

CITY OF SALEM, OREGON

**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) MUNICIPAL SEPARATE STORM SEWER SYSTEM
(MS4) PERMIT**

(Permit Number 101513, File Number 108919)

**ANNUAL REPORT
FY 2020-21**

October 22, 2021

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.

Mark Bechtel, AICP, Operations Division Manager

Date

**Prepared by
City of Salem Public Works Department**



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LIST OF ACRONYMS

ACWA	Association of Clean Water Agencies
APWA	American Public Works Association
BMP	Best Management Practice
CFR	Code of Federal Regulations
CIP	Capital Improvement Plan
COE	U.S. Army Corps of Engineers
CON	Construction-related BMPs
DEQ	Oregon Department of Environmental Quality
EPA	U.S. Environmental Protection Agency
EPSC	Erosion Prevention and Sediment Control
ES	Environmental Services (City of Salem)
FEMA	Federal Emergency Management Act
GIS	Geographic Information System
IDEP	Illicit Discharge Elimination Program
IGA	Inter-governmental Agreement
ILL	Illicit discharge-related BMPs
IND	Industrial-related BMPs
MEP	Maximum Extent Practicable
mg/L	Milligrams per liter
MOA	Memorandum of Agreement
MS4	Municipal Separate Storm Sewer System
MWOG	Mid-Willamette Valley Outreach Group
ODA	Oregon Department of Agriculture
ODOT	Oregon Department of Transportation
PSFA	Private Stormwater Facility Agreement
ppm	Parts per million
RC	Residential and commercial area-related BMPs
SDC	System Development Charge
SKAPAC	Salem/Keizer Area Planning Advisory Committee
SRC	Salem Revised Code
SSORP	Sanitary Sewer Overflow Response Plan
SWMP	Stormwater Management Plan
TMDL	Total Maximum Daily Load

1 INTRODUCTION

1.1 Permit Background

In 1990, the United States Environmental Protection Agency (EPA) published its Phase I regulations governing stormwater discharges under the National Pollutant Discharge Elimination System (NPDES) program of the Clean Water Act. In Oregon, the EPA has delegated the permitting of NPDES municipal separate storm sewer system (MS4) discharges to the Oregon Department of Environmental Quality (DEQ).

Under the EPA's initial Phase I implementation of the program, municipalities having a population greater than 100,000 were required to obtain an NPDES MS4 permit. The City of Salem (City) passed that threshold with the 1990 Census and was included in the program by the DEQ, with the Oregon Department of Transportation (ODOT) originally designated as a co-permittee with Salem.

The regulations established a two-part application process for obtaining a NPDES Permit to discharge municipal stormwater to "waters of the state." The City submitted the Part 1 NPDES stormwater permit application in April 1994. The supplemental Part 2 application and associated Stormwater Management Plan (SWMP) were subsequently finalized and submitted to DEQ in July 1996. DEQ issued the City's initial NPDES MS4 permit in December 1997, with an expiration date of September 2002.

An application for permit renewal was submitted to the DEQ in April 2002, and the City's second MS4 permit was issued in March 2004. The next permit renewal application was submitted to the DEQ in 2008. This application included a revised SWMP (2008 SWMP) that was developed in part using the EPA document *Municipal Separate Storm Sewer System Program Evaluation Guidance* (January 2008). Following permit negotiations, the 2008 SWMP was further revised and submitted to the DEQ on August 13, 2010.

The City's renewed (third) MS4 permit was issued on December 30, 2010. Consistent with requirements of Schedule D.6 of the renewed MS4 permit, the City resubmitted the SWMP (revised 2010 SWMP) to DEQ on March 17, 2011. The EPA conducted an inspection of the City's MS4 program from July 31, 2012, through August 2, 2012, to assess compliance with the NPDES MS4 permit. The results of the audit were released during the FY 2013-14 reporting period and indicated that the City was deficient in meeting its construction site runoff control requirements. An EPA Administrative Compliance Order by Consent (Consent Order) was issued for the City to: 1) develop and document its construction site plan review procedures; 2) develop and document inspection procedures for construction sites; and 3) submit a separate report of all construction site inspections annually through the expiration of the current MS4 permit. The City remedied the deficiencies in its construction site erosion control program within 90 days of the Consent Order, submitted its first annual construction site inspection report on November 1, 2013, and continues to meet the requirements of the NPDES MS4 permit and the EPA Consent Order.

The City's current permit had an expiration date of December 29, 2015. A renewal application was submitted in December 2015 (per the conditions listed under Schedule F, Section A.4) and the DEQ has confirmed (in a letter dated March 1, 2016) that the permit has been administratively extended. The DEQ has started the process for permit renewal for all Phase I MS4 permits, and the City submitted comments on a draft applicant review of their permit on June 26, 2020, and during the public review of the permit in December 2020. The City anticipates receiving a renewed (fourth) permit in autumn 2021.

