City of Oregon City, Oregon

National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System Discharge Permit

2018–2019 Annual Report

Prepared for the
Oregon Department of Environmental Quality

November 1, 2019

Assisted By:

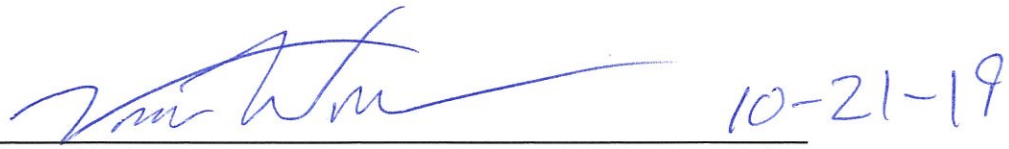
Brown AND Caldwell

CITY OF OREGON CITY

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
MUNICIPAL STORMWATER SYSTEM ANNUAL REPORT

JULY 1, 2018 – JUNE 30, 2019

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.



10-21-19

Vance Walker — Date
Public Works Operations Assistant Director
City of Oregon City

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Table of Contents

List of Tables

List of Appendices

1.0 INTRODUCTION

1.1 NPDES MS4 Permit Background and Permit Renewal

The Oregon Department of Environmental Quality (DEQ) regulates stormwater runoff from the City of Oregon City (City) through the National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) 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 Water Services 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 effective NPDES MS4 permit was issued March 16, 2012, after a multi-year negotiation process with DEQ and an additional year-long delay related to an appeal. The 2012 permit was not appealed, and thus maintains an effective date of March 16, 2012. The permit expired on March 1, 2017, and the City submitted its Permit Renewal Application on February 27, 2017. The Permit Renewal Application required an evaluation of proposed program and Stormwater Management Plan (SWMP) modifications, development of TMDL benchmarks, mapping, a maximum extent practicable (MEP) evaluation, updates to the City's environmental monitoring program, and an evaluation of proposed service area expansions and associated pollutant load estimates. The City's permit is currently in administrative extension, and the renewal date is unknown at this time.

Each co-permittee is required to submit an annual report, summarizing accomplishments and implementation of their individual SWMPs. This annual report documents stormwater management activities from July 1, 2018 to June 30, 2019 in conjunction with the City's 2012 NPDES MS4 permit. Although an updated SWMP was prepared and submitted as part of the Permit Renewal Application, **the City's 2012 SWMP remains the effective NPDES MS4 program document for purposes of this annual report**. During this administrative extension period, the City is continuing to implement its stormwater program in accordance with the 2012 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 NPDES MS4 permit.

Table 1: Summary of the NPDES MS4 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
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.

Per Section 5.5 of the City's Willamette Basin TMDL Implementation Plan, an annual progress report is also to be submitted to DEQ. This TMDL annual report is included in Appendix D.

2.0 ADAPTIVE MANAGEMENT PROCESS IMPLEMENTATION

2.1 Adaptive Management Program

In accordance with the issuance of the City's NPDES MS4 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 5 years, in conjunction with their permit renewal application and updated permit requirements. The City's submitted adaptive management approach is consistent 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 measurable 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 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 measurable goals and tracking measures to the BMP objective, and

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

Additionally, at the end of the permit term, technical investigations and studies completed over the permit term are reviewed and used to help target and identify specific issues that need to be addressed to maintain waterbody health and help formulate BMP activities (measurable goals and tracking measures). During the 2012-2017 permit term, such technical studies included a water quality trends analysis, pollutant load reduction evaluation, hydromodification assessment, and a retrofit assessment.

During the 2016-2017 permit renewal application process, the City, with the assistance of a consultant, reviewed the adaptive management evaluation factors and the studies listed above. This information informed the City's MEP evaluation and proposed SWMP changes submitted as part of the Permit Renewal Application. Proposed program changes were categorized as an organizational change, a removed activity (due to completion), an implementation change (due to identified efficiencies and adjustments to internal processes and procedures), and a change due to consolidation of activities. An updated (2017) SWMP was also included, reflecting refinement of BMPs, measurable goals, and tracking measures, for use in future permit negotiations and reissuance.

2.2 SWMP Updates for the 2018 – 2019 Reporting Year

The 2018-2019 reporting year is the seventh full year in which the City's effective 2012 SWMP has been implemented. For the 2018-2019 permit year, no updates were made to the 2012 SWMP or BMP measurable goals and tracking measures, due to regulatory limitations preventing permit modifications while a permit is in administrative extension. It should be noted that a summary of proposed SWMP modifications was submitted with Oregon City's Permit Renewal Application on February 27, 2017, but those modifications have not been implemented pending reissuance of the permit.

2.3 Monitoring Plan Updates for the 2018 – 2019 Reporting Year

As documented previously, the 2017 Comprehensive Clackamas County Stormwater Monitoring Plan (CCCSMP) is the effective monitoring plan for the city of Oregon City. There have been no updates or modifications to the 2017 CCCSMP.

3.0 SUMMARY OF PROGRAM EXPENDITURES

A summary of the City of Oregon City's revenue and expenditures for the 2018–2019 fiscal year and a projection of the City's revenue and expenditures for the 2019–2020 fiscal year are provided in Table 2, below. Projection of expenditures is considered draft at this time.

Table 2: Summary of Program Expenditures

	Fiscal Year			
	2018 Audited Actual	2019 Unaudited Actual	2020 Adopted Budget	2021 Adopted Budget
Beginning Fund Balance	$ 1,352,382	$ 1,263,035	$ 1,642,549	$ 1,196,495
Stormwater Fee Rates (per EDU per month)	Rate = $9.65 / $9.94 3% rate increase	Rate = $9.94 / $10.24 3% rate increase	Rate = $10.24 / $10.54 3% rate increase	Rate = $10.54 / $10.86 3% rate increase
Revenues				
Charges for Service	2,765,517	2,799,837	2,936,229	3,024,316
Intergovernmental	-	-	-	-
Interest Income	13,731	34,228	30,000	20,000
Miscellaneous Income	-	988	-	-
Erosion Control Permits	41,482	43,714	45,000	45,000
Project Management	29,266	29,214	26,409	26,409
TOTAL Revenues	2,849,995	2,907,981	3,037,638	3,115,725
Expenditures				
Personnel Services	1,114,288	1,086,889	1,210,105	1,269,558
Materials & Services	863,157	849,328	923,587	909,732
Capital Outlay Totals	556,897	273,290	645,000	535,000
Total Transfers	405,000	405,000	705,000	205,000
TOTAL Expenditures	2,939,342	2,614,507	3,483,692	2,919,290
Change in Fund Balance	(89,347)	293,474	(446,054)	196,435
Ending Fund Balance	$ 1,263,035	$ 1,556,509	$ 1,196,495	$ 1,392,930
Capital Outlay - Details				
Operations New Equip. >$5000	$ 2,715	$ 1,250	$ -	$ 45,000
Capital Construction	554,182	272,040	645,000	490,000
	$ 556,897	$ 273,290	$ 645,000	$ 535,000
Transfers - Details				
Transfer to Building Reserve	$ 300,000	$ 300,000	$ 600,000	$ -
Transfer to Equipment Replacement	105,000	105,000	105,000	105,000
Interdept. Transfers	-	-	-	100,000
	$ 405,000	$ 405,000	$ 705,000	$ 205,000

4.0 MONITORING DATA

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

Per the 2004 NPDES MS4 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, was prepared for submittal with the 2006 NPDES Permit Annual Compliance Reports. The CCCSMP 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.

In 2016, the City, in collaboration with other co-permittees, participated in a series of workshops to propose modifications to the CCCSMP due to completion of monitoring obligations under the 2012 NPDES MS4 permit. Modifications reflected completion of some select, one-time monitoring obligations under the 2012 permit and refinement of monitoring locations, parameters, and activities based on information collected over the permit term. Key modifications included the following:

- Inclusion of Oak Lodge Water Services District and the City of Wilsonville instream, stormwater, and biologic monitoring activities
- Removal of mercury and pesticide monitoring activities, as those obligations have been met
- Removal of biochemical oxygen demand (BOD) and total volatile solids (for co-permittees outside of the Tualatin basin) from the analyte list, because of the limited usefulness of the collected data to date
- Adjustment of analytical methods and reporting limits based on consistency with Code of Federal Regulations (CFR) Title 40 and current laboratory capabilities
- Adjustment of monitoring locations to ensure geographic distribution of data and to continue to inform trends analyses
- Inclusion of routine instream sampling, in addition to targeted dry weather/wet weather instream sampling activities

- Removal of Clackamas County Service District #1's (CCSD #1s) geomorphic monitoring activities from the Plan, as physical conditions are evaluated during biologic (macroinvertebrate) monitoring activities
- Minor editorial updates to improve clarity and consistency with current practices

Per Schedule B.2.e of the permit and 7.2 of the CCCSMP, the City and other CCCSMP participants submitted to DEQ a 30-day notice of the proposed CCCSMP modifications for the Department's review and approval on December 16, 2016. As no response was received from DEQ within 30 days, the proposed modifications were deemed approved without written approval. Implementation of the 2017 CCCSMP began July 1, 2017. For this reporting year (2018–2019), **the 2017 CCCSMP is the effective monitoring plan for the City of Oregon City**.

