10.0	1300	500	50,000
1. C7C3002	1. Airport	DDW009628	C7C3002-01	L899771-01	Not	Not Detected(ND)	Not Detected(ND)	7.85	1.55	2460
Samplers:	2. Century Drive	DDW003323	C7C3002-02 **	L899771-02	Not	Not Detected(ND)	Not Detected(ND)	41.2	3.33	384
Jeff Buystedt	3. Boyd Acres	DDW003354	C7C3002-03	L899771-03	Not	Not Detected(ND)	Not Detected(ND)	10.4	1.56	266
Dave Buchanan	4. Empire Ave	DDW008884	C7C3002-04**	L899771-04	Not	Not Detected(ND)	Not Detected(ND)	129	13.2	625
Sean Mulderig	5. Brookswood	DDW003312	C7C3002-05**	L899771-05	Not	Not Detected(ND)	Not Detected(ND)	24.5	1.46	232
	6. Ladera Rd*	DDW003252								
	7. Duplicate	DDW008884	C7C3002-07	L899771-06	Not	0.780	Not Detected(ND)	52.9	6.12	309
	8. Field Blank	-	C7C3002-08	L899771-07	Not	Not Detected(ND)	Not Detected(ND)	0.703	Not	47.5

* There was not enough rainfall to collect a sample at Ladera

*Analysis was performed by ESC Lab Sciences

** For EPA 625, samples C7C3002-02 Was diluted 10x due to matrix interference, therefore; the RDL and MDL are 10x greater. Samples C7C3002-04,05 were diluted 5x due to matrix interference,

Date Sampled	Sample Location	UIC Number	COB Sample #	ESC Sample #	*Benzo(a)pyrene	*Bis2-(ethylhexyl)phthalat	*Pentachlorophenol	*Copper	*Lead	*Zinc
Units					ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
Analytical Method					EPA 625	EPA 625	EPA 625	EPA 200.8	EPA 200.8	EPA 200.8
Detection Limit (RDL)					1.00	3.00	10.0	1.00	1.00	10.0
Method Detection Limit (MDL)					0.340	0.709	0.313	0.270	0.260	9.55
Effluent Discharge Action Level at Injection Point (ug/l)					2.00	300	10.0	1300	500	50,000
3. C7F1203	1. Airport	DDW009628								
Samplers:	2. Century Drive	DDW003323								
Jeff Buystedt	3. Boyd Acres	DDW003354								
Sean Mulderig	4. Empire Ave	DDW008884								
	5. Brookswood	DDW003312								
	6. Ladera Rd	DDW003252	C7F1203-01	L915564-01	Not	Not Detected(ND)	Not Detected(ND)	32.7	2.47	219
	7. Duplicate	DDW003354								
	8. Field Blank	-								

* Analysis was performed by ESC Lab Sciences

Note: For sample Number C7F1203, ESC performed the full EPA 625 analysis and reported all analytes from the analytical run. Reported here are just the required analytes. The additional results for EPA

ANALYTICAL REPORT

October 28, 2016

City of Bend Water Department

Sample Delivery Group:	L866644
Samples Received:	10/18/2016
Project Number:	STORMWATER
Description:	Stormwater Analysis

Report To: Drexell Barnes / Jeff Bysted
62975 Boyd Acres Rd
Bend, OR 97701

Entire Report Reviewed By:

Darren Reeder
Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



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C6J1403-01 L866644-01 WW

Collected by: Buystedt/Davenport | Collected date/time: 10/14/16 14:20 | Received date/time: 10/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 200.7	WG919163	1	10/23/16 07:00	10/24/16 17:42	ST
Semi Volatile Organic Compounds (GC/MS) by Method 625	WG919841	1	10/25/16 08:06	10/26/16 00:54	JF

C6J1403-02 L866644-02 WW

Collected by: Buystedt/Davenport | Collected date/time: 10/14/16 12:13 | Received date/time: 10/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 200.7	WG919163	1	10/23/16 07:00	10/24/16 17:50	ST
Semi Volatile Organic Compounds (GC/MS) by Method 625	WG919841	5	10/25/16 08:06	10/26/16 04:02	JF

C6J1403-03 L866644-03 WW

Collected by: Buystedt/Davenport | Collected date/time: 10/14/16 15:47 | Received date/time: 10/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 200.7	WG919163	1	10/23/16 07:00	10/24/16 17:53	ST
Semi Volatile Organic Compounds (GC/MS) by Method 625	WG919841	1	10/25/16 08:06	10/26/16 01:17	JF

C6J1403-04 L866644-04 WW

Collected by: Buystedt/Davenport | Collected date/time: 10/14/16 11:20 | Received date/time: 10/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 200.7	WG919163	1	10/23/16 07:00	10/24/16 17:56	ST
Semi Volatile Organic Compounds (GC/MS) by Method 625	WG919841	1	10/25/16 08:06	10/26/16 09:18	JF

C6J1403-05 L866644-05 WW

Collected by: Buystedt/Davenport | Collected date/time: 10/14/16 13:31 | Received date/time: 10/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 200.7	WG919163	1	10/23/16 07:00	10/24/16 17:58	ST
Semi Volatile Organic Compounds (GC/MS) by Method 625	WG919841	5	10/25/16 08:06	10/26/16 04:49	JF

C6J1403-06 L866644-06 WW

Collected by: Buystedt/Davenport | Collected date/time: 10/14/16 13:56 | Received date/time: 10/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 200.7	WG919163	1	10/23/16 07:00	10/24/16 18:01	ST
Semi Volatile Organic Compounds (GC/MS) by Method 625	WG919841	5	10/25/16 08:06	10/26/16 04:26	JF

C6J1403-07 L866644-07 WW

Collected by: Buystedt/Davenport | Collected date/time: 10/14/16 15:47 | Received date/time: 10/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 200.7	WG919163	1	10/23/16 07:00	10/24/16 18:04	ST
Semi Volatile Organic Compounds (GC/MS) by Method 625	WG919841	1	10/25/16 08:06	10/26/16 01:41	JF

C6J1403-08 L866644-08 WW

Collected by: Buystedt/Davenport
Collected date/time: 10/14/16 15:52
Received date/time: 10/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 200.7	WG919163	1	10/23/16 07:00	10/24/16 18:07	ST
Semi Volatile Organic Compounds (GC/MS) by Method 625	WG919841	1	10/25/16 08:06	10/26/16 02:04	JF

All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Darren Reeder
Technical Service Representative

Sample Handling and Receiving

The following samples were prepared and/or analyzed past recommended holding time. Concentrations should be considered minimum values.

ESC Sample ID	Project Sample ID	Method
L866644-01	C6J1403-01	625
L866644-02	C6J1403-02	625
L866644-03	C6J1403-03	625
L866644-04	C6J1403-04	625
L866644-05	C6J1403-05	625
L866644-06	C6J1403-06	625
L866644-07	C6J1403-07	625
L866644-08	C6J1403-08	625

Metals (ICP) by Method 200.7

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Copper	0.0236		0.0100	1	10/24/2016 17:42	WG919163
Lead	ND		0.00500	1	10/24/2016 17:42	WG919163
Zinc	0.708		0.0500	1	10/24/2016 17:42	WG919163

Semi Volatile Organic Compounds (GC/MS) by Method 625

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Benzo(a)pyrene	ND		0.00100	1	10/26/2016 00:54	WG919841
Bis(2-ethylhexyl)phthalate	ND		0.00300	1	10/26/2016 00:54	WG919841
Pentachlorophenol	ND		0.0100	1	10/26/2016 00:54	WG919841
(S) Nitrobenzene-d5	*60.9*		*21.8-123*		*10/26/2016 00:54*	WG919841
(S) 2-Fluorobiphenyl	*70.3*		*29.5-131*		*10/26/2016 00:54*	WG919841
(S) p-Terphenyl-d14	*73.3*		*29.3-137*		*10/26/2016 00:54*	WG919841
(S) Phenol-d5	*24.6*		*5.00-70.1*		*10/26/2016 00:54*	WG919841
(S) 2-Fluorophenol	*40.4*		*10.0-77.9*		*10/26/2016 00:54*	WG919841
(S) 2,4,6-Tribromophenol	*70.4*		*11.2-130*		*10/26/2016 00:54*	WG919841

Metals (ICP) by Method 200.7

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Copper	0.0736		0.0100	1	10/24/2016 17:50	WG919163
Lead	ND		0.00500	1	10/24/2016 17:50	WG919163
Zinc	0.384		0.0500	1	10/24/2016 17:50	WG919163

Semi Volatile Organic Compounds (GC/MS) by Method 625

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Benzo(a)pyrene	ND		0.00500	5	10/26/2016 04:02	WG919841
Bis(2-ethylhexyl)phthalate	ND		0.0150	5	10/26/2016 04:02	WG919841
Pentachlorophenol	ND		0.0500	5	10/26/2016 04:02	WG919841
(S) Nitrobenzene-d5	*65.2*		*21.8-123*		*10/26/2016 04:02*	WG919841
(S) 2-Fluorobiphenyl	*60.3*		*29.5-131*		*10/26/2016 04:02*	WG919841
(S) p-Terphenyl-d14	*56.5*		*29.3-137*		*10/26/2016 04:02*	WG919841
(S) Phenol-d5	*27.3*		*5.00-70.1*		*10/26/2016 04:02*	WG919841
(S) 2-Fluorophenol	*35.9*		*10.0-77.9*		*10/26/2016 04:02*	WG919841
(S) 2,4,6-Tribromophenol	*79.1*		*11.2-130*		*10/26/2016 04:02*	WG919841

Sample Narrative:

625 L866644-02 WG919841: Dilution due to matrix

Metals (ICP) by Method 200.7

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Copper	0.0200		0.0100	1	10/24/2016 17:53	WG919163
Lead	ND		0.00500	1	10/24/2016 17:53	WG919163
Zinc	0.244		0.0500	1	10/24/2016 17:53	WG919163

Semi Volatile Organic Compounds (GC/MS) by Method 625

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Benzo(a)pyrene	ND		0.00100	1	10/26/2016 01:17	WG919841
Bis(2-ethylhexyl)phthalate	ND		0.00300	1	10/26/2016 01:17	WG919841
Pentachlorophenol	ND		0.0100	1	10/26/2016 01:17	WG919841
(S) Nitrobenzene-d5	*65.9*		*21.8-123*		*10/26/2016 01:17*	WG919841
(S) 2-Fluorobiphenyl	*72.2*		*29.5-131*		*10/26/2016 01:17*	WG919841
(S) p-Terphenyl-d14	*78.3*		*29.3-137*		*10/26/2016 01:17*	WG919841
(S) Phenol-d5	*26.5*		*5.00-70.1*		*10/26/2016 01:17*	WG919841
(S) 2-Fluorophenol	*39.4*		*10.0-77.9*		*10/26/2016 01:17*	WG919841
(S) 2,4,6-Tribromophenol	*83.3*		*11.2-130*		*10/26/2016 01:17*	WG919841

Metals (ICP) by Method 200.7

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Copper	0.0672		0.0100	1	10/24/2016 17:56	WG919163
Lead	0.00535		0.00500	1	10/24/2016 17:56	WG919163
Zinc	0.539		0.0500	1	10/24/2016 17:56	WG919163

Semi Volatile Organic Compounds (GC/MS) by Method 625

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Benzo(a)pyrene	ND		0.00100	1	10/26/2016 09:18	WG919841
Bis(2-ethylhexyl)phthalate	ND		0.00300	1	10/26/2016 09:18	WG919841
Pentachlorophenol	ND		0.0100	1	10/26/2016 09:18	WG919841
(S) Nitrobenzene-d5	*66.1*		*21.8-123*		*10/26/2016 09:18*	WG919841
(S) 2-Fluorobiphenyl	*69.5*		*29.5-131*		*10/26/2016 09:18*	WG919841
(S) p-Terphenyl-d14	*71.4*		*29.3-137*		*10/26/2016 09:18*	WG919841
(S) Phenol-d5	*23.8*		*5.00-70.1*		*10/26/2016 09:18*	WG919841
(S) 2-Fluorophenol	*35.1*		*10.0-77.9*		*10/26/2016 09:18*	WG919841
(S) 2,4,6-Tribromophenol	*87.7*		*11.2-130*		*10/26/2016 09:18*	WG919841

Metals (ICP) by Method 200.7

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Copper	0.0688		0.0100	1	10/24/2016 17:58	WG919163
Lead	ND		0.00500	1	10/24/2016 17:58	WG919163
Zinc	0.172		0.0500	1	10/24/2016 17:58	WG919163

Semi Volatile Organic Compounds (GC/MS) by Method 625

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Benzo(a)pyrene	ND		0.00500	5	10/26/2016 04:49	WG919841
Bis(2-ethylhexyl)phthalate	ND		0.0150	5	10/26/2016 04:49	WG919841
Pentachlorophenol	ND		0.0500	5	10/26/2016 04:49	WG919841
(S) Nitrobenzene-d5	*39.1*		*21.8-123*		*10/26/2016 04:49*	WG919841
(S) 2-Fluorobiphenyl	*47.9*		*29.5-131*		*10/26/2016 04:49*	WG919841
(S) p-Terphenyl-d14	*42.7*		*29.3-137*		*10/26/2016 04:49*	WG919841
(S) Phenol-d5	*18.0*		*5.00-70.1*		*10/26/2016 04:49*	WG919841
(S) 2-Fluorophenol	*23.5*		*10.0-77.9*		*10/26/2016 04:49*	WG919841
(S) 2,4,6-Tribromophenol	*62.5*		*11.2-130*		*10/26/2016 04:49*	WG919841

Sample Narrative:

625 L866644-05 WG919841: Dilution due to matrix

Metals (ICP) by Method 200.7

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Copper	0.0207		0.0100	1	10/24/2016 18:01	WG919163
Lead	ND		0.00500	1	10/24/2016 18:01	WG919163
Zinc	0.190		0.0500	1	10/24/2016 18:01	WG919163

Semi Volatile Organic Compounds (GC/MS) by Method 625

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Benzo(a)pyrene	ND		0.00500	5	10/26/2016 04:26	WG919841
Bis(2-ethylhexyl)phthalate	ND		0.0150	5	10/26/2016 04:26	WG919841
Pentachlorophenol	ND		0.0500	5	10/26/2016 04:26	WG919841
(S) Nitrobenzene-d5	*94.8*		*21.8-123*		*10/26/2016 04:26*	WG919841
(S) 2-Fluorobiphenyl	*101*		*29.5-131*		*10/26/2016 04:26*	WG919841
(S) p-Terphenyl-d14	*107*		*29.3-137*		*10/26/2016 04:26*	WG919841
(S) Phenol-d5	*42.6*		*5.00-70.1*		*10/26/2016 04:26*	WG919841
(S) 2-Fluorophenol	*57.6*		*10.0-77.9*		*10/26/2016 04:26*	WG919841
(S) 2,4,6-Tribromophenol	*128*		*11.2-130*		*10/26/2016 04:26*	WG919841

Sample Narrative:

625 L866644-06 WG919841: Dilution due to matrix

Metals (ICP) by Method 200.7

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Copper	0.0204		0.0100	1	10/24/2016 18:04	WG919163
Lead	ND		0.00500	1	10/24/2016 18:04	WG919163
Zinc	0.320		0.0500	1	10/24/2016 18:04	WG919163

Semi Volatile Organic Compounds (GC/MS) by Method 625

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Benzo(a)pyrene	ND		0.00100	1	10/26/2016 01:41	WG919841
Bis(2-ethylhexyl)phthalate	ND		0.00300	1	10/26/2016 01:41	WG919841
Pentachlorophenol	ND		0.0100	1	10/26/2016 01:41	WG919841
(S) Nitrobenzene-d5	*67.0*		*21.8-123*		*10/26/2016 01:41*	WG919841
(S) 2-Fluorobiphenyl	*72.6*		*29.5-131*		*10/26/2016 01:41*	WG919841
(S) p-Terphenyl-d14	*83.1*		*29.3-137*		*10/26/2016 01:41*	WG919841
(S) Phenol-d5	*31.0*		*5.00-70.1*		*10/26/2016 01:41*	WG919841
(S) 2-Fluorophenol	*45.4*		*10.0-77.9*		*10/26/2016 01:41*	WG919841
(S) 2,4,6-Tribromophenol	*94.2*		*11.2-130*		*10/26/2016 01:41*	WG919841

Metals (ICP) by Method 200.7

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Copper	ND		0.0100	1	10/24/2016 18:07	WG919163
Lead	ND		0.00500	1	10/24/2016 18:07	WG919163
Zinc	ND		0.0500	1	10/24/2016 18:07	WG919163

Semi Volatile Organic Compounds (GC/MS) by Method 625

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Benzo(a)pyrene	ND		0.00100	1	10/26/2016 02:04	WG919841
Bis(2-ethylhexyl)phthalate	ND		0.00300	1	10/26/2016 02:04	WG919841
Pentachlorophenol	ND		0.0100	1	10/26/2016 02:04	WG919841
(S) Nitrobenzene-d5	*63.2*		*21.8-123*		*10/26/2016 02:04*	WG919841
(S) 2-Fluorobiphenyl	*70.6*		*29.5-131*		*10/26/2016 02:04*	WG919841
(S) p-Terphenyl-d14	*84.0*		*29.3-137*		*10/26/2016 02:04*	WG919841
(S) Phenol-d5	*31.1*		*5.00-70.1*		*10/26/2016 02:04*	WG919841
(S) 2-Fluorophenol	*49.0*		*10.0-77.9*		*10/26/2016 02:04*	WG919841
(S) 2,4,6-Tribromophenol	*71.3*		*11.2-130*		*10/26/2016 02:04*	WG919841

