# City of Oregon City, Oregon

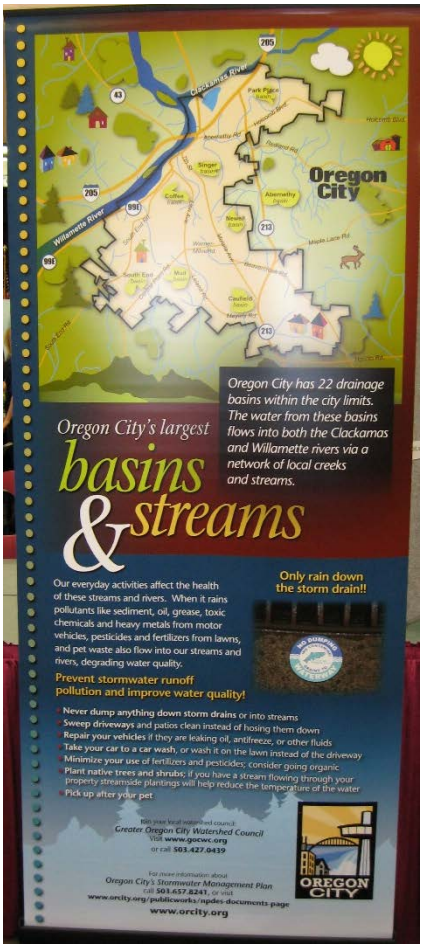
# National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System Discharge Permit and Willamette River TMDL

## 2015–2016 Annual Report

*Prepared for the*

Oregon Department of Environmental Quality

November 1, 2016




*Assisted By:*

Brown AND Caldwell

**CITY OF OREGON CITY**

**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM**
**MUNICIPAL STORMWATER SYSTEM ANNUAL REPORT**

**JULY 1, 2015 – JUNE 30, 2016**

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

Martin Montalvo 10/26/2016

Martin Montalvo Date
Public Works Operations Manager
City of Oregon City

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# 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 under 30,000 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, 2015 to June 30, 2016 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 SWMP 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 |

| | Annual reporting requirement | Location in document |
|---|---|---|
| h) | A summary describing the number and nature of enforcement actions, inspections, and public education programs.[a] | Section 6.0 and Appendix A |
| 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 2015–2016 Reporting Year

The 2015-2016 reporting year is the fourth full permit year in which the City's effective SWMP (dated 2012) has been implemented. For the 2015-2016 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.

Dry weather field screening was conducted on August 20, 2015 per BMP 1-2. Staff expressed safety concerns at two locations (priority sites 1 and 2). Additionally, an illicit discharge was reported at an outfall not currently being monitored annually. The City's IDDE Standard Operating Procedure has been updated to address the safety concerns and to incorporate the requested addition. These changes will be reflected in the 2016 – 2017 annual report.

## 3.0 Summary of Program Expenditures

A summary of the City of Oregon City's revenue and expenditures for the 2015–2016 fiscal year and a projection of the City's revenue and expenditures for the 2016–2017 fiscal year are provided in Table 2. Projection of expenditures is considered draft at this time.

# 521 Storm Drain (Stormwater) Division

**City of Oregon City**

| | Fiscal Year | | | |
|---|---|---|---|---|
| | **2014/15** Audited Actual | **2015/16** Unaudited Actual | **2016/17** Current Budget | **2017/18** Projected Budget |
| **Beginning Fund Balance** | $ 836,813 | $ 1,018,371 | $ 800,847 | $ 868,426 |
| Stormwater Fee Rates (per EDU per month) | Rate = $8.80 / $9.05<br>3% rate increase | Rate = $9.05 / $9.35<br>3% rate increase | Rate = $9.35 / $9.65<br>3% rate increase | Rate = $9.65 / $9.95<br>3% rate increase |
| **Revenues** | | | | |
| Charges for Service | $ 2,423,297 | $ 2,525,616 | $ 2,506,731 | $ 2,581,933 |
| Interest Income | $ 3,994 | $ 1,524 | $ 1,273 | $ 1,500 |
| Miscellaneous Income | $ 15,116 | $ 13,097 | $ 1,061 | $ 2,000 |
| Erosion Control Permits | $ 35,596 | $ 52,566 | $ 51,500 | $ 50,000 |
| Project Management | $ 21,753 | $ 30,636 | $ 26,409 | $ 20,000 |
| **TOTAL Revenues** | $ 2,499,756 | $ 2,623,439 | $ 2,586,974 | $ 2,655,433 |
| **Expenditures** | | | | |
| Personnel Services | $ 1,046,529 | $ 1,064,132 | $ 1,211,458 | $ 1,247,802 |
| Materials & Services | $ 564,187 | $ 542,770 | $ 648,685 | $ 650,000 |
| Capital Outlay Totals | $ 207,969 | $ 406,425 | $ 321,000 | $ 215,000 |
| Total Transfers | $ 499,512 | $ 580,876 | $ 585,011 | $ 584,000 |
| **TOTAL Expenditures** | $ 2,318,198 | $ 2,594,204 | $ 2,766,154 | $ 2,696,802 |
| **Change in Fund Balance** | $ 181,558 | $ 29,235 | $ (179,180) | $ (41,369) |
| **Ending Fund Balance** | $ 1,018,371 | $ 1,047,606 | $ 621,667 | $ 827,057 |
| **Capital Outlay - Details** | | | | |
| Operations New Equip. >$5000 | $ 12,500 | $ - | $ 15,000 | $ 15,000 |
| Capital Construction | $ 195,469 | $ 406,425 | $ 306,000 | $ 200,000 |
| Land | $ - | $ - | $ - | $ - |
| | $ 207,969 | $ 406,425 | $ 321,000 | $ 215,000 |
| **Transfers - Details** | | | | |
| Transfer to Building Reserve | $ 250,000 | $ 300,000 | $ 300,000 | $ 300,000 |
| Outside ADM Services | $ 108,012 | $ 118,831 | $ 121,346 | $ 120,000 |
| Interdept. Transfers | $ 56,500 | $ 57,045 | $ 58,665 | $ 59,000 |
| Fleet Reserve Transfer | $ 85,000 | $ 105,000 | $ 105,000 | $ 105,000 |
| | $ 499,512 | $ 580,876 | $ 585,011 | $ 584,000 |

# 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 (2015–2016), 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 2015–2016 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 for this reporting year are provided in Appendix B.

## 4.2 CCCSMP Updates and Modifications for the 2015–2016 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 2015-2016 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.

During the 2015–2016 monitoring year, the City of Oregon City collected all required in-stream (four monitoring events at six sites) and outfall (three events at two sites) samples. However, the City was unable to collect one "make-up" outfall sampling event (carried over from the 2014-2015 reporting period) due to scheduling conflicts and unavailable staff. The City is committed to collecting the additional outfall samples during the 2016 – 2017 monitoring year in order to make up for the reduced number of samples collected.

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: 2015–2016 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 at railroad trestle) | Grab & Composite | 4/year | Dry Weather (2/year) and Storm Event (2/year) |
| OC012is | Coffee Creek behind 415 S McLoughlin (outfall at Willamette) | Grab & Composite | 4/year | Dry Weather (2/year) and Storm Event (2/year) |
| OC013is | Park Place Creek behind 13530 Redland Rd | Grab & Composite | 4/year | Dry Weather (2/year) and 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 502 7th St (MH - 37138 located on Center St) [a] | Grab & Composite | 4/year | Dry Weather (2/year) and Storm Event (2/year) |
| Outfall Monitoring | | | | |
| OC006ofm | Clackamas River at O.C. Shopping Center | Composite | 3/year | Storm Event |
| OC007ofm | Clackamas River at Clackamette Cove | Composite | 3/year | Storm Event |

[a] Address corrected and MH designation updated to reflect current asset management program.

# 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 change was approved between July 1, 2015 and June 30, 2016:

- Providence Willamette Hospital rezoned from R-6 Single Family Dwelling District to Mixed Use Employment District (ZC 15-04).

No annexations were approved during the reporting period.

## 5.2 Summary of Development Activities within the UGB

During the reporting year 2015 – 2016, there were 18 development applications reviewed and approved for compliance with water quality/water quantity standards. These included site plan and design review (6), subdivisions (8), minor partition (1), detailed development plans (2), and concept plan (1). Estimated total new and replaced impervious surface area related to development projects that commenced during the reporting year equals 20.1 acres.

There were nine public improvement projects (CIPs), including water quality and/or flow control projects, for this reporting period. Two were contracted out and seven 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.

Schedule A.4.e – Public Involvement and Participation

The final draft of Oregon City's 2015 – 2016 Annual Report was posted on the city website for public review from October 5, 2016 through October 19, 2016. No comments were received.

Schedule A.4.d – Education and Outreach

Oregon City Public Works purchased a "dogipot" for the Parks Department in February 2016 (total cost $535.90). Installation at Jon Storm Park, adjacent to the Willamette River, provides bags for pet waste disposal and is meant to minimize bacterial pollution.

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

There were 13 stormwater staff meetings conducted during the 2015–2016 reporting period. Dates, topics, and attendees are summarized below in Table 4.

Schedule B.5.K

Oregon City submitted the following documents on October 29, 2015:

- The 303(d) evaluation as described in Schedule D.2
- The Wasteload Allocation Attainment Assessment as described in Schedule D.3.b
- The TMDL Pollutant Load Reduction Evaluation as described in Schedule D.3.c.

