



City of Wilsonville, Oregon

NPDES MS4 Permit and
Willamette River TMDL Implementation Plan
Annual Report

2020–2021 Reporting Year

Prepared for the
Oregon Department of Environmental Quality

December 1, 2021

CITY OF WILSONVILLE

**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) and
TMDL IMPLEMENTATION PLAN
ANNUAL REPORT**

JULY 1, 2020 – JUNE 30, 2021

The undersigned hereby submits this National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater System Annual Report in accordance with NPDES Permit Number 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.



Chris Neamtzu, AICP
Community Development Director

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1.0 INTRODUCTION

The Oregon Department of Environmental Quality (DEQ) regulates stormwater runoff from the City of Wilsonville (City) through a Municipal Separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System (NPDES) Permit 101348, issued to Clackamas County and its co-permittees, and through the total maximum daily load (TMDL) program.

This annual report fulfills the reporting requirement under the City's Phase 1 NPDES MS4 permit and the City's Willamette River TMDL Implementation Plan (TMDL Plan) for the reporting period of July 1, 2020 to June 30, 2021. The City implements a Stormwater Management Plan (SWMP) to address specific regulatory obligations of its NPDES MS4 permit for point source pollutant parameters and the TMDL Plan to address elevated temperature in Willamette River tributaries (e.g., Boeckman Creek, Coffee Lake Creek).

1.1 Regulatory Background – NPDES MS4 Permit

The City's NPDES MS4 permit was originally issued in 1995 to Clackamas County co-permittees including the cities of Lake Oswego, Oregon City, West Linn, Milwaukie, Wilsonville, Happy Valley, Johnson City, and Rivergrove, the Oak Lodge Water Services District (formerly the Oak Lodge Sanitary District), and Clackamas County.

The City's MS4 NPDES permit was most recently reissued March 16, 2012, after a multi-year negotiation process with DEQ and an additional year-long delay related to an appeal. The permit expired March 1, 2017, and has been administratively extended, which still makes it the effective NPDES MS4 permit for the City.

During the 2016-2017 reporting period, the City prepared its NPDES MS4 permit renewal application, which required an evaluation of proposed program and SWMP changes, development of TMDL benchmarks, mapping, a maximum extent practical evaluation, updates to the City's monitoring program, and evaluation of service area expansions and associated pollutant loading. This significant effort was compiled into a report and submitted to DEQ on February 28, 2017. Although an updated SWMP was prepared and submitted as part of the NPDES MS4 permit renewal application, the City's 2012 SWMP remains the effective NPDES MS4 program document.

1.2 Regulatory Background – TMDL Implementation Plan

The City originally submitted its TMDL Plan to DEQ on March 31, 2008. Comments from DEQ were received and addressed by the City, and DEQ approved of the City's TMDL Plan in May of 2009. In August 2014, at the end of the initial 5-year implementation period, the City updated its TMDL Plan to include refined measurable goals, performance measures and milestones.

In February 2019, the City submitted an updated TMDL Plan to DEQ for approval following the second 5-year implementation period. On November 2, 2020, the City received confirmation from DEQ that this 2019 TMDL Plan was approved.

The City's TMDL Plan identifies and describes management strategies that the City will implement to address nonpoint sources of pollution generated in the Middle Willamette River subbasin in the Willamette Basin. The **non-point source** TMDL parameter of concern is temperature, and therefore, the TMDL Plan focuses on temperature management activities. The City's NPDES MS4 permit, as implemented through the SWMP, identifies practices the City will

implement to address **point sources** of pollution. The point source TMDL parameters of concern are bacteria and mercury.

1.3 Document Organization

Table 1 below outlines the organization of this annual report document, with respect to the annual reporting requirements outlined in Schedule B.5 of the City’s NPDES MS4 permit. This report emphasizes efforts and activities associated with individual Best Management Practices (BMPs) from the City’s 2012 SWMP, as summarized in Appendix A. Activities related to the City’s TMDL Plan are reported in Appendix B.

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 5.0 and Appendix C
g) Any proposed modifications to the monitoring plan necessary to ensure that adequate data and information are collected to conduct stormwater program assessments.	Section 5.0
h) A summary describing the number and nature of enforcement actions, inspections, and public education programs ^a	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 4.0
j) A summary related to MS4 discharges describing concept planning or other activities in preparation of UGB expansions or land annexations.	Section 4.0

^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.

2.0 ADAPTIVE MANAGEMENT PROCESS IMPLEMENTATION

The City submitted its adaptive management approach to DEQ on November 1, 2012. The City's approach includes two elements:

1. An **annual** process to determine if the City's stormwater program is being implemented in accordance with the SWMP, and to determine if progress towards measurable goals is being made. The annual process may include program adjustments, if needed.
2. A comprehensive process at the **end of the permit term** and submitted as part of the City's permit renewal package, to identify proposed program modifications including modification, addition, or removal of BMPs incorporated into the SWMP. Such program modifications are based on a more in-depth evaluation of submitted program documentation and studies.

The City conducted a comprehensive process to identify proposed program modifications as part of their NPDES MS4 permit renewal application, submitted February 2017. For the 2020-2021 reporting year, because the City's NPDES MS4 permit is in administrative extension, no major permit modifications, including major changes to the SWMP, can be made. Review of BMP implementation during the preparation of this annual report did not reveal the need for immediate adaptive management changes.

3.0 PROGRAM EXPENDITURES

The City's stormwater management program is funded through a combination of its stormwater utility, system development charges (SDCs) for new development, and additional fees associated with erosion control, natural resources, and stormwater plan reviews and inspections. A portion of the utility fee and all SDC revenue is placed in a fund dedicated for capital improvement project (CIP) development.

For the 2020-2021 reporting year, the stormwater utility rate was \$11.90 per equivalent residential unit (ERU). The fee will not increase in 2021-2022. Future increases will be implemented with the adoption of the updated Stormwater Master Plan in 2022.

A summary of the City's direct stormwater program expenditures for the 2020-2021 reporting year and anticipated stormwater program expenditures for the 2021-2022 reporting year are outlined below. The Natural Resources Program manages requirements for the NPDES permit, and costs are reflected under the Management Activities. The Public Works Department performs operations and maintenance activities, and costs are reflected under Maintenance Activities. Administrative support is funded separately.

Table 2. Stormwater Program Expenditures		
	Management Activities	Maintenance Activities
Reporting Year 2020-2021		
Wages and benefits	\$256,172	\$222,821
Materials and services	\$71,869	\$577,693
Reporting Year 2021-2022 (projected)		
Wages and benefits	\$266,033	\$283,420
Materials and services	\$97,200	\$788,536

4.0 OVERVIEW OF PLANNING AND LAND USE CHANGES, UGB EXPANSION AND NEW DEVELOPMENT ACTIVITIES

The City has experienced rapid growth over the last two decades. When the initial NPDES MS4 permit was issued, the City’s population was approximately 9,300. The current (2019) population is approximately 25,635.

The following section outlines land use changes, Urban Growth Boundary (UGB) expansions, land annexations and new development activities that occurred during this reporting year. Figure 1 reflects the City’s current zoning and city limits.

4.1 Annexations and UGB Expansion

As of October 2019, the City’s NPDES MS4 permit area is approximately 4,999 acres.