Method Blank (MB)

(MB) R3172942-1 10/24/16 17:19

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Copper	U		0.007	0.0100
Lead	U		0.002	0.00500
Zinc	U		0.0034	0.0500

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3172942-2 10/24/16 17:21 • (LCSD) R3172942-3 10/24/16 17:24

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Copper	1.00	1.00	0.990	100	99	85-115			1	20
Lead	1.00	1.02	1.02	102	102	85-115			0	20
Zinc	1.00	1.01	0.998	101	100	85-115			1	20

L865652-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L865652-01 10/24/16 17:26 • (MS) R3172942-5 10/24/16 17:32 • (MSD) R3172942-6 10/24/16 17:34

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Copper	1.00	ND	1.01	1.02	101	102	1	70-130			0	20
Lead	1.00	ND	1.03	1.04	103	104	1	70-130			0	20
Zinc	1.00	ND	1.02	1.01	102	101	1	70-130			0	20

L866644-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L866644-08 10/24/16 18:07 • (MS) R3172942-7 10/24/16 18:09 • (MSD) R3172942-8 10/24/16 18:12

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Copper	1.00	ND	0.997	0.994	100	99	1	70-130			0	20
Lead	1.00	ND	1.02	1.02	102	102	1	70-130			0	20
Zinc	1.00	ND	1.01	1.01	101	101	1	70-130			0	20

Method Blank (MB)

(MB) R3173460-3 10/25/16 18:15

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Benzo(a)pyrene	U		0.000340	0.00100
Bis(2-ethylhexyl)phthalate	U		0.000709	0.00300
Pentachlorophenol	U		0.000313	0.0100
(S) Nitrobenzene-d5	*53.9*			*21.8-123*
(S) 2-Fluorobiphenyl	*66.9*			*29.5-131*
(S) p-Terphenyl-d14	*74.4*			*29.3-137*
(S) Phenol-d5	*24.7*			*5.00-70.1*
(S) 2-Fluorophenol	*38.6*			*10.0-77.9*
(S) 2,4,6-Tribromophenol	*48.0*			*11.2-130*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3173460-1 10/25/16 17:28 • (LCSD) R3173460-2 10/25/16 17:52

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzo(a)pyrene	0.0500	0.0403	0.0340	80.6	68.1	45.6-106			16.8	20
Bis(2-ethylhexyl)phthalate	0.0500	0.0366	0.0301	73.1	60.2	36.9-134			19.3	23.6
Pentachlorophenol	0.0500	0.0330	0.0248	66.0	49.6	10.9-97.4			28.3	35.1
(S) Nitrobenzene-d5				*70.9*	*58.6*	*21.8-123*				
(S) 2-Fluorobiphenyl				*79.4*	*66.3*	*29.5-131*				
(S) p-Terphenyl-d14				*88.1*	*72.7*	*29.3-137*				
(S) Phenol-d5				*28.3*	*25.3*	*5.00-70.1*				
(S) 2-Fluorophenol				*41.5*	*37.7*	*10.0-77.9*				
(S) 2,4,6-Tribromophenol				*88.6*	*70.4*	*11.2-130*				

Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.

Qualifier	Description
	The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.**
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Conneticut	PH-0197	North Carolina [1]	DW21704
Florida	E87487	North Carolina [2]	41
Georgia	NELAP	North Dakota	R-140
Georgia [1]	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky [1]	90010	South Dakota	n/a
Kentucky [2]	16	Tennessee [1 4]	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

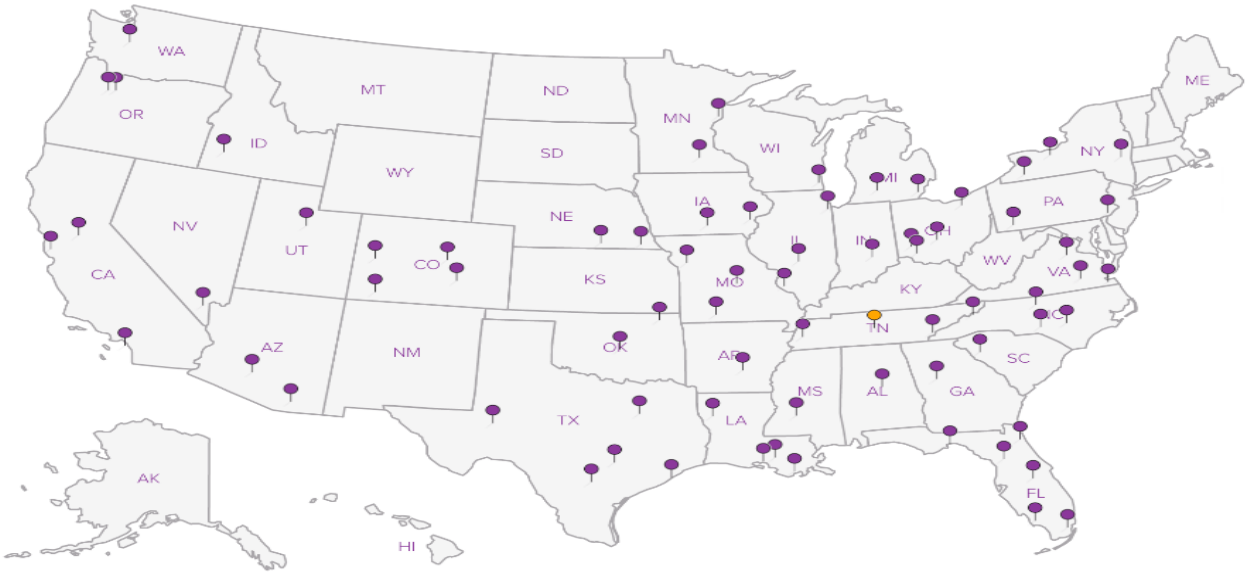
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [n/a] Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



Company Name/Address:
City of Bend- Laboratory
62975 Boyd Acres Rd.
Bend, OR 97701

Billing Information:
City of Bend Laboratory
62975 Boyd Acres Rd
Bend, OR 97701

Report to: Jeff Buystedt

Email To: jbuystedt@bendoregon.gov

Project Description: Stormwater 2016-17 UIC Monitoring

City/State Collected: Bend OR

Phone: 541-420-6892
Fax:

Client Project # STORMWATER

Lab Project # C6J1403

Collected by (print): Buystedt/Davenport

Site/Facility ID #

P.O. # 117597-001

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	100ml NP 4 C Benzo(A)pyrene	100ml NP 4 C Di(2-ethylhexyl)phthalate	100ml NP 4 C Pentachlorophenol	Metals 500ML HDPE - HNO3 (CU, PB, ZN) C2	Rem./Contaminant	Sample # (lab only)
C6J1403-01	Grab	Other		10/14/2016	1420	2 3	X	X	X	X	Airport	-01
C6J1403-02	Grab	Other		10/14/2016	1213	2 3	X	X	X	X	Century	02
C6J1403-03	Grab	Other		10/14/2016	1547	2 3	X	X	X	X	Boyd	03
C6J1403-04	Grab	Other		10/14/2016	1120	2 3	X	X	X	X	Empire	04
C6J1403-05	Grab	Other		10/14/2016	1331	2 3	X	X	X	X	Brooks	05
C6J1403-06	Grab	Other		10/14/2016	1356	2 3	X	X	X	X	Ladera	06
C6J1403-07	Grab	Other		10/14/2016	1547	2 3	X	X	X	X	Dup Boyd	07
C6J1403-08	Grab	Other		10/14/2016	1552	2 3	X	X	X	X	Field Blk	08

Chain of Custody Page ___ of ___

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L866644
E196

Acctnum:
Template:
Prelogin:
TSR:
PB:

Shipped Via: Fedex

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other Stormwater 10-18-16

Remarks: 671101259429/671101259340

pH _____ Temp _____

Flow _____ Other _____

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Christine Davenport	10-14-16	1608	Fridge #2 3.8°C
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Fridge #2 Jeff Buyst 3.7°	10-17-16	0746	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			Guy Dean

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____

Temp: 3.2 °C Bottles Received: 24

Date: 10-18-16 Time: 900

Condition: (lab use only) MR (BW)

COC Seal Intact: ___Y ___N ___NA

pH Checked: C2 NCF:

ESC
L·A·B S·C·I·E·N·C·E·S
YOUR LAB OF CHOICE

Cooler Receipt Form

Client:	BENDWAT01	SDG#	L866644
Cooler Received/Opened On:	10-18-16	Temperature Upon Receipt:	3.2 °c
Received By:	Greg Dearmin		
Signature:			

Receipt Check List	Yes	No	N/A
Were custody seals on outside of cooler and intact?			✓
Were custody papers properly filled out?	✓		
Did all bottles arrive in good condition?	✓		
Were correct bottles used for the analyses requested?	✓		
Was sufficient amount of sample sent in each bottle?	✓		
Were all applicable sample containers correctly preserved and checked for preservation? (Any not in accepted range noted on COC)	✓		
If applicable, was an observable VOA headspace present?			✓
Non Conformance Generated. (If yes see attached NCF)			

ANALYTICAL REPORT

April 05, 2017

City of Bend Water Department

Sample Delivery Group:	L899771
Samples Received:	04/01/2017
Project Number:	Stormwater
Description:	Stormwater Analysis

Report To: Drexell Barnes / Jeff Bysted
62975 Boyd Acres Rd
Bend, OR 97701

Entire Report Reviewed By:

Darren Reeder
Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



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C7C3002-01 L899771-01 WW

Collected by: Buchanan | Collected date/time: 03/30/17 13:11 | Received date/time: 04/01/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICPMS) by Method 200.8	WG966903	1	04/04/17 09:15	04/05/17 12:06	LAT
Metals (ICPMS) by Method 200.8	WG966903	5	04/04/17 09:15	04/05/17 12:59	LAT
Semi Volatile Organic Compounds (GC/MS) by Method 625	WG966803	1	04/03/17 23:00	04/04/17 14:03	KMP

C7C3002-02 L899771-02 WW

Collected by: Buchanan | Collected date/time: 03/30/17 14:24 | Received date/time: 04/01/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICPMS) by Method 200.8	WG966903	1	04/04/17 09:15	04/05/17 12:10	LAT
Semi Volatile Organic Compounds (GC/MS) by Method 625	WG966803	10	04/03/17 23:00	04/04/17 16:01	KMP

C7C3002-03 L899771-03 WW

Collected by: Buchanan | Collected date/time: 03/30/17 12:47 | Received date/time: 04/01/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICPMS) by Method 200.8	WG966903	1	04/04/17 09:15	04/05/17 12:13	LAT
Semi Volatile Organic Compounds (GC/MS) by Method 625	WG966803	1	04/03/17 23:00	04/04/17 14:27	KMP

C7C3002-04 L899771-04 WW

Collected by: Buchanan | Collected date/time: 03/30/17 12:55 | Received date/time: 04/01/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICPMS) by Method 200.8	WG966903	1	04/04/17 09:15	04/05/17 12:25	LAT
Semi Volatile Organic Compounds (GC/MS) by Method 625	WG966803	5	04/03/17 23:00	04/04/17 16:24	KMP

C7C3002-05 L899771-05 WW

Collected by: Buchanan | Collected date/time: 03/30/17 14:12 | Received date/time: 04/01/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICPMS) by Method 200.8	WG966903	1	04/04/17 09:15	04/05/17 12:29	LAT
Semi Volatile Organic Compounds (GC/MS) by Method 625	WG966803	5	04/03/17 23:00	04/04/17 16:48	KMP

C7C3002-07 L899771-06 WW

Collected by: Buchanan | Collected date/time: 03/30/17 12:55 | Received date/time: 04/01/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICPMS) by Method 200.8	WG966903	1	04/04/17 09:15	04/05/17 12:32	LAT
Semi Volatile Organic Compounds (GC/MS) by Method 625	WG966803	1	04/03/17 23:00	04/04/17 15:37	KMP

C7C3002-08 L899771-07 WW

Collected by: Buchanan | Collected date/time: 03/30/17 12:45 | Received date/time: 04/01/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICPMS) by Method 200.8	WG966903	1	04/04/17 09:15	04/05/17 12:36	LAT
Semi Volatile Organic Compounds (GC/MS) by Method 625	WG966803	1	04/03/17 23:00	04/04/17 14:50	KMP

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.



Darren Reeder
Technical Service Representative

Metals (ICPMS) by Method 200.8

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Copper	7.85		0.270	1.00	1	04/05/2017 12:06	WG966903
Lead	1.55		0.260	1.00	1	04/05/2017 12:06	WG966903
Zinc	2460		9.55	50.0	5	04/05/2017 12:59	WG966903

Semi Volatile Organic Compounds (GC/MS) by Method 625

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzo(a)pyrene	U		0.340	1.00	1	04/04/2017 14:03	WG966803
Bis(2-ethylhexyl)phthalate	U		0.709	3.00	1	04/04/2017 14:03	WG966803
Pentachlorophenol	U		0.313	10.0	1	04/04/2017 14:03	WG966803
(S) Nitrobenzene-d5	*69.2*			*10.0-126*		*04/04/2017 14:03*	WG966803
(S) 2-Fluorobiphenyl	*75.0*			*22.0-127*		*04/04/2017 14:03*	WG966803
(S) p-Terphenyl-d14	*83.4*			*29.0-141*		*04/04/2017 14:03*	WG966803
(S) Phenol-d5	*39.6*			*10.0-120*		*04/04/2017 14:03*	WG966803
(S) 2-Fluorophenol	*49.6*			*10.0-120*		*04/04/2017 14:03*	WG966803
(S) 2,4,6-Tribromophenol	*76.8*			*10.0-153*		*04/04/2017 14:03*	WG966803

Metals (ICPMS) by Method 200.8

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Copper	41.2		0.270	1.00	1	04/05/2017 12:10	WG966903
Lead	3.33		0.260	1.00	1	04/05/2017 12:10	WG966903
Zinc	384		1.91	10.0	1	04/05/2017 12:10	WG966903

Semi Volatile Organic Compounds (GC/MS) by Method 625

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzo(a)pyrene	U		3.40	10.0	10	04/04/2017 16:01	WG966803
Bis(2-ethylhexyl)phthalate	U		7.09	30.0	10	04/04/2017 16:01	WG966803
Pentachlorophenol	U		3.13	100	10	04/04/2017 16:01	WG966803
(S) Nitrobenzene-d5	*155*	J1		*10.0-126*		*04/04/2017 16:01*	WG966803
(S) 2-Fluorobiphenyl	*133*	J1		*22.0-127*		*04/04/2017 16:01*	WG966803
(S) p-Terphenyl-d14	*156*	J1		*29.0-141*		*04/04/2017 16:01*	WG966803
(S) Phenol-d5	*77.9*			*10.0-120*		*04/04/2017 16:01*	WG966803
(S) 2-Fluorophenol	*105*			*10.0-120*		*04/04/2017 16:01*	WG966803
(S) 2,4,6-Tribromophenol	*146*			*10.0-153*		*04/04/2017 16:01*	WG966803

Sample Narrative:

625 L899771-02 WG966803: Dilution due to matrix

Metals (ICPMS) by Method 200.8

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Copper	10.4		0.270	1.00	1	04/05/2017 12:13	WG966903
Lead	1.56		0.260	1.00	1	04/05/2017 12:13	WG966903
Zinc	266		1.91	10.0	1	04/05/2017 12:13	WG966903

Semi Volatile Organic Compounds (GC/MS) by Method 625

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzo(a)pyrene	U		0.340	1.00	1	04/04/2017 14:27	WG966803
Bis(2-ethylhexyl)phthalate	U		0.709	3.00	1	04/04/2017 14:27	WG966803
Pentachlorophenol	U		0.313	10.0	1	04/04/2017 14:27	WG966803
(S) Nitrobenzene-d5	*61.7*			*10.0-126*		*04/04/2017 14:27*	WG966803
(S) 2-Fluorobiphenyl	*64.7*			*22.0-127*		*04/04/2017 14:27*	WG966803
(S) p-Terphenyl-d14	*79.4*			*29.0-141*		*04/04/2017 14:27*	WG966803
(S) Phenol-d5	*36.3*			*10.0-120*		*04/04/2017 14:27*	WG966803
(S) 2-Fluorophenol	*45.6*			*10.0-120*		*04/04/2017 14:27*	WG966803
(S) 2,4,6-Tribromophenol	*74.2*			*10.0-153*		*04/04/2017 14:27*	WG966803

Metals (ICPMS) by Method 200.8

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Copper	129		0.270	1.00	1	04/05/2017 12:25	WG966903
Lead	13.2		0.260	1.00	1	04/05/2017 12:25	WG966903
Zinc	625		1.91	10.0	1	04/05/2017 12:25	WG966903