# BMP 4-5 – Staff Meetings with BMP Responsible Parties

| Date/Time | Attendees | BMP's /Topics | Items Discussed | Next Steps/Program Adjustments |
|---|---|---|---|---|
| 8/13/15<br>1:00-3:00 | Oregon City Engineering Staff | Updated Design Standards | Updated items; new requirements | Implement new standards. |
| 8/27/15<br>1:00-2:00 | Chris Dunlop, Gail Johnson, (B&C) Angela Wieland and Alissa Maxwell | GIS mapping for upcoming permit deadlines | Methodology for pollutant load calculations | B&C to send spreadsheet; Chris to finalize mapping. |
| 10/2/15<br>8:00-8:15 | Gail Johnson, James Peck | TMDL Implementation Plan | TMDL Implementation Plan requirements; clarified what was planted for 2014-1015 Annual Report | James to familiarize himself with plan. We will coordinate future plantings to facilitate reporting. |
| 10/14/15<br>2:00-2:40 | Martin Montalvo, Gail Johnson, Alissa Maxwell | Wasteload Allocation Attainment Assessment | (Conference Call)<br>WLAAA modeling scenarios | Alissa has necessary information to move forward with assessment. |
| 12/1/15<br>9:00-noon | Martin Montalvo, Gail Johnson, Aleta Froman-Goodrich, Katie Englund, Chris Dunlop, Jonathan Archibald, Eric Hand, Tom Morisette, John Lewis, (B&C) Krista Reininga and Alissa Maxwell | Stormwater Master Plan, Staff Workshop | Background and workshop goals, overview of master plan update process<br>Basin by basin review (using maps) to note the following:<br>Problem areas<br>Upcoming projects<br>Opportunity areas<br>Identify data gaps | OC to provide B&C with priority grate list.<br>B&C to consolidate information from map mark-ups. |
| 12/21/15<br>12:30-12:40 | Gail Johnson, James Peck | TMDL Implementation Plan | Priority planting locations for January 2016 | Maps of potential planting locations given to James for use in field. |
| 12/29/15<br>11:00-12:30 | Gail Johnson, Aleta Froman-Goodrich, Wendy Marshall | Private Water Quality Facility Inspection Program (PWQF) | Review current process for completion and tracking of the Maintenance Covenant and Access Agreements; how to streamline process in future | Engineering group to refine process so information about completed agreements is available to all. |
| 1/12/16<br>11:00-12:40 | Gail Johnson, Aleta Froman-Goodrich, Wendy Marshall | PWQF | Reviewed, and made minor revisions to, letters sent to responsible parties of maintenance agreements; revised maintenance covenant document and decided what other documents should be part of the package; drafted SOP for processing, tracking, and reporting. | Engineering group to draft SOP based on today's discussion; Gail to revise letters and create tracking spreadsheet. |

# BMP 4-5 – Staff Meetings with BMP Responsible Parties

| Date/Time | Attendees | BMP's /Topics | Items Discussed | Next Steps/Program Adjustments |
|---|---|---|---|---|
| 3/17/16<br>3:00-3:45 | James Peck, John Sewall | Monitoring | Access to stormwater monitoring sites; issues at three sites | Work orders created for clearing access at two sites; changing access to third site just downstream of railroad trestle. |
| 3/31/16<br>8:00-10:00 | Martin Montalvo, Gail Johnson, Aleta Froman-Goodrich, Chris Dunlop, Jonathan Archibald, Eric Hand, John Lewis, (B&C) Krista Reininga, Alissa Maxwell, and Matt Grzegorzewski | Stormwater Master Plan Project Kickoff Meeting | Project goals (understand problem and opportunity areas, develop a prioritized capital projects list, engage the public and elected officials), scope and schedule overview, field work summary (for both city staff and BC), communications strategy, public outreach strategy, draft table of contents, deliverables | Move forward with project. City to provide data/information as requested. Field work to be scheduled soon. |
| 3/31/16<br>10:00-11:00 | Martin Montalvo, Gail Johnson, Chris Dunlop, (B&C) Alissa Maxwell, Krista Reininga | Clackamas Permit Renewal and Personal Services Agreement (PSA) Budget | Permit renewal tasks and schedule. Service area expansion and total annual pollutant loads. | Need clarification on expansion areas, including mapping (city to provide). PSA to be updated for next fiscal year. |
| 4/6/16<br>10:00-10:30 | Martin Montalvo, Jonathan Archibald, (B&C) Krista Reininga, Alissa Maxwell | First of "check in" conference calls to promote Master Plan progress. These will be ongoing throughout the process. | Strategy for data collection and GIS integration. | City to evaluate status of current GIS equipment, B&C to provide spreadsheet of data needs and SOP for field data collection. |
| 5/31/16<br>3:00-4:20 | Martin Montalvo, Jonathan Archibald, Laura Terway, Chris Dunlop, Gail Johnson, Tom Morisette, (B&C) Alissa Maxwell | NPDES MS4 Permit Renewal | Determine areas that may be annexed during the next 5-year permit term. TMDL Benchmarks; what BMPs will be installed | Chris to update maps, Martin and Laura to provide clarification on some of the annexation locations. |

# Appendix A

# Oregon City SWMP Implementation Status

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.

| Appendix A. Status of Implementing Components of Oregon City's 2012 Stormwater Management Plan (SWMP) | | | | | | | |
|---|---|---|---|---|---|---|---|
| BMP or activity | Addresses bacteria? | Addresses mercury? | Responsible department | Measurable goals (2012 SWMP) | Tracking measures (2012 SWMP) | Annual report information: tracking measure status, Permit year 2015 – 2016 | Additional detail related to activities conducted |
| **Element 1. Illicit Discharge Detection and Elimination** | | | | | | | |
| BMP 1-1: Implement the Illicit Discharge Elimination Program | ● | ● | Oregon City Public Works Department (OCPW) | • Document and implement updated Standard Operating Procedures (SOPs) for the Illicit Discharge Detection and Elimination (IDDE) Program by November 1, 2012.<br>• Conduct actions to remove identified illicit discharges in conjunction with timeframes outlined in OC's MS4 NPDES Permit.<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>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>2) No illicit discharge investigations were deemed necessary as a result of annual dry weather field screening conducted during this reporting period. | 1) OC 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 | ○ | ○ | OCPW | • Conduct dry-weather field screening once per year, at a minimum, at major outfalls.<br>• Characterize dry weather flows as permissible, non-permissible, or unknown.<br>• Conduct sampling, analysis, and investigations for non-permissible and unknown dry weather discharges.<br>• Maintain maps of major outfalls and dry weather field screening locations.<br>• Notify the OCPW Operations Manager of all identified illicit discharges and take necessary steps to eliminate them.<br>• Update procedures for dry weather field screening by November 1, 2012. | 1) Track the number and location of outfalls inspected annually.<br>2) Summarize inspection results and track the number and location of outfalls requiring monitoring and/or investigations.<br>3) Report the outcome and resolution of any investigation activities.<br>4) Report the outcome and resolution of any code enforcement actions.<br>5) Track the status of updating standard procedures. | 1) Eight outfalls were inspected as part of annual dry weather field screening activities.<br>2) Outfalls were inspected on 8/20/15. Flow was observed at five of the outfalls; discharge was characterized as permissible at all five outfalls.<br>3) N/A<br>4) N/A<br>5) OC developed an IDDE SOP (effective date: November 1, 2012) that includes procedures for conducting dry weather field screening. No changes were made to the procedures during this reporting period. | 1) Dry weather screening was conducted at the following outfalls:<br>1. 99E and 5th Street: 8-inch<br>2. 99E and 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 OCPW | • Respond to reports of hazardous and non-hazardous spills and follow the OC *Spill Response Plan*.<br>• Report all hazardous and non-hazardous spills to DEQ as necessary. | 1) Indicate the number of spills reported to OCPW and DEQ.<br>2) Track responses to reported spills.<br>3) Indicate sources, causes, and types of discharges resulting from spill activities.<br>4) Track any changes to the OC *Spill Response Plan*. | 1) Five spills were reported to OCPW during the 2015-2016 reporting period.<br>2) Responses were appropriate for each spill. See list below.<br>3) One spill required DEQ reporting. Four spills were of various types. Minor (non-reported) spills resulted primarily from vehicle accidents or mechanical failure and had no discharges.<br>• Tri-Lett Industries at 13530 Redland Rd – Liquid Oxygen spill on site. Clackamas County Fire District responded along with responsible party. OCPW provided traffic control as requested.<br>• Four spills regarding fuel and oil sheen on roadway- cleaning with absorbent material, sweeping, and proper disposal. All were minor and none required DEQ reporting.<br>4) There were no changes to the OC *Spill Response Plan* during this reporting period. | |
| **Element 2. Industrial and Commercial Facilities** | | | | | | | |
| BMP 2-1: Screen Existing and New Industrial Facilities | ○ | ○ | OCPW | • Review the business license inventory for 1200Z industries once over the permit term.<br>• Notify DEQ of any existing or new industrial facilities within OC 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. 126 business license applications were reviewed during the 2015-2016 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. OC's consultant has coordinated with DEQ related to the methodology and process for identifying "potential" 1200-Z permittees. |
| BMP 2-2: Implement an Industrial/Commercial Inspection Program for High Priority Facilities | ○ | ○ | OCPW | • Pursue approval to hire staff to implement a business inspection program.<br>• Develop a priority list of industrial/commercial facilities for inspection.<br>• Investigate 25% of OC's manufacturing businesses once during the permit term.<br>• Develop an industrial/commercial inspection procedure by July 1, 2013. | 1) Track the number of inspections conducted.<br>2) Report on inspection results and follow up actions.<br>3) Report on status of documenting and updating procedures. | 1) One inspection was conducted during the 2015-2016 reporting period.<br>2) Inspection of the Red Soils Business Park (office at 410 Beavercreek Rd #509) on 3/30/16. Eleven manufacturing businesses are located here. None are allowed to conduct outdoor activities. Manager was provided with resources for spill response materials as well as private water quality facility o&m information.<br>3) Table 2 of the Industrial/Commercial Facility Inspection Program SOP was updated 11/15 to reflect current Oregon City manufacturing related business license holders. The 2013 Table 2 identified 31 facilities. Updated table identified 40 manufacturing businesses potentially subject to inspection. | • OC has not hired additional staff to implement the business inspection program.<br>• OC developed an Industrial/Commercial Facility Inspection Program 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. |
| **Element 3. Construction Site Runoff Control** | | | | | | | |