In Wilsonville, annexations are typically applicant- and development-driven. The City and City Council do not typically initiate the annexation of property outside of the city limits. The City actively conducts development-based concept planning for large development areas to facilitate annexation. Past concept planning efforts include the following:

- Villebois.** This 480-acre area is located along the City’s western boundary and prior to UGB expansion, this area was once the Dammasch State Hospital site, rural residential parcels and agricultural lands. The Villebois Village Master Plan was adopted in 2003 and incorporates sustainability practices and onsite stormwater management to minimize impacts of new development. This area is nearing full build out with approximately 2,930 single and multi-family units constructed.
- Frog Pond West.** This 181-acre area is located adjacent to the City’s eastern boundary, north of Boeckman Road and west of Stafford Road. The Master Plan was adopted in spring 2017 and calls for the redevelopment of rural residential and agricultural lands to residential. A total of nearly 61 acres have been annexed within Frog Pond West. To date, four subdivisions consisting of 267 single family homes have been approved for construction.
- Frog Pond East & South.** Metro approved a UGB expansion of 280 acres in December 2018 and received final approval from the Department of Land Conservation and Development in 2019. At full build-out, this area is expected to provide over 1,300 homes of

varying housing types and sizes. Master Planning has begun with adoption anticipated by December 2022.

- **Coffee Creek Industrial.** This 226-acre area is located adjacent to the City's northwestern boundary and is composed of industrial, residential, and agricultural land uses. The Coffee Creek Master Plan was adopted in 2007. Annexation and redevelopment, in accordance with the Master Plan, will include regionally significant industrial land uses including warehouse, manufacturing, and office space designed according to the City's Industrial Form-based Code provisions. In 2021, the City completed construction of an industrial roadway along SW Garden Acres Road to promote development in this area.
- **Basalt Creek.** This area is located along the north and northwest boundary of the City, bound by Basalt Creek Parkway and Greenhill Lane to the north, Coffee Lake Creek on the west, and I-5 to the east. A Transportation Refinement Plan for the area was completed in August 2013, and the Basalt Creek Concept Plan was adopted in August 2018. The City updated the Urban Planning Area Agreement with Washington County and adopted Comprehensive Plan Amendments in spring 2019. Master planning is still needed. Annexation and development, in accordance with these plans and policies, will result in an attractive business district including high-tech and craft industries with office, manufacturing, and warehouse space. To date, no developmental approvals have been granted by the City.

4.2 Land Use Changes and New Development Activities

In 2014, the City prepared updated stormwater design standards, as outlined in Section 3 of its Public Works Standards, to address post-construction stormwater control in accordance with the current NPDES MS4 permit requirements. The City requires structural stormwater controls for water quality and water quantity on all new and redevelopment projects that add or replace 5,000 square feet or more of impervious surface. The updated standards require the use of low impact development (LID) practices, stormwater facility sizing based on a flow duration standard, and inclusion of specific stormwater submittal requirements.

During the 2020-2021 reporting year, there were no zoning changes that would affect the types of development activities allowed or associated land usage.

During the 2020-2021 reporting year, the City issued six post-construction permits for development activities triggering stormwater management requirements. Development activities included two housing developments, an industrial building, a commercial building, and two site remodeling projects. Development activities from 82 housing units, a religious institution, an industrial building, and multiple community and infrastructure improvements resulted in 275,010 square feet of new and replaced impervious surface.

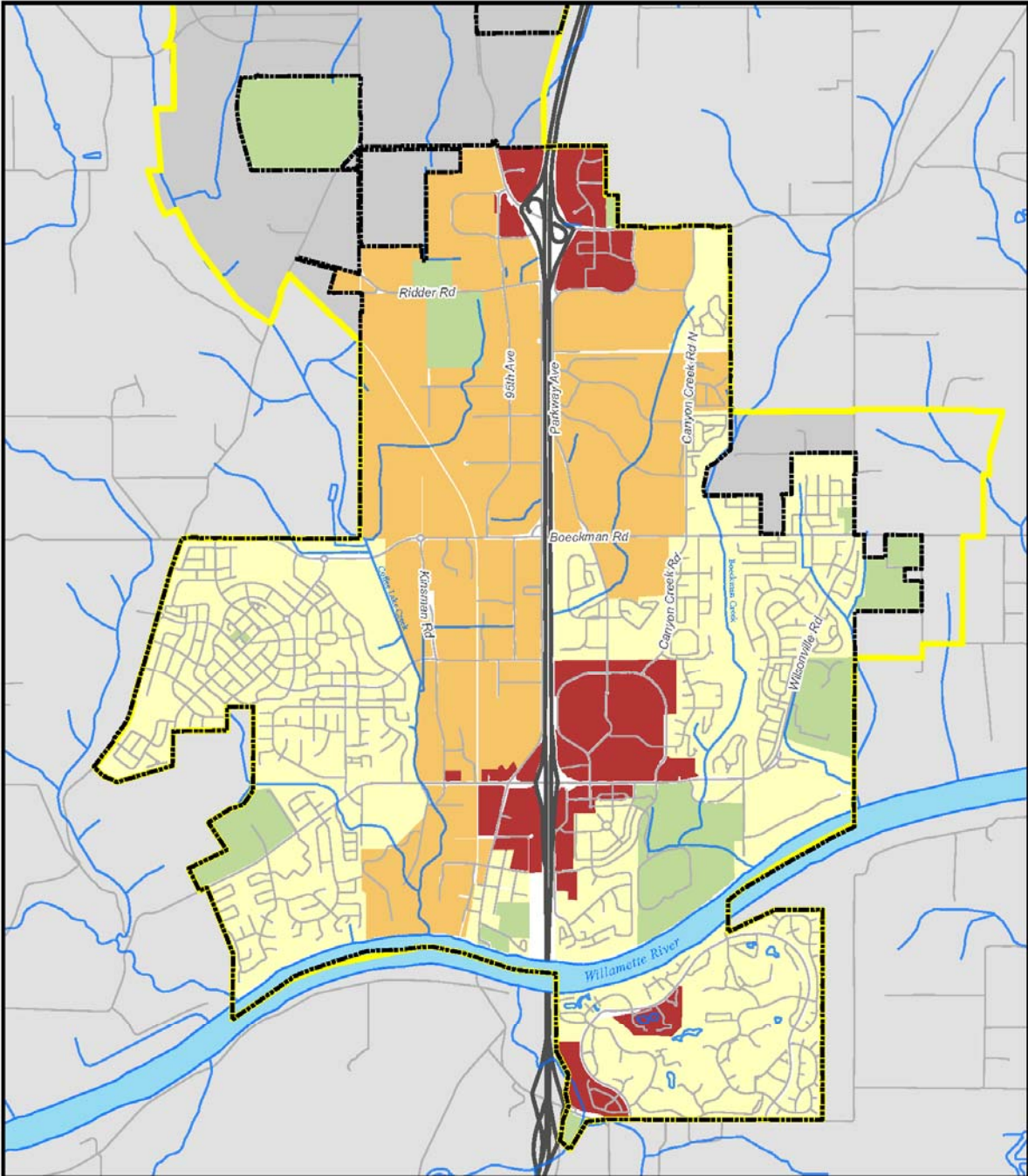


Figure 1

Zoning Types
The City of Wilsonville, Oregon



- Legend**
- UGB
 - IND
 - COM
 - PUB
 - RES
 - Streams
 - Roads



5.0 ENVIRONMENTAL MONITORING

The 2020-21 reporting year is the fourth year the City implemented the Coordinated Clackamas County Stormwater Monitoring Plan (CCCSMP). In 2016, the City opted to participate in the CCCSMP and discontinue implementation of the City's Monitoring Plan. The 2017 CCCSMP reflecting the City's participation was submitted to DEQ on December 16, 2016. No DEQ comments were received within 30 days. The City submitted its NPDES MS4 permit renewal application to include an updated monitoring objectives matrix and the 2017 CCCSMP as their environmental monitoring program.