1.2 Purpose and Scope

The MS4 permit area is defined as the area included within the city limits (encompassing 47 square miles), as exhibited in Figure 1. This is the area for which the City has responsibility for implementing its stormwater management program. Land use within the permit area is exhibited in Figure 2.

This NPDES MS4 Annual Report summarizes stormwater-related activities listed in the 2010 SWMP that were completed during the period of July 1, 2020, through June 30, 2021, to address the requirements of the City's current MS4 permit. The information presented in this report is based on the requirements listed in Schedule B.5 of the MS4 Permit (see Table 1).

Table 1. Annual Reporting Requirements for the MS4 Permit		
Permit Section	Reporting Requirement	Location in Annual Report
B(5)(a)	The status of implementing the stormwater management program and each SWMP program element, including progress in meeting the measurable goals identified in the SWMP.	Section 2
B(5)(b)	Status or results, or both, of any public education program effectiveness evaluation conducted during the reporting year and a summary of how the results were or will be used for adaptive management.	Section 2 (RC 5-1)
B(5)(c)	A summary of the adaptive management process implementation during the reporting year, including any proposed changes to the stormwater management program (e.g., new BMPs) identified through implementation of the adaptive management process.	Section 1.3
B(5)(d)	Any proposed changes to SWMP program elements that are designed to reduce TMDL pollutants.	Section 1.3
B(5)(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
B(5)(f)	A summary of monitoring program results, including monitoring data that are accumulated throughout the reporting year and/or assessments or evaluations.	Section 2 (MON 1-1, 1-2, and 1-3), Attachment 1
B(5)(g)	Any proposed modifications to the monitoring plan that are necessary to ensure that adequate data and information are collected to conduct stormwater program assessments.	Attachment 1
B(5)(h)	A summary describing the number and nature of enforcement actions, inspections, and public education programs, including results of ongoing field screening and follow-up activities related to illicit discharges.	Section 2 (ILL 2-4)
B(5)(i)	An overview, as related to MS4 discharges, of concept planning, land use changes and new development activities that occurred within the Urban Growth Boundary (UGB) expansion areas during the reporting year, and those forecast for the following year including the number of new post-construction permits issued, and the estimate of the total new or replaced impervious surface area related to new development and redevelopment projects commenced during the reporting year.	Section 5
B(5)(j)	Results of ongoing field screening and follow-up activities related to illicit discharges.	Section 2 (ILL 2-4), Attachment 1

1.3 Adaptive Management

The stormwater management program that is described in the City's current SWMP is the result of adaptively managing (e.g., implementing, evaluating, and adjusting) the program since first being issued an MS4 permit in 1997. The history of this adaptive management approach may be found in Section 2 of the City's "National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System Permit Renewal (September 2, 2008)," and describes how the current DEQ-approved SWMP meets the "maximum extent practicable" requirement. By adaptively managing its stormwater management program, the City continues to reduce the discharge of pollutants from its stormwater system.

Consistent with Schedule D.4 of the MS4 permit, City staff submitted an "Adaptive Management Approach" to DEQ on October 24, 2011, that will continue to be adhered to through expiration of the MS4 permit. This approach involves both an annual review of BMP activities and collected data, as well as a comprehensive assessment of BMP activities in preparation for MS4 permit renewal.

Per the Adaptive Management Approach, a series of 12 meetings were held with staff across the City in reporting year (FY 2014-15) to review BMP activities completed over the permit term, information received through the annual adaptive management process, and to complete a comprehensive assessment of BMP activities listed in the 2010 SWMP. Information collected through this assessment informed the proposed SWMP modifications that were submitted to DEQ as part of the MS4 Permit Renewal Package in December 2015. The proposed revisions were posted on the City's website for an open public comment period prior to submittal to DEQ.

In preparation of this annual report and as described in the Adaptive Management Approach, City staff were again asked to consider if changes in BMP activities were anticipated or proposed in the next fiscal year (FY 2021-22). Staff completed the documents for their individual BMP activity. This information will be used to inform the update to the Stormwater Management Plan once a new permit is received.