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| Appendix A. Status of Implementing Components of Oregon City's 2012 Stormwater Management Plan (SWMP) | | | | | | | |
|---|---|---|---|---|---|---|---|
| BMP or activity | Addresses bacteria? | Addresses mercury? | Responsible department | Measurable goals (2012 SWMP) | Tracking measures (2012 SWMP) | Annual report information: tracking measure status, Permit year 2015 – 2016 | Additional detail related to activities conducted |
| BMP 3-1: Implement the Erosion Control Ordinances | ● | ○ | OCPW | • Review erosion control plans for all developments greater than 1,000 square feet.<br>• Require erosion and sediment control plans not in compliance with standards to be amended and approved prior to construction.<br>• By November 1, 2014, adopt the Clackamas County *Erosion Control Manual* or revise OC's manual in accordance with the MS4 NPDES permit requirements. | 1) Record the number of erosion control plan reviews completed and approved.<br>2) Track the number of erosion control permits issued annually.<br>3) Report on the status of adopting the Clackamas manual or updating OC's manual. | 1) 167 erosion control plans were reviewed and approved.<br>2) 167 erosion control permits were issued.<br>3) OC has adopted the Clackamas County *Erosion Control Manual*, in conjunction with its update of the City's *Stormwater and Grading Design Standards* manual. | |
| BMP 3-2: Provide Educational Information to Construction Site Operators | ○ | ○ | OCPW | • Continue to provide OC's most current erosion control manual on OC website.<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 | ● | ○ | OCPW | • Conduct a minimum of three erosion control inspections at each permitted site.<br>• Conduct appropriate enforcement activities for erosion control violations. | 1) Record the number of erosion control inspections conducted annually.<br>2) Report the number of notices of non-compliance issued during inspections. | 1) A total of 538 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>2) 28 notices of non-compliance were issued. Ten stop work orders were issued. | 1) The total number of inspections are comprised of:<br>• 192 initial site visits, Inspection 1<br>• 158 random inspections, Inspection 2<br>• 188 final inspections, Inspection 3 |
| **Element 4. Education and Outreach** | | | | | | | |
| BMP 4-1: Provide Public Education and Outreach Materials Regarding Stormwater Management | ○ | ○ | OCPW | • Include a water quality related article in each City newsletter, distributed to citizens three times per year.<br>• Participate in the Regional Coalition (Coalition) for Clean Rivers and Streams.<br>• Seek out opportunities to partner with other agencies/jurisdictions/organizations to educate and promote watershed health and low impact development.<br>• Periodically install signs near water quality structures and around OC promoting water quality.<br>• Sponsor the volunteer catch basin stenciling program.<br>• Distribute an annual water quality report to OC residents. | 1) Track the number, types, and topics of public educational materials distributed to the public.<br>2) Report any large scale public educational campaigns initiated during a given year.<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 five water quality-related articles were included in Trail News.<br>• OC participated in one special event and assisted with one health advisory notice.<br>• The December 2015 utility bill included a message promoting the new Coalition for Clean Rivers and Streams website.<br>• Mailed 15,122 postcards announcing availability of the Annual Water Quality Report on OC's website.<br>• Stormwater banner displayed at the OC Building & Planning Dept (4/12/16 – 4/27/16).<br>• Promoted two stormwater-related publications/presentations on OC's website.<br>2) No large scale public educational campaigns were initiated.<br>3) Coordinated efforts included:<br>• Continued to sponsor the "Water…Do Your Part" campaign via KOIN media outlets.<br>• Continued participation in the Coalition for Clean Rivers and Streams.<br>• Continued participation with other agencies to promote water quality education through Clackamas River Water Providers. | • OC continues to conduct catch basin marking and stenciling to increase public awareness. During this reporting period 401 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 | ○ | ○ | OCPW | • 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) OC submitted a Public Education Effectiveness Evaluation Summary to DEQ on June 29, 2015. | The Association of Clean Water Agencies (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 OC. |
| BMP 4-3: Conduct Staff Training for Pest Management | ○ | ○ | OCPW and Parks | • Ensure OCPW and Parks Dept. staff conducting pest management activities are certified for spraying activities according to OSHA requirements.<br>• Ensure licensed staff attends annual refresher courses. | 1) Track the number of employees licensed for spraying activities.<br>2) Report number of employees that attended initial or refresher training. | 1) Staff licensed for spraying activities: OCPW = 6; Parks Dept. = 4<br>2) Two OCPW staff and three Parks Dept staff attended refresher training classes during the reporting period. | Annual refresher training for the Public Pesticide Applicator license is not required. OCPW and Parks Dept staff attend refresher training per requirements of their licensing. |
| BMP 4-4: Conduct Staff Training in Spill Response | ○ | ○ | OCPW | • Provide non-hazardous spill response training annually through monthly safety meetings.<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) Spill response training was scheduled for July 19, 2016. | |

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| Appendix A. Status of Implementing Components of Oregon City's 2012 Stormwater Management Plan (SWMP) | | | | | | | |
|---|---|---|---|---|---|---|---|
| BMP or activity | Addresses bacteria? | Addresses mercury? | Responsible department | Measurable goals (2012 SWMP) | Tracking measures (2012 SWMP) | Annual report information: tracking measure status, Permit year 2015 – 2016 | Additional detail related to activities conducted |
| BMP 4-5: Ensure Municipal Staff Training in Stormwater Pollution Prevention | ○ | ○ | OCPW | • Conduct municipal training for employees associated with stormwater management in OC.<br>• Coordinate with other Clackamas County co-permittees regarding regional water quality efforts.<br>• Participate in training and advisory committee opportunities available through state and local agencies and groups.<br>• Conduct regular stormwater staff meetings once or twice a year. | 1) Track the number of employees receiving training in stormwater management annually.<br>2) Track OC staff participation in groups, committees, and organizations relevant to stormwater quality management.<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 an APWA Conference, 10/19-22/15<br>• One OCPW employee attended Stormwater Management for OR's Jurisdictions 11/18/15<br>• Two OCPW employees attended Erosion Control & Stormwater Management 1/26/16<br>• Six OCPW employees attended NEBC Managing Stormwater in Oregon 6/21/16<br>2) OC staff participates in the following groups and organizations:<br>• ACWA - active participant in the ACWA Stormwater committee and Phase I Stormwater subcommittee<br>• Continued collaboration with other co-permittees on Comprehensive Clackamas Stormwater Monitoring Program<br>• Greater OC Watershed Council<br>• Clackamas County Water Education Team<br>• Regional Coalition for Clean Rivers and Streams<br>3) There were 13 stormwater staff meetings conducted during the 2015-2016 reporting period. | 3) Dates, topics, and attendees are summarized in Table 4 in Section 6.0 of the annual report. |
| **Element 6. Post-Construction Site Runoff** | | | | | | | |
| BMP 6-1: Implement Municipal Construction Standards | ● | ● | OC Community Development | Per OC'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>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. For applications that proceed to the construction phase all constructed treatment facilities will be noted in the appropriate reporting period.<br>2) Five treatment/detention facilities were constructed, two existing regional treatment/detention facilities were utilized that were designed for these new stormwater flows, two rain garden treatment facilities, one stormfilter water quality manhole with detention facility, and four storm chamber detention/treatment facilities were constructed during the reporting period of 7/1/2015 through 6/30/2016:<br>• Total drainage area = 41.8 acres | 2) Details of treatment facility construction:<br>• TP 12-04 Pavilion Park Phase II (11-Lot Subdivision): Utilized an existing regional treatment/detention pond designed for the phase II development drainage flows, all stormwater drainage inlet basins are sumped;<br>• TP 14-01 Sunnybrook 2 (27-Lot Subdivision): newly constructed treatment/detention facility, all stormwater drainage inlet basins are sumped;<br>• TP 14-03 Ellis Estates (25-Lot Subdivision): newly constructed treatment/detention facility, all stormwater drainage inlet basins are sumped;<br>• TP 14-04 Adeline Acres (16-Lot Subdivision): newly re-constructed and enlarged treatment/detention facility, all stormwater drainage inlet basins are sumped;<br>• TP 14-05 Marlo Farms (39-Lot Subdivision): newly constructed treatment/detention facility, all stormwater drainage inlet basins are sumped;<br>• TP 14-07 Douglas Grove (11-Lot Subdivision): utilized existing regional treatment/detention facility that was originally designed for the development's stormwater flows, all stormwater drainage inlet basins are sumped;<br>• TP 15-01 Highland Park (32-Lot Subdivision): newly constructed treatment/detention facility, all stormwater drainage inlet basins are sumped;<br>• SP 14-09 Petra Memory Care (Site Plan): constructed four private stormwater treatment/detention chambers and porous/pervious pavement, all stormwater drainage inlet basins are sumped;<br>• SP 14-10 Lewis & Clark Bank (Site Plan): Private stormwater filter treatment/detention underground facility with two public rain gardens, all stormwater drainage inlet basins are sumped; |