As described in the CCCSMP, the NPDES MS4 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 2018–2019 reporting year included dry weather field screening, as described in the City's SWMP under the BMP 1-2: "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 instream 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 instream and outfall sample collection efforts for this reporting year are provided in Appendix B.

4.2 CCCSMP Updates and Modifications for the 2018–2019 Reporting Year

The 2017-2018 reporting year was the first full year implementing the revised 2017 CCCSMP. There have been no updates or modifications to the 2017 CCCSMP.

In 2018, seven Clackamas County jurisdictions, including the cities of Gladstone, Lake Oswego, Milwaukie, Oregon City, West Linn, Wilsonville, and Oak Lodge participated in biological monitoring as is expected to be required during a future NPDES MS4 permit period.

4.3 Summary of Monitoring Data

In accordance with the 2017 CCCSMP, Oregon City is required to conduct instream and outfall monitoring. Routine instream 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 2018 – 2019 monitoring year, the City of Oregon City collected all required instream samples (four events at six sites). Only two of the three outfall samples (three events at two sites) were collected during the 2018-2019 monitoring year. Samples were unable to be collected due to the lack of late winter/early spring rainfall. The City is committed to collecting additional outfall samples during the 2019-2020 monitoring year (thus collecting four events at each location) to make up for the reduced number of samples collected during the 2018-2019 reporting year. Complete sampling results are summarized in Appendix B. The sampling results presented have been formatted to simplify the data review process.

Table 3: 2018–2019 Oregon City Monitoring Locations and Required Frequencies

Site #	Location	Sample Type	Required Frequency	Routine Sampling
In-Stream Monitoring				
OC010is	Abernethy Creek at 17082 Holly Ln (Holly Ln Bridge)	Grab & Composite	4/year	Dry Weather (2/year) and Wet Weather (2/year)
OC011is	Abernethy Creek at 316 17th St (17th at railroad trestle)	Grab & Composite	4/year	Dry Weather (2/year) and Wet Weather (2/year)
OC012is	Coffee Creek behind 415 S McLoughlin (outfall at Willamette)	Grab & Composite	4/year	Dry Weather (2/year) and Wet Weather (2/year)
OC013is	Park Place Creek behind 13530 Redland Rd	Grab & Composite	4/year	Dry Weather (2/year) and Wet Weather (2/year)
OC014is	Singer Creek at the north end of Singer Creek Park (Linn Ave)	Grab & Composite	4/year	Dry Weather (2/year) and Wet Weather (2/year)
OC015is	Singer Creek 502 7th St (MH - 37138 located on Center St)	Grab & Composite	4/year	Dry Weather (2/year) and Wet Weather (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

** Only two of the three and outfall samples (three events at two sites) were collected during the 2018-2019 monitoring year. Four outfall sampling events will be collected during the 2019-2020 reporting year.

5.0 OVERVIEW OF PLANNING AND LAND USE CHANGES, UGB EXPANSIONS AND NEW DEVELOPMENT ACTIVITIES

5.1 Summary of Land-Use Changes and UGB Expansions

The following land use/ zoning changes and/or annexations were approved by the City between July 1, 2018 and June 30, 2019:

- Zone Changes:
  - None

- Annexations:
  - AN 18-02: 0.75 Acres, 14530 S Maplelane Road

5.2 Summary of Development Activities within the UGB

During the reporting year 2018 – 2019, there were 24 development applications (five of which did not trigger the requirement for stormwater improvements) reviewed and approved for compliance with water quality/water quantity standards. These included detailed development plan (1), site plan and design review (7), subdivisions (8), minor partitions (6), and geologic hazard development (2). The estimated total new and replaced impervious surface area related to development projects that commenced during the reporting year equals 52.8 acres.

There was one public improvement project (CIPs), including water quality and/or flow control projects, for this reporting period. The project was contracted out. Details of that project can be found in Appendix A

6.0 ADDITIONAL ACTIVITIES

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

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

There were seventeen stormwater staff meetings conducted during the 2018 – 2019 reporting period. Dates, topics, and attendees are summarized below in Table 4.

Table 4: Staff Meetings and Training

Date/ Time	Attendees	BMPs/Topics	Items Discussed	Next Steps/ Program Adjustments
10-1-18	Jonathan Archibald, John Lewis, Aleta Froman-Goodrich, Brian Monnin, Eric Hand; Alissa Maxwell and Krista Reininga from Brown and Caldwell (BC)	Stormwater Master Plan	This meeting summary provides background information on the stormwater master plan review process, key discussion items from our comment review meeting on October 1, 2018, and potential next steps to move the Stormwater Master Plan from full draft to the final.	Acknowledge and incorporate recent stormwater work in to the SWMP, review capacity issues, discussion of analysis to be performed by BC and information needed by City
10-29-18	Brian Monnin, Josh Wheeler, Aleta Froman-Goodrich	BMP 8-4	Private Water Quality Facilities (PWQFs). Discuss workflow of PWQF Maintenance Covenant and Access Agreements.	Revised workflow details and structure of PWQF Maintenance Covenant and Access Agreements.
11-29-18	Clackamas Co-Permittees group	PWQFs – BMP 8-4	How the different co-permittees are currently dealing with both permittee owned water quality facilities as well as privately owned water quality facilities	Continue the conversation and discussion including examples of how each entity manages stormwater facilities.
11-29-18	Ron Wierenga, Brian Monnin, Jere Sonne, Curtis Barton, Mallory Ott	Fats, Oils & Greases Program	Discussion of how to implement FOG Programs, including Preferred Pumper Program, city codes and ordinances.	Review topics discussed and city codes. Attend next Preferred Pumper Program Meeting, continue the discussion.
12-3-18	John Lewis, Dan Hepler, Brian Monnin, Kevin Hanks, Jayson Thornberg, Eric Hand, Kim Davis	BMPS 8-3	Discuss goals and objectives of Oregon City's SWPPS. Locations, inspections, maps, asset management, old facilities, new facilities, staff updates	Update staff contacts. Update survey sites. Staff signup sheet for program review.
12-31-18	Brian Monnin, Eric Hand	TMDL Implementation Plan	Discuss TMDL 5 year review and effectiveness of current Implementation Plan. Discuss ideas and goals of upcoming TMDL IP Draft	Submit TMDL Draft Implementation Plan to DEQ
1-14-19	Brian Monnin, Angela Wieland, Mallory Ott	TMDL Implementation Plan Draft	Discuss summary of strategies and measurable goals for Implementation Draft Plan	Update TMDL Implementation Plan
2-20-19	Brian Monnin, Mallory Ott	FOG Workshop	Discussion of FOG Programs, how to start, how to implement, next steps in creating and implementing a FOG program	No further action required.

Table 4: Staff Meetings and Training

Date/ Time	Attendees	BMPs/Topics	Items Discussed	Next Steps/ Program Adjustments
2-28-19	Brian Monnin, Mallory Ott	SWMP 8-4 PWQF site visit at Providence Willamette Falls Campus	Proper maintenance and upkeep of PWQFs on Providence campus	Maintenance and Inspection Forms due annually to OCPW.
3-1-19	Brian Monnin	NCAP Soaking it In Landscaping Event	Talks and presentations on effectiveness of water quality facilities. Hands on field trip discussion on inspecting private water quality storm facilities	No further action required.
3-19-19	Storm/Sani Department, Brian Monnin, Mallory Ott	SWMP 8-4 PWQF Inspection and Maintenance Program	Read and review PWQF Inspection and Maintenance Program.	Staff is aware of SOPs for PWQFs and will inform Storm/Sani manager or Water Quality Coordinator of maintenance issues.
3-20-19	OCPW staff	Hazmat Training	Hazmat Training	Staff is trained in Hazmat
3-25-19	Brian Monnin, Phase I permittees	Phase I MS4 Permittees Renewal ACWA Roundtable Kickoff	Discuss what permittees were going to present to DEQ about their permits. Prepare for meeting with DEQ to discuss permits.	Discuss with DEQ permittees views on their current permits.
5-2-19	Brian Monnin and Clackamas Co-Permittees	NPDES MS4 Permit with specific conversations on PWQFs and Public Outreach and Education	Roundtable discussion of how Co-permittees are working through their Permits. Started a conversation of a regional decant facility.	Ongoing
5-3-19	Brian Monnin, Eric Hand, Pablo Martinez, Ryan Johnson	NPDES MS4 Permit and meet and greet	Discussion of how Oregon City is dealing with their permit. Discussion of how and when DEQ plans on issuing the next permit. Meet and greet for everyone to get to know one another.	Ongoing
5-9-19	Brian Monnin, Mallory Ott and Phase I permittees	Debriefing of NPDES MS4 listening session meeting with DEQ	Roundtable discussion on thoughts of how the meeting went. Discussed next steps on how to communicate with DEQ about pros and cons of our current permit.	Ongoing
5-22-19	Brian Monnin, Mallory Ott, Jared Swartout	SWMP 8-4 PWQF site visit at 950 South End Rd.	Proper maintenance and upkeep of PWQFs at 950 South End Rd.	Maintenance and Inspection Forms due annually to OCPW