Detail related to the environmental monitoring activities conducted during the 2020-2021 reporting year are outlined in Section 5.1 and the results are summarized in Appendix C.

5.1 Summary of Monitoring Data

Under the City's Monitoring Plan, the City has two instream monitoring locations and one stormwater outfall monitoring location. Monitoring events are grouped into the dry season and wet season to maintain compliance with the permit. The City chose to collect three of the four instream sample events during the wet weather season. The sampling schedule was determined prior to the start of the sampling year. Grab samples are collected during dry weather conditions and time-composited grab samples during rainfall events. The City contracted stormwater and instream sample collection activities during the 2020-21 reporting year. Specific monitoring locations and frequencies are outlined in Table 3.

Table 3. Summary of Wilsonville Environmental Monitoring Activities per CCCSMP				
Sampling type	Monitoring location	Waterbody name/ receiving water	Sampling frequency	Land use represented
Outfall (stormwater) monitoring	Library Detention Pond inlet at Memorial Park	Tributary to Boeckman Creek	3x/year	<ul style="list-style-type: none"> • Commercial • Residential
Ambient (instream) monitoring	Boeckman Creek at the Boeckman Road crossing	Boeckman Creek (upstream)	4x/year (min. of 2 events during the wet season)	<ul style="list-style-type: none"> • Agricultural (outside City limits) • Commercial • Residential
Ambient (instream) monitoring	Boeckman Creek at the Rose Lane footbridge in Memorial Park	Boeckman Creek (downstream)	4x/year (min. of 2 events during the wet season)	<ul style="list-style-type: none"> • Commercial • Residential

Monitoring results for all locations are summarized in Appendix C. The summary tables include parameters, methods, and results for each event collected. Additionally, a water quality standard has been added for comparison where applicable. Monthly rainfall totals for the 2020-21 reporting year are summarized in Table 4.

Stormwater outfall monitoring was conducted at the Library Detention Pond three times during the 2020-21 reporting year. The initial stormwater monitoring event occurred on September 18, 2020 during the first significant rainfall for the 2020-21 reporting year. This event had

exceedances of the zinc, temperature, and E.coli water quality criteria. The E.coli criteria was also exceeded during the second event on October 13, 2020. The zinc water quality criteria was exceeded during the final sampling event on May 19, 2021.

Instream monitoring on Boeckman creek occurs quarterly throughout the reporting year. Results of the instream monitoring indicate that Boeckman creek exceeded water quality criteria for E.coli during the July and January sampling events. The water quality criteria for phosphorous was exceeded during all four sampling events. A QA/QC issue has been identified for zinc during the January 2021 sampling event. The reported result for dissolved zinc was greater than the reported result for total zinc.

Table 4. Monthly Rainfall Totals (inches) 2020-21											
July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May	June
0.00	0.31	1.90	1.69	5.47	6.51	7.30	1.94	1.31	0.36	1.02	1.66

Data retrieved from the National Weather Service <http://w2.weather.gov/climate/index.php?wfo=pqr>

5.2 Temperature Monitoring

The City deployed three continuous temperature monitoring sensors during the summer of 2020. Boeckman Creek and Coffee Lake Creek were chosen as the two streams to monitor for temperature as they are the two streams within the City of Wilsonville that contribute the largest amount of flow to the Willamette River. Sensors were placed at the mouth of Boeckman Creek and Coffee Lake Creek, respectively. A third sensor was attached to a boat dock within the Willamette River.

Unfortunately, the temperature sensors at the mouth of Boeckman Creek and Coffee Lake Creek failed to log data during their deployment. The location of the functional sensor is shown on Figure 2. Monitoring results for the temperature logger located in the Willamette River is summarized in Appendix C. Troubleshooting and maintenance of the sensors was performed before deployment during the summer of 2021.

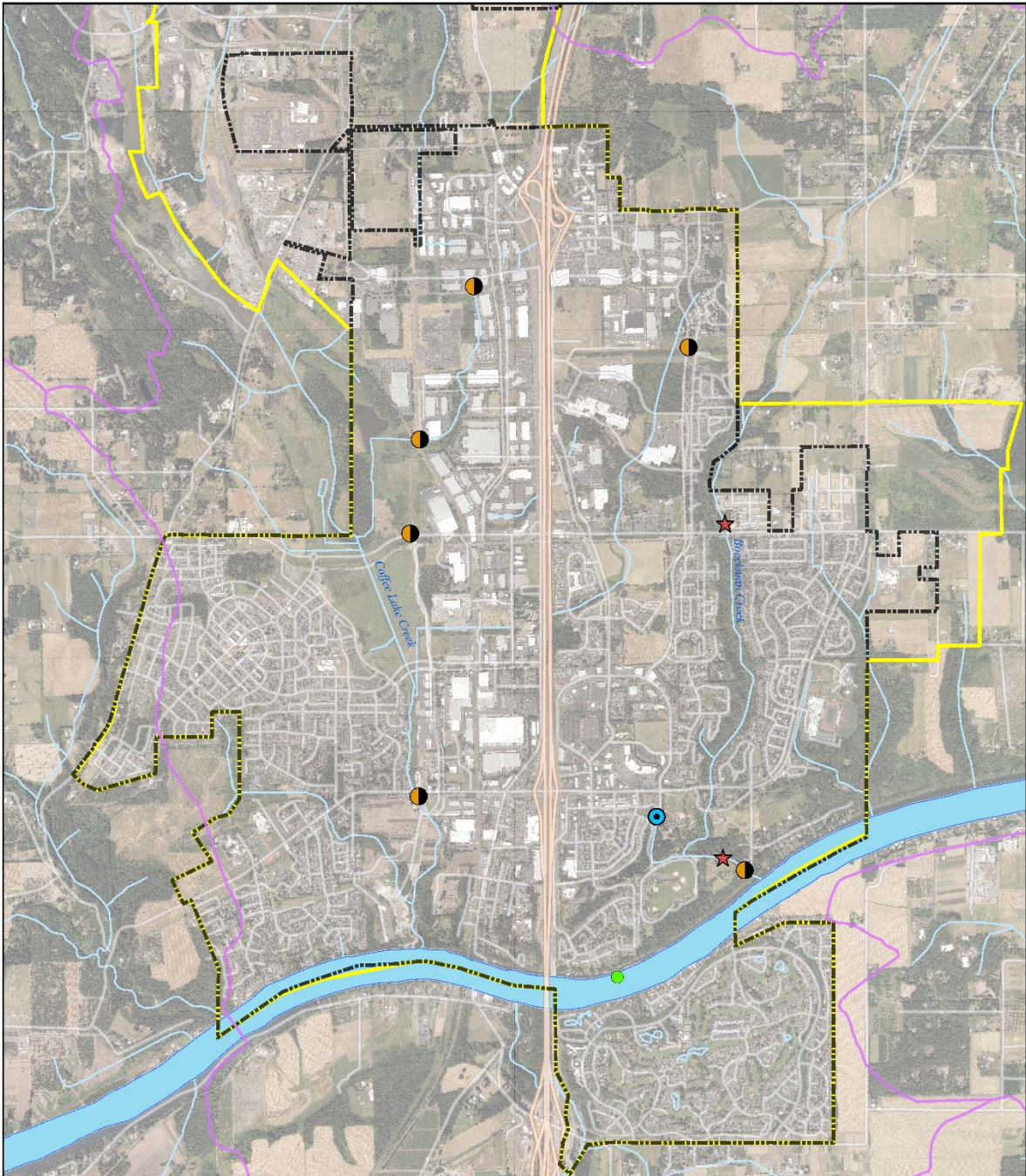


Figure C-1

Environmental Monitoring Activities
The City of Wilsonville, Oregon



0 0.25 0.5 1 Miles



- City Limits
- UGB
- Streams
- Watershed
- Temp. Monitors
- Dry Weather Outfall
- Instream Monitoring
- Stormwater Monitoring

