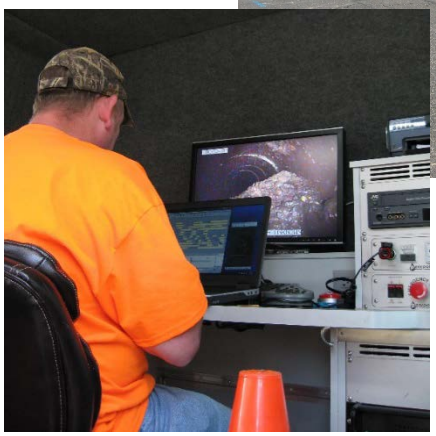
# City of Oregon City, Oregon

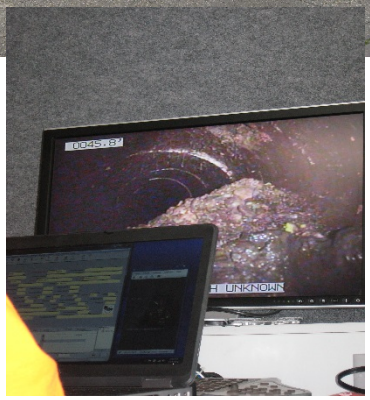
## National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System Discharge Permit and Willamette River TMDL

## 2013–2014 Annual Report

*Prepared for the*
Oregon Department of Environmental Quality

November 1, 2014





*Assisted By:*
Brown AND Caldwell

CITY OF OREGON CITY

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

MUNICIPAL STORMWATER SYSTEM ANNUAL REPORT

JULY 1, 2013 – JUNE 30, 2014

We, the undersigned, hereby submit this National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Annual Report in accordance with NPDES Permit No. 101348. We certify under penalty of law that this document and all attachments were prepared under our direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on our inquiry of the person, or persons, who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of our knowledge and belief, true, accurate and complete. We are aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Oct. 28, 2014

Martin Montalvo Date
Public Works Operations Manager

## Table of Contents



## List of Tables

## List of Appendices

# 1.0 Introduction

## 1.1 MS4 NPDES Permit Background

The Oregon Department of Environmental Quality (DEQ) regulates stormwater runoff from the City of Oregon City through the Municipal Separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System (NPDES) Permit No. 101348, issued to Clackamas County and its co-permittees. Clackamas County co-permittees include the City of Oregon City along with the cities of Lake Oswego, Gladstone, West Linn, Milwaukie, Wilsonville, Happy Valley, Johnson City, and Rivergrove, the Oak Lodge Sanitary District, and Clackamas County. Each co-permittee is a relatively small community, most having populations between 15,000 and 25,000 with some (Johnson City, Rivergrove) having populations significantly smaller.

The City's MS4 NPDES permit was reissued March 16, 2012, after a multi-year negotiation process with DEQ and an additional year-long delay related to an appeal. The 2012 reissued permit was not appealed, and thus maintains an effective date of March 16, 2012.

Each co-permittee is required to submit an annual report, summarizing accomplishments and implementation of their individual Stormwater Management Plans (SWMPs). In conjunction with the reissuance of the City's permit, SWMP updates to address requirements of the reissued permit were submitted and approved by DEQ. This annual report documents stormwater management activities from July 1, 2013 to June 30, 2014 in conjunction with the City's reissued MS4 NPDES permit.

## 1.2 Document Organization

The following table (Table 1) outlines the organization of this annual report document, with respect to the annual reporting requirements per Schedule B(5) of the City's MS4 NPDES permit.

## Table 1: Summary of the MS4 NPDES Annual Report Requirements

| | Annual reporting requirement | Location in document |
|---|---|---|
| a) | Status of implementing SWMP elements, including progress in meeting measurable goals. | Appendix A |
| b) | Status of any public education effectiveness evaluation conducted during the reporting year, and a summary of how results were used in adaptive management. | Appendix A |
| c) | Summary of the adaptive management process implementation during the reporting year including new BMPs. | Section 2.0 |
| d) | Proposed changes to SMWP program elements to reduce TMDL pollutants to the MEP. | Section 2.0 |
| e) | A summary of total stormwater program expenditures and funding sources over the reporting fiscal year, and those anticipated in the next fiscal year. | Section 3.0 |
| f) | A summary of monitoring program results, including monitoring data that is accumulated throughout the reporting year. | Section 4.0 & Appendix B |
| g) | Any proposed modifications to the monitoring plan necessary to ensure that adequate data and information are collected to conduct stormwater program assessments. | Section 4.0 |
| h) | A summary describing the number and nature of enforcement actions, inspections, and public education programs.[a] | Section 6 and Appendix A and Appendix E |
| i) | An overview, as related to MS4 discharges, describing land use changes, UGB expansions, land annexations, and new development activities. The number of new post-construction permits issued and estimate of new and replaced impervious surface must also be included. | Section 5.0 |
| j) | A summary related to MS4 discharges describing concept planning or other activities in preparation of UGB expansions or land annexations. | Section 5.0 and Appendix A |
| NA) | Additional Efforts Conducted by the City. | Section 6.0 |

[a] Enforcement actions, inspections, and public education programs are included in the City's SWMP as BMPs, and are reported along with the status of implementing all components of the SWMP in Appendix A.

Each section of this report corresponds to the specific permit requirements in Schedule B(5). This report emphasizes efforts and activities associated with individual Best Management Practices (BMPs) from the City's 2012 SWMP, as summarized in Appendix A.

# 2.0 Adaptive Management Process Implementation

## 2.1 Adaptive Management Program

In accordance with the issuance of the City's renewed MS4 NPDES permit (in 2012), the City was required to document their adaptive management approach to assess annually and modify, as necessary, existing and new SWMP components. The City submitted their approach to DEQ on November 1, 2012.

Historically, the City has implemented adaptive management principals to annually refine implementation methods and data collection activities in conjunction with their effective SWMP and BMPs. More significant modifications to SWMP activities occur every five years, in conjunction with their permit renewal application and updated permit requirements. The City's

adaptive management approach (submitted November 1, 2012) maintains consistency with the City's historical approach for implementing adaptive management principals.

Annually, as the City completes their NPDES MS4 annual report, the City reviews SWMP implementation through BMP-specific measureable goals and tracking measures. The City collects data and feedback from staff responsible for implementing and reporting on each BMP to gage whether implementation was deemed to be effective or whether there are suggested improvements to be made. Suggested adjustments to BMP implementation will include consideration of resource availability, budget/ funding, and overall need.

Every 5 years, during the permit renewal process and SWMP update effort, additional factors are considered as part of the City's overall adaptive management process. These factors include more detailed information related to BMP implementation, such as:

1. Whether technology or information is available that would help improve or refine BMPs,

2. How representative are the measureable goals and tracking measures to the BMP objective, and

3. Are resources available to make changes to the measureable goals and BMP objectives?

Additionally, at the end of the permit term, technical investigations and studies are required in conjunction with compliance dates outlined in the permit. Such studies include (but are not limited to) a water quality trends analysis, pollutant load reduction evaluation, hydromodification assessment, and a retrofit assessment. All studies will help target and identify specific issues that need to be addressed to maintain waterbody health and help formulate BMP activities (measureable goals and tracking measures) that can be used to support improvements.

## 2.2 SWMP Updates for the 2013–2014 Reporting Year

The 2013-2014 reporting year is the second full permit year in which the City's effective SWMP (dated 2012) has been implemented. For the 2013-2014 permit year, no updates were made to the 2012 SWMP or BMP measureable goals and tracking measures beyond those submitted to DEQ in May 2012. Review of BMP implementation during the preparation of this annual report did not reveal the need for adaptive management changes.

# 3.0 Summary of Program Expenditures

A summary of the City of Oregon City's revenue and expenditures for the 2013–2014 fiscal year and a projection of the City's revenue and expenditures for the 2014–2015 fiscal year are provided in Table 2. Projection of expenditures is considered draft at this time.

## 521 Storm Drain (Stormwater) Division 5-Year Budget Projections

**11-Oct-13** Prepared by JML

| **Fiscal Year** | | **2012/13** | **2013/14** | **2014/15** | **2015/16** | **2016/17** | **2017/18** | **2018/19** | **"Assumed" Multiplier** |
|---|---|---|---|---|---|---|---|---|---|
| | | **Actual (See Note 1)** | **Actual** | **Proposed** | **Assumed** | **Assumed** | **Assumed** | **Assumed** | |
| **Beginning Fund Balance** | | $ 377,021 | $ 551,411 | $ 797,172 | $ 735,630 | $ 536,103 | $ 484,813 | $ 462,316 | |
| | | Rate = $8.55 | Rate = $8.81 | Rate = $9.07 | Rate = $9.34 | Rate = $9.62 | Rate = $9.91 | Rate = $9.91 | |
| **Revenues** | | 3% rate increase | 3% rate increase | 3% rate increase | 3% rate increase | 3% rate increase | 3% rate increase | 3% rate increase | |
| | Oregon City Charges for Service | $ 2,204,120 | $ 2,321,609 | $ 2,301,535 | $ 2,417,993 | $ 2,540,343 | $ 2,668,884 | $ 2,803,930 | Inc. 2% population growth |
| | Interest Income | $ 2,050 | $ 3,351 | $ 1,200 | $ 1,236 | $ 1,273 | $ 1,311 | $ 1,351 | 3% |
| | Miscellaneous Income | $ 16,337 | $ 18,837 | $ 1,000 | $ 1,030 | $ 1,061 | $ 1,093 | $ 1,126 | 3% |
| | Erosion Control Permits | $ 58,048 | $ 28,671 | $ 51,500 | $ 53,045 | $ 54,636 | $ 56,275 | $ 57,964 | 3% |
| | Project Management | $ 17,567 | $ 17,800 | $ 12,000 | $ 12,360 | $ 12,731 | $ 13,113 | $ 13,506 | 3% |
| | Revenues | $ 2,298,122 | $ 2,390,268 | $ 2,367,235 | $ 2,485,664 | $ 2,610,044 | $ 2,740,677 | $ 2,877,876 | |
| **Total Resources** | | $ 2,675,143 | $ 2,941,679 | $ 3,164,407 | $ 3,221,294 | $ 3,146,147 | $ 3,225,490 | $ 3,340,192 | |
| **Expenditures** | | | | | | | | | |
| | Personnel Services | $ 968,984 | $ 970,208 | $ 1,138,389 | $ 1,195,308 | $ 1,255,074 | $ 1,317,828 | $ 1,383,719 | 5% |
| | Total Materials & Services | $ 552,804 | $ 558,210 | $ 560,027 | $ 588,028 | $ 617,430 | $ 648,301 | $ 680,716 | 5% |
| | Capital Outlay Totals | $ 85,920 | $ 96,537 | $ 222,250 | $ 386,000 | $ 265,000 | $ 265,000 | $ 265,000 | |
| | Total Transfers | $ 516,024 | $ 519,552 | $ 508,111 | $ 515,854 | $ 523,830 | $ 532,045 | $ 540,506 | |
| **Total Expenses** | | $ 2,123,732 | $ 2,144,507 | $ 2,428,777 | $ 2,685,191 | $ 2,661,334 | $ 2,763,174 | $ 2,869,941 | |
| **Ending Fund Balance** | | $ 551,411 | $ 797,172 | $ 735,630 | $ 536,103 | $ 484,813 | $ 462,316 | $ 470,251 | |
| **Total Expenditures** | | $ 2,675,143 | $ 2,941,679 | $ 3,164,407 | $ 3,221,294 | $ 3,146,147 | $ 3,225,490 | $ 3,340,192 | |

| **Capital Outlay - Details** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Operations New Equip. >$5000 | $ - | $ - | $ - | $ 136,000 | $ 15,000 | $ 15,000 | $ 15,000 | |
| | Capital Construction | $ 85,920 | $ 96,537 | $ 222,250 | $ 250,000 | $ 250,000 | $ 250,000 | $ 250,000 | |
| | Land | | $ - | $ - | $ - | $ - | $ - | $ - | |
| | Total | $ 85,920 | $ 96,537 | $ 222,250 | $ 386,000 | $ 265,000 | $ 265,000 | $ 265,000 | |
| **Transfers - Details** | | | | | | | | | |
| | Transfer to Building Reserve | $ 300,000 | $ 250,000 | $ 250,000 | $ 250,000 | $ 250,000 | $ 250,000 | $ 250,000 | |
| | Utility Billing | $ 93,024 | $ 137,706 | $ 115,611 | $ 119,079 | $ 122,652 | $ 126,331 | $ 130,121 | |
| | Interdept. Transfers | $ 45,000 | $ 56,846 | $ 57,500 | $ 59,225 | $ 61,002 | $ 62,832 | $ 64,717 | 3% |
| | Fleet Reserve Transfer | $ 78,000 | $ 75,000 | $ 85,000 | $ 87,550 | $ 90,177 | $ 92,882 | $ 95,668 | 3% |
| | Total | $ 516,024 | $ 519,552 | $ 508,111 | $ 515,854 | $ 523,830 | $ 532,045 | $ 540,506 | |

**Footnote:**

1) Changes were made to FY 2012/2013 actual amounts as a result of final audit adjustments.

# 4.0 Monitoring Data

## 4.1 Summary of the Comprehensive Clackamas County Stormwater Monitoring Plan (CCCSMP)

Per the 2004 MS4 NPDES permit requirements (Schedule B), the City of Oregon City, along with Clackamas County and other co-permittees, was required to develop and implement a stormwater monitoring program. Given the effort associated with implementing an effective environmental monitoring program that adequately met all permit requirements and objectives, Clackamas County (i.e., CCSD#1 and SWMACC) and six other co-permittees including the City of Oregon City agreed to consolidate efforts and prepare one comprehensive stormwater monitoring plan. This plan, called the Comprehensive Clackamas County Stormwater Monitoring Plan (CCCSMP), was prepared for submittal with the 2006 NPDES Permit Annual Compliance Reports. The plan was implemented beginning July 1, 2007 and minor editorial changes were made in 2008.

In conjunction with requirements of the 2012 reissued NPDES MS4 permit, the 2007/2008 CCCSMP was reviewed for consistency with revised monitoring objectives. Monitoring locations and frequencies were adjusted to reflect requirements of the 2012 Permit. Additional efforts related to mercury monitoring, pesticide monitoring, macroinvertebrate (biologic) monitoring, and geomorphic monitoring were added to the CCCSMP. A description of the proposed time-composite sampling methodology was included as an appendix to the CCCSMP. Additional information such as quality assurance procedures were also added in conjunction with Schedule B.2 of the 2012 Permit.

The updated (2012) CCCSMP was submitted to DEQ in September 2012. Comments from DEQ were received in October 2012, and final revisions to the 2012 CCCSMP were submitted to DEQ June 30, 2013. For this reporting year (2013–2014), the 2012 CCCSMP was the effective, implemented monitoring plan for the City of Oregon City.

As described in the CCCSMP, the MS4 NPDES stormwater monitoring program requires two components. The first component is program monitoring, which involves the tracking and assessment of programmatic activities, as described in the individual permittees SWMP, through the use of performance indicators or metrics. Results of the program monitoring are reported in Appendix A as the annual tracking measures. The second component is environmental monitoring, which includes visual monitoring and the actual collection and analysis of samples. Visual monitoring efforts for the 2013–2014 reporting year included dry weather field screening, as described in the City's SWMP under the BMP: "Conduct Annual Dry Weather Field Screening." Results of the visual monitoring efforts are reported in Appendix A under the applicable BMP. Environmental monitoring also consists of in-stream sample collection and outfall sample collection, and the City's sampling efforts are outlined in more detail in Sections 4.2 and 4.3 and in the CCCSMP. Results of the in-stream and outfall sample collection efforts are provided in Appendix B.

## 4.2 CCCSMP Updates and Modifications for the 2013–2014 Reporting Year

New requirements related to stormwater monitoring were outlined in the City's reissued MS4 NPDES permit (dated March 16, 2012). As mentioned in Section 4.1, new requirements included the documentation of a rationale related to the time-composite sampling methodology, documentation of laboratory quality assurance and control procedures, and inclusion of

mercury, pesticide, and macroinvertebrate monitoring. Monitoring frequencies and parameters were also revised based on requirements in the 2012 Permit and experience implementing the CCCSMP since 2006. No modifications to the monitoring plan were made for the 2013-2014 reporting year.