Semi Volatile Organic Compounds (GC/MS) by Method 625

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzo(a)pyrene	U		1.70	5.00	5	04/04/2017 16:24	WG966803
Bis(2-ethylhexyl)phthalate	U		3.54	15.0	5	04/04/2017 16:24	WG966803
Pentachlorophenol	U		1.56	50.0	5	04/04/2017 16:24	WG966803
(S) Nitrobenzene-d5	*45.7*			*10.0-126*		*04/04/2017 16:24*	WG966803
(S) 2-Fluorobiphenyl	*51.4*			*22.0-127*		*04/04/2017 16:24*	WG966803
(S) p-Terphenyl-d14	*67.5*			*29.0-141*		*04/04/2017 16:24*	WG966803
(S) Phenol-d5	*26.7*			*10.0-120*		*04/04/2017 16:24*	WG966803
(S) 2-Fluorophenol	*33.1*			*10.0-120*		*04/04/2017 16:24*	WG966803
(S) 2,4,6-Tribromophenol	*68.1*			*10.0-153*		*04/04/2017 16:24*	WG966803

Sample Narrative:

625 L899771-04 WG966803: Dilution due to matrix

Metals (ICPMS) by Method 200.8

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Copper	24.5		0.270	1.00	1	04/05/2017 12:29	WG966903
Lead	1.46		0.260	1.00	1	04/05/2017 12:29	WG966903
Zinc	232		1.91	10.0	1	04/05/2017 12:29	WG966903

Semi Volatile Organic Compounds (GC/MS) by Method 625

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzo(a)pyrene	U		1.70	5.00	5	04/04/2017 16:48	WG966803
Bis(2-ethylhexyl)phthalate	U		3.54	15.0	5	04/04/2017 16:48	WG966803
Pentachlorophenol	U		1.56	50.0	5	04/04/2017 16:48	WG966803
(S) Nitrobenzene-d5	*30.5*			*10.0-126*		*04/04/2017 16:48*	WG966803
(S) 2-Fluorobiphenyl	*31.1*			*22.0-127*		*04/04/2017 16:48*	WG966803
(S) p-Terphenyl-d14	*33.0*			*29.0-141*		*04/04/2017 16:48*	WG966803
(S) Phenol-d5	*16.1*			*10.0-120*		*04/04/2017 16:48*	WG966803
(S) 2-Fluorophenol	*19.7*			*10.0-120*		*04/04/2017 16:48*	WG966803
(S) 2,4,6-Tribromophenol	*31.8*			*10.0-153*		*04/04/2017 16:48*	WG966803

Sample Narrative:

625 L899771-05 WG966803: Dilution due to matrix

Metals (ICPMS) by Method 200.8

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Copper	52.9		0.270	1.00	1	04/05/2017 12:32	WG966903
Lead	6.12		0.260	1.00	1	04/05/2017 12:32	WG966903
Zinc	309		1.91	10.0	1	04/05/2017 12:32	WG966903

Semi Volatile Organic Compounds (GC/MS) by Method 625

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzo(a)pyrene	U		0.340	1.00	1	04/04/2017 15:37	WG966803
Bis(2-ethylhexyl)phthalate	0.780	J	0.709	3.00	1	04/04/2017 15:37	WG966803
Pentachlorophenol	U		0.313	10.0	1	04/04/2017 15:37	WG966803
(S) Nitrobenzene-d5	*71.8*			*10.0-126*		*04/04/2017 15:37*	WG966803
(S) 2-Fluorobiphenyl	*69.5*			*22.0-127*		*04/04/2017 15:37*	WG966803
(S) p-Terphenyl-d14	*87.8*			*29.0-141*		*04/04/2017 15:37*	WG966803
(S) Phenol-d5	*39.9*			*10.0-120*		*04/04/2017 15:37*	WG966803
(S) 2-Fluorophenol	*49.5*			*10.0-120*		*04/04/2017 15:37*	WG966803
(S) 2,4,6-Tribromophenol	*89.0*			*10.0-153*		*04/04/2017 15:37*	WG966803

Metals (ICPMS) by Method 200.8

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Copper	0.703	J	0.270	1.00	1	04/05/2017 12:36	WG966903
Lead	U		0.260	1.00	1	04/05/2017 12:36	WG966903
Zinc	47.5		1.91	10.0	1	04/05/2017 12:36	WG966903

Semi Volatile Organic Compounds (GC/MS) by Method 625

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzo(a)pyrene	U		0.340	1.00	1	04/04/2017 14:50	WG966803
Bis(2-ethylhexyl)phthalate	U		0.709	3.00	1	04/04/2017 14:50	WG966803
Pentachlorophenol	U		0.313	10.0	1	04/04/2017 14:50	WG966803
(S) Nitrobenzene-d5	*60.6*			*10.0-126*		*04/04/2017 14:50*	WG966803
(S) 2-Fluorobiphenyl	*62.6*			*22.0-127*		*04/04/2017 14:50*	WG966803
(S) p-Terphenyl-d14	*84.4*			*29.0-141*		*04/04/2017 14:50*	WG966803
(S) Phenol-d5	*35.4*			*10.0-120*		*04/04/2017 14:50*	WG966803
(S) 2-Fluorophenol	*46.0*			*10.0-120*		*04/04/2017 14:50*	WG966803
(S) 2,4,6-Tribromophenol	*69.0*			*10.0-153*		*04/04/2017 14:50*	WG966803

Method Blank (MB)

(MB) R3208221-1 04/04/17 18:56

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Copper	U		0.270	1.00
Lead	U		0.260	1.00
Zinc	U		1.91	10.0

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3208221-2 04/04/17 18:59 • (LCSD) R3208221-3 04/04/17 19:03

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Copper	50.0	54.5	52.7	109	105	85-115			3	20
Lead	50.0	50.9	49.6	102	99	85-115			3	20
Zinc	50.0	52.1	49.8	104	100	85-115			4	20

L899544-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L899544-01 04/04/17 19:07 • (MS) R3208221-5 04/04/17 19:14 • (MSD) R3208221-6 04/04/17 19:17

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Copper	50.0	3.59	52.0	53.0	97	99	1	70-130			2	20
Lead	50.0	1.18	50.8	51.4	99	100	1	70-130			1	20
Zinc	50.0	ND	58.9	58.3	99	98	1	70-130			1	20

L899670-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L899670-01 04/05/17 12:45 • (MS) R3208411-7 04/05/17 12:48 • (MSD) R3208411-8 04/05/17 12:52

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Copper	50.0	2.49	58.0	57.0	111	109	1	70-130			2	20
Lead	50.0	ND	52.7	51.3	105	103	1	70-130			3	20
Zinc	50.0	75.4	129	133	108	116	1	70-130			3	20

Method Blank (MB)

(MB) R3207985-3 04/04/17 08:58

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Benzo(a)pyrene	U		0.340	1.00
Bis(2-ethylhexyl)phthalate	U		0.709	3.00
Pentachlorophenol	U		0.313	10.0
(S) Nitrobenzene-d5	*68.1*			*10.0-126*
(S) 2-Fluorobiphenyl	*76.3*			*22.0-127*
(S) p-Terphenyl-d14	*90.0*			*29.0-141*
(S) Phenol-d5	*46.6*			*10.0-120*
(S) 2-Fluorophenol	*55.3*			*10.0-120*
(S) 2,4,6-Tribromophenol	*68.5*			*10.0-153*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3207985-1 04/04/17 08:11 • (LCSD) R3207985-2 04/04/17 08:35

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzo(a)pyrene	50.0	37.4	39.3	74.8	78.6	41.0-120			4.95	20
Bis(2-ethylhexyl)phthalate	50.0	42.4	43.7	84.8	87.5	37.0-121			3.14	21
Pentachlorophenol	50.0	29.1	29.8	58.3	59.6	20.0-126			2.20	32
(S) Nitrobenzene-d5				*66.2*	*77.9*	*10.0-126*				
(S) 2-Fluorobiphenyl				*74.7*	*80.2*	*22.0-127*				
(S) p-Terphenyl-d14				*86.7*	*91.4*	*29.0-141*				
(S) Phenol-d5				*38.5*	*47.5*	*10.0-120*				
(S) 2-Fluorophenol				*50.5*	*62.0*	*10.0-120*				
(S) 2,4,6-Tribromophenol				*77.3*	*83.6*	*10.0-153*				

Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits.

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.**
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Conneticut	PH-0197	North Carolina [1]	DW21704
Florida	E87487	North Carolina [2]	41
Georgia	NELAP	North Dakota	R-140
Georgia [1]	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky [1]	90010	South Dakota	n/a
Kentucky [2]	16	Tennessee [1 4]	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

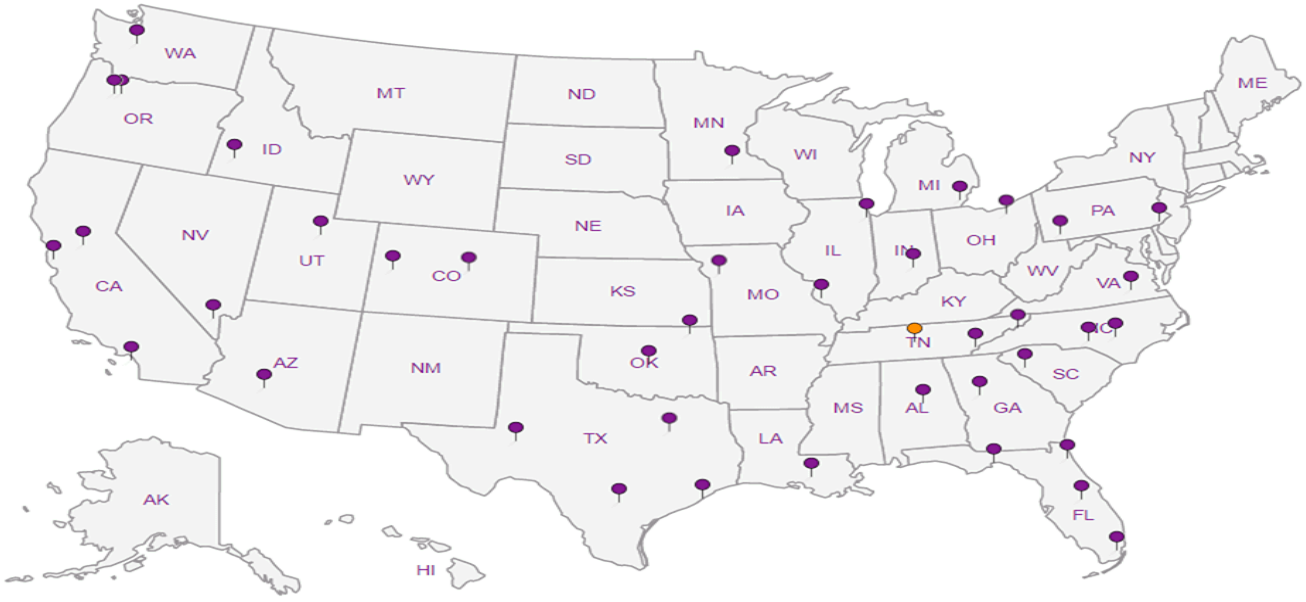
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [n/a] Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



Company Name/Address:
City of Bend- Laboratory
62975 Boyd Acres Rd.
Bend, OR 97701

Billing Information:
City of Bend Laboratory
62975 Boyd Acres Rd
Bend, OR 97701

Report to: **Jeff Buystedt**

Email To: **jbuystedt@bendoregon.gov**

Project Description: **Stormwater UIC Monitoring**

City/State Collected: **Bend OR**

Phone: **541-420-6892**
Fax:

Client Project # **STORMWATER**

Lab Project # **BENDWAT01-STORMWATER**

Collected by (print): **Buchanan**

Site/Facility ID #

P.O. # **117597-001**

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

ESC LABS
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 899711
G126

Acctnum:
Template:
Prelogin:
TSR:
PB:

Shipped Via: **Fedex**

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	625 100ml Amb	625 (Benzo(a)pyrene,	625 Bis(2-ethylhexyl)phthalate,	625 Pentachlorophenol		200.8 Metals 500ML HDPE - HNO3 (CU, PB, ZN) ✓					Rem./Contaminant	Sample # (lab only)
C7C3002-01	Grab	Other		3/30/17	1311	3	X	X	X	X		X					Airport	61
C7C3002-02	Grab	Other		3/30/17	1424	3	X	X	X	X		X					Century	02
C7C3002-03	Grab	Other		3/30/17	1247	3	X	X	X	X		X					**Boyd**	03
C7C3002-04	Grab	Other		3/30/17	1255	3	X	X	X	X		X					Empire	04
C7C3002-05	Grab	Other		3/30/17	1412	3	X	X	X	X		X					Brooks	05
* No Sample	Grab	Other				3											Ladera	
C7C3002-07	Grab	Other		3/30/17	1255	3	X	X	X	X		X					Dup Emp	06
C7C3002-08	Grab	Other		3/31/17	1245	3	X	X	X	X		X					Field Blk	07

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other **Stormwater**

Remarks:

pH ___ Temp ___
Flow ___ Other ___

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
[signature]	3-30-17	1440	Fridge #2
Fridge #2	3-31-17	1401	Fed E
			[signature]

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ ___

Temp: 1.9 °C Bottles Received: 21

Date: 4/4/17 Time: 845

Condition: (lab use only) a

COC Seal Intact: ___ Y ___ N ✓ NA

pH Checked: C2 NCF:

ESC LAB SCIENCES
Cooler Receipt Form

Client:	Broadwater	SDG#	369771
Cooler Received/Opened On: 4/ / /17		Temperature:	1.9
Received By: **Rickey Mosley**			
Signature:			

Receipt Check List	NP	Yes	No
COC Seal Present / Intact?	✓		
COC Signed / Accurate?		✓	
Bottles arrive intact?		✓	
Correct bottles used?		✓	
Sufficient volume sent?		✓	
If Applicable			
VOA Zero headspace?			
Preservation Correct / Checked?		✓	