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 2018–2019	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. • Conduct actions to remove identified illicit discharges in conjunction with timeframes outlined in OC's NPDES MS4 Permit. • Track and record all identified illicit discharges and how such discharges were removed.	1) Track status of documenting and updating the IDDE SOP. 2) Track the number, location, type of discharge, resolution, and enforcement action for any illicit discharge investigation conducted.	1) The IDDE SOP was updated on 7/29/16 (see BMP 1-2, item 5). 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. • Characterize dry weather flows as permissible, non-permissible, or unknown. • Conduct sampling, analysis, and investigations for non-permissible and unknown dry weather discharges. • Maintain maps of major outfalls and dry weather field screening locations. • Notify the OCPW Operations Manager of all identified illicit discharges and take necessary steps to eliminate them. • Update procedures for dry weather field screening by November 1, 2012.	1) Track the number and location of outfalls inspected annually. 2) Summarize inspection results and track the number and location of outfalls requiring monitoring and/or investigations. 3) Report the outcome and resolution of any investigation activities. 4) Report the outcome and resolution of any code enforcement actions. 5) Track the status of updating standard procedures.	1) Nine outfalls were inspected as part of annual dry weather field screening activities. 2) Outfalls were inspected on 7/18/18. Flow was observed at 5 of the outfalls; all discharges were a trickle and flow were characterized as permissible. 3) N/A 4) N/A 5) On 7/29/16 OC updated the IDDE SOP that includes procedures for conducting dry weather field screening. Priority sites 1 and 2 were relocated to address staff safety concerns. One site was added (site 9) as a result of a reported illicit discharge.	1) Dry weather screening was conducted at the following outfalls: • 99E and 6th Street (manhole 33556): 12-inch • 427 Main Street (manhole 33558): 15-inch • Abernethy Road at Tri-Lett: 15-inch • Clackamas River Drive: 48-inch • Metro Wetlands Pond: 48-inch • Falcon Drive: 30-inch • Berry Hill: 24-inch • Beavercreek at Hwy 213: 24-inch • Behind 1651 Beavercreek Road: 48-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*. • Report all hazardous and non-hazardous spills to DEQ as necessary.	1) Indicate the number of spills reported to OCPW and DEQ. 2) Track responses to reported spills. 3) Indicate sources, causes, and types of discharges resulting from spill activities. 4) Track any changes to the OC *Spill Response Plan*.	1) 5 spills were reported to OCPW during the 2018-2019 reporting period. 2) Responses were appropriate for each spill. See list below. 3) Two spills required DEQ reporting. Three minor spills were of various types. Minor (non-reported) spills resulted primarily from vehicle accidents, mechanical failure, or materials spilled on roadway and had no discharges. • 202 Pearl St.–Oil change pan left near City catch basin. No oil observed in catch basin. Oil change pan with excess oil was pick up an turned over to our Fleet Division for disposal along with other waste oil from Fleet Division. No OERS report filed as oil was contained in oil pan. • 300 Beavercreek Rd., (Benchmade)–Antifreeze dumped in private catch basin. OCPW responded and assisted onsite facilities manager with clean up of antifreeze. No OERS report filed but probably should have been. • 1839 Beavercreek Rd.-Paint spill on roadway. Approximately 1 gallon of paint spilled on roadway. Absorbent material was applied and shoveled up. No DEQ reporting required. • S 2nd St., (Tumwater to High St.)–concrete spill on roadway. Material was shovel up and street swept. No DEQ reporting required. • South End Rd. Hill–Paint spill on roadway. Approximately 2 gallons of paint spilled on roadway. Absorbent material was applied shoveled up. No DEQ reporting required. 4) There were no changes to the OC *Spill Response Plan* during this reporting period.	

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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 2018–2019	Additional detail related to activities conducted
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. • Notify DEQ of any existing or new industrial facilities within OC that may be subject to an industrial stormwater NPDES permit.	Track the number of existing or new facilities subject to a stormwater industrial NPDES permit during the permit term.	The Water Quality Coordinator continued to review all new business license applications to identify activities that could be subject to an industrial stormwater permit. 136 business license applications were reviewed during the 2018-2019 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. • Develop a priority list of industrial/commercial facilities for inspection. • Investigate 25% of OC's manufacturing businesses once during the permit term. • Develop an industrial/commercial inspection procedure by July 1, 2013.	1) Track the number of inspections conducted. 2) Report on inspection results and follow up actions. 3) Report on status of documenting and updating procedures.	1 and 2) Two inspections were conducted during the 2018-2019 reporting period. • Inspection of Summit Woodworking, 13663 S. Holcomb Blvd was conducted on 10-24-18. No issues were noted. Educated owner on SCAP. • Inspection of PDX Custom Woodworking LLC., 1601 Beavercreek Road was conducted on 4-24-19. No issues were noted. 3) Table 2 of the Industrial/Commercial Facility Inspection Program SOP was updated May 2019 to reflect current Oregon City manufacturing-related business license holders. The 2013 Table 2 identified 31 facilities. The updated table identifies 37 manufacturing businesses potentially subject to inspection.	• OC has not hired additional staff to implement the business inspection program. • 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. • OC investigated more than 25% of manufacturing businesses once during the permit term.
Element 3. Construction Site Runoff Control							
BMP 3-1: Implement the Erosion Control Ordinances	●	○	OCPW	• Review erosion control plans for all developments greater than 1,000 sf. • Require erosion and sediment control plans not in compliance with standards to be amended and approved prior to construction. • By November 1, 2014, adopt the Clackamas County *Erosion Control Manual* or revise OC's manual in accordance with the NPDES MS4 permit requirements.	1) Record the number of erosion control plan reviews completed and approved. 2) Track the number of erosion control permits issued annually. 3) Report on the status of adopting the Clackamas manual or updating OC's manual.	1) 167 erosion control plans were reviewed and approved. 2) 167 erosion control permits were issued. 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. • Continue to offer discounts on erosion control permits to contractors completing the Erosion Control Certification Program.	Track the number of contractors receiving a discount on erosion control permit fees.	Two 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. • Conduct appropriate enforcement activities for erosion control violations.	1) Record the number of erosion control inspections conducted annually. 2) Report the number of notices of non-compliance issued during inspections.	1) A total of 325 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). 2 16 notices of non-compliance were issued. Two stop work orders were issued.	1) The total number of inspections are comprised of: • 162 initial site visits, Inspection 1 • 91 random inspections, Inspection 2 • 72 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. • Participate in the Regional Coalition for Clean Rivers and Streams (Coalition). • Seek out opportunities to partner with other agencies/jurisdictions/organizations to educate and promote watershed health and low impact development. • Periodically install signs near water quality structures and around OC promoting water quality. • Sponsor the volunteer catch basin stenciling program. • Distribute an annual water quality report to OC residents.	1) Track the number, types, and topics of public educational materials distributed to the public. 2) Report any large scale public educational campaigns initiated during a given year. 3) Track coordinated public outreach activities with other permittees.	1) The following educational activities were conducted (see Appendix C for details): • A total of eight water quality-related articles were included in Trail News. • OC participated in one special event and promoted a second one on the City website. • The March 2019 utility bill included a message with tips on car washing. • Mailed 15,137 postcards announcing availability of the Annual Water Quality Report on OC's website. • Stormwater banner displayed at City Hall (10/22/18-11/2/18). 2) Continued participation in regional Stormdrain Cleaning Assistance Program (SCAP) in 2018-19 permit year. 3) Coordinated efforts included: • Continued to sponsor the "Water…Do Your Part" campaign via KOIN media outlets. • Continued participation in the Coalition for Clean Rivers and Streams. • 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 381 catch basins were either stenciled with the message "Dump No Waste–Drains to Stream" or had "No Dumping, Drains to Waterway" markers installed.