## 4.3 Summary of Monitoring Data

In accordance with the 2012 CCCSMP, Oregon City is required to conduct in-stream and outfall monitoring. In-stream monitoring is required at six locations reflecting four tributaries to the Willamette River. Outfall monitoring is required at two outfall locations that discharge to the Clackamas River. Time-weighted composite (during storm events) and single grab samples are taken in accordance with the frequencies outlined in Table 3 below.

In addition to the required instream and outfall monitoring, the City was required to conduct mercury monitoring at one location during the 2012-2013 water year (October 1, 2012 to September 30, 2013). Two samples, one during the wet weather season and one during the dry weather season, were required.

During the 2012-2013 monitoring year, the City collected their wet weather season mercury sample on March 20, 2013. The City collected a dry weather season mercury sample on May 29, 2013. This annual report includes results for an additional dry weather season mercury sample that was collected on September 30, 2013 (see Appendix B) to make up for the problematic dry weather sample from the prior reporting period (see the 2012-2013 Annual Report for additional information regarding the problematic sample).

Oregon City is also required to "conduct or contribute to an instream biological monitoring project/task" during the 2012 – 2017 NPDES MS4 permit period. To fulfill this requirement, the City partnered with five co-permittees (the cities of Gladstone, Lake Oswego, Milwaukie, West Linn, and Wilsonville). Seventeen stream reaches, two of which are located in Oregon City, were sampled during the fall of 2013. See the 2012 CCCSMP for further details.

During the 2013–2014 monitoring year, the City of Oregon City collected all required instream and outfall samples. The City also collected two additional instream samples and one additional outfall sample to make up for a reduced number of samples collected during the prior reporting period (see the 2012-2013 Annual Report for additional information regarding missed samples).

Complete sampling results are summarized and included in Appendix B. The sampling results presented have been formatted to simplify the data review process.

### Table 3: 2013–2014 Oregon City Monitoring Locations and Required Frequencies

| Site # | Location | Sample Type | Required Frequency | Weather |
|---|---|---|---|---|
| In-Stream Monitoring | | | | |
| OC010is | Abernethy Creek At 17082 Holly Ln., (Holly Ln. Bridge) | Grab & Composite | 4/year | Dry Weather (2/year) and Storm Event (2/year) |
| OC011is | Abernethy Creek At 316 17th St. (17th @ railroad trestle) | Grab & Composite | 4/year | Dry Weather (2/year) and Storm Event (2/year) |
| OC012is | Coffee Creek Behind 415 McLoughlin (outfall @ Willamette) | Grab & Composite | 4/year | Dry Weather (2/year) and Storm Event (2/year) |
| OC013is | Park Place Creek Behind 13530 | Grab & | 4/year | Dry Weather (2/year) and |

| Site # | Location | Sample Type | Required Frequency | Weather |
|---|---|---|---|---|
| | Redland Rd. | Composite | | Storm Event (2/year) |
| OC014is | Singer Creek at the north end of Singer Creek Park (Linn Ave.) | Grab & Composite | 4/year | Dry Weather (2/year) and Storm Event (2/year) |
| OC015is | Singer Creek 507 7th St. (MH - SD0726 located on Center) | Grab & Composite | 4/year | Dry Weather (2/year) and Storm Event (2/year) |
| Outfall Monitoring | | | | |
| OC006ofm | Clackamas River @ O.C. Shopping Center | Composite | 3/year | Storm Event |
| OC007ofm | Clackamas River @ Clackamette Cove | Composite | 3/year | Storm Event |

# 5.0 Overview of Planning and Land Use Changes, UGB Expansions and New Development Activities

## 5.1 Summary of Land-Use Changes and UGB Expansions

The following land use/ zoning changes were approved between July 1, 2013 and June 30, 2014:

Adoption of the South End Concept Plan (Comprehensive Plan amendment) – (No actual land use / zone changes unless properties within the Concept Plan area are successfully annexed).

Kinslie Heights Subdivision rezoned from R-10 to R-6 (ZC 13-01)
Woodlawn Subdivision rezoning from R-10 to R-8 (ZC 13-02)
Central Point Road rezoning from R-10 to R-8 (ZC 13-03)

One small half-acre annexation was approved during the reporting period (AN 13-01), but no new development has occurred within the proposed UGB expansion areas.

## 5.2 Summary of Development Activities within the UGB

During the reporting year 2013-2014, there were 18 development applications reviewed and approved for compliance with water quality/water quantity standards. These included minor partitions (4), site plan and design review (10), and subdivisions (4). Estimated total new and replaced impervious surface area related to development projects that commenced during the reporting year equals 421,400 square feet.

There were five public improvement projects (CIPs), including water quality and/or flow control projects, for this reporting period. One was contracted out and four were done in-house. Details of these projects can be found in Appendix A.

# 6.0 Additional Activities

The following stormwater-related activities occurred within the City and are not currently documented in Appendix A.

BMP 4-5:  Ensure Municipal Staff Training in Stormwater Pollution Prevention

There were 13 stormwater staff meetings conducted during the 2013–2014 reporting period. Dates, topics, and attendees are summarized below in Table 4:

## Table 4: City Training Activities

| Date/ Time | Attendees | BMP's /Topics | Items Discussed | Next Steps/Program Adjustments |
|---|---|---|---|---|
| 7/25/13 1:15-1:45 | Martin Montalvo, Gail Johnson | -TMDL 5 year Report to DEQ<br>-BMP 7-3 SWPPS training | Review responses to items 3, 4, 6 &7.<br><br>In-house vs contracted training | Martin to review by 7/29.<br>Martin to gather existing training info for August safety meeting. |
| 8/6/13 2:00-2:30 | Martin Montalvo, Gail Johnson | -BMP 8-4 PWQF<br>-BMPs 6-1, 6-2 Design Standards<br>-BMP 7-3 SWPPS & spill response training | Staff training: manual created and provided to staff for review per SOP.<br>Scheduling workshop for September.<br>Martin is creating PowerPoints. | WQ staff to begin implementing program.<br>Conduct workshop (B&C lead).<br>Training scheduled for 8/20/13. |
| 9/19/13 10:00-2:30 | John Lewis, Martin Montalvo, Gail Johnson, Aleta Froman-Goodrich, Todd Martinez, Tony Konkol, Peter Walter, John Burrell, Krista Reininga, Alissa Maxwell | -BMP 3-1 Erosion Control Manual<br>-BMP 6-2 Update Code and Development Standards | Stormwater Design Standards Update Workshop #1<br>Summary of existing standards, including erosion control; matrix comparison to permit requirements; current process and policies review; what other agencies are doing; options moving forward. | Staff to review WES manual in greater depth in preparation for next workshop.<br>Must move forward soon to allow for code changes in order to meet November 1, 2014 deadline. |
| 10/11/13 8:45-9:45 | John Lewis, Martin Montalvo, Gail Johnson | -BMP 6-2 Design Standards<br>-TMDL Implementation<br>-Personal Services Agreement w/B&C | Next steps in design and code update.<br>Need to move forward – intern project?<br>Reviewed remaining tasks for permit compliance; existing budget. | Over next several months, meetings w/key staff to review "bite-size" components.<br>Need description of project.<br>Get scope from B&C, include all items discussed today. |
| 10/22/13 1:00-2:00 | Martin Montalvo, Eric Hand, Gail Johnson | -Tracking data for annual reporting | Reviewed Appendix A to determine what items should be tracked in Lucity. | Martin to bring items to AM Specialist for inclusion in Lucity. |
| 12/18/13 9:00-noon | John Lewis, Martin Montalvo, Gail Johnson, Aleta Froman-Goodrich, Todd Martinez, Tony Konkol, plus 6 staff from Wilsonville and 3 B&C consultants | -BMP 6-2 Design Standards Update | Stormwater Design Standards Update Workshop #2<br>Overview of WES Manual and sizing tool; joint session to cost-share consultant time. | Three upcoming workshops (January, February, and March) to focus on individual chapters and to customize for OC. Will have joint session as needed with Wilsonville. |
| 1/22/14 1:00-4:00 | John Lewis, Martin Montalvo, Gail Johnson, Aleta Froman-Goodrich, Todd Martinez, Tony Konkol, 2 B&C consultants | -BMP 6-2 Design Standards Update | Strategy Workshop #1<br>Policy & Technical Questions addressed: thresholds, definitions, infiltration/LID strategy, flow control strategy & sizing tools. Decisions made to customize WES manual for OC use and permit compliance. | Prepare for Strategy Workshop #2 |
| 2/13/14 9:00-12:30 | John Lewis, Martin Montalvo, Gail Johnson, Aleta Froman-Goodrich, Tony Konkol, Eric Hand, 2 B&C consultants | -BMP 6-2 Design Standards Update | Strategy Workshop #2<br>Policy & Technical Questions addressed:<br>Impervious area reduction techniques, fee in lieu program, incentives<br>Facility Selection & Design topics:<br>Allowable BMPs, facility use & design, bmp hierarchy | Individual assignments for specific chapter comparison of current manual with WES manual, in preparation for next in-house meeting. |

| Date/ Time | Attendees | BMP's /Topics | Items Discussed | Next Steps/Program Adjustments |
|---|---|---|---|---|
| 4/3/14 9:00-12:00 | John Lewis, Martin Montalvo, Gail Johnson, Aleta Froman-Goodrich, Todd Martinez, Eric Hand, Tony Konkol, Lisa Oreskovich | -BMP 6-2 Design Standards Update | In-house work session. Reviewed chapters 5 and 6 for any changes needed to customize WES manual for OC use. | Need a second in-house work session to complete chapter reviews; possible smaller work groups for specific topics (for example consolidation of all construction notes). |
| 4/16/14 1:00-4:30 | John Lewis, Martin Montalvo, Gail Johnson, Aleta Froman-Goodrich, Todd Martinez, Eric Hand, Tony Konkol | -BMP 6-2 Design Standards Update | In-house work session. Reviewed chapter 8 and Appendix A. | Aleta & Todd to complete review of Chapter 5. Suggestions to take appropriate items from ODOT standards to incorporate for irrigation, etc. (Chapter 8). |
| 5/2/14 1:30-2:30 | Martin Montalvo, Aleta Froman-Goodrich, Gail Johnson | -BMP 6-2 Design Standards Update | Clarification on timeline for submittals and chapter reviews in preparation for next Workshop with B&C; code change schedule | Prepare for Strategy Workshop #3 |
| 5/6/14 9:30-2:00 | Martin Montalvo, Gail Johnson, Aleta Froman-Goodrich, Todd Martinez, Eric Hand, Tony Konkol, 2 B&C consultants | -BMP 6-2 Design Standards Update | Strategy Workshop #3<br>Policy & Technical Questions addressed:<br>Code changes, proposed manual outline, site planning, maintenance responsibility, downspout disconnection, rainwater harvesting, fee in lieu, buffers, submittals. | Action Item list provided by B&C in preparation for next steps – chapter reviews, submittal requirements, redline WES manual or determine what to use from existing city manual, update maintenance covenant. |
| 6/4/14 2:00-4:00 | Martin Montalvo, Gail Johnson, John Lewis, Aleta Froman-Goodrich, Todd Martinez, Eric Hand | -BMP 6-2 Design Standards Update | Review of B&C Decision Matrix | Provide redlines to B&C, request further clarification on a few items. Follow updated schedule for deliverables in advance of first draft. |

# Appendix A

# Oregon City SWMP Implementation Status

# Appendix A. Status of Implementing Components of Oregon City's 2012 SWMP

Key to Pollutant Symbols
A full circle (●) indicates the BMP is expected to address the parameter.
An empty circle (○) indicates the BMP may be expected to address the parameter.
A blank cell indicates that the effect of the BMP is unknown at this time.

| Best Management Practice or Activity | Addresses Bacteria? | Addresses Mercury? | Responsible Department | Measurable Goals (2012 SWMP) | Tracking Measures (2012 SWMP) | Annual Report Information: Tracking Measure Status, Permit Year 2013–2014 | Additional Detail Related to Activities Conducted |
|---|---|---|---|---|---|---|---|
| Element #1<br>Illicit Discharge Detection and Elimination | | | | | | | |
| BMP 1-1: Implement the Illicit Discharge Elimination Program | ● | ● | Oregon City Public Works Department | • Document and implement updated Standard Operating Procedures for the IDDE Program by November 1, 2012.<br><br>• Conduct actions to remove identified illicit discharges in conjunction with timeframes outlined in the City's MS4 NPDES Permit.<br><br>• Track and record all identified illicit discharges and how such discharges were removed. | 1) Track status of documenting and updating the IDDE SOP.<br><br>2) Track the number, location, type of discharge, resolution and enforcement action for any illicit discharge investigation conducted. | 1) No changes were made to the IDDE SOP during this reporting period.<br><br>2) One illicit discharge investigation was deemed necessary as a result of annual Dry Weather Field Screening conducted during this reporting period. See BMP 1-2, below for more information and Appendix E for the investigation report. | The City of Oregon City developed an IDDE SOP (effective date: November 1, 2012), in conjunction with other Clackamas County co-permittees. The SOP includes guidelines for identification and enforcement of illicit discharges. |
| BMP 1-2: Conduct Annual Dry Weather Field Screening | ○ | ○ | Oregon City Public Works Department | • Conduct dry-weather field screening once per year, at a minimum, at major outfalls.<br><br>• Characterize dry weather flows as permissible, non-permissible, or unknown.<br><br>• Conduct sampling, analysis, and investigations for non-permissible and unknown dry weather discharges.<br><br>• Maintain maps of major outfalls and dry weather field screening locations.<br><br>• Notify the Public Works Operations Manager of all identified illicit discharges and take necessary steps to eliminate them.<br><br>• Update procedures for dry weather field screening by November 1, 2012. | 1) Track the number and location of outfalls inspected annually.<br><br>2) Summarize inspection results and track the number and location of outfalls requiring monitoring and/or investigations.<br><br>3) Report the outcome and resolution of any investigation activities.<br><br>4) Report the outcome and resolution of any code enforcement actions.<br><br>5) Track the status of updating standard procedures. | 1) 8 outfalls were inspected as part of the annual dry weather field screening activities.<br><br>2) Outfalls were inspected on 7/30/13. Flow was observed at 4 of the outfalls; discharge was characterized as permissible at 3 of the 4 outfalls. One follow-up investigation was required at outfall #7 Berry Hill.<br><br>3) The presence of two or more physical indicators at outfall #7 resulted in a potential probability of illicit discharge, so a source investigation was conducted. One cross connections were found and corrected. Additional information regarding the investigation and resolution is provided in Appendix E.<br><br>4) N/A<br><br>5) The City of Oregon City developed an IDDE SOP (effective date: November 1, 2012). The SOP includes procedures for conducting dry weather field screening. | Dry weather screening was conducted at the following outfalls:<br><br>#1 99E & 5th Street – 8-inch<br>#2 99E & 5th Street – 15-inch<br>#3 Abernethy Road at Tri-Lett – 15-inch<br>#4 Clackamas River Drive – 48-inch<br>#5 Metro Wetlands Pond – 48-inch<br>#6 Falcon Drive – 30-inch<br>#7 Berry Hill – 24-inch<br>#8 Beavercreek at Hwy 213 – 24-inch |
| BMP 1-3: Implement the Spill Response Program | ○ | ○ | Clackamas Fire District #1 (Hazardous Materials Team) and Oregon City Public Works Department | • Respond to reports of hazardous and non-hazardous spills and follow the Oregon City Spill Response Plan.<br><br>• Report all hazardous and non-hazardous spills to DEQ as necessary. | 1) Indicate the number of spills reported to Public Works and DEQ.<br><br>2) Track responses to reported spills.<br><br>3) Indicate sources, causes, and types of discharges resulting from spill activities.<br><br>4) Track any changes to the Oregon City Spill Response Plan. | 1) Eight spills were reported to Oregon City Public Works (OCPW) during the 2013-2014 reporting period. Two required DEQ reporting.<br><br>2) Responses were appropriate for each spill. See list below.<br><br>3) Spills were of various types. Minor (non-reported) spills resulted primarily from vehicle accidents or mechanical failure and had no discharges.<br>- Four vehicle accidents (minor) - cleaning with absorbent pads, sweeping, and proper disposal.<br>- Two spills of food grade fats, oils, & grease - cleaning with absorbent pads, sweeping, and proper disposal. One was minor and one was reported to DEQ & OERS.<br>- One paint spill (minor) - applied absorbent sweep, street sweeping, and proper disposal.<br>- One carpet cleaning process water discharge – catch basin was vacuumed out and storm line cleaned and vacuumed. Reported to DEQ & OERS.<br><br>4) There were no changes to the Oregon City Spill Response Plan during this reporting period. | In June 2013, Oregon City revised its Spill Response Plan for hazardous & non-hazardous spills to reflect the most current guidelines provided by Oregon DEQ. Training regarding these revisions was conducted with the Oregon City Public Works Operations employees on August 21, 2013. |
| Element #2<br>Industrial and Commercial Facilities | | | | | | | |
| BMP 2-1: Screen Existing and New Industrial Facilities | ○ | ○ | Oregon City Public Works Department | • Review the business license inventory for 1200Z industries once over the permit term.<br><br>• Notify DEQ of any existing or new industrial facilities within the City that may be subject to an industrial stormwater NPDES permit. | 1) Track the number of existing or new facilities subject to a stormwater industrial NPDES permit during the permit term. | 1) The Water Quality Coordinator continued to review all new business license applications for potential water quality-related issues. 153 business license applications were reviewed during the 2013-2014 reporting period. The screening did not identify any additional facilities potentially subject to an industrial stormwater permit. | DEQ provided additional guidance on industrial facility screening in June 2013. Oregon City's consultant has coordinated with DEQ related to the methodology and process for identifying "potential" 1200-Z permittees. |