Figure 1. Permit Area Map

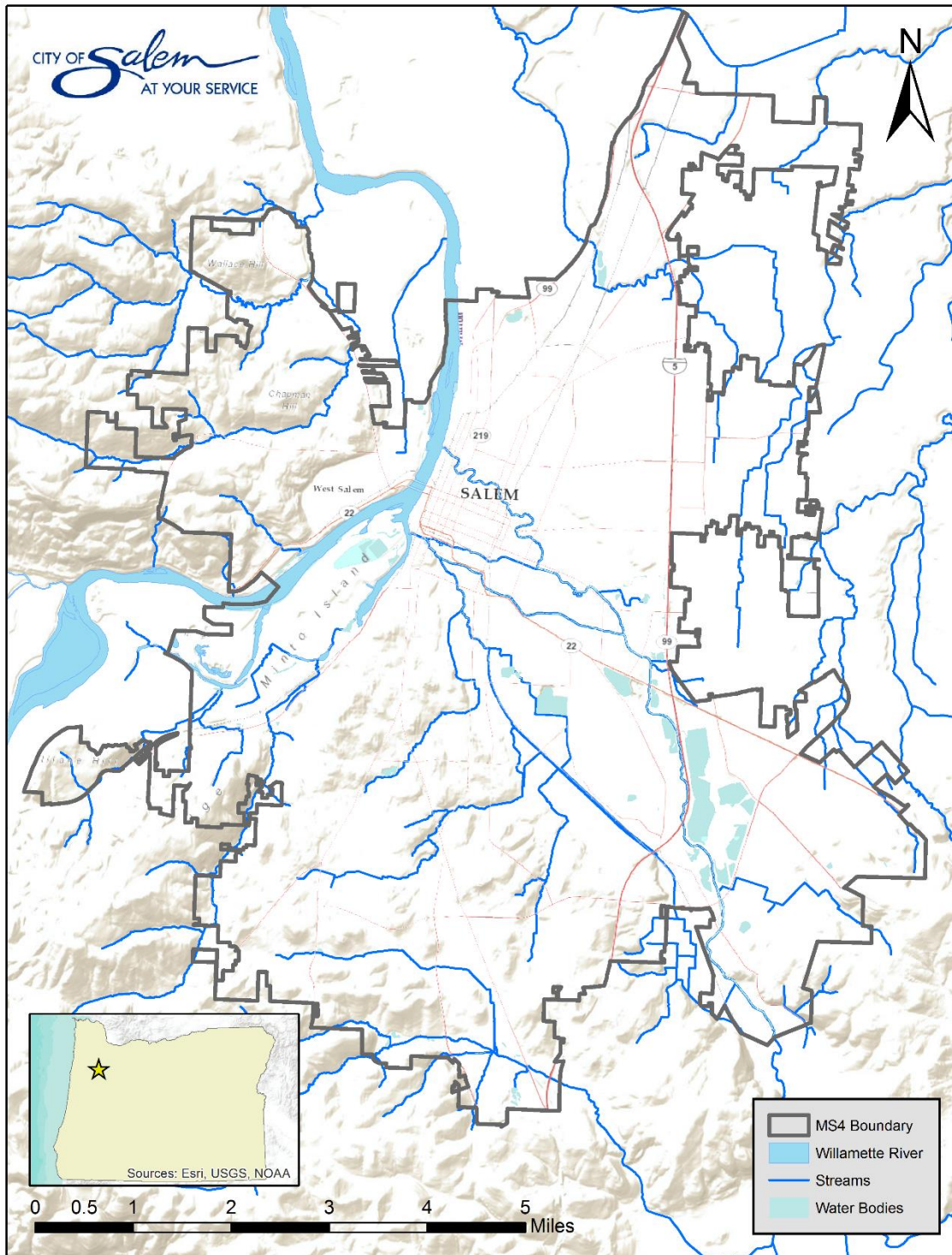
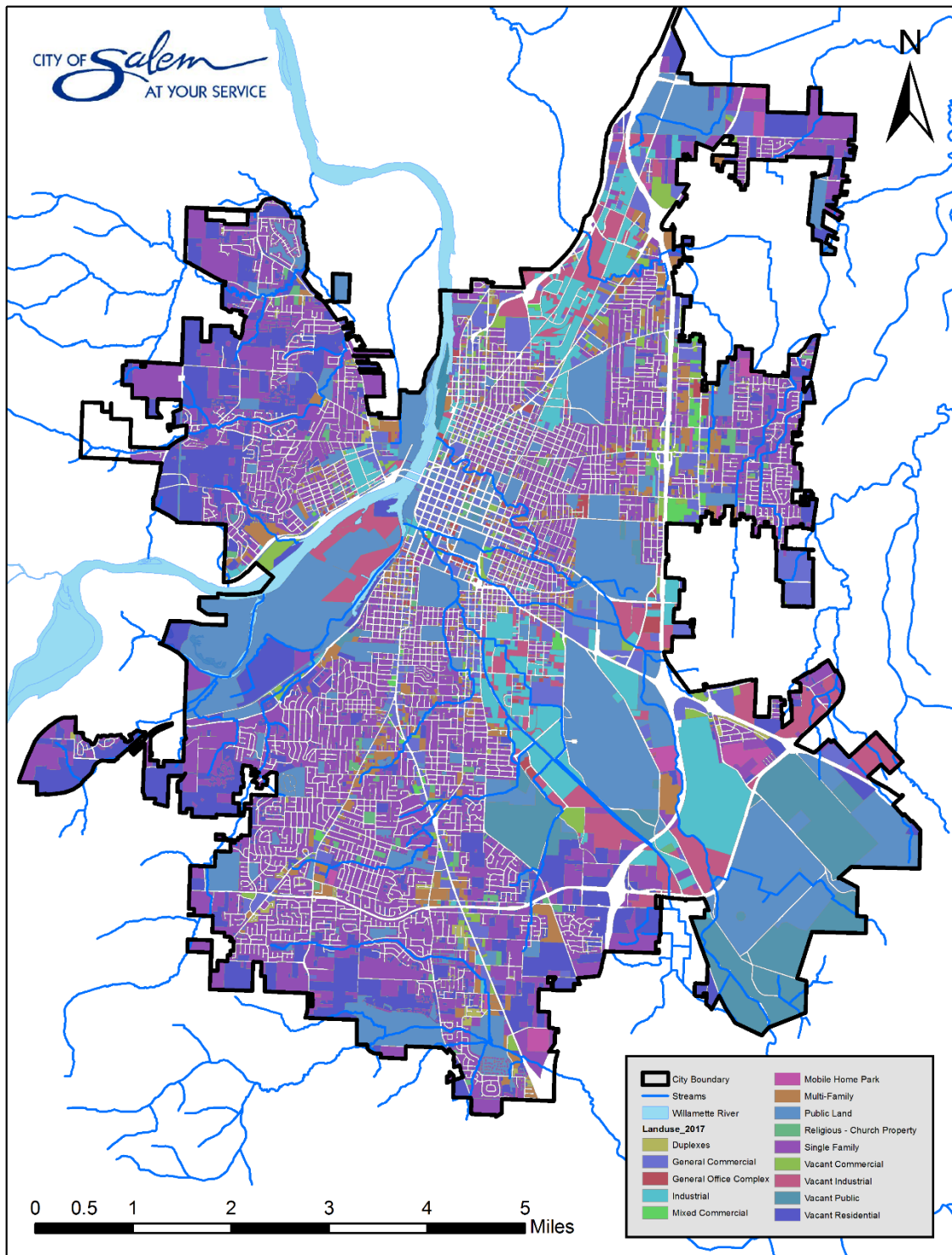