Appendix I

UNDERGROUND INJECTION CONTROLS AND DRINKING WATER PROTECTION AREA INVESTIGATION, DELINEATION AND MANAGEMENT

FacilityID	InstalDate	LifecycleStatus	LocationDescription	Comments	DesignVolGal	TestTimeMinutes	DEQDepthDiameter	DEQLat	DEQLong	DEQMaintenance	DEQ Mixed Waste	DEQ Has Plug	DEQStatus	DEQTestVolGal	DEQTypeCode	DEQWithin2YR	DEQWithin500	DEQWithinECSI	DEQ_UICNum	DEQYearConstructed	DEQTreatment1	DEQTreatment2	DEQTreatment3	DEQTreatment4	DEQInstallYear	DEQWasteType	DEQWellNum	DEQImpervSFC	DEQDistanceToWell	DEQDistanceToSFW	DEQDepthToGW	
DDF000001	1/1/2013	I	NE BROKEN BOW DR	Drain field (contech)			0	44.07810200	-121.28668989						5D2	NO	NO	NO	10025		3	3	7	7	2013	Stormwater		5859	0	5442	4891	0	
DDF000002	1/1/1900	I	CHINA HAT RD	Drain field (contech)			0	44.00448440	-121.31923022						5D2	YES	YES	NO	10025		1	0	0	0	0	Stormwater		5860	0	401	8923	0	
DDF000003	1/1/1900	I	NW Iowa	Drain field (contech); 40' x 10'			0	44.06825030	-121.32996717						5D2	NO	NO	NO	10025		3	0	0	0	0	Stormwater		5995	0	6748	3607	0	
DDF000004	1/1/1900	I	NW Iowa	Drain field (contech); 20' x 10'			0	44.06824958	-121.32982443						5D2	NO	NO	NO	10025		3	0	0	0	0	Stormwater		5996	0	6782	3582	0	
DDH001000	1/1/1994	I	DDH001000, 110, VOGT RD		0		0 9.6 x 6	44.10733000	-121.29072000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 1/1/1994		3	54	0	0	1994	Stormwater		110	0	772	110	0	
DDH001001	1/1/1994	I	DDH001001, 108, HUNTERS CIR		0		0 11x 6	44.10876000	-121.29213000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 1/1/1994		3	54	0	0	1994	Stormwater		108	0	1234	160	0	
DDH001003	1/1/1986	I	DDH001003, 408, WILDERNESS WAY		0		0 16.7 x 6	44.02890000	-121.26576000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025 1/1/1986		3	54	0	0	1986	Stormwater		408	0	1241	950	0	
DDH001004	1/1/1986	I	DDH001004, 3260, WILDERNESS WAY		0		0 18.9 x 6	44.02916000	-121.26766000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025 1/1/1986		3	0	0	0	1986	Stormwater		3260	0	1356	500	0	
DDH001005	1/1/1982	I	DDH001005, 98, HAWKIN PL		0		0 19.2 x 6	44.11068000	-121.28923000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 1/1/1982		3	54	0	0	1982	Stormwater		98	0	1808	850	0	
DDH001006	1/1/1982	I	DDH001006, 99, COLT LN		0		0 7 x 6	44.10972000	-121.29241000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 1/1/1982		3	54	0	0	1982	Stormwater		99	0	1018	425	0	
DDH001007	1/1/1982	I	DDH001007, 100, COLT LN		0		0 10.1 x 6	44.11043000	-121.29181000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 1/1/1982		3	54	0	0	1982	Stormwater		100	0	1114	575	0	
DDH001008	1/1/1982	I	DDH001008, 102, HUNTERS CIR		0		0 14.3 x 6	44.10981000	-121.29136000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 1/1/1982		3	0	0	0	1982	Stormwater		102	0	1277	325	0	
DDH001009	1/1/1984	I	DDH001009, 410, SILVER TIP CT		0		0 9.25 x 6	44.02175000	-121.30201000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 1/1/1984		3	54	0	0	1989	Stormwater		410	0	1757	1000	0	
DDH001010	1/1/1984	I	DDH001010, 2994, WILDWOOD DR		0		0 28.7x 6	44.02163000	-121.30334000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 1/1/1984		3	0	0	0	1989	Stormwater		2994	0	1714	1000	0	
DDH001011	1/1/1984	I	DDH001011, 2993, ROCKY TOP CT		0		0 13.8 x 6	44.02106000	-121.30280000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 1/1/1984		3	0	0	0	1989	Stormwater		2993	0	1500	1200	0	
DDH001012	7/1/1988	I	DDH001012, 3001, PLATINUM WAY		0		0 30.7 x 6	44.01352000	-121.34019000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025 7/1/1988		3	0	0	0	1988	Stormwater		3001	0	2051	3200	0	
DDH001013	7/1/1989	I	DDH001013, 3706, PLATINUM DR		0		0 19.2 x 6	44.01356000	-121.34065000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025 7/1/1989		3	0	0	0	1989	Stormwater		3706	0	2168	3100	0	
DDH001014	7/1/1988	I	DDH001014, 3458, ALEXANDRITE DR		0		0 33.9 x 6	44.01171000	-121.34014000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025 7/1/1988		3	0	0	0	1988	Stormwater		3458	0	2243	3000	0	
DDH001015	7/1/1988	I	DDH001015, 3459, ALEXANDRITE DR		0		0 16 x 6	44.01263000	-121.34102000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025 7/1/1988		3	0	0	0	1988	Stormwater		3459	0	2338	3200	0	
DDH001016	7/1/1999	I	DDH001016, 3433, ASHFORD DR	E side of Ashford, in front of 60898	0		0 20 x 6	44.01158000	-121.33410000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 7/1/1999		3	0	0	0	1999	Stormwater		3433	0	1128	2200	0	
DDH001017	6/13/1978	I	DDH001017, 1055, POWELL BUTTE HWY		0		0 29.583 x 6	44.09138000	-121.20307000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025 6/13/1978		3	0	0	0	1978	Stormwater		1055	0	857	800	0	
DDH001018	6/13/1978	I	DDH001018, 1054, POWELL BUTTE HWY		0		0 23.25 x 6	44.09217000	-121.20292000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025 6/13/1978		3	0	0	0	1978	Stormwater		1054	0	572	1000	0	
DDH001019	6/13/1978	I	DDH001019, 1053, POWELL BUTTE HWY		0		0 12.41666 x 6	44.09377000	-121.20289000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025 6/13/1978		3	0	0	0	1978	Stormwater		1053	0	77	1600	0	
DDH001020	6/13/1978	I	DDH001020, 1052, POWELL BUTTE HWY		0		0 16.416 x 6	44.09403000	-121.20290000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025 6/13/1978		3	0	0	0	1978	Stormwater		1052	0	132	1700	0	
DDH001021	1/1/2003	I	DDH001021, 2440, NW BORDEAUX LN		0		60 175 x 6	44.07063000	-121.36323000	Biennial	NO	NO	AC	Unknown	A3	128.41	NO	NO	10025 1/1/2003		3	0	0	0	2003	Stormwater		2440	0	562	2200	0	
DDH001022	7/1/1988	I	DDH001022, 1401, TOPAZ CT		0		0 19 x 6	44.01322000	-121.34231000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025 7/1/1988		3	0	0	0	1988	Stormwater		1401	0	2081	2800	0	
DDH001023	7/1/1988	I	DDH001023, 1402, TOPAZ CT		0		0 22.3 x 6	44.01314000	-121.34229000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025 7/1/1988		3	0	0	0	1988	Stormwater		1402	0	2102	2900	0	
DDH001024	1/1/1999	I	DDH001024, 1570, SE CESSNA DR		0		0 20 x 6	44.04952000	-121.27611000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025 1/1/1999		3	0	0	0	1999	Stormwater		1570	0	760	3100	0	
DDH001025	1/1/1998	I	DDH001025, 348, NE JONES RD		0		0 23.3 x 6	44.06928000	-121.29366000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025 1/1/1998		3	0	0	0	1998	Stormwater		348	0	2896	4000	0	
DDH001026	1/1/1974	I	DDH001026, 1418, NW HUNTER PL		0		0 28.4 x 6	44.05474000	-121.31092000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025 1/1/1974		3	0	0	0	1974	Stormwater		1418	0	3364	2300	0	
DDH001027	8/9/2004	I	DDH001027, 1464, NW FLORIDA AVE		0		0 14.3 x .5	44.05392000	-121.31713000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025 8/9/2004		3	0	0	0	2004	Stormwater		1464	0	2452	1700	0	
DDH001028	6/13/1982	I	DDH001028, 90, NE 27TH ST		0		0 9.3 x 6	44.07924000	-121.28375000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 6/13/1982		3	0	0	0	1982	Stormwater		90	0	2541	2200	0	
DDH001029	6/13/1982	I	DDH001029, 94, NE 27TH ST		0		0 26 x 6	44.07714000	-121.26387000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 6/13/1982		3	0	0	0	1982	Stormwater		94	0	3297	2800	0	
DDH001030	6/13/1982	I	DDH001030, 97, NE 27TH ST		0		0 17.4 x 6	44.07715000	-121.26395000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 6/13/1982		3	0	0	0	1982	Stormwater		97	0	3290	2900	0	
DDH001031	6/13/1982	I	DDH001031, 591, NE 27TH ST		0		0 38.4 x 6	44.07221000	-121.26383000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 6/13/1982		3	0	0	0	1982	Stormwater		591	0	5085	2100	0	
DDH001032	6/13/2004	I	DDH001032, 1751, NW WALL ST		0		0 14.1 x 6	44.06151000	-121.31147000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025 6/13/2004		3	0	0	0	2004	Stormwater		1751	0	5563	650	0	
DDH001033	6/13/2004	I	DDH001033, 1750, NW WALL ST		0		0 11.1 x 6	44.06146000	-121.31121000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025 6/13/2004		3	0	0	0	2004	Stormwater		1750	0	5560	700	0	
DDH001034	6/13/1998	I	DDH001034, 1511, NE OLNEY AVE		0		0 8.3 x 6	44.06491000	-121.30323000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025 6/13/1998		3	0	0	0	1998	Stormwater		1511	0	4213	2000	0	
DDH001035	1/1/1983	I	DDH001035, 2036, MEL CT		0		0 23.2 x 6	44.01992000	-121.30678000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 1/1/1983		3	54	0	0	1983	Stormwater		2036	0	1423	1350	0	
DDH001036	6/23/1997	I	DDH001036, 154, SE 15TH ST		0		0 32.5 x 6	44.04100000	-121.31268000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 6/23/1997		3	0	0	0	1997	Stormwater		154	0	1762	875	0	
DDH002000	8/7/2007	I	DDH002000, 338, NW CITY HEIGHTS DR		0		0 60.8 x 6	44.06991000	-121.33205000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 8/7/2007		3	0	0	0	2007	Stormwater		338	0	5996	4600	0	
DDH002001	8/7/2007	I	DDH002001, 337, NW CITY HEIGHTS DR		0		0 88 x 6	44.06992000	-121.33210000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 8/7/2007		3	0	0	0	2007	Stormwater		337	0	5955	4600	0	
DDH002002	8/1/2007	I	DDH002002, 1505, NW CITY VIEW DR		0		0 101.4 x 6	44.07160000	-121.33118000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 8/1/2007		3	0	0	0	2007	Stormwater		1505	0	5995	4000	0	
DDH002003	1/1/1996	I	DDH002003, 256, NW STANNIUM RD		0		0 27.1 x 6	44.05906000	-121.34045000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 1/1/1996		3	0	0	0	1996	Stormwater		256	0	6766	3900	0	
DDH002004	1/1/1996	I	DDH002004, 968, NW 15TH ST		0		0 17.4 x 6	44.06123000	-121.33551000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 1/1/1996		3	0	0	0	1996	Stormwater		968	0	6613	4200	0	