| Best Management Practice or Activity | Addresses Bacteria? | Addresses Mercury? | Responsible Department | Measurable Goals (2012 SWMP) | Tracking Measures (2012 SWMP) | Annual Report Information: Tracking Measure Status, Permit Year 2013–2014 | Additional Detail Related to Activities Conducted |
|---|---|---|---|---|---|---|---|
| BMP 2-2: Implement an Industrial/ Commercial Inspection Program for High Priority Facilities | ○ | ○ | Oregon City Public Works Department | • Pursue approval to hire staff to implement a business inspection program.<br><br>• Develop a priority list of industrial/commercial facilities for inspection.<br><br>• Investigate 25% of the City's manufacturing businesses once during the permit term.<br><br>• Develop an industrial/commercial inspection procedure by July 1, 2013. | 1) Track the number of inspections conducted.<br><br>2) Report on inspection results and follow up actions.<br><br>3) Report on status of documenting and updating procedures. | 1) No inspections were conducted during the 2013-2014 reporting period. However, an initial letter was sent to one "high priority" facility, dated June 26, 2014, requesting the opportunity to conduct an inspection. Results will be reported in the 2014-2015 annual report.<br><br>2) N/A<br><br>3) No changes were made to the Industrial/Commercial Facility Inspection Program SOP during this reporting period. | The City has not been able to hire staff to implement the business inspection program; the City may utilize seasonal/intern assistance until additional staff can be added.<br><br>The City developed an Industrial/ Commercial Facility Inspection Program Standard Operating Procedures (SOP) July 1, 2013. The SOP includes procedures and guidelines related to facility screening, DEQ notification of potential industrial stormwater permit needs, and high pollutant source facility inspections. The SOP identifies a total of 31 manufacturing businesses potentially subject to inspection. |
| Element #3<br>Construction Site Runoff Control | | | | | | | |
| BMP 3-1: Implement the Erosion Control Ordinances | ● | ○ | Oregon City Public Works Department | • Review erosion control plans for all developments greater than 1,000 square feet.<br><br>• Require erosion and sediment control plans not in compliance with standards to be amended and approved prior to construction.<br><br>• By November 1, 2014, adopt the Clackamas County erosion control manual or revise the City's manual in accordance with the MS4 NPDES permit requirements. | 1) Record the number of erosion control plan reviews completed and approved.<br><br>2) Track the number of erosion control permits issued annually.<br><br>3) Report on the status of adopting the Clackamas manual or updating the City's manual. | 1) 110 erosion control plans were reviewed and approved.<br><br>2) 110 erosion control permits were issued.<br><br>3) The City is actively working to develop an updated Stormwater and Grading Design Standards manual. The updated manual will include a chapter dedicated to erosion prevention and sediment control that references the Clackamas County erosion control manual. | |
| BMP 3-2: Provide Educational Information to Construction Site Operators | ○ | ○ | Oregon City Public Works Department | • Continue to provide the City's most current erosion control manual on the City website.<br><br>• Continue to offer discounts on erosion control permits to contractors completing the Erosion Control Certification Program. | 1) Track the number of contractors receiving a discount on erosion control permit fees. | 1) No contractors received a discount on permit fees. | |
| BMP 3-3: Conduct Erosion Control Inspections | ● | ○ | Oregon City Public Works Department | • Conduct a minimum of three erosion control inspections at each permitted site.<br><br>• Conduct appropriate enforcement activities for erosion control violations. | 1) Record the number of erosion control inspections conducted annually.<br><br>2) Report the number of notices of non-compliance issued during inspections. | 1) A total of 362 erosion control inspections were conducted this permit year. Due to the time frames with which construction occurs, some sites had all three required inspections, and some sites have only had one or two inspections at this time (construction is still ongoing).<br><br>2) 7 notices of non-compliance were issued. 4 stop work orders were issued. | The total number of inspections are comprised of:<br>• 119 Initial site visits, Inspection 1<br>• 80 Random inspections, Inspection 2<br>• 163 Final inspections, Inspection 3 |
| Element #4<br>Education and Outreach | | | | | | | |
| BMP 4-1: Provide Public Education and Outreach Materials Regarding Stormwater Management | ○ | ○ | Oregon City Public Works Department | • Include a water quality related article in each City newsletter, distributed to citizens three times per year.<br><br>• Participate in the Regional Coalition of Clean Rivers and Streams.<br><br>• Seek out opportunities to partner with other agencies/ jurisdictions/ organizations to educate and promote watershed health and low impact development.<br><br>• Periodically install signs near water quality structures and around the City promoting water quality.<br><br>• Sponsor the volunteer catch basin stenciling program.<br><br>• Distribute an annual water quality report to Oregon City residents. | 1) Track the number, types and topics of public educational materials distributed to the public.<br><br>2) Report any large scale public educational campaigns initiated during a given year.<br><br>3) Track coordinated public outreach activities with other permittees. | 1) The following educational activities were conducted (see Appendix C for details):<br>- A total of 6 water quality-related articles were included in Trail News.<br>- OC promoted and/or participated in a total of 3 special events.<br>- The March utility bill included a message promoting chemical-free lawns and gardens.<br>- Mailed 14,743 postcards announcing availability of the Annual Water Quality Report on the city website.<br>- Stormwater banner displayed at building/planning (4/29/14 – 5/13/14).<br>- Promoted 3 stormwater-related publications/presentations on the city website.<br>2) No large scale public education campaigns were initiated.<br>3) Coordinated efforts included:<br>- Continued to sponsor the "Do the Right Thing" campaign via KOIN media outlets.<br>- Continued participation in the Regional Coalition of Clean Rivers and Streams.<br>- Continued participation with other agencies to promote water quality education through Clackamas River Water Providers. | Specific details on the public education and awareness activities conducted by the City of Oregon City are available in Appendix C.<br><br>During this reporting year the Regional Coalition of Clean Rivers and Streams (Coalition) continued to utilize online media, websites, and social media profiles to implement a diverse campaign. The Coalition's annual report summarizes these efforts.<br><br>Oregon City continues to conduct catch basin marking and stenciling to increase public awareness. During this reporting period 1,576 catch basins were either stenciled with the message "Dump No Waste – Drains to Stream" or had "No Dumping, Drains to Waterway" markers installed. |
| BMP 4-2: Participate in a Public Education Effectiveness Evaluation | ○ | ○ | Oregon City Public Works Department | • Coordinate with other local, Phase I jurisdictions in providing/compiling information regarding a public education effectiveness evaluation by July 1, 2015. | 1) Report on activities conducted annually. | 1) The ACWA Stormwater Committee completed a coordinated effort to compile existing educational survey information and develop conclusions to inform how public education efforts result in behavioral change. The study was conducted by DHM Consulting with cost shared among interested Phase I and Phase II communities, including Oregon City. | Oregon City continues to coordinate with other ACWA Stormwater Committee members to review the DHM report to be used for the effectiveness evaluation (due date July 1, 2015). |

| Best Management Practice or Activity | Addresses Bacteria? | Addresses Mercury? | Responsible Department | Measurable Goals (2012 SWMP) | Tracking Measures (2012 SWMP) | Annual Report Information: Tracking Measure Status, Permit Year 2013–2014 | Additional Detail Related to Activities Conducted |
|---|---|---|---|---|---|---|---|
| BMP 4-3: Conduct Staff Training for Pest Management | ○ | ○ | Oregon City Public Works Department and Parks Department | • Ensure Public Works and Parks staff conducting pest management activities are certified for spraying activities according to OSHA requirements.<br><br>•Ensure licensed staff attends annual refresher courses. | 1) Track the number of employees licensed for spraying activities.<br><br>2) Report number of employees that attended initial or refresher training. | 1) Public Works staff licensed for spraying activities = 6; Parks Dept staff = 4<br><br>2) Six Public Works staff and four Parks Dept staff attended refresher training classes during the reporting period. | |
| BMP 4-4: Conduct Staff Training in Spill Response | ○ | ○ | Oregon City Public Works Department | • Provide non-hazardous spill response training annually through monthly safety meetings.<br><br>• Coordinate annual training and refresher courses for staff initially responding to spills using OSHA hazardous materials educational resources. | 1) Track spill-related training and education. | 1) 25 Public Works staff and 6 Parks Dept staff were provided spill response training. Two training sessions were held (8/21/13 and 10/22/13) in conjunction with implementation of the City's Stormwater Pollution Prevention Strategy for Municipal Facilities. | |
| BMP 4-5: Ensure Municipal Staff Training in Stormwater Pollution Prevention | ○ | ○ | Oregon City Public Works Department | • Conduct municipal training for employees associated with stormwater management in the City.<br><br>• Coordinate with other Clackamas County co-permittees regarding regional water quality efforts.<br><br>• Participate in training and advisory committee opportunities available through state and local agencies and groups.<br><br>• Conduct regular stormwater staff meetings one to two times per year. | 1) Track the number of employees receiving training in stormwater management annually.<br><br>2) Track Oregon City staff participation in groups, committees, and organizations relevant to stormwater quality management.<br><br>3) Track regular stormwater staff meetings and staff attendance at those meetings. | 1) Employees receiving training in stormwater management:<br>- Three OCPW employees attended the Annual ACWA Stormwater Summit 5/15/2014.<br>- OCPW Director attended APWA conferences 10/13 and 4/14.<br>- OC City Engineer and two OCPW employees attended APWA conference 10/13.<br><br>2) OC staff participates in the following groups and organizations:<br>- Association of Clean Water Agencies (ACWA) and active participant in the ACWA Phase I Stormwater subcommittee<br>- Continued collaboration with other co-permittees on Comprehensive Clackamas Stormwater Monitoring Program (CCCSMP)<br>- Greater Oregon City Watershed Council (GOCWC)<br>- Clackamas County Water Education Team<br>- Regional Coalition for Clean Rivers and Streams<br><br>3) There were 13 stormwater staff meetings conducted during the 2013-2014 reporting period. Dates, topics, and attendees are summarized in Table 4 in Section 6.0 of the 2013-2014 NPDES MS4 annual report. | |
| Element #6<br>Post-Construction Site Runoff | | | | | | | |
| BMP 6-1: Implement Municipal Construction Standards | ● | ● | Oregon City Community Development Department | • Per City's Development Code, review all new development and applicable redevelopment for conformance with current City stormwater standards and ordinances. | 1) Track the number of development applications reviewed and approved for compliance with stormwater regulations.<br><br>2) Track the number, type, and drainage area of treatment facilities constructed annually. | 1) 18 development applications were reviewed and approved for compliance with water quality/water quantity standards.<br><br>2) 3 treatment/ detention facilities were constructed during the reporting period of 7/1/2013 through 6/30/2014:<br>- 3 infiltration planters<br>- Total Drainage area = 1.2 acres | Details of treatment facility construction:<br>Visionary Court 6-Lot Subdivision – 3 sumped catch basins, 1 flow control manhole, and 3 infiltration planters; Total contributing drainage area = 1.2 acres<br><br>NOTE: Four new subdivisions were constructed that used existing detention facilities. |
| BMP 6-2: Review and Update Code and Development Standards related to Stormwater Quality Control | ● | ● | Oregon City Community Development Department | • Review the City's current/ planned stormwater treatment and detention standards for compliance with new MS4 NPDES permit language.<br><br>• Review the City's current public works development code provisions to ensure that applicable barriers to LID or green infrastructure (GI) are minimized and eliminated where practicable.<br><br>• If necessary, update the City's post-construction stormwater design standards and code language by November 1, 2014. | 1) Track progress related to review of the City's code and development standards per provisions in the MS4 NPDES permit.<br><br>2) Track any code/ standards modifications made by ordinance. | 1) The City is working with a consultant to develop an update to the City's Stormwater and Grading Design Standards to meet the updated MS4 NPDES permit language. The project has included the following workshop-style meetings:<br>- Development Standards Review Meeting, September 19, 2013<br>- Kickoff Meeting, December 18, 2013<br>- Strategy Meeting #1, January 22, 2014<br>- Strategy Meeting #2, February 13, 2014<br>- Strategy Meeting #3, May 6, 2014<br>During the 2013-2014 reporting period, the City developed a comprehensive strategy/policy matrix, identified base documents to use in developing the updated manual (Clackamas County's 2010 Draft Stormwater Management Design Standards and the City's current Stormwater and Grading Design Standards), and developed a detailed outline of the updated manual.<br><br>2) The City began their code and development standard update process September 2013. The updated Stormwater and Grading Design Standards manual and associated municipal code update is expected to be complete in fall 2014. | Completion of design standards and code updates is not required until November 1, 2014.<br><br>A draft of the Stormwater and Grading Design Standards manual for internal review completed in July 2014 with the final manual expected in fall 2014. |