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| BMP 6-2: Review and Update Code and Development Standards related to Stormwater Quality Control | ● | ● | OC Community Development | • Review OC's current/planned stormwater treatment and detention standards for compliance with new MS4 NPDES permit language.<br>• Review OC'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>• If necessary, update OC's post-construction stormwater design standards and code language by November 1, 2014. | 1) Track progress related to review of OC's code and development standards per provisions in the MS4 NPDES permit.<br>2) Track any code/standards modifications made by ordinance. | 1) The update has been completed to OC's *Stormwater and Grading Design Standards* to meet the current MS4 NPDES permit language. The update prioritizes the use of LID and GI to the maximum extent practicable and addresses flow duration.<br>2) OC reviewed and updated the Oregon City Municipal Code Chapter 13.12 Stormwater Management, the *Stormwater and Grading Design Standards* manual, and the *Erosion and Sediment Control Standards* manual. The updated manuals were adopted through Resolution 15-14 and the associated municipal code update was adopted by Ordinance 15-1006 on May 20, 2015. | |
| **Element 7. Pollution Prevention for Municipal Operations** | | | | | | | |
| BMP 7-1: Conduct Street Sweeping and Roadway Repair Activities | ● | ● | OCPW | • 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>2) Estimate the miles of streets swept per year.<br>3) Track volume of debris removed. | 1) 6.36 city-wide sweeps for this reporting period.<br>2) During the 2015-2016 reporting period, 4,687 miles of roadway were swept.<br>3) 1,690.5 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 | ○ | ○ | OCPW and Parks | • All chemical applicators, both contractor and city, must follow state laws related to the use of pesticides.<br>• Applicators will complete spray reports for the application of chemicals. | 1) Track any program changes regarding chemical application practices used by OC. | 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. There were no program changes regarding chemical application practices used by OC. | |
| BMP 7-3: Implement a Program to Reduce the Impact of Stormwater Runoff from Municipal Facilities | ○ | ○ | OCPW | • By July 1, 2013, inventory municipal facilities subject to this permit requirement.<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) OC developed a Stormwater Pollution Prevention Strategy document for municipal operations (SWPPS) July 1, 2013. The SWPPS includes a description of each of OC'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 | ● | | OCPW | • Review new and redevelopment for possible cross-connections.<br>• Eliminate cross connections upon identification. | 1) Report whether any cross connections were discovered and describe follow up activities. | 1) Four cross connections were discovered and corrected during this reporting period. Locations and corrective actions were:<br>• 1128 Main St – commercial building was not connected correctly during combined sewer separation project. Plumbing corrected.<br>• 902 12th St – home was not connected correctly during combined sewer separation project. Plumbing corrected.<br>• 114 S Center St - home was not connected correctly during combined sewer separation project. Plumbing corrected.<br>• 902 12th St - home was not connected correctly during combined sewer separation project. Plumbing corrected. | • Dye tests are performed by OCPW upon request from plumbing inspector if there are questions regarding sewer connections.<br>• New construction storm and sanitary stub out standards have been revised – sanitary remains 4-inch-diameter pipe, storm was increased to 6-inch-diameter pipe to avoid confusion in future.<br>• Routine storm sewer video inspection continues and cross-connections are repaired when identified. |
| BMP 7-5: Coordinate with Local Fire Department related to Pollutant Discharge from Fire Fighting Training Activities | | | OCPW | • By November 1, 2012, contact Clackamas Fire District #1 to determine what activities are conducted to minimize pollutant discharges associated with firefighting training activities.<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 OC's Water Quality Coordinator contacted Clackamas Fire District #1 to discuss firefighting training activities conducted in OC. 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 OC stations use water only. |
| BMP 7-6: Conduct Master Planning and | ● | ● | OCPW | • The *Citywide Master Plan* will be updated by the end of the permit term. | 1) Track master planning activities. | 1) The update to OC's *City-wide Drainage Master Plan* commenced with a kick-off workshop on 12/1/15. Funding has been allocated through the 2016-2017 fiscal year. | 2) Following are details of the contracted CIP projects completed during this reporting period: |

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| Implement Capital Projects for Stormwater Quality Enhancement | | | | • Prioritize CIPs by funding availability and water quality/flood control benefit.<br>• Update maps to include location and drainage area of any new stormwater quality CIPs. | 2) Track number and cost of major (water quality) CIP projects and discuss added benefit.<br>3) Map the location and drainage area of water quality related CIPs. | 2) A total of nine water quality-related CIP projects were constructed during this reporting period.<br>• Two projects were contracted out, for a total cost of $467,000.<br>• Seven projects were completed in-house, for a total cost of $47,500.<br>3) Mapping:<br>• The two contracted CIP projects have been mapped.<br>• The in-house CIP projects have been mapped. | • 14th Street Storm Drain Improvements CI 14-07 – three sumped catch basins and 450 feet of pipe ($239,000); improvements replaced under capacity and poor condition stormwater pipe conveyance system that the runoff at the outfall was eroding the slope.<br>• Coffee Creek Culvert Rehabilitation CI 14-08 –200 feet of pipe ($228,000); improvements replaced poor condition corroded stormwater conveyance CMP pipe system that was causing erosion problems.<br>• Following are details of the in-house CIP projects completed during this reporting period:<br>• Installed 7 sumped catch basins and 245 feet of pipe, and 4 curb scuppers. |
| **Element 8. Stormwater Management Facilities Operation and Maintenance** | | | | | | | |
| BMP 8-1:<br>Conduct Stormwater Conveyance System Cleaning and Maintenance | ● | ● | OCPW | • Maintain, repair, and/or replace conveyance system components when needed, based on ongoing inspections.<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:<br>Conduct Catch Basin Cleaning and Maintenance | ● | ● | OCPW | • Inspect at least 33% of the public catch basins annually.<br>• Schedule the repair, and replacement of catch basins as needed, based on inspections.<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>2) Track the volume of sediment removed during cleaning activities conducted annually (also includes volume from BMP 8-1).<br>3) Track the number of catch basin replacements annually.<br>4) Track the number of public catch basins added to OC's catch basin inventory annually. | 1) 34% of public catch basins were maintained during this reporting period.<br>2) 130 cubic yards of sediment were removed (includes sediment from pipes, culverts, manholes, open channels, and catch basins).<br>3) Two catch basins were replaced. Two catch basins repaired.<br>4) Eight catch basins were added to, and zero catch basins were removed from, OC's inventory. | 34% = 1,460 public catch basins |
| BMP 8-3:<br>Public Structural Control Facility Cleaning and Maintenance | ● | ● | OCPW | • Inspect and maintain public structural control facilities in accordance with documented frequencies and procedures.<br>• Update the public structural control facility inventory as needed.<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>2) Track the volume of sediment removed during cleaning.<br>3) Track changes to the public structural control facility inventory as needed. | 1) 217 public structural facilities and 3,843 feet of bioswale were inspected during the reporting period. See the next column for maintenance details.<br>2) 30 cubic yards of sediment were removed during maintenance/cleaning.<br>3) Additional public structural facilities added to inventory:<br>• Flow Control Manholes – added 75 manholes not previously listed. Similar to pollution control manholes and will be inspected and maintained on same frequency as pollution control manholes for future reporting. | 1) The following public structural facilities were inspected and maintained during the reporting period:<br>• ponds = 77 inspected; 77 maintained<br>• bioswales = 3,843 feet maintained<br>• rain gardens = 3 inspected; 3 maintained<br>• detention pipes = 27 inspected; 8 cleaned<br>• water quality vaults = 4 inspected; no maintenance required<br>• pollution control/flow control manholes = 154 inspected; 68 cleaned |
| BMP 8-4:<br>Private Structural Control Facility Cleaning and Maintenance | ● | ● | OCPW | • Require new private water quality facilities to submit maintenance agreements to OC.<br>• Compile an inventory of existing private structural water quality facilities and work to collect maintenance agreements for these by July 1, 2013.<br>• Implement an inspection strategy for private water quality facilities by July 1, 2013. | 1) Track the number of maintenance agreements submitted to OC each year.<br>2) Track progress related to the inventory and mapping of existing private structural facilities. | 1) OC continues to require maintenance agreements for private water quality facilities. One maintenance agreement was recorded during this reporting period.<br>2) Files have been reviewed for existing private structural facilities. An inventory list has been created. | 1) The following are details for the newly recorded private water quality facilities:<br>• SP 14-09 Petra Memory Care (Site Plan): constructed four private stormwater treatment/detention chambers and porous/pervious pavement, all stormwater drainage inlet basins are sumped; |

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| | | | | | 3) Track the status of updating the inventory and map of private water quality facilities.<br>4) Track the status of developing procedures in accordance with permit requirements. | 3) Initial mapping is complete; refinements ongoing.<br>4) OC developed 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, OC requires a maintenance agreement and submission of annual inspection records. There were no changes made to the SOPs during this reporting period. | |

# Appendix B

# Oregon City Monitoring Data

**Outfall Monitoring - Oregon City 2015 - 2016**
**Location - Oregon City Shopping Center**
**Sample Site # OC006**
**Stream Name - Clackamas River**
**Land Use - Commercial**

| | | Results | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Composite Rain Event | Composite Rain Event | Composite Rain Event | Statistics | | | |
| **Analysis** | **Units** | **11/19/2015** | **12/17/2015** | **2/4/2016** | **High** | **Low** | **Mean** | **Notes** |
| Total Phosphate Seal | mg/L | <0.04 | 0.02 | <0.04 | **N/A** | **ND** | **0.0067** | (2) |
| Dissolved Oxygen - Winkler | mg/L | 10.50 | 10.8 | 10.3 | **10.8** | **10.3** | **10.53** | (1) |
| Dissolved Oxygen - Field | mg/L | 10.93 | 11.75 | 10.72 | **11.75** | **10.72** | **11.13** | |
| Dissolved Oxygen - Field | % Saturation | 94.6 | 96.8 | 91.5 | **96.8** | **91.5** | **94.3** | |
| Conductivity - Field | uS | 19.14 | 14.91 | 22.0 | **22** | **15** | **19** | |
| Temperature - Field | °C | 8.9 | 6.6 | 8.8 | **8.9** | **6.6** | **8.1** | |
| pH - Field | Std Units | 6.61 | 6.45 | 6.29 | **6.61** | **6.29** | **6.45** | |
| Dissolved Copper | ug/L | 2.1 | 1.0 | 1.7 | **2.1** | **1.0** | **1.6** | |
| Copper | ug/L | 3.3 | 3.1 | 3.6 | **3.6** | **3.1** | **3.3** | |
| Dissolved Lead | ug/L | 0.12 | 0.09 | 0.08 | **0.12** | **0.08** | **0.10** | |
| Lead | ug/L | 0.82 | 1.12 | 1.61 | **1.61** | **0.82** | **1.18** | |
| Dissolved Zinc | ug/L | 27 | 20 | 30 | **30** | **20** | **26** | |
| Zinc | ug/L | 36 | 31 | 40 | **40** | **31** | **36** | |
| E. coli - Colilert | MPN/100mL | 1550 | 980 | 102 | **1550** | **102** | **877** | (3) (4) |
| Ammonia Nitrogen Low Seal | mg/L | 0.069 | 0.065 | <0.05 | **0.069** | **ND** | **0.045** | (2) |
| Nitrate-Nitrite | mg/L | 0.15 | <0.08 | 0.13 | **0.15** | **ND** | **0.093** | (2) |
| Ortho Phosphate Seal | mg/L | 0.02 | <0.025 | <0.025 | **N/A** | **ND** | **0.067** | (2) |
| Total Dissolved Solids | mg/L | 29.0 | 28.0 | 48.0 | **48.0** | **28.0** | **35.0** | |
| Total Solids | mg/L | 25.0 | 18.0 | 68.0 | **68.0** | **18.0** | **37.0** | |
| Total Suspended Solids | mg/L | 4.0 | 3.0 | 9.6 | **9.6** | **3.0** | **5.5** | |
| Volatile Solids | mg/L | 19.0 | 14.0 | 49.0 | **49.0** | **14.0** | **27.3** | |
| Hardness | mg/L | 12 | 10.4 | 11 | **12** | **10** | **11** | |
| BOD | mg/L | 1.2 | 1.5 | 0.8 | **1.5** | **0.8** | **1.2** | |
| Storm Event Rainfall | Inches | 1.04 | 1.16 | 0.59 | **N/A** | **N/A** | **N/A** | (2) (5) |

Notes:

(1) Dissolved Oxygen (Winker Method) samples are taken once per sampling event as QA/QC 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. NM is Not Measured.