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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 2018–2019	Additional detail related to activities conducted
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.	Report on activities conducted annually.	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. • Ensure licensed staff attends annual refresher courses.	1) Track the number of employees licensed for spraying activities. 2) Report number of employees that attended initial or refresher training.	1) Staff licensed for spraying activities: OCPW = 7 Parks Dept. = 7 2) Three OCPW staff and seven Parks Department staff attended refresher training classes during the reporting period.	Annual refresher training is not required. OCPW and Parks Department 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. • Coordinate annual training and refresher courses for staff initially responding to spills using OSHA hazardous materials educational resources.	Track spill-related training and education.	Spill response training for OCPW staff was conducted on March 20, 2019.	
BMP 4-5: Ensure Municipal Staff Training in Stormwater Pollution Prevention	○	○	OCPW	• Conduct municipal training for employees associated with stormwater management in OC. • Coordinate with other Clackamas County co-permittees regarding regional water quality efforts. • Participate in training and advisory committee opportunities available through state and local agencies and groups. • Conduct regular stormwater staff meetings once or twice a year.	1) Track the number of employees receiving training in stormwater management annually. 2) Track OC staff participation in groups, committees, and organizations relevant to stormwater quality management. 3) Track regular stormwater staff meetings and staff attendance at those meetings.	1) OCPW Employees receiving training in stormwater management: • Five employees attended APWA Conferences 10/15/18-10/18/18) • Five employees attended Urban Pest Management/IPM training (2/6/19) • One employee attended Erosion Control and Stormwater Management (1/29/19) • One employee attended ACWA Stormwater Summit (5/8/19) 2) OC staff participates in the following groups and organizations: • ACWA-active participant in the ACWA Stormwater committee and Phase I Stormwater subcommittee • Continued collaboration with other co-permittees on Comprehensive Clackamas Stormwater Monitoring Program • Greater Oregon City Watershed Council • Clackamas County Water Education Team • Regional Coalition for Clean Rivers and Streams 3) There were 17 stormwater staff meetings conducted during the 2018-2019 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. 2) Track the number, type, and drainage area of treatment facilities constructed annually.	1) Twenty-four development applications (five of which did not require stormwater improvements) were reviewed and approved for compliance with water quality/water quantity standards. For applications that proceed to the construction phase, constructed treatment facilities will be noted in the appropriate reporting period. 2) The following were constructed and placed in operation during the reporting period of 7/1/18 through 6/30/19: 23 Private Raingardens, 3 Public Detention Ponds, 1 Public Stormwater Planter, numerous roadside planters • Total drainage area = 66 acres	2) Details of treatment facility construction: • TP 15-06–Hunter Hills Subdivision : 11 Private Raingardens on 11 single family subdivision lots • TP 16-01–Abernethy Landing Subdivision : 92 lot subdivision with roadside planters and a 23,402 Public Stormwater Management Facility • TP 17-03–Wheeler Farms Subdivision : 77 lot subdivision with roadside planters and a 29,664 sf Public Stormwater Management Facility • TP 17-05–John Jeffrey Estates Subdivision : 8 lot subdivision with 1 Public Landscape Planter and 8 Private Raingardens • TP 17-07–Lindsay Anne Too Estates Subdivision : 28 lot subdivision with roadside planters and a 13,906 Public Stormwater Management Facility • SP 17-40–Clackamas Fire District Station 16–2 Private Raingardens, 1 Private Stormwater Swale, 1 Private Detention Pond • CP 18-01–Clackamas County Community College, Dejardin Hall : 2 Private Raingardens Under Construction but not yet complete at the end of the permit term: • Oregon City Police Station (GLUA 19-00011)–Private Contech Detention Chambers • Holcomb Plaza Apartments (SP 15-13)–256 ft of PRIVATE 42" HDPE Pipe • Lazy Creek Lane Subdivision (TP 16-02)–5 lot subdivision with PRIVATE bioswales and raingardens • 19851 S Leland Road (MP 17-03)–3 lot minor partition–a 1,150 sf raingarden–PRIVATELY maintained

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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 2018–2019	Additional detail related to activities conducted
							• Hillock Heights Subdivision (TP 17-01)–8 lot subdivision with a 3,669 sf PUBLIC stormwater facility • Laurel Ridge Subdivision (TP 17-06)–6 lot subdivision with roadside planters and PRIVATE raingardens • 314 Pleasant Avenue Apartments (SP 17-119)–PRIVATE 2,000 sf raingarden • Canemah Cottages (SP 17-145)–7 PRIVATE stormwater planters and a PRIVATE 1,089 cf underground detention system • Optimize Technologies (SP 17-165)–PRIVATE 1,389 SF raingarden • Derusha Partition (MP 18-02)–PUBLIC enhanced 1,245 sf drainage swale • AFC Clinic (SP 18-42)–No Stormwater Improvements required due to PRIVATE pervious pavement
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 NPDES MS4 permit language. • 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. • 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 NPDES MS4 permit. 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 NPDES MS4 permit language. The update prioritizes the use of LID and GI to the maximum extent practicable and addresses flow duration. 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. No modifications were adopted during this reporting period.	
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. 2) Estimate the miles of streets swept per year. 3) Track volume of debris removed.	1) 11.7 city-wide sweeps were conducted for this reporting period. One sweep was in progress at the end of the permit term. 2) During the 2018-2019 reporting period, 8,472 miles of roadway were swept. 3) 3,366 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. • Applicators will complete spray reports for the application of chemicals.	Track any program changes regarding chemical application practices used by OC.	Both city and contracted chemical applicators comply with 2300-A, pesticide general permit requirements. Pesticide applications are kept at least 3 ft 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. • By July 1, 2013, identify whether there is a need for additional strategies to minimize discharge from these facilities.	Track updates to strategies used to minimize pollutant discharge from municipal waste storage facilities	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. The SWPPS was updated during the 2017-2018 reporting period to reflect these changes.	OCPW purchased 13895 Fir Street for the future home of OCPW Complex. The Fir Complex was added to the current facilities list and is now being monitored quarterly.
BMP 7-4: Control Infiltration and Cross Connections to the City's Stormwater Conveyance System	●		OCPW	• Review new and redevelopment for possible cross-connections. • Eliminate cross connections upon identification.	Report whether any cross connections were discovered and describe follow up activities.	One cross-connection was discovered and corrected during this reporting period. • 1016 6th St.–Existing cross-connection discovered via routine storm video inspection. Corrections made within 5 days of discovery.	• Dye tests are performed by OCPW upon request from plumbing inspector if there are questions regarding sewer connections. • Routine storm sewer video inspection continues, and cross-connections are repaired when identified.

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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 2018–2019**	**Additional detail related to activities conducted**
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. • As applicable, provide educational information to Clackamas Fire District #1 by November 1, 2012.	Track contacts made with Clackamas Fire District #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 Implement Capital Projects for Stormwater Quality Enhancement	●	●	OCPW	• The *Citywide Master Plan* is planned to be updated and adopted December 2019. • Prioritize CIPs by funding availability and water quality/flood control benefit. • Update maps to include location and drainage area of any new stormwater quality CIPs.	1) Track master planning activities. 2) Track number and cost of major (water quality) CIP projects and discuss added benefit. 3) Map the location and drainage area of water quality related CIPs.	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, 2017-2018, and 2018-19 fiscal years. The *Oregon City Stormwater Master Plan* is planned to be adopted 12/19. 2) A total of one water quality-related CIP projects was constructed during this reporting period for a total cost of $523,000. 3) Mapping: The CIP projects have been mapped.	2) Following are details of the CIP project completed during this reporting period: • 15th St. Stormwater Repair Project CI 17-09–two sumped catch basins and 111 ft of new 36 in. pipe, replacing an old 21 in. pipe ($523,000); improvements replaced under capacity and poor condition stormwater pipe conveyance system
Element 8. Stormwater Management Facilities Operation and Maintenance							
BMP 8-1: Conduct Stormwater Conveyance System Cleaning and Maintenance	●	●	OCPW	• Maintain, repair, and/or replace conveyance system components when needed, based on ongoing inspections. • Update the stormwater system map when discrepancies are found.	Estimation of the volume of debris removed per year during public conveyance system cleaning activities (in conjunction with BMP 8-2).	See BMP 8-2.	
BMP 8-2: Conduct Catch Basin Cleaning and Maintenance	●	●	OCPW	• Inspect at least 33% of the public catch basins annually. • Schedule the repair, and replacement of catch basins as needed, based on inspections. • Update the stormwater system map when discrepancies are found.	1) Track the percentage of total public catch basins inspected and/or maintained annually. 2) Track the volume of sediment removed during cleaning activities conducted annually (also includes volume from BMP 8-1). 3) Track the number of catch basin replacements annually. 4) Track the number of public catch basins added to OC's catch basin inventory annually.	1) 58% of public catch basins were maintained during this reporting period. 2) 272 cubic yards of sediment were removed (includes sediment from pipes, culverts, manholes, open channels, and catch basins). 3) Two catch basins were replaced. Two catch basins repaired. 4) 74 catch basins were added to OC's inventory.	58% = 2,556 public catch basins
BMP 8-3: Public Structural Control Facility Cleaning and Maintenance	●	●	OCPW	• Inspect and maintain public structural control facilities in accordance with documented frequencies and procedures. • Update the public structural control facility inventory as needed. • 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. 2) Track the volume of sediment removed during cleaning. 3) Track changes to the public structural control facility inventory as needed.	1) 289 public structural facilities and 23,228 sf of bioswale were inspected during the reporting period. See the next column for maintenance details. 2) 34 cubic yards of sediment were removed during maintenance/cleaning. 3) Additional public structural facilities added to inventory: • Added four stormwater quality ponds, 360 sf of bioswale. 76 pollution control/flow control manholes to the inventory during the reporting period.	1) The following public structural facilities were inspected and maintained during the reporting period: • ponds = 89 inspected; 89 maintained • bioswales = 23,228 sf maintained. • rain gardens = 3 inspected; 3 maintained • detention pipes = 27 inspected; 26 cleaned • water quality vaults = 4 inspected; no maintenance required • pollution control/flow control manholes = 166 inspected; 69 cleaned
BMP 8-4: Private Structural Control Facility Cleaning and Maintenance	●	●	OCPW	• Require new private water quality facilities to submit maintenance agreements to OC. • Compile an inventory of existing private structural water quality facilities and work to collect maintenance agreements for these by July 1, 2013. • 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. 2) Track progress related to the inventory and mapping of existing private structural facilities. 3) Track the status of updating the inventory and map of private water quality facilities. 4) Track the status of developing procedures in accordance with permit requirements.	1) OC continues to require maintenance agreements for private water quality facilities. Four maintenance agreements were recorded during this reporting period. 2) Files have been reviewed for existing private structural facilities. An inventory list has been created. 3) Initial mapping is complete; refinements ongoing. 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.	1) The following are details for the newly recorded private water quality facilities: • TP 15-06–Hunter Hills Subdivision: 11 Private Raingardens on 11 single family subdivision lots • TP 17-05–John Jeffrey Estates Subdivision: 8 lot subdivision with 1 Public Landscape Planter and 8 Private Raingardens on 8 single family subdivision lots • SP 17-40–Clackamas Fire District Station 16–2 Private Raingardens, 1 Private Stormwater Swale, 1 Private Detention Pond • CP 18-01–Clackamas County Community College, Dejardin Hall : 2 Private Raingardens