| Best Management Practice or Activity | Addresses Bacteria? | Addresses Mercury? | Responsible Department | Measurable Goals (2012 SWMP) | Tracking Measures (2012 SWMP) | Annual Report Information: Tracking Measure Status, Permit Year 2013–2014 | Additional Detail Related to Activities Conducted |
|---|---|---|---|---|---|---|---|
| Element #7<br>Pollution Prevention for Municipal Operations | | | | | | | |
| BMP 7-1: Conduct Street Sweeping and Roadway Repair Activities | ● | ● | Oregon City Public Works Department | • Sweep city streets every 3-4 months on average, more frequently in high traffic areas and during leaf pick up and following deicing activities. | 1) Track the average number of citywide sweeps per year.<br><br>2) Estimate the miles of streets swept per year.<br><br>3) Track volume of debris removed. | 1) 4.17 citywide sweeps for this reporting period.<br><br>2) During the 2013-2014 reporting period, 3,071 miles of roadway were swept.<br><br>3) 743.5 cubic yards of debris were removed as a result of sweeping and leaf pickup activity. | |
| BMP 7-2: Minimize Pollutant Discharges Associated with Landscape Management Practices | ○ | ○ | Oregon City Public Works Department and Parks Department | • All chemical applicators, both contractor and city, must follow state laws related to the use of pesticides.<br><br>• Applicators will complete spray reports for the application of chemicals. | 1) Track any program changes regarding chemical application practices used by the City. | 1) Both city and contracted chemical applicators comply with 2300-A, pesticide general permit requirements. Pesticide applications are kept at least three feet away from any water's edge. | |
| BMP 7-3: Implement a Program to Reduce the Impact of Stormwater Runoff from Municipal Facilities | ○ | ○ | Oregon City Public Works Department | • By July 1, 2013, inventory municipal facilities subject to this permit requirement.<br><br>• By July 1, 2013, identify whether there is a need for additional strategies to minimize discharge from these facilities. | 1) Track updates to strategies used to minimize pollutant discharge from municipal waste storage facilities | 1) The City developed a Stormwater Pollution Prevention Strategy document for municipal operations (SWPPS) July 1, 2013. The SWPPS includes a description of each of the City's six facilities that treat, store, or transport municipal waste. Additionally, it identifies potential pollutant sources as well as short and long term pollution reduction strategies. No updates to the SWPPS were identified during the reporting period. | |
| BMP 7-4: Control Infiltration and Cross Connections to the City's Stormwater Conveyance System | ● | | Oregon City Public Works Department | • Review new and redevelopment for possible cross-connections.<br><br>• Eliminate cross connections upon identification. | 1) Report whether any cross connections were discovered and describe follow up activities. | 1) Seven cross connections were discovered and corrected during this reporting period. Locations and corrective actions were:<br><br>- 19370 Pease Road – septic tank drain field leach lines plumbed to storm system. Disconnected leach line from storm system and capped off.<br>- 14638, 14644, 14650, 14855 Tannery Street – sanitary mistakenly connected to storm by plumber. Plumbing corrected.<br>- 13863 Beavercreek Road (Valvoline Lube/Oil) – interior floor drain/sump connected to storm. Required customer to disconnect and plug off.<br>- 19055 Beavercreek Road (Valvoline Lube/Oil) – oil/water separator connected to storm. Required customer to connect to sanitary. | Dye tests are performed by Public Works upon request from plumbing inspector if there are questions regarding sewer connections.<br>New Construction storm & sanitary stub out standards have been revised – sanitary remains 4" diameter pipe, storm was increased to 6" diameter pipe to avoid confusion in future. |
| BMP 7-5: Coordinate with Local Fire Department related to Pollutant Discharge from Fire Fighting Training Activities | | | Oregon City Public Works Department | • By November 1, 2012, contact Clackamas Fire District #1 to determine what activities are conducted to minimize pollutant discharges associated with fire fighting training activities.<br><br>• As applicable, provide educational information to Clackamas Fire District #1 by November 1, 2012. | 1) Track contacts made with Clackamas Fire District #1. | 1) No contacts were made during this reporting period. | On 9/12/12 Oregon City's Water Quality Coordinator contacted Clackamas Fire District #1 to discuss firefighting training activities conducted in Oregon City. Per an email dated 9/13/12 the Battalion Chief for Training & Safety confirmed that all foam drills were conducted at their primary training facility in Clackamas. Any training activities at the four Oregon City stations use water only. |
| BMP 7-6: Conduct Master Planning and Implement Capital Projects for Stormwater Quality Enhancement | ● | ● | Oregon City Public Works Department | • The Citywide Master Plan will be updated by the end of the permit term.<br><br>• Prioritize CIPs by funding availability and water quality/ flood control benefit.<br><br>• Update maps to include location and drainage area of any new stormwater quality CIPs. | 1) Track master planning activities.<br><br>2) Track number and cost of major (water quality) CIP projects and discuss added benefit.<br><br>3) Map the location and drainage area of water quality related CIPs. | 1) The City continues with the planning phase for updating their existing Citywide Drainage Master Plan.<br><br>2) A total of five water quality related CIP projects were constructed during this reporting period.<br>- One project was contracted out, for a total cost of $43,000.<br>- Four projects were completed in-house, for a total cost of $20,000.<br>3) Mapping:<br>- The one contracted CIP project is pending.<br>- All four in-house CIP projects have been mapped. | Following are details of the contracted CIP projects completed during this reporting period:<br>- 2013 Pavement Improvements Project CI 13-03 – two sumped catch basins and 800 feet of pipe<br><br>Following are details of the in-house CIP projects completed during this reporting period:<br>- 10th & Main Street – installed two catch basins and 50 feet of pipe<br>- 19130 South End Road – installed one catch basin and 40 feet of pipe<br>- 19135 South End Road – installed oversize manhole<br>- Holcomb Blvd at Leroy Lane – slip-lined 60 feet of pipe |

| Best Management Practice or Activity | Addresses Bacteria? | Addresses Mercury? | Responsible Department | Measurable Goals (2012 SWMP) | Tracking Measures (2012 SWMP) | Annual Report Information: Tracking Measure Status, Permit Year 2013–2014 | Additional Detail Related to Activities Conducted |
|---|---|---|---|---|---|---|---|
| Element #8<br>Stormwater Management Facilities Operation and Maintenance | | | | | | | |
| BMP 8-1: Conduct Stormwater Conveyance System Cleaning and Maintenance | ● | ● | Oregon City Public Works Department | • Maintain, repair, and/or replace conveyance system components when needed, based on ongoing inspections.<br><br>• Update the stormwater system map when discrepancies are found. | 1) Estimation of the volume of debris removed per year during public conveyance system cleaning activities (in conjunction with BMP 8-2). | See BMP 8-2. | |
| BMP 8-2: Conduct Catch Basin Cleaning and Maintenance | ● | ● | Oregon City Public Works Department | • Inspect at least 33% of the public catch basins annually.<br><br>• Schedule the repair, and replacement of catch basins as needed, based on inspections.<br><br>• Update the stormwater system map when discrepancies are found. | 1) Track the percentage of total public catch basins inspected and/or maintained annually.<br><br>2) Track the volume of sediment removed during cleaning activities conducted annually (also includes volume from BMP 8-1).<br><br>3) Track the number of catch basin replacements annually.<br><br>4) Track the number of public catch basins added to the City's catch basin inventory annually. | 1) 41% of public catch basins were maintained during this reporting period.<br><br>2) 107 cubic yards of sediment were removed (includes sediment from pipes, culverts, manholes, open channels, and catch basins).<br><br>3) Three catch basins were replaced. Six catch basins repaired.<br><br>4) Seven catch basins were added to, and two catch basins were removed from, the City's inventory. | 41% = 1,683 public catch basins |
| BMP 8-3: Public Structural Control Facility Cleaning and Maintenance | ● | ● | Oregon City Public Works Department | • Inspect and maintain public structural control facilities in accordance with documented frequencies and procedures.<br><br>• Update the public structural control facility inventory as needed.<br><br>• Update the stormwater system map in accordance with new public facility installations and when discrepancies are found. | 1) Track the number of public structural facilities inspected and maintained.<br><br>2) Track the volume of sediment removed during cleaning.<br><br>3) Track changes to the public structural control facility inventory as needed. | 1) 142 public structural facilities and 2,515 feet of bioswale were inspected during the reporting period. See the next column for maintenance details.<br><br>2) 15 cubic yards of sediment were removed during maintenance/cleaning.<br><br>3) One new water quality facility was added to the inventory:<br>- Visionary Court – 160 foot vegetated bioswale | 1) The following public structural facilities were inspected and maintained during the reporting period:<br>- Ponds = 76 inspected; 76 maintained<br>- Swales = 2,515 feet maintained<br>- Rain gardens = 3 inspected; 3 maintained<br>- Detention Pipes = 20 inspected; 3 cleaned<br>- WQ Vaults = 1 inspected; no maintenance required<br>- Pollution Control Manholes = 42 inspected; 9 cleaned |
| BMP 8-4: Private Structural Control Facility Cleaning and Maintenance | ● | ● | Oregon City Public Works Department | • Require new private water quality facilities to submit maintenance agreements to the City.<br><br>• Compile an inventory of existing private structural water quality facilities and work to collect maintenance agreements for these by July 1, 2013.<br><br>• Implement an inspection strategy for private water quality facilities by July 1, 2013. | 1) Track the number of maintenance agreements submitted to the City each year.<br><br>2) Track progress related to the inventory and mapping of existing private structural facilities.<br><br>3) Track the status of updating the inventory and map of private water quality facilities.<br><br>4) Track the status of developing procedures in accordance with permit requirements. | 1) The City continues to require maintenance agreements for private water quality facilities. One maintenance agreement was received during this reporting period.<br><br>2) Files have been reviewed for existing private structural facilities. An inventory list has been created.<br><br>3) Initial mapping is complete; refinements ongoing.<br><br>4) The City developed standard operating procedures (SOPs) for public water quality facilities and private water quality facilities July 1, 2013. The SOPs outline procedures for ongoing mapping and inventory activities, as well as facility inspections. For private facilities, the City requires a maintenance agreement and submission of annual inspection records. | 1) Visionary Place, agreement signed November 21, 2013<br><br>4) Oregon City's Private Water Quality Facilities Inspection & Maintenance Program was implemented July 1, 2013. Stormwater staff training was conducted and maintenance inspection reports were received from all private facilities with existing maintenance agreements (six total). |

# Appendix B

# Oregon City Monitoring Data

**Outfall Monitoring - Oregon City 2013-14**
**Location - Oregon City Shopping Center @ Clackamette Cove**
**Sample Site # OC006**
**Stream Name - Clackamas River**
**Land Use - Commercial**

| | | Results | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Composite Rain Event | Composite Rain Event | Composite Rain Event | Composite Rain Event | Statistics | | | |
| Analysis | Units | 11/7/2013 | 1/10/2014 | 2/24/2014 | 3/27/2014 | High | Low | Mean | Notes |
| Total Phosphate Seal | mg/L | <0.08 | <0.04 | <0.04 | <0.04 | **ND** | **ND** | **N/A** | (2) |
| Dissolved Oxygen - Winkler | mg/L | Not Required | Not Required | 10.5 | 10.5 | **N/A** | **N/A** | **N/A** | (1)(2) |
| Dissolved Oxygen - Field | mg/L | 10.36 | 9.78 | 10.48 | 10.10 | **10.48** | **9.78** | **10.18** | |
| Dissolved Oxygen - % Saturation | % | 95.7 | 86.20 | 92.2 | 90.80 | **95.7** | **86.2** | **91.23** | |
| Conductivity Field | uS | 13.14 | 127.4 | 36.3 | 49.3 | **127.4** | **13.14** | **56.54** | |
| Temperature Field | °C | 11.6 | 9.90 | 9.6 | 10.1 | **11.6** | **9.6** | **10.30** | |
| pH Field | Std Units | 6.97 | 6.93 | 6.90 | 7.10 | **7.10** | **6.90** | **6.98** | |
| Dissolved Copper ICPMS | ug/L | 3.97 | 5.0 | 4.3 | 3.7 | **5.0** | **3.7** | **4.24** | |
| Copper ICPMS | ug/L | 7.33 | 6.9 | 5.9 | 10.1 | **10.1** | **5.9** | **7.56** | |
| Dissolved Lead ICPMS | ug/L | 0.26 | 0.16 | 0.13 | 0.16 | **0.26** | **0.13** | **0.18** | |
| Lead ICPMS | ug/L | 1.86 | 1.49 | 2.3 | 4.26 | **4.26** | **1.49** | **2.48** | |
| Dissolved Zinc ICPMS | ug/L | 36.8 | 89 | 29 | 36 | **89** | **29** | **47.7** | |
| Zinc ICPMS | ug/L | 47 | 98 | 32 | 62 | **98** | **32** | **60** | |
| E. coli - Colilert | MPN/100mL | 2420 | 727 | 79 | >2420 | **>2420** | **79** | **N/A** | (2)(3)(4) |
| Ammonia Nitrogen Low Seal | mg/L | <0.05 | 0.12 | 0.12 | <0.15 | **N/A** | **ND** | **N/A** | (2) |
| Nitrate-Nitrite | mg/L | 0.138 | 0.38 | 0.158 | 0.342 | **0.38** | **0.138** | **0.255** | |
| Ortho Phosphate Seal | mg/L | <0.040 | <0.04 | <0.04 | <0.10 | **ND** | **ND** | **N/A** | (2) |
| Total Dissolved Solids | mg/L | 30 | 99 | 26 | 51 | **99** | **26** | **52** | |
| Total Solids | mg/L | 37 | 76 | 61 | 75 | **76** | **37** | **62** | |
| Total Suspended Solids | mg/L | 8.0 | 5.0 | 17 | 38 | **38** | **5.0** | **17.0** | |
| Volatile Solids | mg/L | 27 | 73 | 42 | 40 | **73** | **27** | **46** | |
| Hardness | mg/L | 35 | 44 | 23 | 14 | **44** | **14** | **29** | |
| BOD | mg/L | <2.0 | 1.4 | 3.5 | 1.7 | **3.5** | **ND** | **N/A** | (2) |
| Storm Event Rainfall | Inches | 1.61 | 0.25 | 0.25 | 1.13 | **N/A** | **N/A** | **N/A** | (2)(5) |

Notes:

(1) Dissolved Oxygen (Winker Method) samples are taken once per sampling event as Q/C for eletronic meter

(2) Per DEQ request, an "ND" designation is understood to be "less than the lower reporting limit". N/A is Not Applicable

(3) MPN = Most Probable Number

(4) Shading indicates samples that exceed the E. coli standard of 406 MPN/100mL

(5) Rainfall totals from the start of the event to sample collection.

**Outfall Monitoring - Oregon City 2013-14**
**Location - Clackamette Cove**
**Sample Site # OC007**
**Stream Name - Clackamas River**
**Land Use - Industrial**

| | | Results | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Composite Rain Event | Composite Rain Event | Composite Rain Event | Composite Rain Event | Statistics | | | |
| Analysis | Units | 11/7/2013 | 1/10/2014 | 2/24/2014 | 3/27/2014 | High | Low | Mean | Notes |
| Total Phosphate Seal | mg/L | <0.08 | 0.07 | <0.04 | <0.04 | **N/A** | **ND** | **N/A** | (2) |
| Dissolved Oxygen - Winkler | mg/L | Not Required | 11.2 | Not Required | Not Required | **N/A** | **N/A** | **N/A** | (1)(2) |
| Dissolved Oxygen - Field | mg/L | 9.63 | 11.42 | 9.54 | 10.17 | **11.42** | **9.54** | **10.19** | |
| Dissolved Oxygen - % Saturation | % | 89.2 | 98.8 | 82.3 | 91.0 | **98.8** | **82.3** | **90.3** | |
| Conductivity Field | uS | 91.8 | 182.6 | 299 | 221 | **299** | **91.8** | **198.6** | |
| Temperature Field | °C | 11.7 | 9.10 | 8.8 | 9.9 | **11.7** | **8.8** | **9.88** | |
| pH Field | Std Units | 7.09 | 7.45 | 7.28 | 7.53 | **7.53** | **7.09** | **7.34** | |
| Dissolved Copper ICPMS | ug/L | 4.45 | 2.4 | 2.3 | 2.1 | **4.45** | **2.1** | **2.81** | |
| Copper ICPMS | ug/L | 7.61 | 3.9 | 2.8 | 3.4 | **7.61** | **2.8** | **4.43** | |
| Dissolved Lead ICPMS | ug/L | 0.24 | 0.11 | 0.06 | 0.10 | **0.24** | **0.06** | **0.13** | |
| Lead ICPMS | ug/L | 2.31 | 1.06 | 0.7 | 0.97 | **2.31** | **0.7** | **1.26** | |
| Dissolved Zinc ICPMS | ug/L | 22.2 | 11 | 18 | 16 | **22.2** | **11** | **16.8** | |
| Zinc ICPMS | ug/L | 34 | 17 | 18 | 21 | **34** | **17** | **23** | |
| E. coli - Colilert | MPN/100mL | 770 | 133 | 56 | 548 | **770** | **56** | **377** | (4) |
| Ammonia Nitrogen Low Seal | mg/L | <0.05 | <0.05 | 0.12 | <0.15 | **N/A** | **ND** | **N/A** | (2) |
| Nitrate-Nitrite | mg/L | 0.163 | 0.18 | 0.103 | 0.082 | **0.18** | **0.082** | **0.132** | |
| Ortho Phosphate Seal | mg/L | <0.040 | <0.04 | <0.04 | <0.10 | **ND** | **ND** | **ND** | (2) |
| Total Dissolved Solids | mg/L | 94 | 119 | 219 | 168 | **219** | **94** | **150** | |
| Total Solids | mg/L | 81 | 129 | 220 | 143 | **220** | **81** | **143** | |
| Total Suspended Solids | mg/L | 12 | 7.7 | 11 | 9.3 | **12** | **7.7** | **10.0** | |
| Volatile Solids | mg/L | 41 | 53 | 105 | 68 | **105** | **41** | **67** | |
| Hardness | mg/L | 53 | 73 | 142 | 105 | **142** | **53** | **93** | |
| BOD | mg/L | 2.1 | 1.2 | 1.0 | 1.6 | **2.1** | **1.0** | **1.5** | |
| Storm Event Rainfall | Inches | 1.61 | 0.25 | 0.25 | 1.13 | **N/A** | **N/A** | **N/A** | (2) (5) |

Notes:

(1) Dissolved Oxygen (Winker Method) samples are taken once per sampling event as Q/C for eletronic meter

(2) Per DEQ request, an "ND" designation is understood to be "less than the lower reporting limit". N/A is Not Applicable

(3) MPN = Most Probable Number

(4) Shading indicates samples that exceed the E. coli standard of 406 MPN/100mL

(5) Rainfall totals from the start of the event to sample collection.