(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 through sample collection.

**Outfall Monitoring - Oregon City 2015 - 2016**
**Location - Clackamette Cove**
**Sample Site # OC007**
**Stream Name - Clackamas River**
**Land Use - Industrial**

| | | Results | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Composite Rain Event | Composite Rain Event | Composite Rain Event | Statistics | | | |
| **Analysis** | **Units** | **11/19/2015** | **12/17/2015** | **2/4/2016** | **High** | **Low** | **Mean** | **Notes** |
| Total Phosphate Seal | mg/L | <0.04 | 0.08 | <0.04 | **0.08** | **ND** | **0.027** | (2) |
| Dissolved Oxygen - Winkler | mg/L | NM | NM | NM | **NM** | **NM** | **NM** | (1) (2) |
| Dissolved Oxygen - Field | mg/L | 9.53 | 10.80 | 8.87 | **10.80** | **8.87** | **9.73** | |
| Dissolved Oxygen - Field | % Saturation | 84.0 | 90.2 | 74.8 | **90.2** | **74.8** | **83.0** | |
| Conductivity - Field | uS | 95.2 | 166.1 | 238 | **238** | **95** | **166.4** | |
| Temperature - Field | °C | 9.6 | 7.2 | 8.3 | **9.6** | **7.2** | **8.4** | |
| pH - Field | Std Units | 7.05 | 6.83 | 6.96 | **7.05** | **6.83** | **6.95** | |
| Dissolved Copper | ug/L | 2.9 | 3.0 | 2.0 | **3.0** | **2.0** | **2.6** | |
| Copper | ug/L | 4.3 | 6.2 | 4.2 | **6.2** | **4.2** | **4.9** | |
| Dissolved Lead | ug/L | 0.31 | 0.23 | 0.24 | **0.31** | **0.23** | **0.26** | |
| Lead | ug/L | 1.12 | 1.80 | 1.78 | **1.80** | **1.12** | **1.57** | |
| Dissolved Zinc | ug/L | 19 | 28 | 20 | **28** | **19** | **22** | |
| Zinc | ug/L | 27 | 43 | 33 | **43** | **27** | **34** | |
| E. coli - Colilert | MPN/100mL | 2420 | >2420 | 2420 | **>2420** | **2420** | **N/A** | (2)(3)(4) |
| Ammonia Nitrogen Low Seal | mg/L | <0.05 | 0.053 | 0.083 | **0.083** | **ND** | **0.045** | (2) |
| Nitrate-Nitrite | mg/L | 0.22 | 0.13 | 0.086 | **0.22** | **0.086** | **0.145** | |
| Ortho Phosphate Seal | mg/L | 0.03 | 0.03 | <0.025 | **0.03** | **ND** | **0.02** | (2) |
| Total Dissolved Solids | mg/L | 86.0 | 116 | 188 | **188** | **86.0** | **130** | |
| Total Solids | mg/L | 81.0 | 121 | 187 | **187** | **81.0** | **130** | |
| Total Suspended Solids | mg/L | 4.0 | 12.0 | 11.0 | **12.0** | **4.0** | **9.0** | |
| Volatile Solids | mg/L | 37.0 | 50.0 | 67.0 | **67.0** | **37.0** | **51.3** | |
| Hardness | mg/L | 46 | 66.4 | 109 | **109** | **46** | **74** | |
| BOD | mg/L | 1.3 | 1.9 | 2.1 | **2.1** | **1.3** | **1.8** | |
| Storm Event Rainfall | Inches | 1.04 | 1.16 | 0.59 | **N/A** | **N/A** | **N/A** | (2) (5) |

Notes:

(1) Dissolved Oxygen (Winker Method) samples are taken once per sampling event as QA/QC 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. NM is Not Measured.

(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 through sample collection.

**Instream Monitoring - Oregon City 2015 - 2016**
**Location - 17082 Holly Ln (Holly Ln Bridge)**
**Sample Site # OC010**
**Stream Name - Abernethy Creek (Upstream)**

| | | Results | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Grab Sample Dry Weather | Composite Rain Event | Composite Rain Event | Grab Sample Dry Weather | Statistics | | | |
| **Analysis** | **Units** | **7/22/2015** | **1/13/2016** | **4/22/2016** | **6/1/2016** | **High** | **Low** | **Mean** | **Notes** |
| Total Phosphate Seal | mg/L | <0.04 | 0.05 | <0.04 | <0.04 | **0.05** | **ND** | **0.0125** | (2) |
| Dissolved Oxygen - Winkler | mg/L | 7.6 | 11.3 | 8.4 | 8.4 | **11.3** | **7.60** | **8.93** | (1) |
| Dissolved Oxygen - Field | mg/L | 7.90 | 11.79 | 9.00 | 8.70 | **11.79** | **7.90** | **9.35** | |
| Dissolved Oxygen - Field | % Saturation | 84.7 | 98.0 | 91.3 | 90.6 | **98.0** | **84.7** | **91.2** | |
| Conductivity - Field | uS | 128.4 | 64.5 | 82.3 | 97.9 | **128.4** | **64.5** | **93.3** | |
| Temperature - Field | °C | 18.5 | 7.0 | 15.4 | 17.0 | **18.5** | **7.0** | **14.5** | |
| pH - Field | Std Units | 7.47 | 6.68 | 6.82 | 7.31 | **7.47** | **6.68** | **7.07** | |
| Dissolved Copper | ug/L | 0.6 | 0.8 | 0.8 | 0.7 | **0.8** | **0.6** | **0.73** | |
| Copper | ug/L | 0.8 | 3.2 | 1.3 | 1.4 | **3.2** | **0.8** | **1.68** | |
| Dissolved Lead | ug/L | 0.03 | 0.05 | 0.03 | 0.02 | **0.05** | **0.02** | **0.03** | |
| Lead | ug/L | 0.16 | 1.48 | 0.37 | 0.27 | **1.48** | **0.16** | **0.57** | |
| Dissolved Zinc | ug/L | <1 | 1 | 2 | 1 | **2** | **ND** | **1** | (2) |
| Zinc | ug/L | 3 | 9 | 3 | 2 | **9** | **2** | **4.3** | |
| E. coli - Colilert | MPN/100mL | 122 | 387 | 261 | 548 | **548** | **122** | **330** | (3) (4) |
| Ammonia Nitrogen Low Seal | mg/L | <0.05 | <0.05 | <0.05 | <0.05 | **ND** | **ND** | **ND** | (2) |
| Nitrate-Nitrite | mg/L | 0.32 | 1.5 | 0.71 | 0.50 | **1.5** | **0.32** | **0.758** | |
| Ortho Phosphate Seal | mg/L | 0.08 | 0.03 | 0.03 | 0.04 | **0.08** | **0.03** | **0.045** | |
| Total Dissolved Solids | mg/L | 135 | 110 | 88.0 | 90.0 | **135** | **88.0** | **106** | |
| Total Solids | mg/L | 130 | 143 | 84.0 | 173 | **173** | **84** | **133** | |
| Total Suspended Solids | mg/L | 2.5 | 50.0 | 10.4 | 7.2 | **50.0** | **2.5** | **17.5** | |
| Volatile Solids | mg/L | 58.0 | 52.0 | 28.0 | 140 | **140** | **28** | **70** | |
| Hardness | mg/L | 54 | 22 | 28 | 38 | **54** | **22** | **36** | |
| BOD | mg/L | 0.60 | 0.55 | 0.94 | 0.40 | **0.94** | **0.40** | **0.62** | |
| Storm Event Rainfall | Inches | N/A | 1.49 | 0.62 | N/A | **N/A** | **N/A** | **N/A** | (2) (5) |

Notes:

(1) Dissolved Oxygen (Winker Method) samples are taken once per sampling event as QA/QC 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. NM is Not Measured.

(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 through sample collection.

**Instream Monitoring - Oregon City 2015 - 2016**
**Location - 316 17th St at Railroad Trestle**
**Sample Site # OC011**
**Stream Name - Abernethy Creek (Downstream)**