Appendix A

SWMP Implementation Status

Appendix A. 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.									
BMP Title	BMP Name	Program Element(s)	Addresses bacteria?	Addresses mercury?	Responsible City Department	Measurable goals (2012 SWMP)	Tracking measures (2012 SWMP)	Annual Report Information (Tracking Measure Status 2020-21)	Notes
CD1	Illicit Discharge Detection and Elimination	Illicit Discharge Detection and Elimination	○	○	Community Development Public Works	<ul style="list-style-type: none"> Conduct annual dry weather illicit discharge screening/inspections for all major (15 total) and priority minor outfalls (85 total). Continue to follow dry weather field screening procedures for all outfalls suspected of illicit discharges. Notify the Public Works Director of all positively identified illicit connections and take necessary actions to eliminate them. Revise procedures for conducting the illicit discharge elimination and investigation program in accordance with permit requirements by November 1, 2012. 	<ol style="list-style-type: none"> Track number of outfalls inspected annually. Summarize inspection results and indicate outfalls requiring monitoring (sampling) and/or investigations. Document the outcome and resolution of any investigation activities conducted. 	<ol style="list-style-type: none"> Six major outfalls identified as high priority sites were inspected in September after 72 hours of dry weather using the Dry Weather Field Screening Inspection Form. Outfall inspection locations can be found on figure 2. Throughout the reporting year, the Public Works Department inspected 74 outfalls as part of their routine maintenance program. Elevated specific conductance readings were identified on Coffee Lake Creek at the bridge on Wilsonville Rd. Specific sample results listed in the Notes column. All other five outfalls were either dry or had pH and specific conductance readings within limits not requiring further investigation. Exceedance of the specific conductance indicator is a regular occurrence on Coffee Lake Creek. An investigation was performed in 2019 showing that the exceedance occurs upstream of City limits. The City did reach out to businesses outside of City limits to request that they install erosion and containment BMPs. 	The City uses the exceedance of 500 microsiemens as an indicator for additional investigation. Coffee Lake Creek at Wilsonville Rd had a reading of 13920 microsiemens during the annual dry weather outfall inspection event in September 2020.
PW/CD2	Spill Prevention, Training, and Response	Illicit Discharge Detection and Elimination Education and Outreach	○	○	Community Development Public Works	<ul style="list-style-type: none"> City staff to respond to non-hazardous material spills. Notify appropriate parties, including State and National Emergency Response Systems as necessary, of all known spills within the City. Train city staff to the OSHA First Responder Operations level. 	<ol style="list-style-type: none"> Track number of City employees attending OSHA spill-response training and/or refresher courses. Track the number of spills responded to by City staff. Track the type/source of pollutant discharges associated with each reported spill. 	<ol style="list-style-type: none"> 18 City employees attended OSHA spill-response training courses and/or refresher courses during the 2020-21 reporting year. City staff responded to 14 spill reports during the 2020-21 reporting year. Follow up with City resources and staff were deployed to 5 spills. The details related to the type or source of each specific spill are listed in the Notes column. 	The City deployed resources to 5 spills: 1 contractor yard tracking sediment into road, 2 oil spills related to motor vehicles, and 2 concrete truck leaks. The City followed up on an additional 9 spill reports: release of concrete washout at two sites, two releases of hydraulic oil from a trash trucks, a sewer to storm cross connections, report of an oil sheen on a creek, muddy erosion from a residence, pool drainage entering the street, and gasoline from vehicle vandalism entering a private catch basin.
PW/CD3	Industrial and Commercial Facilities	Industrial and Commercial Facilities	○	○	Community Development Public Works	<ul style="list-style-type: none"> Review business license applications and SIC codes for new businesses to identify potential high source facilities. Obtain Environmental Survey from new businesses (i.e., non-residential sewer users) identified as a potential high pollutant source. Update facility information by sending the Environmental Survey to applicable, existing businesses every three years. Identify facilities needing NPDES 1200-Z permits and notify the facility and DEQ within 30 days. Annually inspect facilities identified as warranting inspection. Ensure illicit discharges are eliminated, if discovered. 	<ol style="list-style-type: none"> Track the number of facilities inspected annually. Track the number of existing and potential new NPDES 1200-Z permitted facilities identified annually. Track any enforcement actions associated with inspections. 	<ol style="list-style-type: none"> Seven facilities received a joint inspection by the City's Industrial Pretreatment and Stormwater Management Coordinators. Twenty facilities identified as high potential pollutant sources received a windshield inspection of their outdoor areas. One additional facility was inspected to address erosion concerns. Eleven NPDES 1200-Z facilities are currently in the City. As a result of facility inspections, four facilities received letters identifying stormwater City code violations. Two of the four facilities need routine maintenance and inspection to control sediment discharges. The third site resolved outdoor storage issues. The fourth site holds a 1200-Z permit and received a violation from DEQ. 	

Appendix A. 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.									
BMP Title	BMP Name	Program Element(s)	Addresses bacteria?	Addresses mercury?	Responsible City Department	Measurable goals (2012 SWMP)	Tracking measures (2012 SWMP)	Annual Report Information (Tracking Measure Status 2020-21)	Notes
CD4	Erosion Control and Construction Site Management	Construction Site Runoff Control Education and Outreach	●	●	Community Development	<ul style="list-style-type: none"> Require all new and redevelopment disturbing over 500 square feet to submit an erosion and sediment control plan. Conduct weekly erosion control inspections on all construction sites disturbing over 500 square feet. 	<ol style="list-style-type: none"> Track the number of erosion and sediment control plans approved. Track the number of 1200-CN and 1200-C permits issued. Track the number and frequency of erosion control inspections conducted. Track the number and type of enforcement actions taken by the City or DEQ. 	<ol style="list-style-type: none"> The City approved 17 erosion and sediment control plans for commercial, industrial, & public development sites during the 2020-21 reporting year. There are currently six 1200-CN and seven 1200-C permits active in the City. Certified City inspectors performed a total of 1664 erosion control inspections. Inspectors visit sites weekly during the wet months and monthly during dry months. Additional inspections occurred based on complaints or weather conditions. No formal enforcement actions occurred in the 2020-21 reporting year. Several residential construction sites were instructed to clean up sediment and fix or replace erosion control measures throughout the reporting year. 	
CD5	Public Education Participation	Education and Outreach Pollution Prevention for Municipal Operations Stormwater Management Facilities Operation and Maintenance Activities	○	○	Community Development	<ul style="list-style-type: none"> Publish stormwater related articles in the City newsletter and website. Organize public outreach programs such as Adopt-a-Road and volunteer monitoring of stream corridors. Label catch basins as necessary. Distribute door hangers as necessary in neighborhoods where non-stormwater discharges have been identified. Coordinate with other, local Phase I jurisdictions in providing/compiling information regarding public education effectiveness. Provide the results to DEQ by July 1, 2015. 	<ol style="list-style-type: none"> Track the number of educational articles published per year. Estimate public participation in City-sponsored volunteer events. Track the number of catch basins labeled. 	<ol style="list-style-type: none"> During the 2020-21 reporting year, nine educational/informational articles were published in the City newsletter. City-sponsored volunteer event details for the 2020-21 reporting year are listed in the Notes column. Manhole lids over catch basins are stamped "Dump No Waste Drains to Stream". During 2020-21 reporting year the City affixed 40 catch basin markers prioritizing older neighborhoods that drain directly to outfalls without receiving treatment. 	<ul style="list-style-type: none"> Adopt a Road Participants: 71 volunteers. City's WERK Day: 48 participants removed debris, invasive plants, and planted trees in Wilsonville Parks.