**Instream Monitoring - Oregon City 2013-14**
**Location - 17082 Holly Ln. (Holly Ln. Bridge)**
**Sample Site # OC010**
**Stream Name - Abernethy Creek (Upstream)**

| | | Results | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Grab Sample Dry Weather | Grab Sample Dry Weather | Composite Rain Event | Composite Rain Event | Grab Sample Dry Weather | Grab Sample Dry Weather | Statistics | | | |
| **Analysis** | **Units** | **7/18/2013** | **9/11/2013** | **11/7/2013** | **2/12/2014** | **6/4/2014** | **6/25/2014** | **High** | **Low** | **Mean** | **Notes** |
| Total Phosphate Seal | mg/L | 0.07 | 0.07 | <0.08 | 0.11 | <0.04 | <0.04 | **0.11** | **ND** | **N/A** | (2) |
| Dissolved Oxygen - Winkler | mg/L | Not Required | Not Required | Not Required | Not Required | Not Required | Not Required | **N/A** | **N/A** | **N/A** | (1) (2) |
| Dissolved Oxygen - Field | mg/L | 8.26 | 7.92 | 10.20 | 12.22 | 9.73 | 8.70 | **12.22** | **7.92** | **9.51** | |
| Dissolved Oxygen - % Saturation | % | 88.8 | 86.7 | 95.1 | 98.8 | 96.1 | 92.3 | **98.8** | **86.7** | **92.97** | |
| Conductivity Field | uS | 108.2 | 115.3 | 83.6 | 56.7 | 84.2 | 93.1 | **115.3** | **56.7** | **90.2** | |
| Temperature Field | °C | 19.0 | 19.3 | 11.8 | 5.9 | 14.9 | 17.9 | **19.3** | **5.9** | **14.8** | |
| pH Field | Std Units | 7.50 | 7.40 | 7.41 | 7.62 | 7.46 | 7.36 | **7.62** | **7.36** | **7.46** | |
| Dissolved Copper ICPMS | ug/L | 1.92 | 0.65 | 0.90 | 0.7 | 0.6 | 0.6 | **1.92** | **0.60** | **0.90** | |
| Copper ICPMS | ug/L | 1.89 | 1.05 | 2.12 | 2.1 | 1.0 | 1.6 | **2.12** | **1.00** | **1.63** | |
| Dissolved Lead ICPMS | ug/L | 0.13 | 0.03 | 0.07 | 0.07 | 0.04 | 0.03 | **0.13** | **0.03** | **0.06** | |
| Lead ICPMS | ug/L | 0.27 | 0.25 | 0.73 | 1.0 | 0.25 | 0.35 | **1.0** | **0.25** | **0.48** | |
| Dissolved Zinc ICPMS | ug/L | 10 | 3 | 6.3 | 4 | 4 | 4 | **10** | **3.0** | **5.2** | |
| Zinc ICPMS | ug/L | 11 | 3 | 6.0 | 6 | 2 | 6 | **11** | **2** | **5.7** | |
| E. coli - Colilert | MPN/100mL | 291 | 110 | 517 | 162 | 82 | 101 | **517** | **82** | **211** | (3)(4) |
| Ammonia Nitrogen Low Seal | mg/L | <0.15 | <0.15 | <0.05 | <0.05 | <0.05 | <0.05 | **ND** | **ND** | **N/A** | (2) |
| Nitrate-Nitrite | mg/L | 0.30 | 0.267 | 0.533 | 1.72 | 0.482 | 0.396 | **1.72** | **0.267** | **0.616** | |
| Ortho Phosphate Seal | mg/L | 0.05 | 0.06 | 0.04 | <0.04 | <0.04 | <0.04 | **0.06** | **ND** | **N/A** | (2) |
| Total Dissolved Solids | mg/L | <1 | 100 | 66 | 79 | 82 | 83 | **100** | **ND** | **N/A** | (2) |
| Total Solids | mg/L | 100 | 115 | 110 | 138 | 82 | 100 | **138** | **82** | **108** | |
| Total Suspended Solids | mg/L | 5.0 | 9.0 | 26 | 63 | 7.0 | 5 | **63** | **5.0** | **19.2** | |
| Volatile Solids | mg/L | 56 | 67 | 43 | 55 | 36 | 38 | **67** | **36** | **49** | |
| Hardness | mg/L | 46 | 48 | 42 | 28 | 32 | 40 | **48** | **28** | **39** | |
| BOD | mg/L | 0.7 | <2.0 | <2.0 | 0.8 | <1.1 | <1.2 | **N/A** | **ND** | **N/A** | (2) |
| Storm Event Rainfall | Inches | 0.00 | 0.00 | 1.61 | 1.54 | 0.00 | 0.00 | **N/A** | **N/A** | **N/A** | (2) (5) |

Notes:

(1) Dissolved Oxygen (Winker Method) samples are taken once per sampling event as Q/C for eletronic meter

(2) Per DEQ request, an "ND" designation is understood to be "less than the lower reporting limit". N/A is Not Applicable

(3) MPN = Most Probable Number

(4) Shading indicates samples that exceed the E. coli standard of 406 MPN/100mL

(5) Rainfall totals from the start of the event to sample collection.

**Instream Monitoring - Oregon City 2013-14**
**Location - 316 17th St. @ Railroad Tressel**
**Sample Site # OC011**
**Stream Name - Abernethy Creek (Downstream)**

| | | Results | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Grab Sample Dry Weather | Grab Sample Dry Weather | Composite Rain Event | Composite Rain Event | Grab Sample Dry Weather | Grab Sample Dry Weather | Statistics | | | |
| **Analysis** | **Units** | **7/18/2013** | **9/11/2013** | **11/7/2013** | **2/12/2014** | **6/4/2014** | **6/25/2014** | **High** | **Low** | **Mean** | **Notes** |
| Total Phosphate Seal | mg/L | 0.07 | 0.07 | <0.08 | 0.17 | <0.04 | <0.04 | **0.17** | **ND** | **N/A** | (2) |
| Dissolved Oxygen - Winkler | mg/L | Not Required | Not Required | Not Required | Not Required | Not Required | Not Required | **N/A** | **N/A** | **N/A** | (1) (2) |
| Dissolved Oxygen - Field | mg/L | 7.50 | 7.30 | 9.86 | 11.98 | 9.39 | 7.86 | **11.98** | **7.30** | **8.98** | |
| Dissolved Oxygen - % Saturation | % | 81.7 | 80.9 | 93.5 | 97.0 | 92.6 | 84.4 | **97.0** | **80.9** | **88.35** | |
| Conductivity Field | uS | 126.8 | 130.5 | 87.6 | 61.3 | 97.0 | 106.6 | **130.5** | **61.3** | **101.6** | |
| Temperature Field | °C | 19.7 | 20.0 | 12.7 | 6.0 | 14.8 | 18.5 | **20.0** | **6.0** | **15.3** | |
| pH Field | Std Units | 7.40 | 7.42 | 7.27 | 7.22 | 7.47 | 7.29 | **7.47** | **7.22** | **7.35** | |
| Dissolved Copper ICPMS | ug/L | 1.61 | 0.67 | 1.48 | 0.9 | 0.5 | 0.7 | **1.61** | **0.50** | **0.98** | |
| Copper ICPMS | ug/L | 2.55 | 1.18 | 3.56 | 3.1 | 1.0 | 1.2 | **3.56** | **1.00** | **2.10** | |
| Dissolved Lead ICPMS | ug/L | 0.11 | 0.05 | 0.13 | 0.11 | 0.03 | 0.05 | **0.13** | **0.03** | **0.08** | |
| Lead ICPMS | ug/L | 0.32 | 0.32 | 1.34 | 1.6 | 0.31 | 0.43 | **1.6** | **0.31** | **0.72** | |
| Dissolved Zinc ICPMS | ug/L | 9 | 6 | 8.6 | 6 | 3 | 6 | **9** | **3** | **6.4** | |
| Zinc ICPMS | ug/L | 9 | 5 | 14 | 10 | 3 | 3 | **14** | **3** | **7** | |
| E. coli - Colilert | MPN/100mL | 99 | 261 | 435 | 166 | 93 | 57 | **435** | **57** | **185** | (3) (4) |
| Ammonia Nitrogen Low Seal | mg/L | <0.15 | <0.15 | <0.05 | <0.05 | <0.05 | <0.05 | **ND** | **ND** | **N/A** | (2) |
| Nitrate-Nitrite | mg/L | 0.35 | 0.342 | 0.566 | 1.75 | 0.549 | 0.350 | **1.75** | **0.342** | **0.651** | |
| Ortho Phosphate Seal | mg/L | 0.05 | 0.06 | 0.04 | <0.04 | <0.04 | <0.04 | **0.06** | **ND** | **N/A** | (2) |
| Total Dissolved Solids | mg/L | <1 | 109 | 75 | 74 | 94 | 112 | **112** | **ND** | **77** | (2) |
| Total Solids | mg/L | 132 | 126 | 120 | 172 | 100 | 130 | **172** | **100** | **130** | |
| Total Suspended Solids | mg/L | 4.0 | 10 | 45 | 76 | 7.0 | 9 | **76** | **4.0** | **25.2** | |
| Volatile Solids | mg/L | 64 | 84 | 38 | 70 | 46 | 55 | **84** | **38** | **60** | |
| Hardness | mg/L | 49 | 48 | 45 | 29 | 37 | 43 | **49** | **29** | **42** | |
| BOD | mg/L | 0.7 | <2.0 | <2.0 | 1.3 | <1.1 | <1.2 | **N/A** | **ND** | **N/A** | (2) |
| Storm Event Rainfall | Inches | 0.00 | 0.00 | 1.61 | 1.54 | 0.00 | 0.00 | **N/A** | **N/A** | **N/A** | (2) (5) |

Notes:

(1) Dissolved Oxygen (Winker Method) samples are taken once per sampling event as Q/C for eletronic meter

(2) Per DEQ request, an "ND" designation is understood to be "less than the lower reporting limit". N/A is Not Applicable

(3) MPN = Most Probable Number

(4) Shading indicates samples that exceed the E. coli standard of 406 MPN/100mL

(5) Rainfall totals from the start of the event to sample collection.

**Instream Monitoring - Oregon City 2013-14**
**Location - Behind 415 McLoughlin Blvd.**
**Sample Site # OC012**
**Stream Name - Coffee Creek**

| Analysis | Units | Results: Grab Sample Dry Weather 7/18/2013 | Grab Sample Dry Weather 9/11/2013 | Composite Rain Event 11/7/2013 | Composite Rain Event 2/12/2014 | Grab Sample Dry Weather 6/4/2014 | Grab Sample Dry Weather 6/25/2014 | Statistics: High | Low | Mean | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Phosphate Seal | mg/L | 0.07 | 0.04 | <0.08 | <0.04 | <0.04 | <0.04 | **N/A** | **ND** | **N/A** | (2) |
| Dissolved Oxygen - Winkler | mg/L | Not Required | Not Required | Not Required | Not Required | Not Required | Not Required | **N/A** | **N/A** | **N/A** | (1) (2) |
| Dissolved Oxygen - Field | mg/L | 9.61 | 9.03 | 10.66 | 11.40 | 10.37 | 9.86 | **11.40** | **9.03** | **10.16** | |
| Dissolved Oxygen - % Saturation | % | 96.0 | 95.7 | 100.0 | 100.6 | 98.5 | 98.0 | **100.6** | **95.7** | **98.1** | |
| Conductivity Field | uS | 85.8 | 85.7 | 53.6 | 74.9 | 77.8 | 77.9 | **85.8** | **53.6** | **76.0** | |
| Temperature Field | °C | 15.4 | 17.7 | 12.2 | 9.5 | 13.0 | 14.7 | **17.7** | **9.5** | **13.8** | |
| pH Field | Std Units | 7.53 | 7.33 | 7.15 | 7.29 | 7.42 | 7.38 | **7.53** | **7.15** | **7.35** | |
| Dissolved Copper ICPMS | ug/L | 1.24 | 0.56 | 1.56 | 0.8 | 0.5 | 0.5 | **1.56** | **0.5** | **0.86** | |
| Copper ICPMS | ug/L | 1.99 | 1.02 | 3.81 | 0.9 | 0.7 | 1.1 | **3.81** | **0.7** | **1.59** | |
| Dissolved Lead ICPMS | ug/L | 0.05 | 0.03 | 0.16 | 0.14 | 0.03 | 0.03 | **0.16** | **0.03** | **0.07** | |
| Lead ICPMS | ug/L | 0.32 | 0.39 | 1.73 | 0.4 | 0.28 | 0.40 | **1.73** | **0.28** | **0.59** | |
| Dissolved Zinc ICPMS | ug/L | 8 | 7 | 18.2 | 16 | 8 | 9 | **18.2** | **7** | **11.0** | |
| Zinc ICPMS | ug/L | 11 | 8 | 29 | 10 | 8 | 8 | **29** | **8** | **12** | |
| E. coli - Colilert | MPN/100mL | >2420 | 1986 | 1120 | 326 | 236 | 135 | **>2420** | **135** | **N/A** | (2)(3)(4) |
| Ammonia Nitrogen Low Seal | mg/L | <0.15 | <0.15 | <0.05 | <0.05 | <0.05 | <0.05 | **ND** | **ND** | **ND** | (2) |
| Nitrate-Nitrite | mg/L | 1.0 | 2.10 | 1.09 | 2.91 | 2.16 | 2.39 | **2.91** | **1.0** | **1.94** | |
| Ortho Phosphate Seal | mg/L | 0.05 | 0.05 | 0.05 | <0.04 | <0.04 | <0.04 | **0.05** | **ND** | **N/A** | (2) |
| Total Dissolved Solids | mg/L | <1 | 73 | 33 | 79 | 87 | 79 | **87** | **ND** | **N/A** | (2) |
| Total Solids | mg/L | 92 | 94 | 51 | 87 | 89 | 110 | **110** | **51** | **87** | |
| Total Suspended Solids | mg/L | 3.0 | 3.0 | 21 | 6.0 | 2.3 | 2 | **21.0** | **2.0** | **6.2** | |
| Volatile Solids | mg/L | 28 | 49 | 91 | 49 | 49 | 55 | **91** | **28** | **54** | |
| Hardness | mg/L | 30 | 28 | 44 | 31 | 30 | 30 | **44** | **28** | **32** | |
| BOD | mg/L | 1.3 | <2.0 | <2.0 | 0.4 | <1.1 | 0.15 | **N/A** | **N/A** | **N/A** | (2) |
| Storm Event Rainfall | Inches | 0.00 | 0.00 | 1.61 | 1.54 | 0.00 | 0.00 | **N/A** | **N/A** | **N/A** | (2) (5) |

Notes:

(1) Dissolved Oxygen (Winker Method) samples are taken once per sampling event as Q/C for eletronic meter

(2) Per DEQ request, an "ND" designation is understood to be "less than the lower reporting limit". N/A is Not Applicable

(3) MPN = Most Probable Number

(4) Shading indicates samples that exceed the E. coli standard of 406 MPN/100mL

(5) Rainfall totals from the start of the event to sample collection.