| | | Results | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Grab Sample Dry Weather | Composite Rain Event | Composite Rain Event | Grab Sample Dry Weather | Statistics | | | |
| **Analysis** | **Units** | **7/22/2015** | **1/13/2016** | **4/22/2016** | **6/1/2016** | **High** | **Low** | **Mean** | **Notes** |
| Total Phosphate Seal | mg/L | <0.04 | 0.18 | 0.06 | <0.04 | **0.18** | **ND** | **0.06** | (2) |
| Dissolved Oxygen - Winkler | mg/L | NM | NM | NM | NM | **NM** | **NM** | **NM** | (1) (2) |
| Dissolved Oxygen - Field | mg/L | 7.30 | 11.62 | 9.35 | 8.11 | **11.62** | **7.30** | **9.10** | |
| Dissolved Oxygen - Field | % Saturation | 80.2 | 97.6 | 92.9 | 85.9 | **97.6** | **80.2** | **89.2** | |
| Conductivity - Field | uS | 159.6 | 70.3 | 119.7 | 114.5 | **159.6** | **70.3** | **116.0** | |
| Temperature - Field | °C | 19.7 | 7.3 | 14.5 | 17.9 | **19.7** | **7.3** | **14.9** | |
| pH - Field | Std Units | 7.48 | 6.95 | 6.90 | 7.37 | **7.48** | **6.90** | **7.18** | |
| Dissolved Copper | ug/L | 0.6 | 1.0 | 1.7 | 0.9 | **1.70** | **0.60** | **1.05** | |
| Copper | ug/L | 1.0 | 6.0 | 3.5 | 1.1 | **6.00** | **1.00** | **2.90** | |
| Dissolved Lead | ug/L | 0.03 | 0.08 | 0.07 | 0.04 | **0.08** | **0.03** | **0.06** | |
| Lead | ug/L | 0.23 | 3.24 | 1.09 | 0.29 | **3.2** | **0.23** | **1.21** | |
| Dissolved Zinc | ug/L | <1 | 2 | 3 | 1 | **3** | **ND** | **1.5** | (2) |
| Zinc | ug/L | 3 | 20 | 11 | 2 | **20** | **2** | **9** | |
| E. coli - Colilert | MPN/100mL | 138 | 1050 | 2420 | 139 | **2420** | **138** | **937** | (3) (4) |
| Ammonia Nitrogen Low Seal | mg/L | <0.05 | <0.05 | <0.05 | <0.05 | **ND** | **ND** | **ND** | (2) |
| Nitrate-Nitrite | mg/L | 0.28 | 1.3 | 0.70 | 0.52 | **1.3** | **0.28** | **0.70** | |
| Ortho Phosphate Seal | mg/L | 0.08 | 0.03 | 0.03 | 0.04 | **0.08** | **0.03** | **0.05** | |
| Total Dissolved Solids | mg/L | 173 | 124 | 90.0 | 112 | **173** | **90** | **125** | |
| Total Solids | mg/L | 161 | 193 | 104 | 169 | **193** | **104** | **157** | |
| Total Suspended Solids | mg/L | 6.0 | 98.0 | 25.2 | 5.6 | **98** | **5.6** | **33.7** | |
| Volatile Solids | mg/L | 83.0 | 58.0 | 25.0 | 97.0 | **97** | **25** | **66** | |
| Hardness | mg/L | 64 | 27 | 33 | 44 | **64** | **27** | **42** | |
| BOD | mg/L | 0.56 | 0.76 | 2.1 | 0.45 | **2.1** | **0.45** | **1.0** | |
| Storm Event Rainfall | Inches | N/A | 1.49 | 0.62 | N/A | **N/A** | **N/A** | **N/A** | (2) (5) |

Notes:

(1) Dissolved Oxygen (Winker Method) samples are taken once per sampling event as QA/QC 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. NM is Not Measured.

(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 through sample collection.

**Instream Monitoring - Oregon City 2015 - 2016**
**Location - Behind 415 S McLoughlin Blvd**
**Sample Site # OC012**
**Stream Name - Coffee Creek**

| | | Results | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Grab Sample Dry Weather | Composite Rain Event | Composite Rain Event | Grab Sample Dry Weather | Statistics | | | |
| **Analysis** | **Units** | **7/22/2015** | **1/13/2016** | **4/22/2016** | **6/1/2016** | **High** | **Low** | **Mean** | **Notes** |
| Total Phosphate Seal | mg/L | <0.04 | <0.04 | <0.04 | <0.04 | **ND** | **ND** | **ND** | (2) |
| Dissolved Oxygen - Winkler | mg/L | NM | NM | NM | NM | **NM** | **NM** | **NM** | (1) (2) |
| Dissolved Oxygen - Field | mg/L | 9.36 | 11.35 | 10.23 | 9.86 | **11.35** | **9.36** | **10.20** | |
| Dissolved Oxygen - Field | % Saturation | 96.7 | 100.8 | 98.4 | 97.2 | **100.8** | **96.7** | **98.3** | |
| Conductivity - Field | uS | 85.9 | 62.4 | 47.8 | 87.0 | **87.0** | **47.8** | **70.8** | |
| Temperature - Field | °C | 16.6 | 9.6 | 12.9 | 14.4 | **16.6** | **9.6** | **13.4** | |
| pH - Field | Std Units | 7.40 | 7.12 | 6.52 | 7.37 | **7.40** | **6.52** | **7.10** | |
| Dissolved Copper | ug/L | 0.6 | 0.8 | 2.3 | 0.6 | **2.30** | **0.6** | **1.08** | |
| Copper | ug/L | 0.9 | 2.8 | 3.5 | 0.8 | **3.50** | **0.8** | **2.00** | |
| Dissolved Lead | ug/L | 0.04 | 0.12 | 0.15 | 0.05 | **0.15** | **0.04** | **0.09** | |
| Lead | ug/L | 0.33 | 1.35 | 1.05 | 0.33 | **1.35** | **0.33** | **0.77** | |
| Dissolved Zinc | ug/L | 4 | 10 | 12 | 8 | **12.0** | **4** | **8.5** | |
| Zinc | ug/L | 8 | 20 | 21 | 10 | **21** | **8** | **15** | |
| E. coli - Colilert | MPN/100mL | >2420 | 411 | 816 | 35 | **>2420** | **35** | **N/A** | (2)(3)(4) |
| Ammonia Nitrogen Low Seal | mg/L | 0.050 | <0.05 | <0.05 | <0.05 | **0.050** | **ND** | **0.01** | (2) |
| Nitrate-Nitrite | mg/L | 2.2 | 1.9 | 1.3 | 2.7 | **2.70** | **1.3** | **2.03** | |
| Ortho Phosphate Seal | mg/L | 0.05 | 0.03 | 0.03 | 0.03 | **0.05** | **0.03** | **0.04** | |
| Total Dissolved Solids | mg/L | 112 | 79.0 | 72.0 | 95.0 | **112** | **72** | **90** | |
| Total Solids | mg/L | 92.0 | 81.0 | 75.0 | 151 | **151** | **75** | **100** | |
| Total Suspended Solids | mg/L | 3.0 | 12.0 | 16.8 | 2.8 | **16.8** | **2.8** | **8.7** | |
| Volatile Solids | mg/L | 42.0 | 41.0 | 34.0 | 105 | **105** | **34** | **56** | |
| Hardness | mg/L | 28 | 17 | 20 | 34 | **34** | **17** | **25** | |
| BOD | mg/L | 0.27 | 0.50 | 1.9 | 0.050 | **1.9** | **0.05** | **0.68** | |
| Storm Event Rainfall | Inches | N/A | 1.49 | 0.62 | N/A | **N/A** | **N/A** | **N/A** | (2) (5) |

Notes:

(1) Dissolved Oxygen (Winker Method) samples are taken once per sampling event as QA/QC 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. NM is Not Measured.

(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 through sample collection.

**Instream Monitoring - Oregon City 2015 - 2016**
**Location - Behind 13530 Redland Rd**
**Sample Site # OC013**
**Stream Name - Park Place Creek**

| | | Results | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Grab Sample Dry Weather | Composite Rain Event | Composite Rain Event | Grab Sample Dry Weather | Statistics | | | |
| Analysis | Units | 7/22/2015 | 1/13/2016 | 4/22/2016 | 6/1/2016 | High | Low | Mean | Notes |
| Total Phosphate Seal | mg/L | 0.04 | 0.12 | 0.04 | 0.04 | **0.12** | **0.04** | **0.06** | |
| Dissolved Oxygen - Winkler | mg/L | NM | NM | NM | NM | **NM** | **NM** | **NM** | (1) (2) |
| Dissolved Oxygen - Field | mg/L | 4.97 | 9.81 | 5.75 | 4.42 | **9.81** | **4.42** | **6.24** | |
| Dissolved Oxygen - Field | % Saturation | 51.7 | 83.7 | 55.7 | 44.9 | **83.7** | **44.9** | **59.0** | |
| Conductivity - Field | uS | 312.0 | 136.6 | 339 | 300 | **339** | **136.6** | **271.9** | |
| Temperature - Field | °C | 17.0 | 8.0 | 13.4 | 15.8 | **17.0** | **8.0** | **13.6** | |
| pH - Field | Std Units | 6.91 | 6.72 | 6.84 | 6.86 | **6.91** | **6.72** | **6.83** | |
| Dissolved Copper | ug/L | 0.3 | 1.8 | 1.7 | 0.8 | **1.80** | **0.3** | **1.15** | |
| Copper | ug/L | 1.0 | 5.9 | 2.9 | 2.1 | **5.90** | **1.0** | **2.98** | |
| Dissolved Lead | ug/L | 0.02 | 0.08 | 0.02 | 0.01 | **0.08** | **0.01** | **0.03** | |
| Lead | ug/L | 0.71 | 2.44 | 0.63 | 0.67 | **2.44** | **0.63** | **1.11** | |
| Dissolved Zinc | ug/L | 3 | 9 | 9 | 8 | **9** | **3** | **7** | |
| Zinc | ug/L | 8 | 31 | 18 | 11 | **31** | **8** | **17** | |
| E. coli - Colilert | MPN/100mL | 166 | 687 | 276 | 147 | **687** | **147** | **319** | (3) (4) |
| Ammonia Nitrogen Low Seal | mg/L | 0.20 | 0.24 | 0.70 | 0.62 | **0.70** | **0.20** | **0.44** | |
| Nitrate-Nitrite | mg/L | 0.26 | 0.98 | 1.1 | 1.3 | **1.30** | **0.260** | **0.91** | |
| Ortho Phosphate Seal | mg/L | <0.04 | 0.02 | <0.025 | <0.025 | **N/A** | **N/A** | **N/A** | (2) |
| Total Dissolved Solids | mg/L | 261 | 122 | 183 | 214 | **261** | **122** | **195** | |
| Total Solids | mg/L | 269 | 153 | 199 | 315 | **315** | **153** | **234** | |
| Total Suspended Solids | mg/L | 15.0 | 41.0 | 18.4 | 26.0 | **41** | **15.0** | **25.1** | |
| Volatile Solids | mg/L | 80.0 | 52.0 | 68.0 | 150 | **150** | **52** | **88** | |
| Hardness | mg/L | 140 | 53 | 107 | 121 | **140** | **53** | **105** | |
| BOD | mg/L | 1.8 | 2.4 | 3.2 | 1.4 | **3.2** | **1.4** | **2.2** | |
| Storm Event Rainfall | Inches | N/A | 1.49 | 0.62 | N/A | **N/A** | **N/A** | **N/A** | (2) (5) |

Notes:

(1) Dissolved Oxygen (Winker Method) samples are taken once per sampling event as QA/QC 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. NM is Not Measured.

(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 through sample collection.