Appendix B

Oregon City Monitoring Data

Outfall Monitoring - Oregon City 2018 - 2019
Location - Oregon City Shopping Center
Sample Site # OC006
Stream Name - Clackamas River
Land Use - Commercial

		Results					
		Composite Wet Weather	Composite Wet Weather	Statistics			
Analysis	Units	11/28/2018	2/11/2019	High	Low	Mean	Notes
Hardness	mg/L	32.0	40.0	**40.0**	**32.0**	**36.0**	
Total Dissolved Solids	mg/L	3.00	15.0	**15.0**	**3.00**	**9.0**	
Total Suspended Solids	mg/L	20	26	**26**	**20**	**23**	
Copper	mg/L	0.00689	0.00745	**0.00745**	**0.00689**	**0.00717**	
Lead	mg/L	0.00633	0.00557	**0.00633**	**0.00557**	**0.00595**	
Zinc	mg/L	0.0521	0.0593	**0.0593**	**0.0521**	**0.0557**	
Nitrate-Nitrite	mg/L	0.1185	ND	**0.1185**	**ND**	**0.0868**	(2)
Orthophosphate as P	mg/L	ND	ND	**ND**	**ND**	**ND**	(2)
Phosphorus	mg/L	0.10	0.18	**0.18**	**0.10**	**0.14**	
Ammonia as N	mg/L	ND	ND	**ND**	**ND**	**ND**	(2)
Dissolved Oxygen - Winkler	mg/L	9.8	NM	**9.8**	**9.8**	**9.8**	(1) (2)
E. coli - Colilert	MPN/100mL	1414	84	**1414**	**84**	**749**	(3) (4)
Dissolved Copper	mg/L	0.00469	0.00256	**0.00469**	**0.00256**	**0.00363**	
Dissolved Lead	mg/L	0.00024	ND	**0.00024**	**ND**	**0.00017**	(2)
Dissolved Zinc	mg/L	0.0307	0.0373	**0.0373**	**0.0307**	**0.0340**	
Temperature - Field	°C	10.4	5.7	**10.4**	**5.7**	**8.1**	
Dissolved Oxygen - Field	mg/L	10.53	12.16	**12.16**	**10.53**	**11.35**	
Dissolved Oxygen - Field	% Saturation	94.4	96.9	**96.9**	**94.4**	**95.7**	
pH - Field	Std Units	7.20	7.06	**7.20**	**7.06**	**7.13**	
Conductivity - Field	µS/cm	24.9	71.8	**71.8**	**24.9**	**48.4**	
Storm Event Rainfall	Inches	0.87	0.64	**0.87**	**0.64**	**0.76**	(5)

Notes:

(1) Dissolved Oxygen (Winker Method) samples are taken once per sampling event as QA/QC for eletronic meter.

(2) An "ND" designation is understood to be "less than the lower reporting limit " and treated as 1/2 the detection limit 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 2018 - 2019 Location - Clackamette Cove Sample Site # OC007 Stream Name - Clackamas River Land Use - Industrial							
		Results					
		Composite Wet Weather	Composite Wet Weather	Statistics			
Analysis	Units	11/28/2018	2/11/2019	High	Low	Mean	Notes
Hardness	mg/L	80.0	124	**124**	**80**	**102**	
Total Dissolved Solids	mg/L	80.0	93.0	**93.0**	**80.0**	**86.5**	
Total Suspended Solids	mg/L	14	17	**17**	**14**	**16**	
Copper	mg/L	0.0102	0.00612	**0.0102**	**0.00612**	**0.00816**	
Lead	mg/L	0.00872	0.00266	**0.00872**	**0.00266**	**0.00569**	
Zinc	mg/L	0.0522	0.0667	**0.0667**	**0.0522**	**0.0595**	
Nitrate-Nitrite	mg/L	0.665	ND	**0.665**	**ND**	**0.36**	(2)
Orthophosphate as P	mg/L	ND	ND	**ND**	**ND**	**ND**	(2)
Phosphorus	mg/L	0.18	0.15	**0.18**	**0.15**	**0.17**	
Ammonia as N	mg/L	ND	ND	**ND**	**ND**	**ND**	(2)
Dissolved Oxygen - Winkler	mg/L	NM	NM	**NM**	**NM**	**NM**	(1) (2)
E. coli - Colilert	MPN/100mL	>2,420	613	**>2420**	**613**	**1516**	(3) (4)
Dissolved Copper	mg/L	0.00453	0.00207	**0.00453**	**0.00207**	**0.00330**	
Dissolved Lead	mg/L	0.00048	ND	**0.00048**	**ND**	**0.00029**	(2)
Dissolved Zinc	mg/L	0.0340	0.0504	**0.0504**	**0.0340**	**0.0422**	
Temperature - Field	°C	10.7	4.6	**10.7**	**4.6**	**7.7**	
Dissolved Oxygen - Field	mg/L	7.14	8.05	**8.05**	**7.14**	**7.60**	
Dissolved Oxygen - Field	% Saturation	64.4	62.2	**64.4**	**62.2**	**63.3**	
pH - Field	Std Units	6.98	7.14	**7.14**	**6.98**	**7.06**	
Conductivity - Field	µS/cm	188.9	323	**323**	**188.9**	**256**	
Storm Event Rainfall	Inches	0.87	0.64	**0.87**	**0.64**	**0.76**	(5)

Notes:

(1) Dissolved Oxygen (Winker Method) samples are taken once per sampling event as QA/QC for eletronic meter.

(2) An "ND" designation is understood to be "less than the lower reporting limit " and treated as 1/2 the detection limit 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 2018 - 2019 Location - 17082 Holly Ln (Holly Ln Bridge) Sample Site # OC010 Stream Name - Abernethy Creek (Upstream)									
		Results							
		Grab Sample Dry Weather	Grab Sample Wet Weather	Composite Sample Wet Weather	Grab Sample Dry Weather	Statistics			
Analysis	Units	8/9/2018	11/5/2018	2/11/2019	6/10/2019	High	Low	Mean	Notes
Hardness	mg/L	52	54.0	40.0	50.0	**54.0**	**40.0**	**49.0**	
Total Dissolved Solids	mg/L	108	79.0	69.0	75.0	**108**	**69.0**	**82.8**	
Total Suspended Solids	mg/L	4	17	43	5	**43**	**4**	**17**	
Copper	mg/L	0.00159	0.00384	0.00502	0.00223	**0.00502**	**0.00159**	**0.00317**	
Lead	mg/L	0.00495	0.00538	0.00188	0.000257	**0.00538**	**0.000257**	**0.00312**	
Zinc	mg/L	0.00438	0.0166	0.00929	0.00820	**0.0166**	**0.00438**	**0.00962**	
Nitrate-Nitrite	mg/L	0.225	0.214	0.9692	0.334	**0.9692**	**0.214**	**0.4356**	
Orthophosphate as P	mg/L	ND	0.107	ND	ND	**0.107**	**ND**	**0.064**	(2)
Phosphorus	mg/L	0.11	ND	0.10	0.20	**0.20**	**ND**	**0.11**	(2)
Ammonia as N	mg/L	ND	ND	ND	ND	**ND**	**ND**	**ND**	(2)
Dissolved Oxygen - Winkler	mg/L	7.2	NM	NM	NM	**7.2**	**7.2**	**7.2**	(1) (2)
E. coli - Colilert	MPN/100mL	222	58	162	88	**222**	**58**	**133**	(3)
Dissolved Copper	mg/L	0.00377	0.00129	0.00103	ND	**0.00377**	**ND**	**0.00165**	(2)
Dissolved Lead	mg/L	ND	ND	ND	ND	**ND**	**ND**	**ND**	(2)
Dissolved Zinc	mg/L	0.0116	ND	0.00750	0.0110	**0.0116**	**ND**	**0.0080**	(2)
Temperature - Field	°C	19.9	12.0	4.9	16.8	**19.9**	**4.9**	**13.4**	
Dissolved Oxygen - Field	mg/L	7.42	9.28	12.27	9.66	**12.27**	**7.42**	**9.66**	
Dissolved Oxygen - Field	% Saturation	81.4	85.5	96.0	98.9	**98.9**	**81.4**	**90.5**	
pH - Field	Std Units	7.77	7.58	7.59	7.73	**7.77**	**7.58**	**7.67**	
Conductivity - Field	µS/cm	136.6	116.6	64.0	97.9	**136.6**	**64.0**	**103.8**	
Storm Event Rainfall	Inches	0.00	0.00	0.64	0.00	**0.64**	**0.00**	**0.16**	(5)