**Instream Monitoring - Oregon City 2013-14**
**Location - Behind 13530 Redland Rd.**
**Sample Site # OC013**
**Stream Name - Park Place Creek**

| Analysis | Units | Results: Grab Sample Dry Weather 7/18/2013 | Grab Sample Dry Weather 9/11/2013 | Composite Rain Event 11/7/2013 | Composite Rain Event 2/12/2014 | Grab Sample Dry Weather 6/4/2014 | Grab Sample Dry Weather 6/25/2014 | Statistics: High | Low | Mean | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Phosphate Seal | mg/L | 0.06 | 0.09 | 0.14 | 0.05 | <0.04 | <0.04 | **0.14** | **ND** | **N/A** | (2) |
| Dissolved Oxygen - Winkler | mg/L | Not Required | Not Required | Not Required | Not Required | Not Required | Not Required | **N/A** | **N/A** | **N/A** | (1) (2) |
| Dissolved Oxygen - Field | mg/L | 3.96 | 4.16 | 6.96 | 9.30 | 4.61 | 3.72 | **9.30** | **3.72** | **5.45** | |
| Dissolved Oxygen - % Saturation | % | 40.5 | 43.2 | 65.5 | 80.9 | 44.5 | 38.0 | **80.9** | **38.0** | **52.1** | |
| Conductivity Field | uS | 329 | 264.0 | 129.6 | 186.0 | 289 | 294.0 | **329** | **129.6** | **248.6** | |
| Temperature Field | °C | 16.6 | 16.7 | 12.4 | 8.9 | 13.7 | 16.0 | **16.7** | **8.9** | **14.1** | |
| pH Field | Std Units | 7.05 | 6.95 | 6.98 | 7.27 | 7.11 | 7.02 | **7.27** | **6.95** | **7.06** | |
| Dissolved Copper ICPMS | ug/L | 0.80 | 0.53 | 2.49 | 1.9 | 0.4 | 0.5 | **2.49** | **0.4** | **1.10** | |
| Copper ICPMS | ug/L | 0.99 | 1.47 | 5.01 | 1.9 | 0.8 | 1.0 | **5.01** | **0.8** | **1.86** | |
| Dissolved Lead ICPMS | ug/L | 0.03 | <0.01 | 0.06 | 0.12 | <0.01 | <0.01 | **0.12** | **ND** | **N/A** | (2) |
| Lead ICPMS | ug/L | 0.14 | 0.70 | 1.45 | 0.5 | 0.20 | 0.46 | **1.45** | **0.14** | **0.58** | |
| Dissolved Zinc ICPMS | ug/L | 9 | 4 | 11 | 13 | 6 | 9 | **13** | **4** | **9** | |
| Zinc ICPMS | ug/L | 8 | 8 | 16 | 8 | 7 | 7 | **16** | **7** | **9** | |
| E. coli - Colilert | MPN/100mL | 81 | 1203 | 179 | 488 | 276 | 10 | **1203** | **10** | **373** | (3) (4) |
| Ammonia Nitrogen Low Seal | mg/L | 0.36 | <0.15 | <0.05 | 0.150 | 0.731 | 0.727 | **0.731** | **ND** | **N/A** | (2) |
| Nitrate-Nitrite | mg/L | 0.58 | 0.513 | 1.01 | 2.66 | 1.05 | 0.545 | **2.66** | **0.513** | **1.06** | |
| Ortho Phosphate Seal | mg/L | <0.04 | <0.04 | <0.040 | <0.04 | <0.04 | <0.04 | **ND** | **ND** | **ND** | (2) |
| Total Dissolved Solids | mg/L | 115 | 194 | 130 | 149 | 230 | 232 | **232** | **115** | **175** | |
| Total Solids | mg/L | 230 | 238 | 120 | 172 | 240 | 260 | **260** | **120** | **210** | |
| Total Suspended Solids | mg/L | 5.0 | 27 | 25 | 6.0 | 10 | 20 | **27** | **5.0** | **15.5** | |
| Volatile Solids | mg/L | 117 | 171 | 47 | 76 | 92 | 81 | **171** | **47** | **97** | |
| Hardness | mg/L | 138 | 112 | 71 | 81 | 125 | 128 | **138** | **71** | **109** | |
| BOD | mg/L | 2.3 | 2.0 | <2.0 | 1.0 | <1.1 | 1.6 | **2.3** | **ND** | **N/A** | (2) |
| Storm Event Rainfall | Inches | 0.00 | 0.00 | 1.61 | 1.54 | 0.00 | 0.00 | **N/A** | **N/A** | **N/A** | (2) (5) |

Notes:

(1) Dissolved Oxygen (Winker Method) samples are taken once per sampling event as Q/C for eletronic meter

(2) Per DEQ request, an "ND" designation is understood to be "less than the lower reporting limit". N/A is Not Applicable

(3) MPN = Most Probable Number

(4) Shading indicates samples that exceed the E. coli standard of 406 MPN/100mL

(5) Rainfall totals from the start of the event to sample collection.

**Instream Monitoring - Oregon City 2013-14**
**Location - Singer Creek Park**
**Sample Site # OC014**
**Stream Name - Singer Creek (Upstream)**

| | | Results | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Grab Sample Dry Weather | Grab Sample Dry Weather | Composite Rain Event | Composite Rain Event | Grab Sample Dry Weather | Grab Sample Dry Weather | Statistics | | | |
| **Analysis** | **Units** | **7/18/2013** | **9/11/2013** | **11/7/2013** | **2/12/2014** | **6/4/2014** | **6/25/2014** | **High** | **Low** | **Mean** | **Notes** |
| Total Phosphate Seal | mg/L | 0.05 | <0.04 | <0.08 | <0.04 | <0.04 | <0.04 | **N/A** | **ND** | **N/A** | (2) |
| Dissolved Oxygen - Winkler | mg/L | 9.2 | 8.75 | 11.2 | 11.0 | 10.25 | 9.10 | **11.2** | **8.75** | **9.92** | |
| Dissolved Oxygen - Field | mg/L | 9.89 | 9.41 | 10.50 | 11.14 | 10.49 | 9.86 | **11.14** | **9.41** | **10.22** | |
| Dissolved Oxygen - % Saturation | % | 97.7 | 96.9 | 99.2 | 99.2 | 98.1 | 97.0 | **99.2** | **96.9** | **98.0** | |
| Conductivity Field | uS | 75.9 | 76.4 | 47.0 | 65.2 | 69.7 | 71.5 | **76.4** | **47.0** | **67.6** | |
| Temperature Field | °C | 14.5 | 15.8 | 12.1 | 9.5 | 11.9 | 13.8 | **15.8** | **9.5** | **12.9** | |
| pH Field | Std Units | 7.62 | 7.29 | 7.16 | 7.21 | 7.39 | 7.41 | **7.62** | **7.16** | **7.35** | |
| Dissolved Copper ICPMS | ug/L | 0.93 | 0.34 | 1.11 | 0.6 | 0.2 | 0.3 | **1.11** | **0.2** | **0.58** | |
| Copper ICPMS | ug/L | 2.35 | 1.07 | 2.80 | 0.8 | 0.9 | 1.2 | **2.80** | **0.8** | **1.52** | |
| Dissolved Lead ICPMS | ug/L | 0.04 | 0.04 | 0.16 | 0.10 | <0.01 | 0.03 | **0.16** | **ND** | **N/A** | (2) |
| Lead ICPMS | ug/L | 0.89 | 0.67 | 1.72 | 0.4 | 0.68 | 0.80 | **1.72** | **0.40** | **0.86** | |
| Dissolved Zinc ICPMS | ug/L | 5 | 3 | 8.6 | 6 | 2 | 5 | **8.6** | **2** | **4.9** | |
| Zinc ICPMS | ug/L | 11 | 4 | 8 | 3 | 3 | 8 | **11** | **3** | **6** | |
| E. coli - Colilert | MPN/100mL | 121 | 51 | 192 | 29 | 93 | 78 | **192** | **29** | **94** | (3) |
| Ammonia Nitrogen Low Seal | mg/L | <0.15 | <0.15 | <0.05 | <0.05 | <0.05 | <0.05 | **ND** | **ND** | **ND** | (2) |
| Nitrate-Nitrite | mg/L | 2.0 | 1.91 | 1.41 | 3.10 | 2.27 | 2.24 | **3.10** | **1.41** | **2.16** | |
| Ortho Phosphate Seal | mg/L | <0.04 | <0.04 | <0.040 | <0.04 | <0.04 | <0.04 | **ND** | **ND** | **ND** | (2) |
| Total Dissolved Solids | mg/L | 3 | 79 | <1 | 72 | 78 | 82 | **82** | **ND** | **N/A** | (2) |
| Total Solids | mg/L | 107 | 113 | 79 | 67 | 100 | 120 | **120** | **67** | **98** | |
| Total Suspended Solids | mg/L | 19 | 23 | 36 | 7.0 | 7.0 | 20 | **36** | **7.0** | **18.7** | |
| Volatile Solids | mg/L | 46 | 62 | 43 | 47 | 48 | 67 | **67** | **43** | **52** | |
| Hardness | mg/L | 33 | 27 | 31 | 30 | 24 | 25 | **33** | **24** | **28** | |
| BOD | mg/L | 0.4 | <2.0 | <2.0 | 0.6 | <1.1 | 0.20 | **N/A** | **N/A** | **N/A** | (2) |
| Storm Event Rainfall | Inches | 0.00 | 0.00 | 1.61 | 1.54 | 0.00 | 0.00 | **N/A** | **N/A** | **N/A** | (2) |

Notes:

(1) Dissolved Oxygen (Winker Method) samples are taken once per sampling event as Q/C for eletronic meter

(2) Per DEQ request, an "ND" designation is understood to be "less than the lower reporting limit". N/A is Not Applicable

(3) MPN = Most Probable Number

(4) Shading indicates samples that exceed the E. coli standard of 406 MPN/100mL

(5) Rainfall totals from the start of the event to sample collection.

**Instream Monitoring - Oregon City 2013-14**
**Location - 507 7th St., Manhole # SD0726**
**Sample Site # OC015**
**Stream Name - Singer Creek (Downstream)**

| | | Results | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Grab Sample Dry Weather | Grab Sample Dry Weather | Composite Rain Event | Composite Rain Event | Grab Sample Dry Weather | Grab Sample Dry Weather | Statistics | | | |
| **Analysis** | **Units** | **7/18/2013** | **9/11/2013** | **11/7/2013** | **2/12/2014** | **6/4/2014** | **6/25/2014** | **High** | **Low** | **Mean** | **Notes** |
| Total Phosphate Seal | mg/L | 0.08 | <0.04 | 0.10 | 1.76 | <0.04 | <0.04 | **1.76** | **ND** | **N/A** | (2) |
| Dissolved Oxygen - Winkler | mg/L | Not Required | Not Required | Not Required | Not Required | Not Required | Not Required | **N/A** | **N/A** | **N/A** | (1) (2) |
| Dissolved Oxygen - Field | mg/L | 9.36 | 8.97 | 10.76 | 11.49 | 10.33 | 9.86 | **11.49** | **8.97** | **10.13** | |
| Dissolved Oxygen - % Saturation | % | 99.3 | 97.7 | 100.3 | 100.0 | 98.3 | 98.8 | **100.3** | **97.7** | **99.1** | |
| Conductivity Field | uS | 90.2 | 93.3 | 43.8 | 86.1 | 86.1 | 82.3 | **93.3** | **43.8** | **80.3** | |
| Temperature Field | °C | 18.1 | 18.9 | 11.8 | 8.8 | 13.0 | 15.0 | **18.9** | **8.8** | **14.3** | |
| pH Field | Std Units | 7.64 | 7.45 | 7.14 | 7.47 | 7.49 | 7.42 | **7.64** | **7.14** | **7.44** | |
| Dissolved Copper ICPMS | ug/L | 1.00 | 1.37 | 1.77 | 0.8 | 0.6 | 1.3 | **1.77** | **0.6** | **1.14** | |
| Copper ICPMS | ug/L | 4.19 | 3.29 | 5.54 | 1.0 | 1.2 | 2.5 | **5.54** | **1.0** | **2.95** | |
| Dissolved Lead ICPMS | ug/L | 0.14 | 0.12 | 0.44 | 0.29 | 0.10 | 0.11 | **0.44** | **0.10** | **0.20** | |
| Lead ICPMS | ug/L | 4.39 | 2.06 | 5.29 | 0.9 | 0.69 | 0.84 | **5.29** | **0.69** | **2.36** | |
| Dissolved Zinc ICPMS | ug/L | 6 | 4 | 9.7 | 13 | 3 | 7 | **13** | **3** | **7** | |
| Zinc ICPMS | ug/L | 20 | 11 | 27 | 7 | 6 | 6 | **27** | **6** | **13** | |
| E. coli - Colilert | MPN/100mL | 77 | 34 | 980 | 214 | 276 | 179 | **980** | **34** | **293** | (3) (4) |
| Ammonia Nitrogen Low Seal | mg/L | <0.15 | <0.15 | <0.05 | <0.05 | <0.05 | <0.05 | **ND** | **ND** | **ND** | (2) |
| Nitrate-Nitrite | mg/L | 0.73 | 0.788 | 1.13 | 3.07 | 1.77 | 1.40 | **3.07** | **0.73** | **1.481** | |
| Ortho Phosphate Seal | mg/L | <0.04 | <0.04 | <0.040 | <0.04 | <0.04 | <0.04 | **ND** | **ND** | **ND** | (2) |
| Total Dissolved Solids | mg/L | <1 | 69 | 5 | 88 | 74 | 112 | **112** | **ND** | **58** | |
| Total Solids | mg/L | 128 | 91 | 110 | 103 | 99 | 110 | **128** | **91** | **107** | |
| Total Suspended Solids | mg/L | 38 | 15 | 60 | 16 | 7.5 | 9 | **60** | **7.5** | **24.3** | |
| Volatile Solids | mg/L | 77 | 49 | 55 | 51 | 48 | 65 | **77** | **48** | **58** | |
| Hardness | mg/L | 38 | 29 | 44 | 49 | 27 | 29 | **49** | **27** | **36** | |
| BOD | mg/L | 0.4 | <2.0 | 2.0 | 0.3 | 1.2 | 0.25 | **2.0** | **N/A** | **N/A** | (2) |
| Storm Event Rainfall | Inches | 0.00 | 0.00 | 1.61 | 1.54 | 0.00 | 0.00 | **N/A** | **N/A** | **N/A** | (2) (5) |

Notes:

(1) Dissolved Oxygen (Winker Method) samples are taken once per sampling event as Q/C for eletronic meter

(2) Per DEQ request, an "ND" designation is understood to be "less than the lower reporting limit " and treated as 0 for calculations. N/A is Not Applicable

(3) MPN = Most Probable Number

(4) Shading indicates samples that exceed the E. coli standard of 406 MPN/100mL

(5) Rainfall totals from the start of the event to sample collection.

**Mercury Monitoring - Oregon City 2013-14**
**Location - Clackamette Cove**
**Sample Site # OC007**
**Stream Name - Clackamas River**
**Land Use - Industrial**
**Collected: 9/30/13 at 9:06 to 9:12 AM**

| | | | Results | | | | | |
|---|---|---|---|---|---|---|---|---|
| Analysis | Units | MDL | Grab Rain Event 9/30/2013 | Qualifier | Duplicate Rain Event | Qualifier | Blank Sample | Qualifier |
| Mercury Total | ng/L | 0.15 | 3.74 | | | | | |
| Mercury Dissolved | ng/L | 0.15 | 1.59 | | | | | |
| Methyl Mercury Total | ng/L | 0.020 | 0.042 | B | | | | |
| Methyl Mercury Dissolved | ng/L | 0.020 | 0.034 | B | | | | |
| Total Suspended Solids | mg/L | 0.7 | 6.5 | | | | | |

**Qualifier Notes**

**B** Detected by the instrument, the result is > the MDL but < or = the MRL. Result is reported and considered an estimate.

**H** Holding time and/or preservation requirements not met. Result is estimated.

**U** Result is < or = to the MDL or client requested reporting limit (CRRL). Result is reported as the MDL or CRRL.

Rainfall for sampling effort was 3.51” as measured from the beginning of the rain event to the collection of the last sample.