**Instream Monitoring - Oregon City 2015 - 2016**
**Location - North end of Singer Creek Park**
**Sample Site # OC014**
**Stream Name - Singer Creek (Upstream)**

| | | Results | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Grab Sample Dry Weather | Composite Rain Event | Composite Rain Event | Grab Sample Dry Weather | Statistics | | | |
| **Analysis** | **Units** | **7/22/2015** | **1/13/2016** | **4/22/2016** | **6/1/2016** | **High** | **Low** | **Mean** | **Notes** |
| Total Phosphate Seal | mg/L | <0.04 | 0.10 | <0.04 | <0.04 | **0.10** | **ND** | **0.025** | (2) |
| Dissolved Oxygen - Winkler | mg/L | NM | NM | NM | NM | **NM** | **NM** | **NM** | (1) (2) |
| Dissolved Oxygen - Field | mg/L | 9.25 | 11.28 | 10.10 | 9.70 | **11.28** | **9.25** | **10.08** | |
| Dissolved Oxygen - Field | % Saturation | 94.3 | 100.4 | 97.2 | 95.5 | **100.4** | **94.3** | **96.9** | |
| Conductivity - Field | uS | 84.5 | 53.7 | 88.4 | 82.5 | **88.4** | **53.7** | **77.3** | |
| Temperature - Field | °C | 15.5 | 9.2 | 12.5 | 13.9 | **15.5** | **9.2** | **12.8** | |
| pH - Field | Std Units | 7.29 | 6.84 | 6.83 | 7.48 | **7.48** | **6.83** | **7.11** | |
| Dissolved Copper | ug/L | 0.4 | 0.7 | 1.1 | 0.4 | **1.10** | **0.4** | **0.65** | |
| Copper | ug/L | 2.2 | 4.7 | 1.8 | 1.1 | **4.70** | **1.1** | **2.45** | |
| Dissolved Lead | ug/L | 0.04 | 0.12 | 0.13 | 0.04 | **0.13** | **0.04** | **0.08** | |
| Lead | ug/L | 1.57 | 5.15 | 0.87 | 0.54 | **5.15** | **0.54** | **2.03** | |
| Dissolved Zinc | ug/L | 1 | 7 | 3 | 2 | **7.0** | **1** | **3.3** | |
| Zinc | ug/L | 7 | 30 | 7 | 4 | **30** | **4** | **12** | |
| E. coli - Colilert | MPN/100mL | 96 | 260 | 387 | 35 | **387** | **35** | **195** | (3) |
| Ammonia Nitrogen Low Seal | mg/L | <0.05 | <0.05 | <0.05 | <0.05 | **ND** | **ND** | **ND** | (2) |
| Nitrate-Nitrite | mg/L | 1.9 | 2.0 | 2.4 | 2.9 | **2.90** | **1.90** | **2.30** | |
| Ortho Phosphate Seal | mg/L | <0.04 | 0.02 | <0.025 | <0.025 | **N/A** | **N/A** | **N/A** | (2) |
| Total Dissolved Solids | mg/L | 109 | 81.0 | 78.0 | 70.0 | **109** | **70** | **85** | |
| Total Solids | mg/L | 137 | 135 | 76.0 | 115 | **137** | **76** | **116** | |
| Total Suspended Solids | mg/L | 58.0 | 63.0 | 10.8 | 10.4 | **63** | **10.4** | **35.6** | |
| Volatile Solids | mg/L | 45.0 | 55.0 | 30.0 | 65.0 | **65** | **30** | **49** | |
| Hardness | mg/L | 28 | 20 | 22 | 29 | **29** | **20** | **25** | |
| BOD | mg/L | 0.37 | 0.61 | 0.74 | 0.090 | **0.74** | **0.090** | **0.45** | |
| Storm Event Rainfall | Inches | N/A | 1.49 | 0.62 | N/A | **N/A** | **N/A** | **N/A** | (2) (5) |

Notes:

(1) Dissolved Oxygen (Winker Method) samples are taken once per sampling event as QA/QC 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. NM is Not Measured.

(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 through sample collection.

**Instream Monitoring - Oregon City 2015 - 2016**
**Location - 502 7th St, Manhole # 37138**
**Sample Site # OC015**
**Stream Name - Singer Creek (Downstream)**

| | | Results | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Grab Sample Dry Weather | Composite Rain Event | Composite Rain Event | Grab Sample Dry Weather | Statistics | | | |
| **Analysis** | **Units** | **7/22/2015** | **1/13/2016** | **4/22/2016** | **6/1/2016** | **High** | **Low** | **Mean** | **Notes** |
| Total Phosphate Seal | mg/L | 0.06 | 0.12 | <0.04 | <0.04 | **0.12** | **ND** | **0.045** | (2) |
| Dissolved Oxygen - Winkler | mg/L | NM | NM | NM | NM | **NM** | **NM** | **NM** | (1) (2) |
| Dissolved Oxygen - Field | mg/L | 9.14 | 11.53 | 10.19 | 9.86 | **11.53** | **9.14** | **10.18** | |
| Dissolved Oxygen - Field | % Saturation | 97.2 | 100.2 | 97.7 | 97.7 | **100.2** | **97.2** | **98.2** | |
| Conductivity - Field | uS | 102.8 | 42.9 | 57.7 | 92.9 | **102.8** | **42.9** | **74.1** | |
| Temperature - Field | °C | 17.8 | 8.5 | 12.7 | 14.4 | **17.8** | **8.5** | **13.4** | |
| pH - Field | Std Units | 7.52 | 6.97 | 7.12 | 7.40 | **7.52** | **6.97** | **7.25** | |
| Dissolved Copper | ug/L | 1.0 | 1.0 | 2.0 | 0.7 | **2.00** | **0.7** | **1.18** | |
| Copper | ug/L | 3.1 | 7.1 | 3.4 | 1.6 | **7.10** | **1.6** | **3.80** | |
| Dissolved Lead | ug/L | 0.15 | 0.19 | 0.34 | 0.11 | **0.34** | **0.11** | **0.20** | |
| Lead | ug/L | 2.65 | 8.74 | 1.90 | 1.07 | **8.74** | **1.07** | **3.59** | |
| Dissolved Zinc | ug/L | 3 | 6 | 9 | 3 | **9** | **3** | **5** | |
| Zinc | ug/L | 18 | 36 | 16 | 7 | **36** | **7** | **19** | |
| E. coli - Colilert | MPN/100mL | >2420 | 613 | 1200 | 387 | **>2420** | **387** | **N/A** | (2)(3)(4) |
| Ammonia Nitrogen Low Seal | mg/L | 0.20 | <0.05 | <0.05 | <0.05 | **0.20** | **ND** | **0.05** | (2) |
| Nitrate-Nitrite | mg/L | 1.4 | 1.7 | 1.4 | 2.0 | **2.0** | **1.4** | **1.63** | |
| Ortho Phosphate Seal | mg/L | 0.08 | 0.02 | <0.025 | <0.025 | **0.08** | **0.02** | **0.03** | |
| Total Dissolved Solids | mg/L | 127 | 84.0 | 91.0 | 89.0 | **127** | **84.0** | **98** | |
| Total Solids | mg/L | 323 | 165 | 91.0 | 140 | **323** | **91.0** | **180** | |
| Total Suspended Solids | mg/L | 23.0 | 96.0 | 168 | 36.0 | **168** | **23.0** | **80.8** | |
| Volatile Solids | mg/L | 44.0 | 52.0 | 38.0 | 86.0 | **86.0** | **38.0** | **55.0** | |
| Hardness | mg/L | 37 | 20 | 24 | 33 | **37** | **20** | **29** | |
| BOD | mg/L | 4.5 | 0.90 | 2.1 | 0.15 | **4.5** | **0.15** | **1.91** | |
| Storm Event Rainfall | Inches | N/A | 1.49 | 0.62 | N/A | **N/A** | **N/A** | **N/A** | (2) (5) |

Notes:

(1) Dissolved Oxygen (Winker Method) samples are taken once per sampling event as QA/QC 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. NM is Not Measured.

(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 through sample collection.

# Appendix C

# Public Education and Outreach Information

**Public Education and Awareness Activities**
**July 1, 2015 – June 30, 2016**

## Summary of Activities

| Date | Event | Location | Contact Total | Program/Subject |
|---|---|---|---|---|
| 8/11/15 | Trail News – Autumn | N/A | All OC residents; available on website | The River Starts Here; "Grate" Time to Rake |
| 9/28/15 – 11/4/15 | Blue-green Algae Bloom | Clackamette Cove | Visitors to the Cove | Signs posted notifying public of health advisory issued by Oregon Health Authority |
| 11/9/15 | Trail News – Winter | N/A | All OC residents; available on website | To Sand or Not to Sand? That is the Question |
| 12/28/15 | Utility Bill | N/A | OC utility customers | The River Starts Here; link to Coalition website |
| 2/29/16 | Trail News – Spring | N/A | All OC residents; available on website | TMDL (temperature) and encourage riparian planting |
| 3/15/16 | 11th Annual Celebrating Water Event | Clackamas Community College | 938* | One staff member provided stormwater awareness display |
| 4/2/16 | Annual Water Quality Report | N/A | 15,122**, available on city website | Water Quality information |
| 4/12/16 – 4/27/16 | Stormwater Banner Display at Planning & Building Department | 221 Molalla Ave Suite 200 Oregon City OR | Visitors & staff at the Planning & Building Department | Display of stormwater public education banner stand |
| 5/9/16 | Trail News – Summer | N/A | All OC residents; available on website | Only Rain Down the Storm Drain! |
| 2015-2016 | KOIN Public Service Announcements | N/A | Metro area | Television and web information about water quality |
| 2015-2016 | Regional Coalition for Clean Rivers & Streams | N/A | Metro area | Pollution prevention messages via website |
| 2015-2016 | 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 |

*800 students, 23 teachers, and 115 chaperones
**A postcard was mailed to each Oregon City address 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 2015
The River Starts Here

- Introduced the updated Regional Coalition for Clean Rivers and Streams website
- Provided new logo and web link

"Grate" Time to Rake

- 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

Winter 2015 – 2016

To Sand or Not to Sand? That is the Question.