Notes:

(1) Dissolved Oxygen (Winker Method) samples are taken once per sampling event as QA/QC for eletronic meter.

(2) An "ND" designation is understood to be "less than the lower reporting limit " and treated as 1/2 the detection limit 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 2018 - 2019
Location - 316 17th St at Railroad Trestle
Sample Site # OC011
Stream Name - Abernethy Creek (Downstream)

		Results							
		Grab Sample Dry Weather	Grab Sample Wet Weather	Composite Sample Wet Weather	Grab Sample Dry Weather	Statistics			
Analysis	Units	8/9/2018	11/5/2018	2/11/2019	6/10/2019	High	Low	Mean	Notes
Hardness	mg/L	86	56.0	36.0	60.0	**86**	**36.0**	**59.5**	
Total Dissolved Solids	mg/L	206	93.0	71.0	107	**206**	**71.0**	**119.3**	
Total Suspended Solids	mg/L	2	5	65	6	**65**	**2**	**20**	
Copper	mg/L	0.00182	0.00342	0.00692	0.00146	**0.00692**	**0.00146**	**0.00341**	
Lead	mg/L	0.0053	0.00320	0.00185	0.000276	**0.0053**	**0.000276**	**0.00266**	
Zinc	mg/L	0.00528	0.0138	0.0173	0.00719	**0.0173**	**0.00528**	**0.01089**	
Nitrate-Nitrite	mg/L	0.211	0.232	0.864	0.324	**0.864**	**0.211**	**0.408**	
Orthophosphate as P	mg/L	0.157	ND	ND	ND	**0.157**	**ND**	**0.077**	(2)
Phosphorus	mg/L	0.1	ND	0.21	0.19	**0.21**	**ND**	**0.13**	(2)
Ammonia as N	mg/L	ND	ND	ND	ND	**ND**	**ND**	**ND**	(2)
Dissolved Oxygen - Winkler	mg/L	NM	7.5	NM	7.4	**7.5**	**ND**	**7.45**	(1) (2)
E. coli - Colilert	MPN/100mL	326	65	186	109	**326**	**65**	**172**	(3)
Dissolved Copper	mg/L	0.00442	0.00169	0.00142	ND	**0.00442**	**ND**	**0.00201**	(2)
Dissolved Lead	mg/L	ND	ND	ND	ND	**ND**	**ND**	**ND**	(2)
Dissolved Zinc	mg/L	0.0137	0.0065	0.00936	0.0128	**0.0137**	**0.0065**	**0.0106**	
Temperature - Field	°C	21.2	12.2	4.6	16.5	**21.2**	**4.6**	**13.6**	
Dissolved Oxygen - Field	mg/L	7.16	8.91	12.32	9.07	**12.32**	**7.16**	**9.37**	
Dissolved Oxygen - Field	% Saturation	80.5	82.1	95.5	91.2	**95.5**	**80.5**	**87.3**	
pH - Field	Std Units	7.69	7.48	7.28	7.59	**7.69**	**7.28**	**7.51**	
Conductivity - Field	µS/cm	307	127.3	77.1	145.6	**307**	**77.1**	**164**	
Storm Event Rainfall	Inches	0.00	0.00	0.64	0.00	**0.64**	**0.0**	**0.2**	(5)

Notes:

(1) Dissolved Oxygen (Winker Method) samples are taken once per sampling event as QA/QC for eletronic meter.

(2) An "ND" designation is understood to be "less than the lower reporting limit " and treated as 1/2 the detection limit 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 2018 - 2019
Location - Behind 415 S McLoughlin Blvd
Sample Site # OC012
Stream Name - Coffee Creek

Analysis	Units	Results: Grab Sample Dry Weather 8/9/2018	Grab Sample Wet Weather 11/5/2018	Composite Sample Wet Weather 2/11/2019	Grab Sample Dry Weather 6/10/2019	Statistics: High	Low	Mean	Notes
Hardness	mg/L	28	40.0	40.0	42.0	**42.0**	**28.0**	**37.5**	
Total Dissolved Solids	mg/L	70	64.0	25.0	95.0	**95.0**	**25.0**	**63.5**	
Total Suspended Solids	mg/L	ND	4.00	13	2	**13**	**ND**	**5**	(2)
Copper	mg/L	0.00176	0.00253	0.00664	0.00156	**0.00664**	**0.00156**	**0.00312**	
Lead	mg/L	0.0052	0.00361	0.00165	0.000366	**0.0052**	**0.000366**	**0.00271**	
Zinc	mg/L	0.0106	0.0211	0.0281	0.0144	**0.0281**	**0.0106**	**0.0186**	
Nitrate-Nitrite	mg/L	1.46	1.75	1.34	1.93	**1.93**	**1.34**	**1.62**	
Orthophosphate as P	mg/L	ND	ND	ND	ND	**ND**	**ND**	**ND**	(2)
Phosphorus	mg/L	0.06	ND	0.10	0.16	**0.16**	**ND**	**0.09**	(2)
Ammonia as N	mg/L	ND	ND	ND	ND	**ND**	**ND**	**ND**	(2)
Dissolved Oxygen - Winkler	mg/L	NM	NM	NM	NM	**NM**	**NM**	**NM**	(1) (2)
E. coli - Colilert	MPN/100mL	2421	613	649	39	**2421**	**39**	**931**	(3) (4)
Dissolved Copper	mg/L	0.00273	ND	0.00117	ND	**0.00273**	**ND**	**0.00123**	(2)
Dissolved Lead	mg/L	ND	ND	ND	ND	**ND**	**ND**	**ND**	(2)
Dissolved Zinc	mg/L	0.0202	0.00949	0.0183	0.0149	**0.0202**	**0.00949**	**0.0157**	
Temperature - Field	°C	17.7	12.5	6.3	14.10	**17.7**	**6.30**	**12.65**	
Dissolved Oxygen - Field	mg/L	8.85	10.54	12.15	10.32	**12.15**	**8.85**	**10.47**	
Dissolved Oxygen - Field	% Saturation	93.0	98.0	98.7	99.3	**99.3**	**93.0**	**97.3**	
pH - Field	Std Units	7.57	7.64	7.25	7.49	**7.64**	**7.25**	**7.49**	
Conductivity - Field	µS/cm	86.9	85.0	56.6	84.4	**86.9**	**56.6**	**78.2**	
Storm Event Rainfall	Inches	0.00	0.00	0.64	0.00	**0.64**	**0.00**	**0.16**	(5)

Notes:

(1) Dissolved Oxygen (Winker Method) samples are taken once per sampling event as QA/QC for eletronic meter.