# Appendix C

# Public Education and Outreach Information

**Public Education and Awareness Activities**
**July 1, 2013 – June 30, 2014**

**Summary of Activities**

| Date | Event | Location | Contact Total | Program/Subject |
|---|---|---|---|---|
| 7/17/13 | GOCWC Newsletter | N/A | Site users | Provided link to the latest newsletter |
| 8/12/13 – 9/9/13 | Down the River Clean Up | Clackamas River | Site users | Latest news item of OC website advertising this annual event |
| 8/13/13 | Trail News – Autumn | N/A | All OC residents; available on website | Only Rain Down the Storm Drain/Keep the Storm Drain Clear; Stormwater Summit attendance by OCPW staff |
| 9/21/13 | Public Health & Safety Fair | Hilltop Mall Oregon City | Visitors to Safety Fair | TV van display discussing sanitary & storm video inspection program |
| 2/12/14 – 3/3/14 | Metro publication featuring Oregon City's Newell Creek Canyon | N/A | Site users | Added link to "Latest News" feed on OC website encouraging visitors to read article about Newell Creek Canyon |
| 3/3/14 | Trail News – Spring | N/A | All OC residents; available on website | TMDL (temperature) encourage riparian plantings; SWMP Element #5, Public Involvement & Participation |
| 3/31/14 | Utility Bill | N/A | OC utility customers | Be chemical free for a safer lawn and garden |
| 4/9/14 | WQ Public Education Webpage | N/A | Site users | Power point presentation discussing how OC complies with public education requirements |
| 4/15/14 | 9th Annual Celebrate Water Event | Clackamas Community College | 815* | 2 staff members provided water quality-related displays |
| 4/29/14 – 5/13/14 | Stormwater Banner display in Building/Planning Lobby | 221 Molalla Avenue | Visitors and staff at Building/Planning | Display of stormwater public education banner stand; ACWA "Protecting Your Watershed" brochures available |
| 5/13/14 | Trail News – Summer | N/A | All OC residents; available on website | ROW temporary storage of sediment-laden materials is prohibited; Public Education & OC's Water Quality Program |
| 6/23/14 | Annual Water Quality Report | N/A | 14,743**; available on website | Water Quality information |
| 2013-14 | KOIN Public Service Announcements | N/A | Metro area | Television & web information about water quality |
| 2013-14 | Regional Coalition for Clean Rivers and Streams | N/A | Metro area | Television & web information about water quality |
| 2013-14 | Clackamas River Water Providers | N/A | Residents with the Clackamas River as drinking water source | Various programs to promote source water protection, water conservation, and water quality awareness |

* 665 students (4th & 5th graders) + 20 teachers + 130 parent chaperones

** All Oregon City residents were mailed a postcard announcing the on-line availability of the annual water quality report. Those with limited internet access were encouraged to request a printed copy of the report.

## Specific Activity Information

### Trail News Articles

Autumn 2013:

Only Rain Down the Storm Drain – Keep the Storm Drain Clear!

- Sweeping leaves each fall is a big job
- Dispose of leaves properly, not in street
- Clear blocked catch basins if safe to do so
- Call Oregon City Public Works (OCPW) if flooding occurs

Stormwater Summit

- Three Oregon City Public Works staff members attended the annual ACWA Summit
- Overview of topics presented
- Topics were issues pertinent to Oregon City and MS4 permit requirements
- Provided link to ACWA website

Spring 2014:

Water Quality – Temperature

- OCPW looking for opportunities to partner with others to lower water temperatures in local streams
- Problems caused by loss of riparian vegetation
- Planting native riparian vegetation and trees is a relatively simple and cost-effective solution
- Link provided to OC TMDL Implementation Plan

Public Involvement & Participation

- Oregon City's Stormwater Management Plan Element #5
- Explanation of this new requirement
- Public review periods for annual reports, etc
- Comments received will be considered for incorporation into our adaptive management approach
- Link to OC NPDES Documents page

Summer 2014:

Temporary Obstructions in the Public Right-of-Way (ROW)

- Reminder that a ROW permit may be needed for temporary storage of materials
- Emphasis that temporary storage of sediment-laden materials is prohibited

Public Education & Oregon City's Water Quality Program

- Oregon City Public Works is committed to providing information about water quality
- Discussion about the variety of methods used to deliver this information
- Emphasis on collaboration with others to stretch limited resources
- Link to power point presentation on this topic on OC website

### Special Events

The 11th Annual Down the (Clackamas) River Clean Up – 9/8/13

This event was promoted on the Oregon City website (8/12/13 – 9/9/13). Oregon City staff participated as a clean-up crew (6 seats on a raft).

Public Health & Safety Fair – 9/21/13

One Oregon City Public Works staff member participated at this event held at the Hilltop Mall in Oregon City. Display of the video inspection van and information provided about the City's Sanitary and Stormwater Video Inspection Program.

9th Annual Celebrate Water Event – 4/15/14

Two OCPW staff members participated in this annual educational event, held at Clackamas Community College. 665 4th and 5th grade students, along with 20 teachers and 130 adult chaperones, had the opportunity to learn about water conservation and water quality protection, among other water-related topics. Oregon City's booth featured an interactive display based on the following messages presented on magnets:

"Dirt in the Drain, Turtles Complain" "Clean Water – I Can Help" "Leaves Don't Belong in the Storm Drain"


**Figure 1: Celebrate Water Event, Interactive Magnet Display**

Also featured was a stormwater banner highlighting the city's major drainage basins with ways to protect and improve water quality and a drinking water/wastewater/stormwater interactive model.

**Miscellaneous Items**

Greater Oregon City Watershed Council Newsletter – 7/17/13

A webpage was created on the City's website (http://www.orcity.org/publicworks/greater-oregon-city-watershed-council) to promote this organization, including their latest newsletter and link to their website.

Metro's "Our Big Backyard" Magazine – 2/12/14 – 3/3/14

Metro's quarterly publication featured Oregon City's Newell Creek Canyon. Oregon City's website promoted the magazine as a "Latest News" item during the listed dates. The article, entitled "A Canyon Rising", discussed the history of this natural area and efforts for restoration.

Message on Utility Bill (mailed 3/31/14)

Want a safer lawn and garden for your children and pets? Be chemical-free! Oregon City's rivers and streams will benefit too. Go to www.cleanriversandstreams.org or www.oregonmetro.gov for great suggestions.

Public Education Requirements Power Point Presentation – 4/9/14

A power point presentation, titled "City of Oregon City's Water Quality Program Public Education Requirements" was created and placed on the Public Works Website. This short presentation discusses public education requirements for both drinking water and stormwater and how the city complies with these requirements. View it here: http://www.orcity.org/sites/default/files/water_quality_program_ppt_3.25.14.pdf

Stormwater Banner Display in Building/Planning Lobby – 4/29/14 – 5/13/14

Visitors to the building/planning office, as well as city staff, could view our stormwater banner display featuring Oregon City's largest basins and streams. Included are the following suggestions to prevent stormwater runoff pollution and improve water quality:

- Never dump anything down storm drains or into streams
- Sweep driveways and patios clean instead of hosing them down
- Repair your vehicles if they are leaking oil, antifreeze, or other fluids
- Take your car to a car wash, or wash it on the lawn instead of the driveway
- Minimize your use of fertilizers and pesticides; consider going organic
- Plant native trees and shrubs; if you have a stream flowing through your property streamside plantings will help reduce the temperature of the water
- Pick up after your pet

The banner includes contact information for the Greater Oregon City Watershed Council and how to obtain more information about Oregon City's SWMP. The ACWA brochure "Protecting Your Watershed" was also available.

Annual Water Quality Report – 6/23/14

The 2014 report included the following topics specific to stormwater:

- Stormwater Management – impervious surfaces and the need to prevent pollution and explanation of Oregon City's obligations and commitment to compliance with our NPDES permit.
- Pollution Prevention – suggestions to reduce our impact in the following areas:
    - Lawn and garden care
    - Vehicle care
    - Roof treatments
    - Pressure washing
    - Pet waste

- Photos with the following captions, followed by additional information:
    - Catch basin cleaning, It's a dirty job, but someone has to do it!
    - Video Inspection Van, Underground Diagnostics
    - Riparian Health, Does a stream flow through your property?
    - Coffee Creek Falls, Macroinvertebrate Assessment
    - Dog Pots, Pick up after your pets!

During the fourth week of June a total of 14,743 postcards were mailed to Oregon City residents announcing the on-line availability of the annual water quality report. Those with limited internet access were encouraged to request a printed copy of the report.

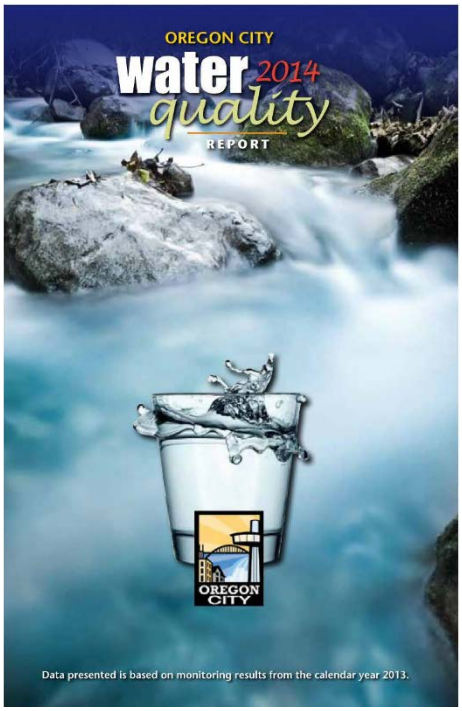



**Figure 2: Cover of Annual Water Quality Report**

Clackamas River Water Providers – ongoing throughout the year

Oregon City, through its association with South Fork Water Board, partners with other agencies that use the Clackamas River for potable water, to promote source water protection and water conservation. Programs include water quality monitoring and a pesticide outreach program. For specific information, and to read their annual report, visit the CRWP website at www.clackamasproviders.org.

The Oregon City Website – ongoing throughout the year

A wide variety of information pertaining to stormwater, water quality, and Oregon City's NPDES MS4 permit is available to the public at www.orcity.org.

**Collaboration with Other Agencies**

"Do the Right Thing" Campaign on KOIN Channel 6 Television and Website

Oregon City continues to partner with other agencies in the Portland metro area by sponsoring public education messaging via KOIN media outlets. A variety of topics were highlighted including:

- Plant a Tree
- Report Spills
- Natural Gardens
- Pets
- Rain Gardens
- Autos
- Hazardous Waste
- Plant Natives
- Streams
- Stormwater

Regional Coalition of Clean Rivers and Streams

Oregon City is one of the Clean River Partners of Clackamas County. As such, the city continues to support the effort, along with other agencies in the Portland/Vancouver metro area, to educate the public about the impact of stormwater runoff pollution on the health of our rivers and streams. For specific information, visit the Coalition website at http://cleanriversandstreams.org/

# Appendix D

# Willamette River
# TMDL Implementation Plan
# Annual Report

City of Oregon City

Willamette River TMDL Implementation Plan

Annual Progress Report

Year 5

November 1, 2014

## Introduction

The City of Oregon City (City) submitted its Willamette River Total Maximum Daily Load Implementation Plan (TMDL Plan) to the Oregon Department of Environmental Quality (DEQ) on March 31, 2008. Comments from DEQ were received and addressed by the City, and DEQ approved of the City's TMDL Plan in May 2009. The July 1, 2013 – June 30, 2014 reporting year is the fifth year of implementation of the TMDL Plan. This progress report provides a summary of the City's efforts during implementation year five.

## Background

The City's TMDL Plan identifies and describes management strategies that the City will implement to address nonpoint sources of pollution generated in the Clackamas and Middle Willamette River subbasins in the Willamette River watershed. The TMDL parameters of concern for these subbasins include temperature, bacteria, and mercury.

Management strategies for bacteria and mercury are summarized in the TMDL Plan, and compliance with the TMDL for these parameters is covered by the City's municipal separate storm sewer system (MS4) National Pollutant Discharge Elimination System (NPDES) stormwater permit. DEQ addresses TMDL requirements within the City's MS4 NPDES permit as they pertain to pollutants associated with point sources of stormwater runoff. The MS4 NPDES permit requires best management practices (BMPs) to be applied to address sources of pollution in stormwater runoff. For TMDL pollutant parameters, the MS4 NPDES permit requires Oregon City to develop pollutant load reduction benchmarks to show progress towards meeting TMDL wasteload allocations. Additionally, the MS4 NPDES permit requires an adaptive management approach that focuses on refining BMPs over time until wasteload allocations are achieved. The City was reissued their MS4 NPDES permit on March 16, 2012. The City's effective (2012) Stormwater Management Plan (SWMP) outlines BMPs to comply with the reissued permit.

Stormwater runoff in the Willamette Valley is not considered a problem with respect to temperature, and therefore, temperature is not addressed under City's MS4 NPDES permit. Management strategies for temperature were developed and identified in the TMDL Plan. Historically, riparian vegetation removal and channel modifications result in reduced baseflow, reduced stream shade, and increased instream temperatures. As part of the TMDL Plan, a Geographic Information System-based evaluation of the City's stream corridors was conducted to evaluate existing shade conditions and identify opportunities for riparian vegetation enhancement. Strategies to address temperature were identified, and a timeline and schedule for implementation were provided in the TMDL Plan.

## Implementation Status

The City's MS4 NPDES permit serves as the Willamette River TMDL Plan for bacteria and mercury. Progress towards implementing best management strategies (or BMPs) to address bacteria and mercury are summarized in the City's 2013−2014 MS4 NPDES Annual Report, submitted to DEQ on November 1, 2014.

The City's progress towards implementing strategies to address temperature is summarized in Table 1 of this progress report. Such strategies include public education and outreach activities, implementation of development standards to promote infiltration, and shade preservation and planting activities. As described in the TMDL Plan, the City has committed to contributing $8,000 per year for the first five years of TMDL implementation towards efforts to enhance riparian vegetation. Table 1 lists how this commitment has been met.

On April 10, 2013, DEQ invited designated management agencies (DMAs) with TMDL obligations to a TMDL implementation workshop. The intent of the workshop was to: 1) provide background information and summarize TMDL implementation strategies conducted by select agencies, and 2) discuss the need for DEQ to conduct a 5-year look back on TMDL implementation during 2013. At the time, the City of Oregon City, along with other Clackamas County Phase I co-permittees, had only completed three years of TMDL implementation. A follow up meeting with DEQ was held on May 22, 2013 to discuss TMDL implementation schedules specific for the Clackamas County Phase I co-permittees. At the request of DEQ, the City of Oregon City submitted an abbreviated 3-year TMDL Review Report to DEQ in July 2013. The submitted TMDL Review Report summarized accomplishments to date and outlined limitations and difficulties with ongoing implementation of the City's TMDL Plan.

At the request of DEQ, the City of Oregon City submitted an updated TMDL Implementation Plan on May 30, 2014. As suggested, the City reviewed DEQ's Willamette TMDL DMA 5-Year Summary Report prior to revising the City's implementation plan that will cover the next five years.