- Magnesium Chloride (liquid de-icer) as another tool during storm events
- Less sand equals less clean-up, less debris in catch basins
- Public safety and environmental stewardship are both served by using de-icer

Spring 2016

Improving Water Quality by Lowering Water Temperature

- Problems caused by loss of riparian vegetation
- Planting native riparian vegetation and trees is a relatively simple and cost-effective solution
- Links provided to OC TMDL Implementation Plan, Greater Oregon City Watershed Council, and Clackamas River Basin Council

Summer 2016

Only Rain Down the Storm Drain!

- Oregon City is obligated to detect, remove and eliminate anything that should not be flowing into the storm system and polluting our streams and rivers
- Provided ways to report: call Public Works or use OC Request!
- Link provided to Metro website for hazardous material disposal

**Special Events**

11th Annual Celebrating Water Event – 3/15/16

One OCPW staff member participated in this annual educational event, held at Clackamas Community College. 800 4th and 5th grade students, along with 23 teachers and 115 chaperones, had the opportunity to learn about water conservation and water quality protection, among other water-related topics. The 2016 booth featured an interactive display entitled "Take the Stormwater Runoff Challenge". A crossword puzzle of the same name was provided as a hand-out. Also featured was a stormwater banner display highlighting Oregon City's major drainage basins with ways to protect and improve water quality.


**Figure 1: Celebrating Water Event Display 2016**

**Miscellaneous Items**

Blue-green Algae Health Advisory in the Clackamette Cove – 9/28/15 – 11/4/15

A health advisory was issued 9/28/15 due to high levels of blue-green algae in the Clackamette Cove portion of the Clackamas River, near Clackamette Park in Oregon City. Signs were posted and information was available on the City's website. The advisory was lifted on 11/4/15.

Message on Utility Bill (mailed 12/28/15)

The River Starts Here – Stormwater pollution is now our number one source of water pollution. What can you do? Go to http://theriverstartshere.org/ for pollution prevention tips.

Annual Water Quality Report – 4/2/16

The 2016 report included the following topics specific to stormwater:

- Oregon City's compliance with our NPDES permit and a link to our NPDES documents webpage
- Pollution prevention suggestions:
    - Lawn and garden care
    - Vehicle care
    - Roof treatments
    - Pressure washing
    - Pet waste
- For those with a stream flowing through their property, explanation of why a healthy riparian area is beneficial for reducing water temperature
- Photos/graphics with accompanying captions:
    - The River Starts Here logo with link to the website
    - Photo of a stormwater pond sign – To report illegal dumping or to participate in our Catch Basin Marking & Stenciling Program call 503.657.8241
    - A new rain garden and the cover of our updated Stormwater and Grading Design Standards – Oregon City's updated Stormwater and Grading Design Standards encourages the use of low impact development facilities which, like the rain garden shown above, help improve water quality in our rivers and streams. Link to website provided.

During the first week of April a total of 15,122 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.

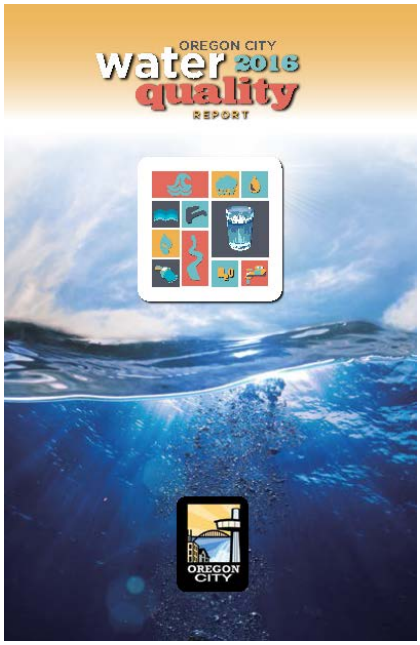


**Figure 2: Cover of 2016 Annual Water Quality Report**

Stormwater Banner Display at the Planning & Building Department – 4/12/16 – 4/27/16

Visitors to the Planning & Building Department, 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 to 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 additional information about Oregon City's Stormwater Management Plan.

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**

"Water…Do Your Part" Campaign on KOIN Channel 6 Television and Website (http://koin.com/water-do-your-part/)

Oregon City continues to partner with other agencies in the Portland metro area in sponsoring public education messaging via KOIN media outlets. The campaign identifies simple things that can be done to keep our rivers and streams healthy. The following topics are highlighted on the website:

- Natural Gardens
- Invasives
- Pets
- Yards
- Rain Gardens
- Autos
- Stormwater
- Plant Natives
- Streams
- Hazardous Waste
- Homes
- For Kids
- Report Spills

Regional Coalition for 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 metro area, to educate the public about the impact of stormwater runoff pollution on the health of our rivers and streams. For specific information about the latest campaign – The River Starts Here – visit the Coalition website at http://theriverstartshere.org/.

# Appendix D

# Willamette River
# TMDL Implementation Plan
# Annual Report

City of Oregon City

Willamette River TMDL Implementation Plan

Annual Progress Report

Year 2

November 1, 2016

## Introduction

The City of Oregon City (City) submitted its first 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. On March 10, 2014 DEQ requested an update to the City's TMDL Plan which the City provided on May 30, 2014. The July 1, 2015 – June 30, 2016 reporting year is the second year of implementation for this updated TMDL Plan. This progress report provides a summary of the City's efforts during implementation year two.

## 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 2015−2016 MS4 NPDES Annual Report, submitted to DEQ on November 1, 2016.

As required by Schedule D.3.b of the permit, Oregon City submitted a TMDL Wasteload Allocation Attainment Assessment (WLAAA) on October 29, 2015. Four hypothetical BMP scenarios were evaluated to determine what types of BMPs and coverage levels would be needed to achieve the established TMDL waste load allocations for bacteria (E. coli). A financial analysis of the cost to construct and maintain these BMPs was included in the evaluation.

The WLAAA results showed that two of the four scenarios could theoretically achieve the bacteria TMDL. As modeled, infiltration rain gardens would need to be installed citywide for all currently untreated areas (both public and private) and all existing areas being treated in wet ponds and dry ponds would require infiltration retrofits.

Given that native soils in Oregon City have limited infiltration rates, achieving the level of infiltration required would not be feasible. Obtaining easements or purchasing property for installation on private land would be problematic. The fiscal obligation required for installation and maintenance would not be feasible with current funding levels and the City's definition of maximum extent practicable.

Results from the WLAAA indicate that achievement of the waste load allocation for E. coli is not practical or feasible with current structural stormwater treatment BMPs given the City's practical and physical constraints and current fiscal abilities. The City continues its work towards reducing pollutant loads and hydromodification impacts by looking for opportunities for new water quality facilities, incorporating treatment measures into transportation and road improvement projects whenever feasible, and investigating retrofit opportunities on City-owned properties.

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 $5,000 per year for the second five years of TMDL implementation towards efforts to enhance riparian vegetation. Table 1 lists how this commitment has been met.

**Table 1**
**City of Oregon City TMDL Implementation Plan Progress Report 2015 – 2016**
**Summary of Strategies to Address Temperature**

| Best Management Practice or Activity | Responsible Division | Commitment/ Implementation Strategy<br>*What will be done in the next five years* | Measurable Goal<br>*Specific ways to implement strategy (Fiscal analysis as needed)* | Performance Measure<br>*How implementation will be demonstrated* | Timeline<br>*When goal will be achieved* | Milestone<br>*Intermediate indicators of progress* | Status<br>*Progress update for reporting period (Gap analysis discussion as needed)* |
|---|---|---|---|---|---|---|---|
| **Public Education** | Oregon City Public Works (OCPW) | Attend regularly scheduled coordination meetings with the Greater Oregon City Watershed Council (GOCWC). | Attend a minimum of one meeting during the implementation period. | Track meetings attended. | Ongoing throughout the cycle. | Receive and review draft meeting agendas. | The OCPW Operations Manager attended two GOCWC meetings during the 2015-2016 reporting period. |
| | | 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. | Ongoing throughout the cycle. | Ensure temperature-related article for spring Trail News. | Temperature-related articles were disseminated by OCPW in the following:<br>• Spring 2016 Trail News<br>• 2016 Annual Water Quality Report<br>See Appendix C of the City's 2015-2016 MS4 NPDES Annual Report for specific details. |
| **Implement Stormwater Design Standards** | OCPW | Implement provisions of Chapters 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 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. | Ongoing throughout the cycle. | N/A | As reported in the 2014-2015 Progress Report, the City's Municipal Code Chapter 13.12 Stormwater Management, the *Stormwater and Grading Design Standards* manual, and the *Erosion and Sediment Control Standards* manual were updated. No modifications were made during this reporting period. |
| **Preservation of Existing Shade** | Planning and OCPW | 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 3 and Title 13. | Track any enforcement actions taken to protect existing shade. | Ongoing throughout the cycle. | N/A | No enforcement actions taken.<br>Nine NROD (Chapter 17.49) applications processed:<br>• Three Type III discretionary applications<br>• Two Type II Natural Resource Overlay District (NROD) applications requiring impact analysis and mitigation<br>• Four Type I NROD exemption applications approved |
| **Planting Activities for Identified Shade Opportunity Areas** | OCPW | 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. *($5,000 allocated annually for planting activities.)* | Track ground truthing activities to refine priority opportunity areas. | Public priority areas by June 2015. | Recruit intern for ground truthing activities. | As reported in the 2014-2015 Progress Report, an intern was hired (7/7/14 – 9/24/14) for ground truthing activities. No intern was recruited during the 2015-2016 reporting period. |
| | | | | Track planting activities for public, high priority areas. | Ongoing throughout the cycle. | Review priority list annually by December 1st; select next area for planting. | Plantings in high priority areas:<br>• MC-9 – 3 red alder ($150) |
| | | | | Track planting activities for other identified shade opportunity areas. | Ongoing throughout the cycle. | Review as planting opportunities arise. | The following low priority site was planted:<br>• SEC-3 – 3 douglas fir ($30) |
| | | | | Track any re-vegetation and maintenance activities required. | Ongoing throughout the cycle. | Evaluate need for re-planting annually by June 30th. | All 77 stormwater quality facilities were evaluated for re-planting within the designated time frame.<br>Re-vegetation and Maintenance Activities: planted 15 trees, 18 plants and shrubs ($250) |