Appendix A. 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.									
BMP Title	BMP Name	Program Element(s)	Addresses bacteria?	Addresses mercury?	Responsible City Department	Measurable goals (2012 SWMP)	Tracking measures (2012 SWMP)	Annual Report Information (Tracking Measure Status 2020-21)	Notes
CD6	Public Reporting for Spills, Illicit Discharges, and Dumping	Education and Outreach	○	○	Community Development	<ul style="list-style-type: none"> Continue to implement the "Citizen Concern" form for public reporting of spills, illicit discharges, and dumping. Include the phone number and website for reporting illicit discharges in a minimum of one published article each year. 	<ol style="list-style-type: none"> Track the number of citizen reports of spills, illicit discharges, and dumping received each year and follow-up actions resulting from the requests. 	<ol style="list-style-type: none"> The City received five complaints from citizens during the 2020-21 reporting year related to illicit discharges and dumping. Details are provided in the Notes column. 	<ul style="list-style-type: none"> October 2020 – Citizen reported observing a contractor spill concrete washout in a storm drain. City staff responded to site and determined spill to be mostly in grass and insignificant to catch basin. November 2020 – Citizen reported neighbor draining swimming pool into street. City responded to site and did not identify any hoses or evidence of discharge. November 2020 – Citizen reported a strong sewer smell in neighborhood. City inspected pretreatment stormwater manhole and identified a sewer to storm cross connection. March 2021 – Citizen reported observing a large oil sheen on a local stream heading toward the Willamette. City visited the location and did not identify any sheen in the water. March 2021 – Citizen complained about sediment tracking on arterial road. The area has multiple large construction sites that the City is trying to manage for erosion control.
PW/CD7	Municipal Staff Training for Stormwater Pollution Prevention	Education and Outreach Pollution Prevention for Municipal Operations			Community Development Public Works	<ul style="list-style-type: none"> Conduct municipal staff training related to stormwater pollution prevention as appropriate. Coordinate with other Clackamas County co-permittees regarding regional water quality efforts through scheduled co-permittee meetings. Attend applicable conferences and trainings as appropriate. 	<ol style="list-style-type: none"> Track the number of municipal staff training activities. Track number of conferences attended. Track any cost share or joint projects conducted annually with Clackamas County or other permitted agencies. 	<ol style="list-style-type: none"> City staff participated in multiple stormwater trainings this year including: spill prevention and sediment & erosion control. Overall, 11 staff from the Engineering Division, Fleet Services, and Public Works participated in stormwater pollution prevention training. Staff attended five conferences and trainings related to stormwater management during the 2020-21 reporting year. The City currently coordinates with WES and the City of Oregon City in updates to the BMP Sizing Tool (used to address post-construction stormwater requirements). 	
CD8	Public Involvement and Participation	Public Involvement and Participation			Community Development	<ul style="list-style-type: none"> Provide for public review and comment with the monitoring plan, SWMP revisions, and pollutant load reduction benchmarks. 	N/A	N/A	<ul style="list-style-type: none"> The City retains the last four years of NPDES MS4 reports on their website for public review. The City posted their NPDES MS4 permit renewal application to DEQ on their website in September 2017

Appendix A. 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.									
BMP Title	BMP Name	Program Element(s)	Addresses bacteria?	Addresses mercury?	Responsible City Department	Measurable goals (2012 SWMP)	Tracking measures (2012 SWMP)	Annual Report Information (Tracking Measure Status 2020-21)	Notes
CD9	Planning and Development Review	Post-Construction Site Runoff Pollution Prevention for Municipal Operations	●	●	Community Development	<ul style="list-style-type: none"> Continue to require new and redevelopment projects that add or replace over 5,000 square feet of impervious surface to install stormwater quality controls. Review all new and redevelopment plans that add or replace over 5,000 square feet for compliance with stormwater control requirements. 	<ol style="list-style-type: none"> Track number of development applications reviewed for compliance with the City's stormwater requirements. Track the number and type of structural water quality and quantity facilities installed. Track the number of CIPs or retrofits proposed/initiated for water quality improvement. 	<ol style="list-style-type: none"> During the 2020-21 reporting year, seven development applications were reviewed for compliance with the City's stormwater requirements, which pertain to development activities that add or replace 5,000 sq. ft. or more of impervious surface. During the 2020-21 reporting year, a total of 26 structural water quality and quantity facilities were installed. Fourteen of the facilities were installed with the improvement of a roadway in an industrial area. Detail related to the facilities are provided in the Notes column. During the 2020-21 reporting year, two vegetated swales were retrofitted by the Parks and Recreation Department. Additionally, a public street improvement project began construction which will provide stormwater treatment to two roadways in a commercial and industrial area that currently receive no treatment. 	<ul style="list-style-type: none"> During the reporting period 2 vegetated swales, 20 planter boxes, and 4 rain gardens were installed throughout the City.
CD10	Review and Update Applicable Code and Development Standards Related to Stormwater Control	Post-Construction Site Runoff	○	○	Community Development	<ul style="list-style-type: none"> Review the City's current public works standards to minimize or eliminate identified barriers related to the use of low impact development and green infrastructure techniques. Review the City's current stormwater treatment and detention standards for compliance with new MS4 NPDES permit language (e.g., design storm, etc.). Update the City's post-construction stormwater design standards and code language by November 1, 2014. 	<ol style="list-style-type: none"> Track progress related to the review and update of the City's stormwater treatment and detention standards for compliance with the MS4 NPDES permit. 	<ol style="list-style-type: none"> The City of Wilsonville adopted updated Public Works Standards for stormwater in September 2014 to address NPDES MS4 requirements for treatment and flow control. The City's Standards were amended in December 2015 to address minor editorial and clarification items. No additional updates were made during the 2020-21 reporting year. 	
PW11	Routine Road Maintenance	Pollution Prevention for Municipal Operations	●	●	Public Works	<ul style="list-style-type: none"> Sweep all curbed City streets monthly. Schedule and conduct street maintenance activities during dry weather conditions. Continue to sponsor Adopt-a-Road program. 	<ol style="list-style-type: none"> Track street sweeping frequency. Track length of roadway swept annually. Track volume of debris removed annually. 	<ol style="list-style-type: none"> During the 2020-21 reporting year, the City swept all curbed, public streets monthly. During the 2020-21 reporting year, a total of 3,442 miles of road were swept. During the 2020-21 reporting year, street sweeping resulted in the removal of 525 tons of debris. 	
PW/CD12	Pest Management	Pollution Prevention for Municipal Operations			Community Development Public Works	<ul style="list-style-type: none"> Follow the Integrated Pest Management principles and Pest Management Program for public landscape maintenance. Require all staff and hired contractors applying chemicals within the City to be certified. 	<ol style="list-style-type: none"> Track amount of pesticides and fertilizers applied to public property and general area of application. Estimate number and area of sites where the planting of native vegetation was incorporated into the maintenance activities. 	<ol style="list-style-type: none"> During the 2020-21 reporting year, the City applied 19.7 gallons of pesticides to 65.5 acres of public landscaping areas. The City applied 1.5 pounds and 17 gallons of fertilizer to 3.6 acres of City Parks and other public, City owned property. During the 2020-21 reporting year, the Parks and Recreation Department planted approximately 2000 sq. ft. of native plants while rehabilitating five vegetated stormwater facilities and as part of routine landscape maintenance. 	