(2) An "ND" designation is understood to be "less than the lower reporting limit " and treated as 1/2 the detection limit 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 2018 - 2019
Location - Behind 13530 Redland Rd
Sample Site # OC013
Stream Name - Park Place Creek

		Results							
		Grab Sample Dry Weather	Grab Sample Wet Weather	Composite Sample Wet Weather	Grab Sample Dry Weather	Statistics			
Analysis	Units	8/9/2018	11/5/2018	2/11/2019	6/10/2019	High	Low	Mean	Notes
Hardness	mg/L	114	128	72.0	126	**128.0**	**72.0**	**110.0**	
Total Dissolved Solids	mg/L	203	179	97.0	198	**203**	**97.0**	**169**	
Total Suspended Solids	mg/L	3	5.00	29	11	**29**	**3**	**12**	
Copper	mg/L	0.00135	0.00287	0.00594	0.00146	**0.00594**	**0.00135**	**0.00291**	
Lead	mg/L	0.00476	0.00362	0.00183	0.000216	**0.00476**	**0.000216**	**0.00261**	
Zinc	mg/L	0.00585	0.0196	0.0251	0.0120	**0.0251**	**0.00585**	**0.0156**	
Nitrate-Nitrite	mg/L	0.262	1.0444	0.8218	0.5572	**1.0444**	**0.262**	**0.6714**	
Orthophosphate as P	mg/L	0.115	0.257	ND	ND	**0.257**	**ND**	**0.343**	(2)
Phosphorus	mg/L	0.06	0.06	0.18	0.21	**0.21**	**0.06**	**0.13**	
Ammonia as N	mg/L	ND	ND	0.2	0.5	**0.50**	**ND**	**0.2**	(2)
Dissolved Oxygen - Winkler	mg/L	NM	NM	8.3	NM	**8.3**	**8.3**	**8.3**	(1) (2)
E. coli - Colilert	MPN/100mL	178	28	167	138	**178**	**28**	**128**	(3)
Dissolved Copper	mg/L	0.00287	0.00168	0.00199	ND	**0.00287**	**ND**	**0.00176**	(2)
Dissolved Lead	mg/L	ND	ND	ND	ND	**ND**	**ND**	**ND**	(2)
Dissolved Zinc	mg/L	0.0116	0.00582	0.0186	0.0193	**0.0193**	**0.00582**	**0.0138**	
Temperature - Field	°C	17.4	12.5	5.2	17.0	**17.4**	**5.2**	**13.0**	
Dissolved Oxygen - Field	mg/L	4.78	5.55	10.42	5.29	**10.42**	**4.78**	**6.51**	
Dissolved Oxygen - Field	% Saturation	49.9	51.6	82.1	53.0	**82.1**	**49.9**	**59.2**	
pH - Field	Std Units	7.11	6.89	6.93	7.07	**7.11**	**6.89**	**7.00**	
Conductivity - Field	µS/cm	290	262	156.9	308	**308**	**156.9**	**254**	
Storm Event Rainfall	Inches	0.00	0.00	0.64	0.00	**0.64**	**0.00**	**0.16**	(5)

Notes:

(1) Dissolved Oxygen (Winker Method) samples are taken once per sampling event as QA/QC for eletronic meter.

(2) An "ND" designation is understood to be "less than the lower reporting limit " and treated as 1/2 the detection limit 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 2018 - 2019 Location - North end of Singer Creek Park Sample Site # OC014 Stream Name - Singer Creek (Upstream)									
		Results							
		Grab Sample Dry Weather	Grab Sample Wet Weather	Composite Sample Wet Weather	Grab Sample Dry Weather	Statistics			
Analysis	Units	8/9/2018	11/5/2018	2/11/2019	6/10/2019	High	Low	Mean	Notes
Hardness	mg/L	34	48.0	42.0	36.0	**48.0**	**34**	**40.0**	
Total Dissolved Solids	mg/L	71	72.0	51.0	76.0	**76.0**	**51.0**	**67.5**	
Total Suspended Solids	mg/L	8	40	15	17	**40**	**8**	**20**	
Copper	mg/L	0.00197	0.00969	0.00320	0.0262	**0.0262**	**0.00197**	**0.0103**	
Lead	mg/L	0.00532	0.00483	0.00148	0.000806	**0.00532**	**0.000806**	**0.00311**	
Zinc	mg/L	0.00554	0.0317	0.0106	0.0139	**0.0317**	**0.00554**	**0.0154**	
Nitrate-Nitrite	mg/L	1.29	1.77	1.77	2.14	**2.14**	**1.29**	**1.74**	
Orthophosphate as P	mg/L	ND	ND	ND	ND	**ND**	**ND**	**ND**	(2)
Phosphorus	mg/L	0.06	ND	0.10	0.13	**0.13**	**ND**	**0.08**	(2)
Ammonia as N	mg/L	ND	ND	ND	ND	**ND**	**ND**	**ND**	(2)
Dissolved Oxygen - Winkler	mg/L	NM	NM	NM	NM	**NM**	**NM**	**NM**	(1) (2)
E. coli - Colilert	MPN/100mL	47	86	54	28	**86**	**28**	**54**	(3)
Dissolved Copper	mg/L	0.00243	0.00147	ND	ND	**0.00243**	**ND**	**0.00123**	(2)
Dissolved Lead	mg/L	ND	ND	ND	ND	**ND**	**ND**	**ND**	(2)
Dissolved Zinc	mg/L	0.0108	0.00591	0.0136	0.00785	**0.0136**	**0.00591**	**0.00954**	
Temperature - Field	°C	17.7	11.6	7.2	13.50	**17.7**	**7.2**	**12.5**	
Dissolved Oxygen - Field	mg/L	8.89	10.55	11.67	10.37	**11.67**	**8.89**	**10.37**	
Dissolved Oxygen - Field	% Saturation	94.3	97.0	97.6	98.4	**98.4**	**94.3**	**96.8**	
pH - Field	Std Units	7.70	7.68	7.19	7.53	**7.70**	**7.19**	**7.53**	
Conductivity - Field	µS/cm	95.7	81.7	65.9	84.7	**95.7**	**65.9**	**82.0**	
Storm Event Rainfall	Inches	0.00	0.00	0.64	0.00	**0.64**	**0.00**	**0.16**	(5)

Notes:

(1) Dissolved Oxygen (Winker Method) samples are taken once per sampling event as QA/QC for eletronic meter.

(2) An "ND" designation is understood to be "less than the lower reporting limit " and treated as 1/2 the detection limit 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 2018 - 2019
Location - 502 7th St (Manhole # 37138)
Sample Site # OC015
Stream Name - Singer Creek (Downstream)

		Results							
		Grab Sample Dry Weather	Grab Sample Wet Weather	Composite Sample Wet Weather	Grab Sample Dry Weather	Statistics			
Analysis	Units	8/9/2018	11/5/2018	2/11/2019	6/10/2019	High	Low	Mean	Notes
Hardness	mg/L	34	60.0	40.0	46.0	**60.0**	**34**	**45.0**	
Total Dissolved Solids	mg/L	91	30.0	40.0	53.0	**91**	**30.0**	**54**	
Total Suspended Solids	mg/L	50	7	28	18	**50**	**7**	**26**	
Copper	mg/L	0.0042	0.00407	0.00476	0.00261	**0.00476**	**0.00261**	**0.00391**	
Lead	mg/L	0.00728	0.00371	0.00308	0.00190	**0.00728**	**0.00190**	**0.00399**	
Zinc	mg/L	0.0162	0.0226	0.0283	0.0197	**0.0283**	**0.0162**	**0.0217**	
Nitrate-Nitrite	mg/L	1.1833	1.47	1.37	0.898	**1.47**	**0.898**	**1.23**	
Orthophosphate as P	mg/L	ND	ND	ND	ND	**ND**	**ND**	**ND**	(2)
Phosphorus	mg/L	0.12	ND	0.14	0.18	**0.18**	**ND**	**0.12**	(2)
Ammonia as N	mg/L	ND	ND	ND	ND	**ND**	**ND**	**ND**	(2)
Dissolved Oxygen - Winkler	mg/L	NM	NM	NM	NM	**NM**	**NM**	**NM**	(1) (2)
E. coli - Colilert	MPN/100mL	2421	1733	727	5	**2421**	**5**	**1222**	(3) (4)
Dissolved Copper	mg/L	0.00245	0.00144	0.00140	0.00100	**0.00245**	**0.00100**	**0.00157**	
Dissolved Lead	mg/L	ND	ND	ND	ND	**ND**	**ND**	**ND**	(2)
Dissolved Zinc	mg/L	0.0112	0.00629	0.0177	0.0159	**0.0177**	**0.00629**	**0.01277**	
Temperature - Field	°C	18.8	12.4	6.5	16.3	**18.8**	**6.5**	**13.5**	
Dissolved Oxygen - Field	mg/L	8.94	10.55	12.01	9.98	**12.01**	**8.94**	**10.37**	
Dissolved Oxygen - Field	% Saturation	96.4	98.3	98.3	100.4	**100.4**	**96.4**	**98.4**	
pH - Field	Std Units	7.74	7.67	7.00	7.67	**7.74**	**7.00**	**7.52**	
Conductivity - Field	µS/cm	116.8	97.5	74.4	95.3	**116.8**	**74.4**	**96.0**	
Storm Event Rainfall	Inches	0.00	0.00	0.64	0.00	**0.64**	**0.00**	**0.16**	(5)

Notes:

(1) Dissolved Oxygen (Winker Method) samples are taken once per sampling event as QA/QC for eletronic meter.