**Table 1. TMDL Implementation Plan Progress Report 2013–2014**
**Summary of Strategies to Address Temperature (as described in the TMDL Plan)**

| Best Management Practice or Activity | Commitment/ Implementation Strategy | Measurable Goal | Implementation Tracking/ Performance Measure | 2013–2014 Activities | Responsible Division |
|---|---|---|---|---|---|
| Public Education | Attend regularly scheduled coordination meetings with the Greater Oregon City Watershed Council (GOCWC). | Attend a minimum of one meeting annually during implementation period. | Track meetings attended. | Oregon City Public Works Operations Manager attended the June 24, 2014 meeting during the 2013-2014 reporting period.<br>The mayor of Oregon City is currently the vice-chair of the GOCWC and regularly attends meetings.<br>There are ongoing communications between Oregon City Public Works, GOCWC, and Oregon City Parks Department for a storm retrofit project for Scatter Canyon (a tributary to Newell Creek). | Public Works |
| | Include articles regarding temperature-related issues and shade planting projected in the City newsletter and through direct mailings. | Ensure a minimum of one temperature-related piece of educational material during the implementation period. | Record temperature-related educational materials. | The following temperature-related educational materials were disseminated by Oregon City Public Works:<br>1. 11th Annual Down the (Clackamas) River Clean Up – website promotion encouraging participation<br>2. Spring 2014 Oregon City Trail News - article about lowering stormwater temperature and riparian planting<br>3. 2013 Annual Water Quality Report – wetlands photo with caption "Riparian Health"; importance of shade<br>See Appendix C of the City's 2013–2014 MS4 NPDES Annual Report for specific details. | Public Works |
| Implement Stormwater Design Standards | Implement provisions of Chapter 13 and 17 of the City's development code, which includes provisions for use of infiltration- based stormwater treatment systems and tree planting. | Update design standards to include low impact development (LID) and additional infiltration-based guidelines for stormwater treatment during the implementation period. | Track modifications to the City's development standards related to use of LID and BMPs for new and redevelopment. | In September 2013 Oregon City, working with a consultant, began the process of updating its Stormwater and Grading Design Standards to meet the updated MS4 NPDES permit language. The use of LID and BMPs for new and redevelopment will be included. Finalization is expected in conjunction with compliance deadlines established in the permit. | Public Works |
| Preservation of Existing Shade | Continue to enforce regulations pertaining to the protection of riparian vegetation and buffer areas. | • Continue to implement Chapter 17.49 of the City's development code to address Title 13.<br>• Adopt Title 13 provisions by either amending Chapter 17.49 of the development code or drafting a new ordinance during the implementation period. | Track any enforcement actions taken to protect existing shade.<br>Track modifications to the City's development code to address Title 13. | Code Enforcement Action: There were 39 code enforcement actions for street tree removal during this reporting period.<br>Planning Division: 5 development applications within the NROD were processed that included additional tree plantings and/or improvement of the existing condition of the water resource vegetative corridor.<br>Six NROD development applications were processed that included exemptions from Section 17.49 based on ground truthing / site specific analysis.<br>No modifications to OCMC Chapter 17.49 were conducted during the 2013-2014 reporting period. | Planning and Public Works |
| Planting Activities for Identified Shade Opportunity Areas | Conduct planting, plant maintenance, and supplemental irrigation activities for the identified shade opportunity areas. | Utilize annual committed funds towards shading and planting activities for identified opportunity areas. | • Track ground truthing activities to refine priority opportunity areas.<br>• Track planting activities for public, high priority areas.<br>• Track planting activities for other identified shade opportunity areas.<br>• Track any re-vegetation and maintenance activities required. | On May 9, 2014 Oregon City Public Works announced an internship position to conduct ground truthing activities meant to refine priority opportunity areas. This internship was slated to begin early July 2014.<br>Planting Activities for Public High Priority Areas: No planting in high priority areas during this reporting period.<br>Other Planting Activities on Public Areas (not in identified shade opportunity areas):<br>1. Various City Parks/Trails planted 35 trees<br>2. Mt View Cemetery, Scatter Canyon Area – site prep and planting of 2,000 native trees and shrubs ($4,999.70)<br>Re-vegetation and Maintenance Activities:<br>1. John Adams Park (Abernethy Creek) - continued coordination with SOLVE & GOCWC to remove invasive around Native trees and shrubs (annual event).<br>2. Stormwater Quality Facilities (city wide) – planted 10 trees, 226 plants and shrubs<br>3. Singer Creek Falls – planted 3 trees and 46 shrubs; removed invasive | Planning and Public Works |

# Appendix E

# Dry weather Screening Follow-up Investigation and Resolution

## Section 8: Tracking and Source Investigation Results

On July 30, 2013 Oregon City Public Works (OCPW) staff conducted annual dry weather field screening at eight high priority locations identified in the City's Illicit Discharge Detection and Elimination Standard Operating Procedure. Results at one location, Outfall ID #7, Berry Hill, indicated potential probability of illicit discharge. One sample was collected and analyzed for E. coli. Sample results prompted an investigation which is summarized below. Laboratory results are attached.

On August 1, 2013 OCPW Storm and Sanitary team members began investigating the storm conveyance system at the Berry Hill Shopping Center located at 19003 Beavercreek Road in Oregon City after getting back a high E. coli reading at the outfall located across Beavercreek Rd during dry weather sampling.

During the first phase of the investigation the team members found signs of food grease in a pollution control manhole (MH) and in a catch basin (CB) in the drive through for the Taco Bell restaurant. Samples were then taken from the CB and MH which would later test positive for E. coli. After that finding we decided to investigate the entire system, the following is what was found:

- Jiffy Lube – 10990 A Beavercreek Road :
  The CB on Beavercreek Road in front of the Jiffy Lube shop appeared to have anti-freeze in it, but was later found to be green colored concrete cleaner. After investigating more it was discovered that the oil/water separator at the shop had been incorrectly connected to the storm system. We immediately capped it off, had them pump it out and it is now connected to the sanitary sewer.

- Jack in the Box – 19009 B Beavercreek Road:
  The CB's in the Jack in the Box restaurant parking lot had food grease in them along with a CB on Beavercreek Road. The manager was contacted, instructed to have the CB's cleaned out and to talk to their workers about BMP's.

- Izzy's Pizza – 19011 Beavercreek Road :
  The CB in the Izzy's Pizza parking lot had food grease in it. The manager was contacted, instructed to have the CB cleaned out and to talk to their workers about BMP's.

- Sherry's Restaurant – 19001 Beavercreek Road:
  The CB's in the Sherry's restaurant parking lot had food grease in them. The manager was contacted, instructed to have the CB's cleaned out and to talk to their workers about BMP's.

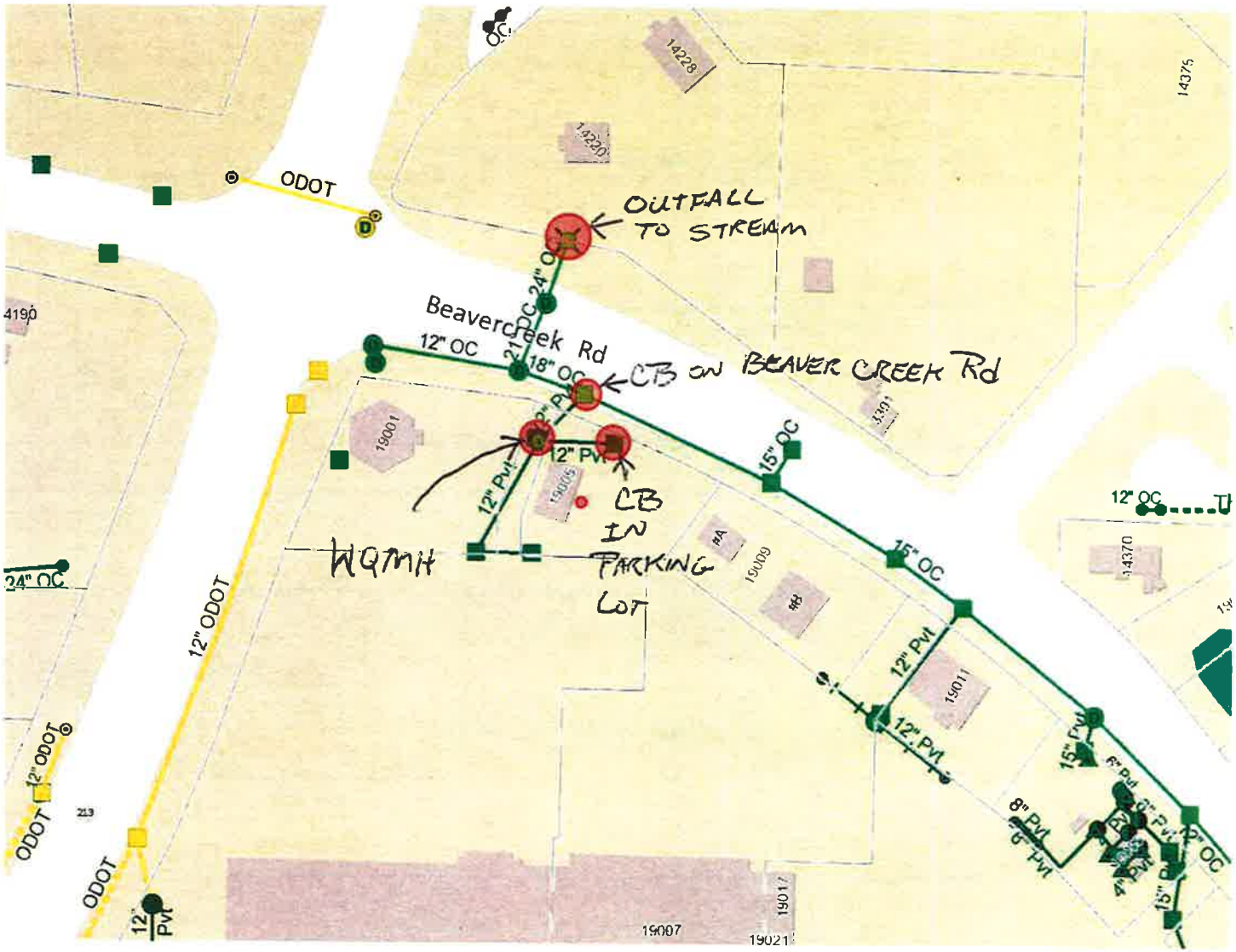
- Taco Bell – 19005 Beavercreek Road:

Three other CB's near the Taco Bell had samples taken from them and also had high E. coli readings. These CB's along with the pollution control MH near Taco Bell were cleaned out by the property management company that is in charge of the K Mart store. Dye tests and video inspections were performed at the Taco Bell and the storm system that had the E. coli readings. No cross connections were found.

All parties involved cooperated and had their CB's and lines cleaned, most of the work was performed by River City Environmental.

Following that investigation the OCPW storm and sanitary team decided to check the oil/water separators in two additional lube shops. The Jiffy Lube at 13863 Beavercreek Road was properly connected. The oil/water separator at the Valvoline Lube Shop, 895 Molalla Avenue, was hooked up to the storm system. This has been corrected and the downstream storm system cleaned.

# Oregon City GIS Map




**Legend**

- Taxlots
- Unimproved ROW
- Manholes
  - (Other owner)
  - OC
  - Private
  - County
  - ODOT
- Inlets
  - (Other owner)
  - OC
  - Private
  - County
  - ODOT
- Outlets
  - (Other owner)
  - OC
  - Private

**Notes**

**Overview Map**

The City of Oregon City makes no representations, express or implied, as to the accuracy, completeness and timeliness of the information displayed. This map is not suitable for legal, engineering, surveying or navigation purposes. Notification of any errors is appreciated.

Map created 8/5/2013

0 176 352 Feet

1: 2,114

City of Oregon City
PO Box 3040
625 Center St
Oregon City
OR 97045
(503) 657-0891
www.orcity.org

Clackamas County - Water Environment Services
Water Quality Laboratory
15941 S. Agnes Avenue, Bldg. B / Oregon City, OR 97045
Phone: 503.557.2839 Fax: 503.557.2840

# LABORATORY ANALYSIS REPORT



**Company Name & Address:**
CITY OF OREGON CITY
ATTN: ERIC HAND
P.O. BOX 3040
OREGON CITY, OR 97045

**Sample ID: AA88229**
**Sample Point: OC_BERRY_HILL_OUTFALL**
**Sample Location: Berry Hill Outfall**

**Sample Date & Time: 07/30/13 13:00**
**Sample Collector: JES**
**Sample Type:**

| Analysis | Result | Units | Reporting Limit | Reference Method | Analysis Date |
|---|---|---|---|---|---|
| E. coli - Colilert | >2420 | MPN/100mL | 1 | SM 9223 | 07/30/2013 |

**Comments:**

Mona LaPierre 8.8.13

Reviewed by Mona LaPierre - Environmental Monitoring Manager (Phone # 503.557.2830) Date of Review

Report print date: 8/8/2013

*This laboratory follows all Standard Operating Procedures. The methods referenced in this report are the methods upon which the SOP is based. The results stated in this report relate only to the specific samples outlined therein. This report shall not be reproduced except in full, without written authorization from the Supervisor.*
**MRL is defined as the minimum levels, concentrations, or quantities of a target analyte that can be reported with a specified degree of confidence.*

Clackamas County - Water Environment Services
Water Quality Laboratory
15941 S. Agnes Avenue, Bldg. B / Oregon City, OR 97045
Phone: 503.557.2839 Fax: 503.557.2840

# LABORATORY ANALYSIS REPORT



**Company Name & Address:**
CITY OF OREGON CITY
ATTN: ERIC HAND
P.O. BOX 3040
OREGON CITY, OR 97045

**Sample ID: AA88324**
**Sample Point: OC_CATCHBASIN_BEAVERCREE**
**Sample Location: Catch Basin at Beaver Creek Road**

**Sample Date & Time: 08/01/13 14:28**
**Sample Collector: JES**
**Sample Type:**

| Analysis | Result | Units | Reporting Limit | Reference Method | Analysis Date |
|---|---|---|---|---|---|
| E. coli - Colilert | >2420 | MPN/100mL | 1 | SM 9223 | 08/01/2013 |

**Comments:**

---

**Company Name & Address:**
CITY OF OREGON CITY
ATTN: ERIC HAND
P.O. BOX 3040
OREGON CITY, OR 97045

**Sample ID: AA88325**
**Sample Point: OC_CATCHBASIN_TACOBELL**
**Sample Location: CatchBasin in Taco Bell Parking Lot**

**Sample Date & Time: 08/01/13 14:20**
**Sample Collector: JES**
**Sample Type:**

| Analysis | Result | Units | Reporting Limit | Reference Method | Analysis Date |
|---|---|---|---|---|---|
| E. coli - Colilert | 1378 | MPN/100mL | 1 | SM 9223 | 08/01/2013 |

**Comments:**

---

Report print date: 8/8/2013

*This laboratory follows all Standard Operating Procedures. The methods referenced in this report are the methods upon which the SOP is based. The results stated in this report relate only to the specific samples outlined therein. This report shall not be reproduced except in full, without written authorization from the Supervisor.*
**MRL is defined as the minimum levels, concentrations, or quantities of a target analyte that can be reported with a specified degree of confidence.*

**Sample ID: AA88326**
**Sample Point: OC_MANHOLE_TACOBELL**
**Sample Location: Manhole Next to Taco Bell**

**Sample Date & Time: 08/01/13 14:24**
**Sample Collector: JES**
**Sample Type:**

| Analysis | Result | Units | Reporting Limit | Reference Method | Analysis Date |
|---|---|---|---|---|---|
| E. coli - Colilert | >2420 | MPN/100mL | 1 | SM 9223 | 08/01/2013 |

**Comments:**

Mona LaPierre 8.8.13

Reviewed by Mona LaPierre - Environmental Monitoring Manager (Phone # 503.557.2830) Date of Review

Report print date: 8/8/2013

Alexin Analytical LABORATORIES, INC.
Professional Laboratory Services
13035 SW Pacific Hwy
Tigard, OR 97223
Tel.: (503) 639-9311 Fax: (503) 684-1588

# ANALYSIS REPORT

ORELAP Accredited Lab#: OR-100013

Reported: 08/05/2013
Received: 08/02/2013
Sampled By: RB
Work Order: 3214016

CLIENT
**Oregon City**
Attn: Gail Johnson
122 S Center St.
Oregon City OR, 97045
Phone: 503-657-8241

**Project:** -
Project # : N/A
PWSID # : -
PO # : -

Sampling Location: -
Sample Matrix: Storm Water

| Lab Number | Sample Name | Sampled | Sample Type |
|---|---|---|---|
| 3214016-01 | Site #1 Newell Cr H.S. | 8/2/13 13:22 | Grab |

| Microbiological Analysis | Method | Units | Result | MRL | Date/ Time Analysis Begun |
|---|---|---|---|---|---|
| †*E. coli* | SM 9223B (colilert-18) 21st Ed. | MPN/100 mL | 46 | 1 | 08/02/13 14:56 |

Analyzed: 08/03/13 10:45 Analyzed by: VG

| Lab Number | Sample Name | Sampled | Sample Type |
|---|---|---|---|
| 3214016-02 | Site #2 Newell Cr. Outfall | 8/2/13 13:28 | Grab |

| Microbiological Analysis | Method | Units | Result | MRL | Date/ Time Analysis Begun |
|---|---|---|---|---|---|
| †*E. coli* | SM 9223B (colilert-18) 21st Ed. | MPN/100 mL | 50 | 1 | 08/02/13 14:56 |

Analyzed: 08/03/13 10:45 Analyzed by: VG

| Lab Number | Sample Name | Sampled | Sample Type |
|---|---|---|---|
| 3214016-03 | Site #3 Newell Cr. Downstream | 8/2/13 13:43 | Grab |

| Microbiological Analysis | Method | Units | Result | MRL | Date/ Time Analysis Begun |
|---|---|---|---|---|---|
| †*E. coli* | SM 9223B (colilert-18) 21st Ed. | MPN/100 mL | 46 | 1 | 08/02/13 14:56 |

Analyzed: 08/03/13 10:45 Analyzed by: VG

**ND** = None detected **MRL** = Minimum Reporting Limit **MCL** = Maximum Contamination Limit
†All procedures for this analysis conform to NELAC standards.

Approved by: Ruth Carpenter
Ruth Carpenter
Microbiology Technical Director