DDH002006	8/9/2004	I	DDH002006, 1415, SW SIMPSON AVE		0		0 74.9 x 6	44.04826000	-121.32870000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025 8/9/2004		3	0	0	0	2004	Stormwater		1415	0	2241	1800	0	
DDH002007	8/1/2007	I	DDH002007, 1726, SW SIMPSON AVE		0		0 71.1 x 6	44.04816000	-121.32629000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 8/1/2007		3	0	0	0	2007	Stormwater		1726	0	1608	1450	0	
DDH002008	1/1/1996	I	DDH002008, 131, SW PRESTWICK PL		0		0 42.9 x 6	44.05103000	-121.34279000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 1/1/1996		3	0	0	0	1996	Stormwater		131	0	5601	1100	0	
DDH002009	8/11/2004	I	DDH002009, 1500, NW MARKEN ST DDH002010, 1638, NW MT WASHINGTON		0		0 37 x 6	44.07266000	-121.35419000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025 8/11/2004		3	0	0	0	2004	Stormwater		1500	0	1439	2900	0	
DDH002010	6/23/1998	I	DR		0		0 18.7 x 6	44.07287000	-121.35334000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 6/23/1998		3	0	0	0	1998	Stormwater		1638	0	1329	2900	0	
DDH002011	7/15/1986	I	DDH002011, 126, NW SUMMIT DR		0		0 104.4 x 6	44.07317000	-121.33647000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 7/15/1986		3	0	0	0	1986	Stormwater		126	0	4500	5000	0	
DDH002012	1/1/1990	I	DDH002012, 1503, NW CLARKSTON DR		0		0 119.6 x 6	44.07253000	-121.33450000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 1/1/1990		3	0	0	0	1990	Stormwater		1503	0	3699	4600	0	
DDH002013	7/15/1986	I	DDH002013, 124, NW SUMMIT DR		0		0 10 x 6	44.07369000	-121.32898000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 7/15/1986		3	0	0	0	1986	Stormwater		124	0	6383	3100	0	
DDH002014	6/23/1980	I	DDH002014, 1606, PONDEROSA ST		0		0 22.6 x 6	44.00993000	-121.33231000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 6/23/1980		3	0	0	0	1980	Stormwater		1606	0	1867	1250	0	
DDH002015	6/23/1978	I	DDH002015, 1604, LODGEPOLE DR		0		0 12.4 x 6	44.01127000	-121.33259000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 6/23/1978		3	0	0	0	1978	Stormwater		1604	0	1165	1850	0	
DDH002016	6/23/1978	I	DDH002016, 1605, LODGEPOLE DR		0		0 23.4 x 6	44.01126000	-121.33309000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 6/23/1978		3	0	0	0	1978	Stormwater		1605	0	1171	1850	0	
DDH002017	8/1/2007	I	DDH002017, 1603, POPLAR ST		0		0 8.33 x 6	44.01087000	-121.33481000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 8/1/2007		3	0	0	0	2007	Stormwater		1603	0	1439	1950	0	
DDH002018	7/1/1998	I	DDH002018, 1576, MAHOGANY ST		0		0 37 x 6	44.01482000	-121.33275000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025 7/1/1998		3	0	0	0	1998	Stormwater		1576	0	1096	3500	0	
DDH002019	7/1/2000	I	DDH002019, 1575, SPRINGCREST DR		0		0 39 x 6	44.01491000	-121.33678000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025 7/1/2000		3	0	0	0	2000	Stormwater		1575	0	1138	3400	0	
DDH002020	7/1/2000	I	DDH002020, 1574, TARGEE DR	Showing depth only after cleaning	0		0 32.416 x 6	44.01576000	-121.33926000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025 7/1/2000		3	0	0	0	2000	Stormwater		1574	0	1842	2900	0	
DDH002021	7/1/1998	I	DDH002021, 1712, DRIFTWOOD LN		0		0 30.6 x 6	44.01543000	-121.32659000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 7/1/1998		3	0	0	0	1998	Stormwater		1712	0	1503	1150	0	
DDH002022	7/1/1998	I	DDH002022, 1713, DRIFTWOOD LN		0		0 10.6 x 6	44.01783000	-121.32579000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025 7/1/1998		3	0	0	0	1998	Stormwater		1713	0	1573	1850	0	
DDH002023	1/1/1900	I	DDH002023, 1095, GRANITE DR		0		0 15.3 x 6	44.01713000	-121.32763000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025		3	0	0	0	0	Stormwater		1095	0	1494	1800	0	
DDH002024	1/1/1988	I	DDH002024, 1410, NE 2ND ST		0		0 67.3 x 6	44.06191000	-121.30399000	Biennial	NO	YES	AC	Unknown	5D3	NO	NO	YES	10025 1/1/1988		3	0	0	0	1988	Stormwater		1410	0	4343	2000	0	
DDH002025	8/30/2006	I	DDH002025, 1530, BEND PKWY		0		0	44.05945000	-121.30735000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025 8/30/2006		3	0	0	0	2006	Stormwater		1530	0	5318	1900	0	
DDH002029	8/1/2007	I	DDH002029, 1483, COUNTRY CLUB DR		0		0 60.6 x 6	44.00787000	-121.29786000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 8/1/2007		1	0	0	0	2007	Stormwater		1483	0	2292	675	0	
DDH002030	8/1/2007	I	DDH002030, 1482, COUNTRY CLUB DR		0		0 9.75 x 6	44.00766000	-121.29802000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 8/1/2007		1	0	0	0	2007	Stormwater		1482	0	2259	625	0	
DDH002033	6/23/1990	I	DDH002033, 2002, SE 27TH ST		0		0 23.25 x 6	44.03366000	-121.26377000	3	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025 6/23/1990		3	0	0	0	1990	Stormwater		2002	0	581	450	0	
DDH002034	1/1/1998	I	DDH002034, 3481, SE TEMPEST DR		0		0 27 x 6	44.04594000	-121.28309000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 1/1/1998		3	0	0	0	1998	Stormwater		3481	0	2912	2700	0	
DDH002035	1/1/1978	I	DDH002035, 1580, SE 4TH ST		0		0 35.4 x 6	44.04241000	-121.28115000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025 1/1/1978		3	0	0	0	1978	Stormwater		1580	0	4773	1600	0	
DDH002036	1/1/1998	I	DDH002036, 1566, SE 3RD ST		0		0 59.75 x 7	44.05009000	-121.30235000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 1/1/1998		3	0	0	0	1998	Stormwater		1566	0	4215	4000	0	
DDH002039	7/23/2000	I	DDH002039, 144, NE REVERE AVE		0		0 16.2 x 6	44.06758000	-121.28791000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 7/23/2000		3	54	0	0	2000	Stormwater		144	0	1792	5000	0	
DDH002040	8/9/2004	I	DDH002040, 495, NE NORTHVIEW DR		0		0 12 x 6	44.06898000	-121.28253000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 8/9/2004		3	0	0	0	2004	Stormwater		495	0	2533	4200	0	
DDH002041	7/23/1985	I	DDH002041, 499, NE REVERE AVE		0		0 8.9 x 6	44.06801000	-121.28333000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 7/23/1985		3	0	0	0	1985	Stormwater		499	0	2120	4200	0	
DDH002042	1/1/1998	I	DDH002042, 1498, NE WATSON DR		0		0 40.8 x 6	44.07289000	-121.28367000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 1/1/1998		3	0	0	0	1998	Stormwater		1498	0	3826	3300	0	
DDH002043	1/1/1986	I	DDH002043, 301, NE VERONICA LN		0		0 13.8 x 6	44.07972000	-121.27642000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 1/1/1986		3	0	0	0	1986	Stormwater		301	0	4399	1450	0	
DDH002044	1/1/1984	I	DDH002044, 64, NE ROCK CHUCK DR		0		0 28.7 x 6	44.08055000	-121.27807000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 1/1/1984		3	0	0	0	1984	Stormwater		64	0	4662	925	0	
DDH002046	6/13/1982	I	DDH002046, 95, NE 27TH ST		0		0 23.5 x 6	44.07426000	-121.26383000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 6/13/1982		3	0	0	0	1982	Stormwater		95	0	4340	2800	0	
DDH002047	6/13/1982	I	DDH002047, 96, NE 27TH ST		0		0 8.2 x 6	44.07426000	-121.26368000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 6/13/1982		3	0	0	0	1982	Stormwater		96	0	4337	2900	0	
DDH002048	1/1/1984	I	DDH002048, 57, NELS ANDERSON RD		0		0 30.9 x 6	44.09116000	-121.35570000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025 1/1/1984		3	54	0	0	1984	Stormwater		57	0	472	500	0	
DDH002049	7/1/1985	I	DDH002049, 1400, PINEBROOK BLVD		0		0 9.9 x 6	44.02162000	-121.32742000	Biennial	NO	NO	AC	Unknown	5D3	YES	YES	NO	10025 7/1/1985		3	0	0	0	1985	Stormwater		1400	0	313	1850	0	
DDH002050	4/26/2006	I	DDH002050, 979, SE 9TH ST		0		0 20.2 x 6	44.04256000	-121.29252000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 4/26/2006		3	0	0	0	2006	Stormwater		979	0	3634	1850	0	
DDH002051	6/13/1978	I	DDH002051, 515, NE 4TH ST		0		0 32.5 x 6	44.06756000	-121.30892000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025 6/13/1978		3	0	0	0	1978	Stormwater		515	0	3919	2900	0	
DDH002052	6/23/1978	I	DDH002052, 564, LODGEPOLE DR		0		0 44.583 x 6	44.01259000	-121.33311000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 6/23/1978		3	0	0	0	1978	Stormwater		564	0	696	2300	0	
DDH002053	6/23/1978	I	DDH002053, 565, LODGEPOLE DR		0		0 16.25 x 6	44.01277000	-121.33351000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 6/23/1978		3	0	0	0	1978	Stormwater		565	0	632	2300	0	
DDH002054	6/23/1978	I	DDH002054, 566, LODGEPOLE DR		0		0 23 x 6	44.01271000	-121.33291000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 6/23/1978		3	0	0	0	1978	Stormwater		566	0	643	2300	0	
DDH002055	7/1/1985	I	DDH002055, 567, NUGGET AVE		0		0 18 x 6	44.00909000	-121.33263000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 7/1/1985		3	0	0	0	1985	Stormwater		567	0	1953	1150	0	
DDH002056	6/23/1980	I	DDH002056, 871, PONDEROSA ST		0		0 16.5 x 6	44.00923000	-121.33212000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 6/23/1980		3	0	0	0	1980	Stormwater		871	0	1864	1200	0	
DDH002058	8/22/2006	I	DDH002058, 2249, NW UTICA AVE		0		0 58.5 x 6	44.06752000	-121.32003000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 8/22/2006		2	0	0	0	2006	Stormwater		2249	0	7272	1850	0	
DDH002059	6/13/2004	I	DDH002059, 1703, NW WALL ST		0		0 12.2 x 6	44.06287000	-121.30999000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025 6/13/2004		3	0	0	0	2004	Stormwater		1703	0	5912	525	0	
DDH002061	1/1/1998	I	DDH002061, 5555, ALLEY		0		0 40.666 x 6	44.05900000	-121.26182000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025 01/01/1998		3	0	0	0	1998	Stormwater		5555	0	4229	2700	0	
DDH002064	1/1/1988	I	DDH002064, 3154, NW SUMMIT DR		0		0 142.4 x 6	44.07456000	-121.33935000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025 1/1/1988		3	0	0	0