Appendix A. 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.									
BMP Title	BMP Name	Program Element(s)	Addresses bacteria?	Addresses mercury?	Responsible City Department	Measurable goals (2012 SWMP)	Tracking measures (2012 SWMP)	Annual Report Information (Tracking Measure Status 2020-21)	Notes
PW/CD13	Municipal Facility Stormwater Management	Pollution Prevention for Municipal Operations	○	○	Community Development Public Works	<ul style="list-style-type: none"> Inventory municipal facilities subject to this permit requirement. Identify and implement strategies to minimize discharges from identified municipal facilities by July 1, 2013. 	<ol style="list-style-type: none"> Inventory municipal facilities and develop strategies to reduce the impact of stormwater runoff from municipal facilities. 	<ol style="list-style-type: none"> The City adopted their Stormwater Pollution Prevention Strategy (SWPPS) for municipal facilities in 2013. Applicable municipal facilities include the Three Bay Facility, the SMART Operations & Fleet Facility, and the Memorial Park Maintenance Barn. For the 2020-21 reporting period, the oil water separator at the SMART Operations & Fleet Facility and a stormwater pretreatment vault at the SMART Bus station were serviced quarterly. 	
PW14	Conveyance System Cleaning	Stormwater Management Facilities Operation and Maintenance Activities	○	○	Public Works	<ul style="list-style-type: none"> Inspect public conveyance system annually for maintenance needs. Maintain and repair public conveyance system as needed based on inspections. 	<ol style="list-style-type: none"> Estimate the length of conveyance system serviced each year. Estimate type and volume of debris removed. 	<ol style="list-style-type: none"> During the 2020-21 reporting year, the City cleaned and maintained approximately 11,735 linear feet of the stormwater conveyance system (mains and laterals). During the 2020-21 reporting year, a total of 1.5 cubic yards of debris was removed and reported in conjunction with conveyance system cleaning activities. 	
PW15	Catch Basin Cleaning	Stormwater Management Facilities Operation and Maintenance Activities	●	●	Public Works	<ul style="list-style-type: none"> Clean all high-priority public catch basins (approximately 25% of all public catch basins) annually and the remaining public catch basins over a four-year period. Inspect catch basins for maintenance and repair needs during catch basin cleaning activities. Schedule catch basin repair activities as needed, based on inspections. 	<ol style="list-style-type: none"> Track percent of total catch basins cleaned each year. Track number of catch basin repair activities conducted each year. Estimate volume of debris removed annually. 	<ol style="list-style-type: none"> During the 2020-21 reporting year, the City cleaned 1,538 catch basins, reflecting 27 percent of all public catch basins in the City. During the 2020-21 reporting year, a total of 7 catch basins were repaired. During the 2020-21 reporting year, 131 cubic yards of debris was removed from catch basins. 	
PW/CD16	Structural Control Cleaning	Stormwater Management Facilities Operation and Maintenance Activities	●	●	Community Development Public Works	<ul style="list-style-type: none"> Inspect public structural controls annually and maintain and repair as needed. Ensure maintenance of new private structural stormwater facilities serving 5,000 square feet of area or greater through the tracking of <i>Stormwater Maintenance and Access Easement</i> agreements. Maintain GIS "atlas" for both public and private water quality structural controls. 	<ol style="list-style-type: none"> Track number of public stormwater structural controls inspected. Track number of public stormwater structural controls maintained. Track covenant agreements on file and annual maintenance reports submitted for private stormwater structural control facilities. Track number of private stormwater structural controls inspected and maintained. 	<ol style="list-style-type: none"> The City has identified 89 structural controls at 31 sites. During the 2020-21 reporting year, the City inspected 80 public structural controls. During the 2020-21 reporting year, the City maintained 59 public structural controls. For the 2020-21 reporting year, there were 106 private stormwater maintenance agreements on file. Annual inspection and maintenance report requests were sent to 108 facility owners in March 2021, and 56 maintenance reports were returned. During FY 2020-21, the City inspected 51 sites containing multiple private stormwater facilities. Most of the parties responsible for private facility maintenance performed some type of maintenance over the course of the year. Follow up inspections by City staff found that twelve facilities needed minor additional maintenance. 	