(2) An "ND" designation is understood to be "less than the lower reporting limit " and treated as 1/2 the detection limit 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, 2018 – June 30, 2019

Summary of Activities

Date	Event	Location	Contact Total	Program/Subject
8/6/18	Trail News – Autumn	NA	All OC residents; available on website	Only Rain Down the Drain
10/22/18 to 11/2/18	Stormwater Banner Display at City Hall	625 Center St Oregon City OR	Visitors & staff at City Hall	Display featuring Oregon City's major streams; tips to improve water quality
11/5/18	Trail News – Winter	NA	All OC residents; available on website	OC Wastewater/Stormwater CCTV, Clear Storm Drains Today!, SCAP Saves Catch Basin Owners $$
2/13/19	Trail News – Spring	NA	All OC residents: available on website	Attn: Mobile Carpet Cleaners, Help Us Improve Water Quality
3/19/19	14th Annual Celebrating Water Event	Clackamas Community College	450*	Two staff members provided stormwater awareness display
4/29/19	Trail News – Summer	NA	All OC residents: available on website	Stormwater Master Plan Update, Attn Humans, Flushable wipes
3/31/19	Message on Utility Bill	N/A	Utility bill recipients	Soap up your car, not your river
4/18/19	Annual Water Quality Report	N/A	15,137**, available on city website	Water Quality information
2018-2019	KOIN Public Service Announcements	N/A	Metro area	Television & web information about water quality
2018-2019	Regional Coalition for Clean Rivers & Streams	N/A	Metro area	Pollution prevention messages via website and social media
2018-2019	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

* Fifteen 4th and 5th grade classes from six Clackamas County Schools – 450 students, 90 chaperones, and 32 teachers.

** 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

The following summarizes the messages that were included in public outreach materials.

Trail News Articles

Autumn 2018

Only Rain Down the Storm Drain

- Do not rake or blow leaves into the street
- Clear blocked catch basins
- Call Oregon City Public Works with questions and concerns

Winter 2018 – 2019

Clear Storm Drains Today!

- Clear catch basins in your neighborhood
- Don't blow leaves into street or catch basins

SCAP Saves Catch Basin Owners $$

- Explanation of Stormdrain Cleaning Assistance Program (SCAP)
- Encourages local businesses to sign up for SCAP Program to clean catch basins for nominal fee

Oregon City Wastewater/Stormwater CCTV – A Winning Inspection Team

- Article highlighting the Wastewater/Stormwater CCTY Inspection Team who received the APWA Everyday Heroes Recognition Award

Spring 2019

Help Us Improve Water Quality

- Restore native riparian vegetation along the edges of streams
- Describes TMDL Implementation Plan strategy and how the City will address the need to lower water temperature
- City is seeking partnering opportunities to work with volunteers, environmental groups, education programs and interest groups

Attn: Mobile Carpet Cleaners

- Explanation of regional stormwater regulations and fines
- Proper disposal options
- Things not to do for mobile carpet cleaners

Summer 2019

Stormwater Master Plan Update

- Updating the Stormwater Master Plan is one of the City's obligations under the NPDES MS4 Phase I Permit
- Explanation of what the SWMP is and why we do it

Attention Humans, Attention Animals

- Please clean up after your pets ad

Graphic included with summer 2019 train news article about reducing bacteria levels

Special Events

14th Annual Celebrating Water Event – 3/19/19

Four Oregon City Public Works staff members participated in this annual educational event, held at Clackamas Community College. 450 4th and 5th grade students from 6 schools, 15 classes, with 90 Chaperones and 32 teachers, had the opportunity to learn about water conservation and water quality protection, among other water-related topics. The 2019 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.

Miscellaneous Items

Message on Utility Bill (mailed 3/31/19)

Soap up your car, not your river! When you wash your car in your driveway or on the street, the dirty water runs into a storm drain and into a local river or stream. What's better? Wash your car on the grass or use a commercial car wash. Visit http://theriverstartshere.org/ for more tips.

Annual Water Quality Report – 4/18/19

The 2019 report included the following topics specific to stormwater:

- Clackamas River – Our Drinking Water Source
- Protecting our drinking water source
- Monitoring For Contaminants
- Monitoring and Testing for Cyanotoxins
- Stormwater Management
- 2018 System Improvements Projects
- Pollution prevention suggestions:
    - Lawn and garden care
    - Vehicle care
    - Roof treatments
    - Pressure washing
    - Pet waste
- Lead in drinking water
- Photos/graphics with accompanying captions:
    - Cross Connection Backflow Prevention Program
    - Riparian Health- does a stream flow through your property
    - Photo of "DogiPot" with discussion of the importance of picking up after pets

Beginning on April 17, 2019, 15,137 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.

Photo on 2019 annual water quality report postcard

Stormwater Banner Display at City Hall – 10/22/18 to 11/2/18

Visitors to the Pioneer Center (615 5th St), 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 were highlighted on their website, social media, and television during the 2018-2019 campaign:

- Fall Lawn Care
- Be Rain Ready
- Hot Tub
- RV Waste
- Pet Waste
- Wildlife Garden
- Native Plants
- Pesticides

- Invasives
- Cigarette butts/Littering
- Metro Garden
- Car Washing

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 current campaign – The River Starts Here – visit the Coalition website at http://theriverstartshere.org/.

Appendix D

TMDL Implementation Plan Annual Report

City of Oregon City, Oregon

Willamette River TMDL Implementation Plan
Annual Progress Report
Year 5

November 1, 2019

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 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. In 2018 DEQ called for the 5 Year Review in the 2014 Plan's fourth year of implementation. The 5-year review took the place of the 2017-2018 annual report. The July 1, 2018 – June 30, 2019 reporting year is the fifth year of implementation for the 2014 TMDL Plan. This annual report provides a summary of the City's efforts during this reporting year.

In February 2019, the City provided an updated TMDL Plan (2019 TMDL Plan) to DEQ for review. To date, the City has not received comments or approval from DEQ.

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

Stormwater runoff in the Willamette Valley is not considered a problem with respect to temperature, and therefore, temperature is not addressed under City's NPDES MS4 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 first 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 first TMDL Plan.

Implementation Status

The City's NPDES MS4 permit addresses the Willamette River TMDL requirements for bacteria and mercury. Progress towards implementing BMPs to address bacteria and mercury are summarized in Appendix A of this 2018−2019 NPDES MS4 Annual Report and TMDL Implementation Annual Report.

As required by Schedule D.3.b of the NPDES MS4 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 wasteload allocations for bacteria (*E. coli*). A financial analysis of the cost to construct and maintain these BMPs was included in the evaluation.

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 D-1 of this annual 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 next 5 years (2014 – 2019) of TMDL implementation to enhance riparian vegetation. Table D-1 lists how this commitment has been addressed during the 2018 – 2019 reporting period. In 2018 the City entered a contract with GOCWC to pursue shade planting opportunities outside of Oregon City's jurisdictional boundaries. The City has committed and additional $5,000 annually towards the partnership with GOCWC.

Table D-1:
City of Oregon City TMDL Implementation Plan Progress Report 2018 – 2019
Summary of Strategies to Address Temperature

Best Management Practice or Activity	Responsible Division	Commitment/ Implementation Strategy *What will be done in the next 5 years*	Measurable Goal *Specific ways to implement strategy (Fiscal analysis as needed)*	Performance Measure *How implementation will be demonstrated*	Timeline *When goal will be achieved*	Milestone *Intermediate indicators of progress*	Status *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.	OCPW Water Quality staff attended ten GOCWC meetings during the 2018-2019 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: • Spring 2019 Trail News • 2018 Annual Water Quality Report See Appendix C of the City's 2018-2019 NPDES MS4 Annual Report for 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. The City has been working on small modifications to the existing standards, but no modifications were adopted 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. Nine NROD (Chapter 17.49) applications processed:
							• One City-approved enhancement project - Abernethy Park
							• Two City approved NROD exemptions in response to emergencies:
							  ○ Public Works Vance Street Tree Removal
							  ○ Public Works Hazel Grove Sewer Replacement
							• Six Type I Exemptions within NROD:
							  ○ NR 18-03, NR 18-04, NROD 18-05, NROD 19-01, NROD 19-04, NROD 19-05
							• Four Type II-III discretionary applications
							  ○ NR 18-07, NR 18-11
							• NR 18-08, NROD 18-10

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 2018-2019 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.	No high priority areas were planted during this reporting period.
				Track planting activities for other identified shade opportunity areas.	Ongoing throughout the cycle.	Review as planting opportunities arise.	In partnership with GOCWC, the following low priority sites were cleared of invasives in preparation for fall plantings: • 17033 S Holly Lane • 17082 S Holly Lane • 17033 S Anchor Way The following stream enhancement project was completed as part of a hazard tree removal project at 19700 Falcon Dr. near site CC-21. • 15 Choke Cherry • 13 Vine Maple • 10 Crabapple • 15 Cascara • 305 native shrubs **Total Cost** ($625)
				Track any re-vegetation and maintenance activities required.	Ongoing throughout the cycle.	Evaluate need for re-planting annually by June 30th.	All 89 stormwater quality facilities and 23,228 sq. ft. of swales were evaluated for re-planting within the designated time frame. Re-vegetation and Maintenance Activities: planted 97 native plants and grasses ($350)