FacilityID	InstalDate	LifecycleStatus	LocationDescription	Comments	DesignVolGal	TestTimeMinutes	DEQDepthDiameter	DEQLat	DEQLong	DEQMaintenance	DEQ Mixed Waste	DEQ Has Plug	DEQStatus	DEQTestVolGal	DEQTypeCode	DEQWithin2YR	DEQWithin500	DEQWithinECSI	DEQ_UICNum	DEQYearConstructed	DEQTreatment1	DEQTreatment2	DEQTreatment3	DEQTreatment4	DEQInstallYear	DEQWasteType	DEQWellNum	DEQImpervSFC	DEQDistanceToWell	DEQDistanceToSFW	DEQDepthToGW	
DDH009058	1/1/1988	I	DDH009058, 67, NE HOLLOW TREE LN	Depth only shown after cleaning	0		0 12.166 x 6	44.08050000	-121.27583000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1988	3	54	0	0	1988	Stormwater	67	0	4119	1300	0	
DDH009059	1/1/1988	I	DDH009059, 583, NE HOLLOW TREE LN	Depth only shown after cleaning	0		0 19.583 x 6	44.08052000	-121.27554000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1988	3	54	0	0	1988	Stormwater	583	0	4051	1350	0	
DDH009060	1/1/1988	I	DDH009060, 582, NE HOLLOW TREE LN	Depth only shown after cleaning	0		0 11.083 x 6	44.08055000	-121.27364000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1988	3	54	0	0	1988	Stormwater	582	0	3688	1500	0	
DDH009061	1/1/1988	I	DDH009061, 59, NE TAYLOR CT		0		0 34 x 6	44.08142000	-121.27456000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1988	3	0	0	0	1988	Stormwater	59	0	3665	1350	0	
DDH009062	1/1/1994	I	DDH009062, 276, NE MONROE LN		0		0 14.2 x 6	44.08208000	-121.27496000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1994	3	0	0	0	1994	Stormwater	276	0	3656	1100	0	
DDH009063	1/1/1996	I	DDH009063, 3132, NE OCKER DR		0		0 15 x 6	44.07706000	-121.27071000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1996	3	0	0	0	1996	Stormwater	3132	0	3982	2600	0	
DDH009064	1/1/1982	I	DDH009064, 3071, NE MONTEREY AVE		0		0 21.8 x 6	44.07776000	-121.27164000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1982	3	0	0	0	1982	Stormwater	3071	0	3917	2300	0	
DDH009065	3/27/1978	I	DDH009065, 3068, NE PURCELL BLVD		0		0 22.3 x 6	44.07810000	-121.27167000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	3/27/1978	3	0	0	0	1978	Stormwater	3068	0	3833	2200	0	
DDH009066	3/27/1978	I	DDH009066, 3070, NE WELLS ACRES RD		0		0 23.8 x 6	44.07844000	-121.27195000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	3/27/1978	3	0	0	0	1978	Stormwater	3070	0	3788	2100	0	
DDH009068	1/1/1982	I	DDH009068, 3127, NE MISTLETOE CT		0		0 17.3 x 6	44.07685000	-121.27348000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1982	3	0	0	0	1982	Stormwater	3127	0	4488	2700	0	
DDH009069	1/1/1984	I	DDH009069, 289, NE RED ROCK LN		0		0 20.3 x 6	44.07868000	-121.27379000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1984	3	0	0	0	1984	Stormwater	289	0	4073	2100	0	
DDH009070	3/27/1978	I	DDH009070, 3069, NE WELLS ACRES RD		0		0 9.6 x 6	44.07779000	-121.27464000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	3/27/1978	3	54	0	0	1978	Stormwater	3069	0	4455	2300	0	
DDH009071	1/1/1982	I	DDH009071, 3131, NE MONTEREY AVE		0		0 22 x 6	44.07706000	-121.27403000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1982	3	0	0	0	1982	Stormwater	3131	0	4531	2600	0	
DDH009072	1/1/1996	I	DDH009072, 3469, NE CORDATA PL		0		0 23.3 x 6	44.07658000	-121.27529000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1996	3	0	0	0	1996	Stormwater	3469	0	4885	2600	0	
DDH009073	1/1/1982	I	DDH009073, 3130, NE MONTEREY AVE		0		0 10.2 x 6	44.07697000	-121.27533000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1982	2	0	0	0	1982	Stormwater	3130	0	4793	2500	0	
DDH009074	8/1/2007	I	DDH009074, 3129, NE CORDATA DR		0		0 21.9 x 6	44.07704000	-121.27606000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	8/1/2007	3	0	0	0	2007	Stormwater	3129	0	4915	2300	0	
DDH009075	3/27/1978	I	DDH009075, 3066, NE WELLS ACRES RD		0		0 17.2 x ?	44.07803000	-121.27614000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	3/27/1978	3	0	0	0	1978	Stormwater	3066	0	4697	2000	0	
DDH009076	1/1/1982	I	DDH009076, 3004, NE LAPOINT CT		0		0 23.6 x 6	44.07805000	-121.27702000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1982	3	0	0	0	1982	Stormwater	3004	0	4875	1850	0	
DDH009077	8/3/2003	I	DDH009077, 3133, NE DAGGETT LN		0		0 12 x 6	44.07680000	-121.27866000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	8/3/2003	3	0	0	0	2003	Stormwater	3133	0	5493	2000	0	
DDH009078	8/3/2003	I	DDH009078, 3120, NE DAGGETT LN		0		0 23 x 6	44.07717000	-121.27866000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	8/3/2003	3	0	0	0	2003	Stormwater	3120	0	5411	1900	0	
DDH009079	6/1/1984	I	DDH009079, 3128, NE SYCAMORE CT		0		0 43 x 6	44.07771000	-121.27812000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	6/1/1984	2	0	0	0	1984	Stormwater	3128	0	5179	1800	0	
DDH009080	8/3/2003	I	DDH009080, 3121, NE DAGGETT LN		0		0 38.6 x 6	44.07820000	-121.27866000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	8/3/2003	3	0	0	0	2003	Stormwater	3121	0	5193	1600	0	
DDH009081	1/1/1986	I	DDH009081, 292, NE RED ROCK LN		0		0 16.7 x 6	44.07855000	-121.27556000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1986	3	0	0	0	1986	Stormwater	292	0	4464	1900	0	
DDH009082	1/1/1986	I	DDH009082, 287, NE RED ROCK LN		0		0 21.8 x 6	44.07860000	-121.27580000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1986	3	0	0	0	1986	Stormwater	287	0	4497	1900	0	
DDH009083	1/1/1986	I	DDH009083, 291, NE DEBORAH CT		0		0 21.2 x 6	44.07898000	-121.27538000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1986	3	0	0	0	1986	Stormwater	291	0	4327	1800	0	
DDH009084	1/1/1986	I	DDH009084, 302, NE VERONICA LN		0		0 22.2 x 6	44.07986000	-121.27469000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1986	3	0	0	0	1986	Stormwater	302	0	3812	1700	0	
DDH009085	1/1/1986	I	DDH009085, 290, NE BLUEBELL LN		0		0 9.6 x 6	44.07947000	-121.27430000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1986	3	0	0	0	1986	Stormwater	290	0	3991	1850	0	
DDH009086	1/1/1988	I	DDH009086, 299, NE MADISON AVE		0		0 21.25 x 6	44.07988000	-121.27553000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1988	3	0	0	0	1988	Stormwater	299	0	4168	1550	0	
DDH009087	1/1/1986	I	DDH009087, 288, NE RED ROCK LN		0		0 13.9 x 6	44.07961000	-121.27521000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1986	3	0	0	0	1986	Stormwater	288	0	4372	1500	0	
DDH009088	1/1/1984	I	DDH009088, 350, NE ROCK CHUCK DR		0		0 53.8 x .6	44.07908000	-121.27767000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1984	3	0	0	0	1984	Stormwater	350	0	4800	1450	0	
DDH009089	1/1/1984	I	DDH009089, 300, NE ROCK CHUCK DR		0		0 24.7 x 6	44.08004000	-121.27820000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1984	3	0	0	0	1984	Stormwater	300	0	4746	1100	0	
DDH009090	1/1/1980	I	DDH009090, 286, NE VILLAGE CT		0		0 24.2 x 6	44.07894000	-121.27615000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1980	3	0	0	0	1980	Stormwater	286	0	5606	1050	0	
DDH009091	3/27/1978	I	DDH009091, 3097, NE WELLS ACRES RD		0		0 46.33 x 6	44.07860000	-121.28157000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	3/27/1978	3	0	0	0	1978	Stormwater	3097	0	5776	1150	0	
DDH009092	1/1/1980	I	DDH009092, 3067, NE WOODRIDGE LN		0		0 79 x 6	44.07782000	-121.28139000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1980	3	0	0	0	1980	Stormwater	3067	0	5712	1450	0	
DDH009093	3/27/1978	I	DDH009093, 3118, NE WELLS ACRES RD		0		0 18 x 6	44.07845000	-121.27885000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	3/27/1978	3	0	0	0	1978	Stormwater	3118	0	5184	1450	0	
DDH009094	8/3/2003	I	DDH009094, 3122, NE DAGGETT LN		0		0 28 x 6	44.07717000	-121.27879000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	8/3/2003	3	0	0	0	2003	Stormwater	3122	0	5437	1900	0	
DDH009095	1/1/1982	I	DDH009095, 3123, NE FLOWER CT		0		0 22.6 x 6	44.07693000	-121.27629000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1982	3	0	0	0	1982	Stormwater	3123	0	5561	1950	0	
DDH009096	9/1/2005	I	DDH009096, 3119, NE CANYON PARK PL		0		0 20.2 x 6	44.07689000	-121.28005000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	9/1/2005	3	0	0	0	2005	Stormwater	3119	0	5477	1850	0	
DDH009097	9/1/2005	I	DDH009097, 3124, NE CANYON PARK DR		0		0 8.6 x 6	44.07709000	-121.28053000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	9/1/2005	3	0	0	0	2005	Stormwater	3124	0	5510	1750	0	
DDH009098	9/1/2005	I	DDH009098, 3125, NE CANYON PARK DR		0		0 23 x 6	44.07710000	-121.28075000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	9/1/2005	3	0	0	0	2005	Stormwater	3125	0	5497	1750	0	
DDH009099	9/1/2005	I	DDH009099, 3126, NE CANYON PARK DR		0		0 36 x 6	44.07709000	-121.28074000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	9/1/2005	3	0	0	0	2005	Stormwater	3126	0	5495	1750	0	
DDH009100	1/1/1990	I	DDH009100, 3134, NE SHEPARD RD		0		0 59.5 x 6	44.07991000	-121.28353000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1990	3	0	0	0	1990	Stormwater	3134	0	5278	1800	0	
DDH009101	1/1/1990	I	DDH009101, 3135, NE SHEPARD RD		0		0 39 x 6	44.07687000	-121.28337000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1990	3	0	0	0	1990	Stormwater	3135	0	5264	1800	0	
DDH009102	8/1/2007	I	DDH009102, 506, NE DIABLO WAY		0		0 20.7 x 6	44.06907000	-121.25923000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	8/1/2007	3	0	0	0	2007	Stormwater	506	0	4788	2200	0	
DDH009103	1/1/1984	I	DDH009103, 510, NE CARSON WAY		0		0 14.8 x 6	44.06897000	-121.25933000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1984	3	0	0	0	1984	Stormwater	510	0	5062	1900	0	
DDH009104	8/1/2007	I	DDH009104, 505, NE DIABLO WAY		0		0 21.8 x 6	44.06809000	-121.25930000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	8/1/2007	3	0	0	0	2007	Stormwater	505	0	4996	2100	0	
DDH009105	1/1/1984	I	DDH009105, 509, NE CARSON WAY		0		0 13.5 x 6	44.06835000	-121.26029000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1984	3	0	0	0	1984	Stormwater	509	0	5162	1850	0	
DDH009106	8/1/2007	I	DDH009106, 511, NE LARAMIE WAY		0		0 12.5 x 6	44.06797000	-121.25958000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	8/1/2007	3	0	0	0	2007	Stormwater	511	0	5381	1700	0	
DDH009107	1/1/1992	I	DDH009107, 87, NE WICHITA WAY	Depth only shown after cleaning	0		0 20 x 6	44.06704000	-121.26281000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1992	3	54	0	0	1992	Stormwater	87	0	5811	1150	0	
DDH009108	1/1/1992	I	DDH009108, 86, NE WICHITA WAY		0		0 13.5 x 6	44.06750000	-121.26317000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1992	3	0	0	0	1992	Stormwater	86	0	5972	1050	0	
DDH009110	1/1/1992	I	DDH009110, 508, NE WICHITA WAY		0		0 21.5 x 6	44.06898000	-121.26250000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1992	3	0	0	0	1992	Stormwater	508	0	5559	1400	0	
DDH009111	1/1/1992	I	DDH009111, 491, NE WICHITA WAY	Depth only shown after cleaning	0		0 18.416 x 6	44.06898000	-121.26155000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1992	3	54	0	0	1992	Stormwater	491	0	5337	1650	0	
DDH009112	1/1/1994	I	DDH009112, 639, NE TUCSON WAY		0		0 24.1 x 6	44.06928000	-121.26115000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1994	3	0	0	0	1994	Stormwater	639	0	5192	1800	0	
DDH009113	6/13/1982	I	DDH009113, 592, NE 27TH ST		0		0 31 x 6	44.07221000	-121.26127000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	6/13/1982	3	0	0	0	1982	Stormwater	592	0	5081	2200	0	
DDH009116	6/13/1982	I	DDH009116, 91, NE 27TH ST		0		0 14 x 6	44.07924000	-121.26369000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	6/13/1982	3	0	0	0	1982	Stormwater	91	0	2534	2200	0	
DDH009118	8/11/2004	I	DDH009118, 3218, NW MARKEN ST		0		0 72.7 x 6	44.06877000	-121.35590000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	8/11/2004	3	0	0	0	2004	Stormwater	3218	0	1563	1550	0	
DDH009119	8/11/2004	I	DDH009119, 3217, NW MARKEN ST		0		0 49.4 x 6	44.06907000	-121.35575000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	8/11/2004	3	0	0	0	2004	Stormwater	3217	0	1400	1124	0	
DDH009120	8/1/2005	I	DDH009120, 3509, NW NORDIC AVE		0		0 19 x 6	44.07280000	-121.35498000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	8/1/2005	3	0	0	0	2005	Stormwater	3509	0	1321	2800	0	
DDH009121	8/11/2004	I	DDH009121, 3185, NW MARKEN ST		0		0 28 x 7	44.07267000	-121.35433000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	8/11/2004	3	0	0	0	2004	Stormwater	3185	0	1442	2900	0	
DDH009122	8/1/2005	I	DDH009122, 3190, NW SCANDIA LOOP		0		0 75.2 x 6	44.07110000	-121.35797000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	YES	10025	8/1/2005	3	0	0	0	2005	Stormwater	3190	0	830	2100	0	
DDH009123	8/2/2005	I	DDH009123, 3211, NW TORSWAY ST		0		0 100.1 x 6	44.07134000	-121.35653000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	YES	10025	8/2/2005	3	0	0	0	2005	Stormwater	3211	0	1105	2300	0	
DDH009124	8/1/2005	I	DDH009124, 3187, NW SCANDIA LOOP		0		0 17.8 x 6	44.07177000	-121.35588000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	8/1/2005	3	0	0	0	2005	Stormwater	3187	0	1160	2500	0	
DDH009125	8/1/2005	I	DDH009125, 3186, NW SCANDIA LOOP		0		0 23 x 6	44.07199000	-121.35480000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	8/1/2005	3	0	0	0	2005	Stormwater	3186	0	1422	2700	0	
DDH009126	8/11/2004	I	DDH009126, 3198, NW MARKEN ST		0		0 13 x 6	44.07195000	-121.35431000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	8/11/2004	3	0	0	0	2004	Stormwater	3198	0	1552	2800	0	
DDH009127	6/23/1998	I	DDH009127, 3084, NW MT WASHINGTON DR		0		0	44.07044000	-121.35388000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	6/23/1998	3	0	0	0	1998	Stormwater	3084	0	1870	2400	0	
DDH009128	8/11/2004	I	DDH009128, 3212, NW MARKEN ST		0		0 11.2 x 6	44.06979000	-121.35507000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	8/11/2004	3	0	0	0	2004	Stormwater	3212	0	1633	1950	0	
DDH009129	8/11/2004	I	DDH009129, 3210, NW POLARSTAR AVE		0		0 53.4 x 6	44.06963000	-121.35487000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	8/11/2004	3	0	0	0	2004	Stormwater	3210	0	815	1550	0	
DDH009130	8/11/2004	I	DDH009130, 3209, NW POLARSTAR AVE		0		0 54 x 6	44.06994000	-121.35908000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	YES	10025	8/11/2004	3	0	0	0	2004	Stormwater	3209	0	625	1650	0	
DDH009131	1/1/1998	I	DDH009131, 3180, NE WATSON CT		0		0 52.5 x 6	44.07295000	-121.35251000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1998	3	0	0	0	1998	Stormwater	3180	0	3848	3200	0	
DDH009132	1/1/1990	I	DDH009132, 3166, NE SHEPARD RD		0		0 43.3 x 6	44.07373000	-121.28367000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1990	3	0	0	0	1990	Stormwater	3166	0	4125	3000	0	
DDH009133	1/1/1990	I	DDH009133, 3165, NE SHEPARD RD		0		0 11.7 x 6	44.07379000	-121.28366000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1990	3	0	0	0	1990	Stormwater	3165	0	4147	2900	0	
DDH009134	1/1/1980	I	DDH009134, 321, NE MEADOW LN		0		0 11.6 x 6	44.07414000	-121.28240000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1980	3	0	0	0	1980	Stormwater	321	0	4340	2800	0	
DDH009135	1/1/1980	I	DDH009135, 322, NE MEADOW LN		0		0 36.3 x 6	44.07417000	-121.28252000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1980	3	0	0	0	1980	Stormwater	322	0	4347	2800	0	
DDH009136	1/1/1980	I	DDH009136, 320, NE MEADOW LN		0		0 40 x 6	44.07418000	-121.28270000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1980	3	0	0	0	1980	Stormwater	320	0	4342	2800	0	
DDH009137	1/1/1982	I	DDH009137, 3137, NE TAURUS CT		0		0 14.7 x 6	44.07605000	-121.27930000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1982	3	0	0	0	1982	Stormwater	3137	0	5248	2200	0	
DDH009138	6/13/1982	I	DDH009138, 1057, NE 27TH ST	Depth only shown after cleaning	0		0 16.75 x 6	44.08502000	-121.26381000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	6/13/1982	3	54	0	0	1982	Stormwater	1057	0	578	1150	0	
DDH009139	1/1/1986	I	DDH009139, 3573, NE BEND RIVER MALL AVE		0		0 64.4 x 6	44.08380000	-121.30383000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	1/1/1986	3	0	0	0	1986	Stormwater	3573	0	847	275	0	
DDH009141	1/1/1998	I	DDH009141, 3155, NE THOMPSON DR		0		0 4.6 x 6	44.07435000	-121.28404000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1998	3	0	0	0	1998	Stormwater	3155	0	4326	2800	0	
DDH009146	8/10/2005	I	DDH009146, 310, NE RAVEN CT		0		0 22 x 6	44.07561000	-121.29216000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	8/10/2005	3	0	0	0	2005	Stormwater	310	0	4867	2100	0	
DDH009147	3/27/1978	I	DDH009147, 1016, NE 8TH ST		0		0 18.9 x 6	44.07518000	-121.29109000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	3/27/1978	3	0	0	0	1978	Stormwater	1016	0	4549	2200	0	
DDH009148	8/9/2005	I	DDH009148, 119, NE MARION PL		0		0 13.1 x 6	44.07445000	-121.29067000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	8/9/2005	3	0	0	0	2005	Stormwater	119	0	4367	2400	0	
DDH009149	8/10/2005	I	DDH009149, 127, NE RAVENWOOD DR		0		0 19.3 x 6	44.07428000	-121.29152000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	8/10/2005	3	0	0	0	2005	Stormwater	127	0	4315	2500	0	
DDH009150	8/10/2005	I	DDH009150, 128, NE RAVENWOOD DR		0		0 24.5 x 6	44.07429000	-121.29089000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	8/10/2005	3	0	0	0	2005	Stormwater	128	0	4329	2500	0	
DDH009151	3/27/1978	I	DDH009151, 637, NE 8TH ST		0		0 15.8 x 6	44.07434000	-121.29205000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	3/27/1978	3	0	0	0	1978	Stormwater	637	0	4416	2500	0	
DDH009152	3/27/1978	I	DDH009152, 2384, NE BUTLER MARKET RD		0		0 14.7 x 6	44.07645000	-121.29298000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	3/27/1978	3	0	0	0	1978	Stormwater	2384	0	4589	1650	0	
DDH009153	3/27/1978	I	DDH009153, 2385, NE BUTLER MARKET RD		0		0 29 x 6	44.07634000	-121.29297000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	3/27/1978	3	54	0	0	1978	Stormwater	2385	0	4620	1700	0	
DDH009154	8/10/2005	I	DDH009154, 309, NE RAVENWOOD DR		0		0 16.7 x .6	44.07628000	-121.29304000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	8/10/2005	3	0	0	0	2005	Stormwater	309	0	4626	1700	0	
DDH009155	3/27/1978	I	DDH009155, 142, NE STUDIO RD		0		0 9.2 x 6	44.07301000	-121.29860000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	3/27/1978	3	0	0	0	1978	Stormwater	142	0	4762	2100	0	
DDH009156	3/27/1978	I	DDH009156, 141, NE STUDIO RD		0		0 49.5 x 6	44.07298000	-121.29838000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	3/27/1978	3	0	0	0	1978	Stormwater	141	0	4731	2100	0	
DDH009157	3/27/1978	I	DDH009157, 313, NE STUDIO RD		0		0 8.5 x 6	44.07485000	-121.29777000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	3/27/1978	3	0	0	0	1978	Stormwater	313	0	4435	1800	0	
DDH009158	3/27/1978	I	DDH009158, 314