Appendix B
TMDL Implementation Plan Status

Table B-1. Management Strategies for Temperature Reduction

BMP or Activity	Commitment/ Implementation Strategy	Measurable Goal(s) Methods to meet strategies	Implementation Tracking/Performance Measure Demonstration of implementation	Timeline	Milestones /Intermediate indicators of progress	Responsible City Department	Status (to be populated with each annual report)
Riparian Area Management	Enforce riparian buffers to protect existing vegetation and minimize impacts to surface waters due to development.	Continue to implement Wilsonville Municipal Code (WMC), Chapter 4 – Planning and Land Development, related to the following: <ul style="list-style-type: none"> Section 4.139 - Implementation of the Significant Resource Overlay Zone (SROZ). The SROZ reflects compliance with Title 3 and Title 13 requirements. Section 4.600 – Limitations on tree removal and tree cutting in the SROZ. 	<ul style="list-style-type: none"> Annually track WMC and Comprehensive Plan updates related to Title 3/ 13 compliance. 	Ongoing	N/A – WMC is currently consistent with Title 3/13 compliance.	Community Development	
	Evaluate opportunities for targeted planting to improve shade conditions throughout Wilsonville waterbodies	Conduct a desktop GIS evaluation and inspect/ ground truth sites identified as public planting opportunity areas in the 2008 Shade Opportunity Mapping exercise.	<ul style="list-style-type: none"> Document planting progress and overall site feasibility based on the desktop GIS evaluation and inspection/ ground truthing efforts. In conjunction with site inspection results, identify ongoing replanting and maintenance needs. 	November 2022	<ul style="list-style-type: none"> By June 30, 2021, compile mapping information per 2008 Shade Opportunity Mapping exercise and updated aerial imagery. By April 1, 2022, ground truth public planting sites identified in the 2008 Shade Opportunity Mapping exercise. By November 1, 2022, prepare a maintenance and planting schedule for applicable public planting sites based on ground truthing exercise. 	Community Development	During the 2020-21 reporting year, where practicable, City staff compiled mapping information and updated aerial imagery.
		Continue participation in opportunistic planting efforts with local and state agencies and organizations.	<ul style="list-style-type: none"> As applicable, document planting and habitat enhancement activities on public property and private property. 	Ongoing	N/A – Implementation is ongoing and opportunistic.	Community Development	
		Continue partnerships and financial contributions to Friends of Trees in support of riparian planting projects. Partnership may include in-kind staff participation on governing boards, technical/ permitting support for sponsored projects within the City, or financial contributions.	<ul style="list-style-type: none"> Annually contribute a minimum of \$5,000 to Friends of Trees. Annually obtain status reports from Friends of Trees to identify planting locations over the reporting year. 	Ongoing	Beginning with the FY 2020-21 annual report, report on financial contributions to Friends of Trees.	Community Development	During the 2020-21 reporting year, the City contributed \$14,000 to Friends of Trees.
		Assess riparian planting and restoration capital project needs in accordance with DEQ's March 2020 cold water refugia (CWR) study and efforts associated with the City's Stormwater Master Plan (SMP) update.	<ul style="list-style-type: none"> Review results of DEQ's CWR study (March 2020) and identify potential CWR opportunity areas relevant to the City. Assess feasibility of planting activities at CWR opportunity areas using GIS mapping and/or field investigation efforts. Conduct stream assessment to assess vegetative cover conditions along specific stream reaches and identify restoration-related capital project needs as part of the SMP update. As applicable, incorporate planting and restoration project needs into the City's stormwater capital improvement program. Annually document completion of riparian planting and restoration capital projects per the City's SMP update. 	Ongoing	<ul style="list-style-type: none"> By June 30, 2021, review the DEQ CWR study and summarize findings and relevant CWR opportunity areas. By June 30, 2022, evaluate the continued applicability of unconstructed riparian planting and restoration CIPs per the City's 2012 SMP, for inclusion in the 2022 SMP Update. By June 30, 2022, summarize results from the stream assessment effort. <p>Please note that capital project implementation is subject to prioritization schedules and approval of the SMP by City Council.</p>	Community Development	During the 2020-21 reporting year, City staff reviewed the DEQ CWR study and assessed its relevance to Wilsonville.

Table B-1. Management Strategies for Temperature Reduction							
BMP or Activity	Commitment/ Implementation Strategy	Measurable Goal(s) Methods to meet strategies	Implementation Tracking/Performance Measure Demonstration of implementation	Timeline	Milestones /Intermediate indicators of progress	Responsible City Department	Status (to be populated with each annual report)
Design Standards for New and Redevelopment	Implement design standards that promote infiltration for public and private development projects.	Promote the use of infiltration for stormwater management through updated stormwater design standards, facility details, sizing tools, and the City's SMP update.	<ul style="list-style-type: none"> As applicable, document changes or updates to the City's stormwater design standards. As applicable, incorporate water quality project needs into the City's stormwater capital improvement program. 	Ongoing	By April 1, 2021, prepare a user manual for developers and engineers with standard details for recommended stormwater treatment facilities. Please note that capital project implementation is subject to prioritization schedules and approval of the SMP by City Council.	Community Development	During the 2020-21 reporting year, the user manual was completed.
Education for Temperature Management	Continue to provide information regarding temperature related issues and shade preservation efforts to the public.	Using the City newsletter, annually distribute a minimum of one article related to temperature issues and management approaches.	<ul style="list-style-type: none"> Annually track the number and content of temperature – related articles distributed to City residents by the City. Annually document shade planting incentives (materials, trainings, etc.) provided to citizens. 	Ongoing	Beginning with the FY 2020-21 annual report, report on article publications related to temperature management.	Community Development	The City published three articles related to the temperature of streams and promoting trees for shade.
		Promote regional programs targeted at improving habitat on private property. Continually distribute information regarding regional programs in City outlets.	<ul style="list-style-type: none"> Annually document the methods of information distribution conducted by the City. 	Ongoing	N/A – Implementation is ongoing.	Community Development	
		Participate in student education and outreach activities in local schools, providing instruction on the importance of maintaining riparian buffers for shade and temperature management.	<ul style="list-style-type: none"> As applicable, document participation and activities conducted with local schools. 	Ongoing	N/A – Implementation is ongoing.	Community Development	
		Support staff training opportunities related to water quality, TMDL compliance, and temperature management through conference attendance and other education activities.	<ul style="list-style-type: none"> Annually provide up to 8-hours of staff training activities. 		Beginning with the FY 2020-21 annual report, report on staff trainings and conference attendance.		Staff attended three online conferences, a training, and a lecture related to TMDL and water quality issues.
Environmental Monitoring	Monitor surface water temperature to document status and evaluate trends with respect to water quality standards.	In conjunction with NPDES MS4 requirements, conduct sampling for temperature at required instream monitoring locations.	<ul style="list-style-type: none"> As applicable, annually report any modification to existing temperature monitoring activities. 	Ongoing	N/A – Implementation is ongoing.	Community Development	
		Conduct ongoing temperature monitoring in the Coffee Lake Creek and Boeckman Creek watersheds over this 5-year TMDL implementation period to build on historic datasets and identify anomalies.	<ul style="list-style-type: none"> Annually summarize this supplemental monitoring in tabular and narrative format. 	Ongoing	<ul style="list-style-type: none"> By April 1, 2021, determine whether updates to the CCCSMP to include additional Coffee Lake Creek monitoring sites may be warranted. 	Community Development	The City will monitor the temperature of Coffee Lake Creek independently from the CCSMP. Results from the 2020 monitoring activities can be found in Section 5.2 and Appendix C.

Appendix C

Environmental Monitoring Results
2020-2021

Instream Monitoring - 2020-2021								
Location - Boeckman Creek at Memorial Park								
COMPOSITE/ GRAB RAINFALL (Y/N) DATE				Results				Notes
				DRY SEASON (July 1 to September 30; May 1 to June 30)		WET SEASON (October 1 to April 30)		
				Grab	Grab	Composite	Grab	
				N	N	Y	N	
				7/15/2020	10/14/2020	1/13/2021	4/14/2021	
Analysis	Method	Units	WQ Std					Notes
Storm Event Rainfall (if applicable)	gauge or rainfall record	Inches						
Conductivity - Field	SM 2520B	uS		414.6	103.8	111.0	192.3	
Temperature - Field	SM 2550B	°C	18	17.2	13.2	10.7	10.3	2
pH - Field	SM 4500 H+B	Std Units		7.69	7.13	6.87	7.52	
Dissolved Oxygen - Field	SM 4500 O G	mg/L	6.5	8.99	9.69	9.61	10.81	3
BOD5	SM 5210B	mg/L		1.93	1.85	2.06	2.80	
Copper, TOTAL	EPA 200.8/3010A	ug/L		1.3	2.5	6.5	0.74	
Copper, DISSOLVED	EPA 200.8/FILTER	ug/L		1.00	2.6	1.4	0.77	
E. coli	SM 9223B	MPN/100mL	406	125.9	259.5	920.8	248.1	1
Hardness	SM 2340C	mg/L		80	20	28	56	
Lead, TOTAL	EPA 200.8/3010A	ug/L		0.24	0.200	2.50	0.15	
Lead, DISSOLVED	EPA 200.8/FILTER	ug/L		0.03	0.10	0.14	ND	
Ammonia Nitrogen	SM 4500 NH3F	mg/L		0.03	0.02	0.05	0.02	
Nitrate-Nitrite	SM 4500-NO3 F	mg/L	10	0.65	0.30	2.91	0.75	4
Phosphorus, TOTAL	SM 4500-P F	mg/L	0.1	0.245	0.153	0.337	0.114	5
Phosphorus, ortho-phosphate	SM 4500-P F	mg/L		0.09	0.09	0.05	0.07	
Zinc, TOTAL	EPA 200.8/3010A	ug/L		10.20	9.6	41.9	8.5	
Zinc, DISSOLVED	EPA 200.8/FILTER	ug/L		4.7	7.1	55.0	6.1	
Total Dissolved Solids	SM 2540E	mg/L		163	73	84	131	
Total Suspended Solids	SM 2540D	mg/L		13.0	5.33	112.0	7.75	