FacilityID	InstallDate	LifecycleStatus	LocationDescription	Comments	DesignVolGal	TestTimeMinutes	DEQDepthDiameter	DEQLat	DEQLong	DEQMaintenance	DEQ Mixed Waste	DEQ Has Plug	DEQStatus	DEQTestVolGal	DEQTypeCode	DEQWithin2YR	DEQWithin500	DEQWithinECSI	DEQ_UICNum	DEQYearConstructed	DEQTreatment1	DEQTreatment2	DEQTreatment3	DEQTreatment4	DEQInstallYear	DEQWasteType	DEQWellNum	DEQImpervSFC	DEQDistanceToWell	DEQDistanceToSFW	DEQDepthToGW	
DDH009221	1/1/1994	I	DDH009221, 520, NE 5TH ST		0		0 34.8 x 6	44.06752000	-121.29904000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	1/1/1994	3	0	0	0	1994	Stormwater	520	0	3508	3300	0	
DDH009222	6/13/1978	I	DDH009222, 516, NE 4TH ST		0		0 30.4 x 6	44.06751000	-121.30078000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	6/13/1978	3	0	0	0	1978	Stormwater	516	0	3909	2900	0	
DDH009223	7/23/1995	I	DDH009223, 504, NE REVERE AVE		0		0 17.6 x 6	44.06769000	-121.30022000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	7/23/1995	3	54	0	0	1995	Stormwater	504	0	3808	3000	0	
DDH009224	7/23/1995	I	DDH009224, 501, NE REVERE AVE		0		0	44.06760000	-121.30054000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	7/23/1995	3	0	0	0	1995	Stormwater	501	0	3866	2900	0	
DDH009225	7/23/1995	I	DDH009225, 502, NE REVERE AVE		0		8 83.3 x 6	44.06771000	-121.30054000	Biennial	NO	NO	AC	84.15	5D3	NO	NO	YES	10025	7/23/1995	3	54	0	0	1995	Stormwater	502	0	3885	2900	0	
DDH009226	7/23/1995	I	DDH009226, 503, NE REVERE AVE		0		0 26.3 x 6	44.06769000	-121.30054000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	7/23/1995	3	0	0	0	1995	Stormwater	503	0	3883	2900	0	
DDH009227	8/30/2006	I	DDH009227, 500, NE 4TH ST		0		0 36 x 6	44.06790000	-121.30066000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	8/30/2006	3	0	0	0	2006	Stormwater	500	0	3948	2900	0	
DDH009228	1/1/1994	I	DDH009228, 1066, NE SEWARD AVE		0		0 37.7 x 6	44.06861000	-121.29938000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	1/1/1994	3	0	0	0	1994	Stormwater	1066	0	3798	3000	0	
DDH009229	1/1/1990	I	DDH009229, 1064, NE THURSTON AVE		0		0 30.4 x 6	44.06946000	-121.29953000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	1/1/1990	3	0	0	0	1990	Stormwater	1064	0	4012	2700	0	
DDH009231	1/1/1978	I	DDH009231, 3221, NE SEWARD AVE		0		0 13 x 6	44.06861000	-121.30077000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	1/1/1978	3	0	0	0	1978	Stormwater	3221	0	4791	2200	0	
DDH009232	1/1/1978	I	DDH009232, 3220, NE SEWARD AVE		0		0 14.9 x 6	44.06861000	-121.30312000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	1/1/1978	3	0	0	0	1978	Stormwater	3220	0	4639	2300	0	
DDH009233	1/1/1978	I	DDH009233, 3222, NE SEWARD AVE		0		10 89.6 x 6	44.06871000	-121.30312000	Biennial	NO	NO	AC	104.72	5D3	NO	NO	YES	10025	1/1/1978	3	0	0	0	1978	Stormwater	3222	0	4656	2300	0	
DDH009235	8/3/2003	I	DDH009235, 326, NE EDGEWOOD ST		0		0 2 x 6	44.07188000	-121.30245000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	8/3/2003	3	0	0	0	2003	Stormwater	326	0	3420	3700	0	
DDH009237	8/3/2003	I	DDH009237, 328, NE VIKING AVE		0		0 10 x 6	44.07146000	-121.28545000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	8/3/2003	3	0	0	0	2003	Stormwater	328	0	3226	3700	0	
DDH009238	1/1/1982	I	DDH009238, 330, NE ULYSSES DR		0		0 14.5 x 6	44.07092000	-121.28959000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1982	3	0	0	0	1982	Stormwater	330	0	3052	3700	0	
DDH009239	1/1/1980	I	DDH009239, 327, NE VIKING CT		0		0 24.5 x 6	44.07156000	-121.28944000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1980	3	0	0	0	1980	Stormwater	327	0	3275	3500	0	
DDH009240	1/1/1980	I	DDH009240, 325, NE HOLLINSHEAD CT		0		0 33.7 x 6	44.07210000	-121.28945000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1980	3	0	0	0	1980	Stormwater	325	0	3469	3300	0	
DDH009241	1/1/1980	I	DDH009241, 329, NE 11TH PL		0		0 11.4 x 6	44.07205000	-121.29109000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1980	3	0	0	0	1980	Stormwater	329	0	3537	3300	0	
DDH009242	3/27/1978	I	DDH009242, 344, NE 8TH ST		0		0 unk x 4	44.07098000	-121.29372000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	3/27/1978	3	0	0	0	1978	Stormwater	344	0	3435	3400	0	
DDH009243	3/27/1978	I	DDH009243, 345, NE 8TH ST		0		0 22 x 6	44.07120000	-121.29387000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	3/27/1978	3	0	0	0	1978	Stormwater	345	0	3527	3300	0	
DDH009245	1/1/1995	I	DDH009245, 334, NE UNDERWOOD AVE		0		0 55 x 6	44.07056000	-121.30227000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	1/1/1995	3	0	0	0	1995	Stormwater	334	0	4827	1950	0	
DDH009246	1/1/1995	I	DDH009246, 333, NE UNDERWOOD AVE		0		0 119 x 8	44.07041000	-121.30233000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	1/1/1995	3	0	0	0	1995	Stormwater	333	0	4809	1950	0	
DDH009249	1/1/1982	I	DDH009249, 3216, NE THURSTON AVE		0		0 82.8 x 6	44.06955000	-121.30354000	Biennial	NO	NO	AC	74.8	5D3	NO	NO	YES	10025	1/1/1982	3	0	0	0	1982	Stormwater	3216	0	4904	2100	0	
DDH009250	1/1/1990	I	DDH009250, 1065, NE THURSTON AVE		0		0 29.1 x 6	44.06956000	-121.29955000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	1/1/1990	3	0	0	0	1990	Stormwater	1065	0	4037	2700	0	
DDH009251	8/31/2006	I	DDH009251, 1063, NE 4TH ST		0		0 27.6 x 6	44.06967000	-121.30066000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	8/31/2006	3	0	0	0	2006	Stormwater	1063	0	4294	2500	0	
DDH009252	6/13/1978	I	DDH009252, 1062, NE 4TH ST		0		0 66.1 x 6	44.07018000	-121.30067000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	6/13/1978	3	0	0	0	1978	Stormwater	1062	0	4409	2300	0	
DDH009253	3/27/1978	I	DDH009253, 336, NE STUDIO RD		0		0 48.6 x 6	44.07091000	-121.29940000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	3/27/1978	3	0	0	0	1978	Stormwater	336	0	4330	2400	0	
DDH009254	3/27/1978	I	DDH009254, 335, NE STUDIO RD		0		0 7.666 x 6	44.07094000	-121.29953000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	3/27/1978	3	0	0	0	1978	Stormwater	335	0	4365	2400	0	
DDH009255	1/1/1994	I	DDH009255, 143, NE STUDIO RD		0		0 117.4 x 6	44.07246000	-121.29859000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	1/1/1994	3	0	0	0	1994	Stormwater	143	0	4652	2200	0	
DDH009256	3/27/1978	I	DDH009256, 638, NE 8TH ST		0		0 21.66 x 6	44.07282000	-121.29334000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	3/27/1978	3	0	0	0	1978	Stormwater	638	0	3999	2800	0	
DDH009258	1/1/1982	I	DDH009258, 3219, NE 2ND ST	Depth only shown after cleaning	0		0 16 x 6	44.06946000	-121.30395000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	1/1/1982	3	0	0	0	1982	Stormwater	3219	0	4978	2100	0	
DDH009259	3/27/1978	I	DDH009259, 525, NE PENN AVE		0		0 25.75 X 6	44.06599000	-121.30400000	Biennial	NO	YES	AC	Unknown	5D3	NO	NO	YES	10025	3/27/1978	3	54	0	0	1978	Stormwater	525	0	4501	1850	0	
DDH009260	1/1/1900	I	DDH009260, 2067, AWBREY BUTTE RD		0		0 71.4 x 6	44.07852000	-121.33231000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025		3	0	0	0	0	Stormwater	2067	0	5424	3600	0	
DDH009262	1/1/1900	I	DDH009262, 2068, AWBREY BUTTE RD		0		0 79.7 x 6	44.07620000	-121.33271000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025		3	0	0	0	0	Stormwater	2068	0	5319	3700	0	
DDH009264	7/1/2008	I	DDH009264, 3320, NW 14TH ST		0		0 37.8 x 6	44.05906000	-121.33192000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	YES	10025	7/1/2008	3	0	0	0	2008	Stormwater	3320	0	5192	2100	0	
DDH009265	7/1/2008	I	DDH009265, 134, NW 14TH ST		0		0 75 x 6	44.06007000	-121.33192000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/1/2008	3	0	0	0	2008	Stormwater	134	0	5494	2300	0	
DDH009273	1/1/2000	I	DDH009273, 3521, NW TRENTON AVE		0		0	44.06689000	-121.32630000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/2000	3	0	0	0	2000	Stormwater	3521	0	7219	2800	0	
DDH009275	6/23/1990	I	DDH009275, 3522, NW 9TH ST		0		0	44.06595000	-121.32485000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	6/23/1990	3	0	0	0	1990	Stormwater	3522	0	6805	2400	0	
DDH009276	1/1/2000	I	DDH009276, 3193, NW 12TH ST	Plugged at this depth	0		0 4.5 x 6	44.07131000	-121.32831000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/2000	3	0	0	0	2000	Stormwater	3193	0	6571	3600	0	
DDH009277	7/15/1986	I	DDH009277, 3169, NW SUMMIT DR		0		0 41. 7x 6	44.07303000	-121.33208000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/15/1986	3	0	0	0	1986	Stormwater	3169	0	5630	3900	0	
DDH009278	7/15/1986	I	DDH009278, 3174, NW SUMMIT DR		0		0 11.5 x 6	44.07303000	-121.33240000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/15/1986	3	0	0	0	1986	Stormwater	3174	0	5547	4000	0	
DDH009279	8/1/2007	I	DDH009279, 3201, NW CITY VIEW DR		0		0 139.7 x 6	44.07115000	-121.33380000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	8/1/2007	3	0	0	0	2007	Stormwater	3201	0	5396	4600	0	
DDH009280	8/1/2007	I	DDH009280, 3207, NW CITY VIEW DR		0		0 95. 1x 6	44.07121000	-121.33380000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	8/1/2007	3	0	0	0	2007	Stormwater	3207	0	5392	4600	0	
DDH009281	8/1/2007	I	DDH009281, 3208, NW CITY VIEW DR		0		0 67 x 6	44.07160000	-121.33140000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	8/1/2007	3	0	0	0	2007	Stormwater	3208	0	5935	4000	0	
DDH009282	8/1/2007	I	DDH009282, 3203, NW CITY VIEW DR		0		0 98.4 x 6	44.07153000	-121.33138000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	8/1/2007	3	0	0	0	2007	Stormwater	3203	0	5952	4000	0	
DDH009283	8/1/2007	I	DDH009283, 3204, NW CITY VIEW DR		0		0 95.9 x 6	44.07177000	-121.33077000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	8/1/2007	3	0	0	0	2007	Stormwater	3204	0	6079	3800	0	
DDH009284	8/1/2007	I	DDH009284, 3205, NW CITY VIEW DR		0		0 93.2 x 6	44.07182000	-121.33083000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	8/1/2007	3	0	0	0	2007	Stormwater	3205	0	6061	3800	0	
DDH009285	1/1/2000	I	DDH009285, 3177, NW 12TH ST		0		0 6.7 x. 6	44.07278000	-121.32976000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/2000	3	0	0	0	2000	Stormwater	3177	0	6244	3400	0	
DDH009287	7/15/1986	I	DDH009287, 3173, NW SUMMIT DR		0		0 55.1 x 6	44.07281000	-121.33400000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/15/1986	3	0	0	0	1986	Stormwater	3173	0	5160	4400	0	
DDH009288	7/15/1986	I	DDH009288, 3176, NW SUMMIT DR		0		0 47 x. 6	44.07281000	-121.33342000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/15/1986	3	0	0	0	1986	Stormwater	3176	0	5100	4400	0	
DDH009290	8/21/2006	I	DDH009290, 3179, NW GLASSOW DR		0		0 165 x 6	44.07269000	-121.33667000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	8/21/2006	3	0	0	0	2006	Stormwater	3179	0	4495	5200	0	
DDH009291	8/1/2007	I	DDH009291, 3200, NW CITY VIEW DR		0		0 49.2 x 6	44.07006000	-121.33417000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	8/1/2007	3	0	0	0	2007	Stormwater	3200	0	5467	5000	0	
DDH009292	8/1/2007	I	DDH009292, 3202, NW CITY VIEW DR		0		0 84.8 x 6	44.06998000	-121.33415000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	8/1/2007	3	0	0	0	2007	Stormwater	3202	0	5478	5000	0	
DDH009293	8/1/2007	I	DDH009293, 3199, NW CITY VIEW DR		0		0 68.2 x. 6	44.07066000	-121.33497000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	8/1/2007	3	0	0	0	2007	Stormwater	3199	0	5183	5000	0	
DDH009294	8/1/2007	I	DDH009294, 3206, NW CITY VIEW DR		0		0 45 x 6	44.07066000	-121.33597000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	8/1/2007	3	0	0	0	2007	Stormwater	3206	0	5159	5000	0	
DDH009295	8/22/2006	I	DDH009295, 2246, NW TOWER ROCK RD		0		0 31 x 6	44.06986000	-121.33689000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	8/22/2006	3	0	0	0	2006	Stormwater	2246	0	4867	5400	0	
DDH009296	8/22/2006	I	DDH009296, 2245, NW TOWER ROCK RD		0		0 72.6 x 6	44.07108000	-121.33676000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	8/22/2006	3	0	0	0	2006	Stormwater	2245	0	4689	5400	0	
DDH009297	8/21/2006	I	DDH009297, 3641, NW GLASSOW DR		0		0 94.1 x 6	44.07200000	-121.33452000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	8/21/2006	3	0	0	0	2006	Stormwater	3641	0	4399	5200	0	
DDH009298	1/1/1988	I	DDH009298, 2242, NW PROMONTORY CT		0		0 44.9 x 6	44.07357000	-121.32582000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1988	3	0	0	0	1988	Stormwater	2242	0	7128	2400	0	
DDH009299	7/15/1986	I	DDH009299, 3151, NW SUMMIT DR		0		0 71.5 x 6	44.07415000	-121.32680000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/15/1986	3	0	0	0	1986	Stormwater	3151	0	6927	2500	0	
DDH009300	7/15/1986	I	DDH009300, 3150, NW SUMMIT DR		0		0 48.9 x 6	44.07430000	-121.32685000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/15/1986	3	0	0	0	1986	Stormwater	3150	0	6997	2400	0	
DDH009301	7/15/1986	I	DDH009301, 3161, NW SUMMIT DR		0		0 16.6 x 6	44.07356000	-121.32824000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/15/1986	3	0	0	0	1986	Stormwater	3161	0	6583	2900	0	
DDH009302	7/15/1986	I	DDH009302, 3163, NW SUMMIT DR		0		0 19.9 x 6	44.07386000	-121.32733000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/15/1986	3	0	0	0	1986	Stormwater	3163	0	6803	2700	0	
DDH009303	1/1/1997	I	DDH009303, 3153, NW PROMONTORY DR		0		0 85.9 x 6	44.07422000	-121.32706000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1997	3	0	0	0	1997	Stormwater	3153	0	6857	2500	0	
DDH009304	1/1/1997	I	DDH009304, 3152, NW PROMONTORY DR		0		0 27.3 x 6	44.07495000	-121.32811000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1997	3	0	0	0	1997	Stormwater	3152	0	6551	2700	0	
DDH009305	1/1/1988	I	DDH009305, 2238, NW PICKETT CT		0		0 43.3 x 6	44.07542000	-121.32874000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1988	3	0	0	0	1988	Stormwater	2238	0	6376	2700	0	
DDH009306	1/1/1997	I	DDH009306, 3141, NW PROMONTORY DR		0		0 86.3 x 6	44.07528000	-121.32907000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1997	3	0	0	0	1997	Stormwater	3141	0	6292	2800	0	
DDH009307	1/1/1997	I	DDH009307, 3142, NW PROMONTORY DR		0		0 25 x 6	44.07547000	-121.32961000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1997	3	0	0	0	1997	Stormwater	3142	0	6146	3000	0	
DDH009308	1/1/1997	I	DDH009308, 3143, NW PROMONTORY DR		0		0 38.5 x 6	44.07564000	-121.33110000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1997	3	0	0	0	1997	Stormwater	3143	0	5750	3300	0	
DDH009309	1/1/1997	I	DDH009309, 3140, NW PROMONTORY DR		0		0 95.2 x 6	44.07544000	-121.33259000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1997	3	0	0	0	1997	Stormwater	3140	0	5364	3700	0	
DDH009310	1/1/1900	I	DDH009310, 2066, NW GILL CT		0		0 9.2 x 6	44.07544000	-121.33356000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025		3	0	0	0	0	Stormwater	2066	0	5111	4000	0	
DDH009311	1/1/1997	I	DDH009311, 3017, NW PROMONTORY DR		0		0 81.8 x 6	44.07525000	-121.33379000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1997	3	0	0	0	1997	Stormwater	3017	0	5057	4000	0	
DDH009312	1/1/1997	I	DDH009312, 3016, NW PROMONTORY DR		0		0 64.5 x 6	44.07520000	-121.33365000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1997	3	0	0	0	1997	Stormwater	3016	0	5094	4000	0	
DDH009313	7/15/1986	I	DDH009313, 3170, NW SUMMIT DR		0		0 71.5 x 6	44.07420000	-121.33120000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/15/1986	3	0	0	0	1986	Stormwater	3170	0	5779	3500	0	
DDH009314	7/15/1986	I	DDH009314, 3171, NW SUMMIT DR		0		0 70.1 x 6	44.07423000	-121.33117000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/15/1986	3	0	0	0	1986	Stormwater	3171	0	5786	3500	0	
DDH009315	7/15/1986	I	DDH009315, 3164, NW SUMMIT DR		0		0 77.5 x 6	44.07395000	-121.33208000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/15/1986	3	0	0	0	1986	Stormwater	3164	0	6116	3200	0	
DDH009316	7/15/1986	I	DDH009316, 3162, NW SUMMIT DR		0		0 80.2 x 6	44.07383000	-121.33001000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/15/1986	3	0	0	0	1986	Stormwater	3162	0	6106	3300	0	
DDH009317	7/15/1986	I	DDH009317, 3158, NW SUMMIT DR		0		0 93. 7x 6	44.07384000	-121.33023000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/15/1986	3	0	0	0	1986	Stormwater	3158	0	6049	3300	0	
DDH009318	7/15/1986	I	DDH009318, 3159, NW SUMMIT DR		0		0 125.7 x 6	44.07386000	-121.33057000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/15/1986	3	0	0	0	1986	Stormwater	3159	0	5961	3400	0	
DDH009319	1/1/2000	I	DDH009319, 3178, NW 12TH ST		0		0 42 x 6	44.07345000	-121.33049000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/2000	3	0	0	0	2000	Stormwater	3178	0	6007	3400	0	
DDH009320	7/15/1986	I	DDH009320, 3167, NW SUMMIT DR		0		0 25.7 x 6	44.07356000	-121.33208000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/15/1986	3	0	0	0	1986	Stormwater	3167	0	5888	3500	0	
DDH009321	7/15/1986	I	DDH009321, 3168, NW SUMMIT DR		0		0 40 x .6	44.07311000	-121.33213000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/15/1986	3	0	0	0	1986	Stormwater	3168	0	5611	3900	0	
DDH009322	10/19/2004	I	DDH009322, 3018, NW THREE SISTERS DR		0		0 106.2 x 6	44.07499000	-121.33477000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	10/19/2004	3	0	0	0	2004	Stormwater	3018	0	4810	4400	0	
DDH009323	1/1/1997	I	DDH009323, 3156, NW PROMONTORY DR		0		0 123 x 6	44.07409000	-121.33734000	3	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1997	1	0	0	0	1997	Stormwater	3156	0	4197	4800	0	
DDH009324	7/15/1986	I	DDH009324, 3157, NW SUMMIT DR		0		0 60 x 6	44.07492000	-121.33895000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/15/1986	3	0	0	0	1986	Stormwater	3157	0	3725	4200	0	
DDH009325	1/1/1984	I	DDH009325, 3138, NW WELCOME CT		0		0 80.3 x 6	44.07576000	-121.33922000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1984	3	0	0	0	1984	Stormwater	3138	0	3619	4000	0	
DDH009326	7/15/1986	I	DDH009326, 3139, NW SUMMIT DR		0		0 41.8 x 6	44.07555000	-121.33972000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/15/1986	3	0	0	0	1986	Stormwater	3139	0	3495	3900	0	
DDH009328	10/19/2004	I	DDH009328, 3020, NW THREE SISTERS DR		0		0 77.66 x 6	44.08017000	-121.33494000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	10/19/2004	3	0	0	0	2004	Stormwater	3020	0	4920	4400	0	
DDH009329	10/19/2004	I	DDH009329, 3019, NW THREE SISTERS DR		0		0 69 x 6	44.07948000	-121.33588000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	10/19/2004	3	0	0	0	2004	Stormwater	3019	0	4614	4200	0	
DDH009330	8/3/2005	I	DDH009330, 3006, NW STARVIEW DR		0		0 17.4 x 6	44.07714000	-121.33993000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	8/3/2005	3	0	0	0	2005	Stormwater	3006	0	3430	3600	0	
DDH009331	8/3/2005	I	DDH009331, 3005, NW STARVIEW DR		0		0 68.3 x 6	44.07822000	-121.34089000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	8/3/2005	3	0	0	0	2005	Stormwater