Notes:

- (1) MPN = Most Probable Number
- (2) WQ standard of 18 C per DEQ's Temperature Water Quality Standard Implementation IMD 2008 for salmon and trout rearing and migration.
- (3) No DO TMDL for the Willamette River; 6.5mg/L selected as target minimum DO concentration for cool water habitat.
- (4) Table 20 - Protection of human health for water and fish ingestion.
- (5) Water quality criteria value of 0.1 mg/L based on EPA standard to control algal growth in flowing waterbodies.

Instream Monitoring - 2020-2021 Location - Boeckman Creek at Boeckman Rd.								
COMPOSITE/ GRAB RAINFALL (Y/N) DATE				Results				Notes
				DRY SEASON (July 1 to September 30; May 1 to June 30)		WET SEASON (October 1 to April 30)		
				Grab	Grab	Composite	Grab	
				N	N	Y	N	
				7/15/2020	10/14/2020	1/13/2021	4/14/2021	
Analysis	Method	Units	WQ Std					
Storm Event Rainfall (if applicable)	gauge or rainfall record	Inches						
Conductivity - Field	SM 2520B	uS		360.9	129.1	94.54	183.1	
Temperature - Field	SM 2550B	°C	18	15.7	12.50	10.4	9.8	2
pH - Field	SM 4500 H+B	Std Units		7.61	7.17	7.02	7.74	
Dissolved Oxygen - Field	SM 4500 O G	mg/L	6.5	9.13	9.54	9.80	10.89	3
BOD5	SM 5210B	mg/L		1.59	1.60	1.87	1.64	
Copper, TOTAL	EPA 200.8/3010A	ug/L		1.70	1.9	3.8	0.70	
Copper, DISSOLVED	EPA 200.8/FILTER	ug/L		0.7	1.9	1.1	0.80	
E. coli	SM 9223B	MPN/100mL	406	1553.07	248.9	980.4	93.2	1
Hardness	SM 2340C	mg/L		60	60	28	52.0	
Lead, TOTAL	EPA 200.8/3010A	ug/L		0.76	0.16	1.7	0.14	
Lead, DISSOLVED	EPA 200.8/FILTER	ug/L		0.03	0.07	0.10	0.041	
Ammonia Nitrogen	SM 4500 NH3F	mg/L		0.04	0.03	0.05	0.03	
Nitrate-Nitrite	SM 4500-NO3 F	mg/L	10	0.5	0.23	3.24	0.80	4
Phosphorus, TOTAL	SM 4500-P F	mg/L	0.1	0.24	0.092	0.217	0.162	5
Phosphorus, ortho-phosphate	SM 4500-P F	mg/L		0.06	0.05	0.05	0.12	
Zinc, TOTAL	EPA 200.8/3010A	ug/L		13.9	40.7	21.8	9.5	
Zinc, DISSOLVED	EPA 200.8/FILTER	ug/L		3.1	8.0	51.6	8.0	
Total Dissolved Solids	SM 2540E	mg/L		127	82	68	123	
Total Suspended Solids	SM 2540D	mg/L		60.0	3.12	73.5	5.5	

Notes:

- (1) MPN = Most Probable Number
- (2) WQ standard of 18 C per DEQ's Temperature Water Quality Standard Implementation IMD 2008 for salmon and trout rearing and migration.
- (3) No DO TMDL for the Willamette River; 6.5mg/L selected as target minimum DO concentration for cool water habitat.
- (4) Table 20 - Protection of human health for water and fish ingestion.
- (5) Water quality criteria value of 0.1 mg/L based on EPA standard to control algal growth in flowing waterbodies.

Outfall Monitoring - 2020-2021 Location - Library Pond at Memorial Park							
				Results			Notes
				Composite	Composite	Composite	
COMPOSITE/ GRAB RAINFALL (Y/N) DATE	Y	Y	Y				
	9/18/2020	10/13/2020	5/19/2021				
Analysis	Method	Units	WQ Std				
Storm Event Rainfall (if applicable)	gauge or rainfall record	Inches					
Conductivity - Field	SM 2520B	uS		95.69	18.55	105.70	
Temperature - Field	SM 2550B	°C	18	18.6	15.7	15.8	2
pH - Field	SM 4500 H+B	Std Units		6.9	6.80	6.93	
Dissolved Oxygen - Field	SM 4500 O G	mg/L	6.5	9.31	9.82	9.61	3
BOD5	SM 5210B	mg/L		16.0	6.24	15.49	
Copper, TOTAL	EPA 200.8/3010A	ug/L	20	17.00	2.90	19.60	5
Copper, DISSOLVED	EPA 200.8/FILTER	ug/L		15.10	2.20	11.00	
E. coli	SM 9223B	MPN/100mL	406	1986.28	1986.28	21.6	1
Hardness	SM 2340C	mg/L		28.0	2.0	22.0	
Lead, TOTAL	EPA 200.8/3010A	ug/L	15	1.70	0.56	3.700	5
Lead, DISSOLVED	EPA 200.8/FILTER	ug/L		1.10	0.14	1.00	
Ammonia Nitrogen	SM 4500 NH3F	mg/L		1.64	0.10	0.75	
Nitrate-Nitrite	SM 4500-NO3 F	mg/L	10	1.03	0.08	0.53	4
Phosphorus, TOTAL	SM 4500-P F	mg/L		0.804	0.145	0.425	
Phosphorus, ortho-phosphate	SM 4500-P F	mg/L		0.43	0.09	0.07	
Zinc, TOTAL	EPA 200.8/3010A	ug/L	120	393.00	28.20	142.00	5
Zinc, DISSOLVED	EPA 200.8/FILTER	ug/L		392.00	19.90	128.00	
Total Dissolved Solids	SM 2540E	mg/L		118	18	77	
Total Suspended Solids	SM 2540D	mg/L	100	12.0	17.25	72.0	5

Notes:

- (1) MPN = Most Probable Number.
- (2) WQ standard of 18 C per DEQ's Temperature Water Quality Standard Implementation IMD 2008 for salmon and trout rearing and migration.
- (3) No DO TMDL for the Willamette River; 6.5mg/L selected as target minimum DO concentration for cool water habitat.
- (4) Table 20 - Protection of human health for water and fish ingestion.
- (5) Water quality criteria values based on current 1200-Z permit benchmarks.