FacilityID	InstalDate	LifecycleStatus	LocationDescription	Comments	DesignVolGal	TestTimeMinutes	DEQDepthDiameter	DEQLat	DEQLong	DEQMaintenance	DEQ Mixed Waste	DEQ Has Plug	DEQStatus	DEQTestVolGal	DEQTypeCode	DEQWithin2YR	DEQWithin500	DEQWithinECSI	DEQ_UICNum	DEQYearConstructed	DEQTreatment1	DEQTreatment2	DEQTreatment3	DEQTreatment4	DEQInstallYear	DEQWasteType	DEQWellNum	DEQImpervSFC	DEQDistanceToWell	DEQDistanceToSFW	DEQDepthToGW	
DDH009390	7/1/1984	I	DDH009390, 3428, AMETHYST ST		0		0 17.2 x 6	44.01440000	-121.33747000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/1984	3	0	0	0	1984	Stormwater	3428	0	1308	3500	0	
DDH009391	7/1/1982	I	DDH009391, 3450, ONYX ST		0		0 33.6 x 6	44.01427000	-121.33747000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/1982	3	0	0	0	1982	Stormwater	3450	0	1309	3400	0	
DDH009392	7/1/1984	I	DDH009392, 2995, AMETHYST ST	Depth only shown after cleaning	0		0 14.333 x 6	44.01438000	-121.33656000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/1984	3	0	0	0	1984	Stormwater	2995	0	1067	3300	0	
DDH009393	7/1/1982	I	DDH009393, 3451, ONYX ST		0		0 10.8 x 6	44.01423000	-121.33732000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/1982	3	0	0	0	1982	Stormwater	3451	0	1270	3400	0	
DDH009394	7/1/1982	I	DDH009394, 3449, ONYX ST		0		0 25.1 x 6	44.01360000	-121.33710000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/1982	3	0	0	0	1982	Stormwater	3449	0	1249	3200	0	
DDH009395	7/1/1982	I	DDH009395, 3457, ARNTZ CT	Depth only shown after cleaning	0		0 10.583 x 6	44.01181000	-121.33647000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/1982	3	54	0	0	1982	Stormwater	3457	0	1421	2500	0	
DDH009396	7/1/1984	I	DDH009396, 3447, GARNET ST	Depth only shown after cleaning	0		0 14 x 6	44.01292000	-121.33882000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/1984	3	0	0	0	1984	Stormwater	3447	0	1752	3200	0	
DDH009397	7/1/1984	I	DDH009397, 3448, GARNET ST	Depth only shown after cleaning	0		0 15.166 x 6	44.01288000	-121.33870000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/1984	3	0	0	0	1984	Stormwater	3448	0	1728	3100	0	
DDH009398	7/1/1984	I	DDH009398, 3446, GARNET ST		0		0 18 x 6	44.01323000	-121.33872000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/1984	3	0	0	0	1984	Stormwater	3446	0	1690	3200	0	
DDH009399	7/1/2000	I	DDH009399, 379, TARGEE DR		0		0 20.6 x 6	44.01526000	-121.34211000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/2000	3	0	0	0	2000	Stormwater	379	0	1829	2400	0	
DDH009400	7/1/2000	I	DDH009400, 380, TARGEE DR	Depth only shown after cleaning	0		0 20 x 6	44.01535000	-121.34205000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/2000	3	0	0	0	2000	Stormwater	380	0	1839	2400	0	
DDH009401	7/1/2000	I	DDH009401, 377, TARGEE DR	Depth only shown after cleaning	0		0 20.416 x 6	44.01548000	-121.33949000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/2000	3	0	0	0	2000	Stormwater	377	0	1878	2900	0	
DDH009402	7/1/2000	I	DDH009402, 376, TARGEE DR	Depth only shown after cleaning	0		0 17.5 x 6	44.01567000	-121.33950000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/2000	3	54	0	0	2000	Stormwater	376	0	1895	2800	0	
DDH009403	7/1/2000	I	DDH009403, 3426, TARGEE DR	Depth only shown after cleaning	0		0 12.5 x 6	44.01631000	-121.33885000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/2000	3	0	0	0	2000	Stormwater	3426	0	1805	2800	0	
DDH009404	7/1/2000	I	DDH009404, 413, CHUCKANUT DR		0		0 26.1 x 6	44.01826000	-121.33853000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/2000	3	0	0	0	2000	Stormwater	413	0	1284	2100	0	
DDH009405	7/1/2000	I	DDH009405, 414, CHUCKANUT DR		0		0 27.3 x 6	44.01817000	-121.33860000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/2000	3	0	0	0	2000	Stormwater	414	0	1285	2200	0	
DDH009406	7/1/2000	I	DDH009406, 3418, HILLER DR		0		0 12.5 x 6	44.01814000	-121.34004000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/2000	3	0	0	0	2000	Stormwater	3418	0	1139	2000	0	
DDH009407	7/1/2000	I	DDH009407, 416, CHUCKANUT DR		0		0 21.1 x 6	44.01816000	-121.33857000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/2000	3	0	0	0	2000	Stormwater	416	0	1108	2000	0	
DDH009408	7/1/2000	I	DDH009408, 415, CHUCKANUT DR		0		0 12 x 6	44.01825000	-121.34192000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/1/2000	3	0	0	0	2000	Stormwater	415	0	1053	1700	0	
DDH009409	7/1/2000	I	DDH009409, 3425, CHUCKANUT DR		0		0 12.8 x 6	44.01773000	-121.34272000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/1/2000	3	0	0	0	2000	Stormwater	3425	0	1281	1650	0	
DDH009410	7/1/2000	I	DDH009410, 3424, CHUCKANUT DR		0		0 17.6 x 6	44.01755000	-121.34284000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/1/2000	3	0	0	0	2000	Stormwater	3424	0	1360	1650	0	
DDH009412	7/1/2000	I	DDH009412, 3422, HILLER DR		0		0 23.7 x 6	44.01652000	-121.34127000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/2000	3	0	0	0	2000	Stormwater	3422	0	1672	2300	0	
DDH009413	7/1/2000	I	DDH009413, 3423, HILLER DR		0		0 19.3 x 6	44.01661000	-121.34109000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/2000	3	0	0	0	2000	Stormwater	3423	0	1642	2300	0	
DDH009414	7/1/2000	I	DDH009414, 417, DOVER LN		0		0 50 x 6	44.01810000	-121.34092000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/1/2000	3	0	0	0	2000	Stormwater	417	0	1169	1550	0	
DDH009415	7/1/2000	I	DDH009415, 378, CHUCKANUT DR		0		0 10.6 x 6	44.01635000	-121.34205000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/2000	3	0	0	0	2000	Stormwater	378	0	1743	2200	0	
DDH009416	7/1/2000	I	DDH009416, 418, CHUCKANUT DR		0		0 15.63 x 6	44.01805000	-121.33648000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/2000	3	0	0	0	2000	Stormwater	418	0	1651	2400	0	
DDH009417	7/1/2000	I	DDH009417, 383, CHUCKANUT DR		0		0 18.4 x 6	44.01746000	-121.33558000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/2000	3	0	0	0	2000	Stormwater	383	0	1333	2700	0	
DDH009418	7/1/2000	I	DDH009418, 387, CHUCKANUT DR		0		0 17.1x6	44.01760000	-121.33555000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/2000	3	0	0	0	2000	Stormwater	387	0	1366	2700	0	
DDH009419	7/1/2000	I	DDH009419, 382, CHUCKANUT DR		0		0 18 x 6	44.01605000	-121.33544000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/2000	3	0	0	0	2000	Stormwater	382	0	971	3200	0	
DDH009420	7/1/2000	I	DDH009420, 386, CHUCKANUT DR		0		0 10.4 x 6	44.01609000	-121.33533000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/2000	3	0	0	0	2000	Stormwater	386	0	955	3200	0	
DDH009421	7/1/2000	I	DDH009421, 384, CHUCKANUT DR		0		0 29.7x6	44.01530000	-121.33549000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/2000	3	0	0	0	2000	Stormwater	384	0	845	3300	0	
DDH009422	7/1/2000	I	DDH009422, 385, CHUCKANUT DR		0		0 18.7 x 6	44.01515000	-121.33562000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/2000	3	0	0	0	2000	Stormwater	385	0	860	3300	0	
DDH009423	7/1/2000	I	DDH009423, 3419, SPRINGCREST DR		0		0 13.7 x 6	44.01720000	-121.33667000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/2000	3	0	0	0	2000	Stormwater	3419	0	1477	2700	0	
DDH009424	7/1/2000	I	DDH009424, 3420, SPRINGCREST DR		0		0 11.1 x 6	44.01722000	-121.33654000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/2000	3	0	0	0	2000	Stormwater	3420	0	1455	2700	0	
DDH009425	7/1/2000	I	DDH009425, 3427, PAM PL		0		0 14 x 6	44.01609000	-121.33579000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/2000	3	0	0	0	2000	Stormwater	3427	0	1558	2900	0	
DDH009426	7/1/2000	I	DDH009426, 3421, VOLARE LN		0		0 14.1 x 6	44.01688000	-121.33735000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/2000	3	0	0	0	2000	Stormwater	3421	0	1554	2700	0	
DDH009427	7/1/1998	I	DDH009427, 3474, DRIFTWOOD LN		0		0 22.2 x 6	44.01532000	-121.32648000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/1/1998	3	0	0	0	1998	Stormwater	3474	0	1528	1150	0	
DDH009428	7/1/1998	I	DDH009428, 3475, DRIFTWOOD LN		0		0 17.8 x 6	44.01696000	-121.32681000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/1998	3	0	0	0	1998	Stormwater	3475	0	1640	1600	0	
DDH009429	1/1/1900	I	DDH009429, 2076, LIMELIGHT DR	Depth only shown after cleaning	0		0 12 x 6	44.01774000	-121.32573000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	YES	10025		3	54	0	0	0	Stormwater	2076	0	1601	1550	0	
DDH009430	1/1/1900	I	DDH009430, 2075, LIMELIGHT DR	Depth only shown after cleaning	0		0 16 x 6	44.01813000	-121.32491000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	YES	10025		3	0	0	0	0	Stormwater	2075	0	1511	1400	0	
DDH009431	1/1/1900	I	DDH009431, 2959, DRIFTWOOD LN		0		0 25.6 x 6	44.01833000	-121.32790000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025		3	54	0	0	0	Stormwater	2959	0	1429	2200	0	
DDH009432	1/1/1900	I	DDH009432, 2955, GRANITE DR		0		0 44.3 x 6	44.01530000	-121.32740000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025		3	0	0	0	0	Stormwater	2955	0	1286	1300	0	
DDH009433	1/1/1900	I	DDH009433, 2957, GRANITE DR		0		0 17.9 x 6	44.01726000	-121.32793000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025		3	0	0	0	0	Stormwater	2957	0	1462	1900	0	
DDH009434	1/1/1900	I	DDH009434, 2956, GRANITE DR		0		0 17 x 6	44.01787000	-121.32795000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025		3	0	0	0	0	Stormwater	2956	0	1346	2400	0	
DDH009435	1/1/1900	I	DDH009435, 2958, GRANITE DR		0		0 23.3 x 6	44.01782000	-121.32973000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025		3	0	0	0	0	Stormwater	2958	0	1307	2400	0	
DDH009436	1/1/1900	I	DDH009436, 2072, S QUEENS DR		0		0 14 x 6	44.01578000	-121.32972000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025		3	0	0	0	0	Stormwater	2072	0	758	1950	0	
DDH009437	1/1/1900	I	DDH009437, 2070, S QUEENS DR		0		0 12.5 x 6	44.01574000	-121.32963000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025		3	0	0	0	0	Stormwater	2070	0	776	1900	0	
DDH009438	1/1/1900	I	DDH009438, 2069, S QUEENS DR	Depth only shown after cleaning	0		0 22.083 x 6	44.01531000	-121.32839000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025		3	54	0	0	0	Stormwater	2069	0	1032	1550	0	
DDH009439	1/1/1900	I	DDH009439, 2071, S QUEENS DR	Depth only shown after cleaning	0		0 28.666 x 6	44.01523000	-121.32831000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025		3	0	0	0	0	Stormwater	2071	0	1046	1500	0	
DDH009440	1/1/1900	I	DDH009440, 2074, KINGS LN		0		0 7.7 x 6	44.01653000	-121.32851000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025		3	0	0	0	0	Stormwater	2074	0	1088	1900	0	
DDH009441	1/1/1900	I	DDH009441, 2073, KINGS LN		0		0 12.1 x 6	44.01658000	-121.32882000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025		3	0	0	0	0	Stormwater	2073	0	1124	1900	0	
DDH009442	7/1/1992	I	DDH009442, 3606, ROMAINE VILLAGE WAY		0		0 52.5 x 6	44.01265000	-121.32225000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/1/1992	3	0	0	0	1992	Stormwater	3606	0	1105	375	0	
DDH009443	7/1/2001	I	DDH009443, 411, FINCHWOOD DR		0		0 20.7 x 6	44.02009000	-121.32999000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/2001	3	0	0	0	2001	Stormwater	411	0	1026	2600	0	
DDH009444	7/1/2001	I	DDH009444, 412, CYPRUS ST		0		0 14.5 x 6	44.01888000	-121.32937000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/2001	3	0	0	0	2001	Stormwater	412	0	1408	2500	0	
DDH009445	7/1/1998	I	DDH009445, 381, MAHOGANY ST	Depth only shown after cleaning	0		0 13 x 6	44.01488000	-121.33917000	Biennial	NO	NO	AC	Unknown	5D3	YES	NO	NO	10025	7/1/1998	3	54	0	0	1998	Stormwater	381	0	1763	3100	0	
DDH009446	7/1/1998	I	DDH009446, 3564, MAHOGANY ST		0		0 16.4 x 6	44.01489000	-121.33209000	Biennial	NO	NO	AC	Unknown	5D3	YES	YES	NO	10025	7/1/1998	3	0	0	0	1998	Stormwater	3564	0	71	2400	0	
DDH009447	7/1/1998	I	DDH009447, 3563, MAHOGANY ST		0		0 27x 6	44.01483000	-121.33208000	Biennial	NO	NO	AC	Unknown	5D3	YES	YES	NO	10025	7/1/1998	3	0	0	0	1998	Stormwater	3563	0	56	2400	0	
DDH009448	7/1/1996	I	DDH009448, 3642, MAHOGANY ST		0		0 26.7 x 6	44.01493000	-121.32840000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/1/1996	3	0	0	0	1996	Stormwater	3642	0	1008	1450	0	
DDH009449	7/1/1996	I	DDH009449, 2982, MAHOGANY ST		0		0 16 x 6	44.01468000	-121.32725000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/1/1996	3	0	0	0	1996	Stormwater	2982	0	1504	750	0	
DDH009450	6/23/1980	I	DDH009450, 3438, PONDEROSA ST		0		0 12.5 x 6	44.01001000	-121.33292000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	6/23/1980	3	0	0	0	1980	Stormwater	3438	0	1619	1500	0	
DDH009451	6/23/1980	I	DDH009451, 3437, PONDEROSA ST		0		0 18 x 6	44.00991000	-121.33253000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	6/23/1980	3	0	0	0	1980	Stormwater	3437	0	1661	1500	0	
DDH009452	7/1/1985	I	DDH009452, 3443, NUGGET AVE		0		0 14.9 x 6	44.00918000	-121.33238000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/1/1985	3	0	0	0	1985	Stormwater	3443	0	1920	1200	0	
DDH009453	6/23/1980	I	DDH009453, 3442, PONDEROSA ST		0		0 13 x 6	44.00892000	-121.32950000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	6/23/1980	3	0	0	0	1980	Stormwater	3442	0	1261	575	0	
DDH009454	7/1/1996	I	DDH009454, 3477, POPLAR ST		0		0 16.8 x 6	44.01098000	-121.32640000	Biennial	NO	NO	AC	Unknown	5D3	NO	YES	NO	10025	7/1/1996	3	54	0	0	1996	Stormwater	3477	0	1345	600	0	
DDH009455	7/1/1996	I	DDH009455, 3607, RIDGE DR		0		0 6.6 x 6	44.01175000	-121.32474000	Biennial	NO	NO	AC	Unknown	5D3	NO	YES	NO	10025	7/1/1996	3	0	0	0	1996	Stormwater	3607	0	453	200	0	
DDH009456	7/1/1996	I	DDH009456, 3608, RIDGE DR		0		0 14, 2 x 6	44.01181000	-121.32464000	Biennial	NO	NO	AC	Unknown	5D3	NO	YES	NO	10025	7/1/1996	3	54	0	0	1996	Stormwater	3608	0	475	180	0	
DDH009457	7/1/1996	I	DDH009457, 3003, RIDGE DR	Depth only shown after cleaning	0		0 13.66 x 6	44.01316000	-121.32462000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/1/1996	3	54	0	0	1996	Stormwater	3003	0	966	275	0	
DDH009458	7/1/1996	I	DDH009458, 2997, MCMULLIN DR		0		0 23 x 6	44.01423000	-121.32632000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/1/1996	3	0	0	0	1996	Stormwater	2997	0	1367	850	0	
DDH009459	7/1/1996	I	DDH009459, 2996, MCMULLIN DR		0		0 25 x 6	44.01421000	-121.32645000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/1/1996	3	0	0	0	1996	Stormwater	2996	0	1368	875	0	
DDH009460	7/1/1996	I	DDH009460, 2999, VILLAGE LN		0		0 21.5 x 6	44.01412000	-121.32622000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/1/1996	3	0	0	0	1996	Stormwater	2999	0	1319	800	0	
DDH009461	7/1/1988	I	DDH009461, 3445, CINDER LN		0		0 75.4 x 6	44.01296000	-121.32566000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/1/1988	3	0	0	0	1988	Stormwater	3445	0	883	525	0	
DDH009462	7/1/1996	I	DDH009462, 3436, MCMULLIN DR		0		0 45.6 x 6	44.01269000	-121.32525000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/1/1996	3	0	0	0	1996	Stormwater	3436	0	783	475	0	
DDH009463	7/1/1978	I	DDH009463, 3441, JASMINE PL		0		0 15 x 6	44.00985000	-121.32953000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/1/1978	3	0	0	0	1978	Stormwater	3441	0	1148	875	0	
DDH009464	7/1/1978	I	DDH009464, 3439, DEFIANCE ST		0		0 20.166 x 6	44.00940000	-121.33044000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/1/1978	3	0	0	0	1978	Stormwater	3439	0	1422	875	0	
DDH009465	7/1/1978	I	DDH009465, 3440, DEFIANCE ST		0		0 17.3 x 6	44.01051000	-121.33076000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/1/1978	3	0	0	0	1978	Stormwater	3440	0	1483	1300	0	
DDH009466	1/1/1999	I	DDH009466, 3432, ALPINE DR		0		0 18.8 x 6	44.01146000	-121.33277000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1999	3	0	0	0	1999	Stormwater	3432	0	1092	1850	0	
DDH009467	1/1/1999	I	DDH009467, 3431, ALPINE DR		0		0 10.7 x 6	44.01135000	-121.33286000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1999	3	0	0	0	1999	Stormwater	3431	0	1130	1850	0	
DDH009468	1/1/1999	I	DDH009468, 3002, ARROW WOOD DR		0		0 12.6 x 6	44.01372000	-121.33507000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1999	3	0	0	0	1999	Stormwater	3002	0	578	1850	0	
DDH009469	1/1/1999	I	DDH009469, 3000, ARROW WOOD PL		0		0 12 x 6	44.01394000	-121.33072000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1999	3	0	0	0	1999	Stormwater	3000	0	489	1900	0	
DDH009470	1/1/1999	I	DDH009470, 3456, ASPEN DR		0		0 22.9 x 6	44.01237000	-121.33089000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1999	3	0	0	0	1999	Stormwater	3456	0	871	1750	0	
DDH009471	1/1/1999	I	DDH009471, 3455, ASPEN DR		0		0 24.9 x 6	44.01226000	-121.33088000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1999	3	0	0	0	1999	Stormwater	3455	0	903	1700	0	
DDH009472	1/1/1999	I	DDH009472, 3454, ASPEN DR		0		0 16.6 x 6	44.01234000	-121.33106000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1999	3	0	0	0	1999	Stormwater	3454	0	855	1750	0	
DDH009473	7/1/1996	I	DDH009473, 3452, CINDER LN		0		0 11.9 x 6	44.01256000	-121.32725000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/1/1996	3	54	0	0	1996	Stormwater	3452	0	1019	1100	0	
DDH009474	1/1/1996	I	DDH009474, 2998, GRANITE DR		0		0 10.2 x 6	44.01446000	-121.32736000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1996	3	0	0	0	1996	Stormwater	2998	0	1282	1150	0	
DDH009475	1/1/1996	I	DDH009475, 3444, FLINT LN		0		0 16.8 x 6	44.01334000	-121.32830000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1996	3	0	0	0	1996	Stormwater	3444	0	1148	1250	0	
DDH009476	7/1/1996	I	DDH009476, 3478, POPLAR ST		0		0 16 x 6	44.01103000	-121.32572000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/1/1996	3	54	0	0	1996	Stormwater	3478	0	564	750	0	
DDH009477	1/1/1996	I	DDH009477, 3479, GRANITE DR		0		0 23 x 6	44.01110000	-121.32745000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1996	3	54	0	0	1996	Stormwater	3479	0	608	775	0	
DDH009478	1/1/1996	I	DDH009478, 3460, PINE CONE DR		0		0 9 x 6	44.01193000	-121.32687000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1996	3	54	0	0	1996	Stormwater	3460	0	652	775	0	
DDH009479	1/1/1996	I	DDH009479, 3430, GRANITE DR		0		0 9.6 x 6	44.01195000	-121.32855000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1996	3	54	0	0	1996	Stormwater	3430	0	997	1200	0	
DDH009480	1/1/1996	I	DDH009480, 3429, GRANITE DR		0		0 11.6 x 6	44.01195000	-121.32840000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	1/1/1996	3	54	0	0	1996	Stormwater	3429	0	961	1200	0	
DDH009481	1/1/1996	I	DDH009481, 3453, GRANITE DR	Depth only shown after cleaning	0		0 14.416 x 6	44.01268000	-121.32838000	Biennial	NO	NO	AC	Unknown	5D3	NO	NO	NO	10025	7/1/1996	3	54	0	0	1996	Stormwater	3453	0	1125	1200	0	
DDH009482	7/1/1985	I	DDH009482, 2990, PINEBROOK BLVD		0		0 20 x 6	44.