Figure 2. Land Use



2 STATUS OF THE STORMWATER MANAGEMENT PLAN

The primary objective of the SWMP is to provide an outline of City activities that will satisfy the NPDES Phase I stormwater regulatory requirements (the MS4 permit) [40 CFR 122.26(d)(2)(iv)]. The intent of the regulations is to allow each permittee the opportunity to design a stormwater management program tailored to suit the individual and unique needs and conditions of the permit area and reduce the discharge of pollutants from the stormwater sewer system to the maximum extent practicable.

The status of BMP activities listed in the 2010 SWMP is discussed in this section of the Annual Report. BMPs within the SWMP have been categorized into five types:

1. Structural and source controls for residential and commercial areas (RC);
2. A program for the control of illicit discharges and improper disposal into the storm drainage system (ILL);
3. A program to monitor and control pollutants from industrial facilities, hazardous waste treatment, storage and disposal facilities, and municipal landfills (IND);
4. A program to implement and maintain structural and non-structural BMPs to reduce pollutants from construction sites (CON); and
5. A program to conduct water quality monitoring activities within the MS4 drainage system and City waterways (MON).

Each BMP identified in the 2010 SWMP is discussed in this report with the following information:

- A table describing BMP tasks, associated measurable goals, and tracking measures as stated in the 2010 SWMP.
- A summary of activities completed during FY 2020-2021 (July 1, 2020 through June 30, 2021) that demonstrates progress toward meeting the measurable goals and tracking measures.

Table 2. RC1—Planning

Task Description	Measurable Goals	Tracking Measures	FY 2020-2021 Activities
RC 1-1: Provide City-wide Master Planning for stormwater to address both water quality and water quantity. As part of master planning efforts, continue to evaluate new detention and water quality opportunities within the Urban Growth Boundary (UGB), and consider sites in upstream areas that may affect Salem, and in downstream areas that may be affected by runoff from Salem.	Maintain Master Plan and complete next update within the MS4 permit cycle.	Track schedule for updating Master Plan. Report on Master Plan update actions.	Ongoing: An update to the City of Salem Stormwater Master Plan was adopted by City Council in October 2020. This plan carried forward analysis conducted for the 2000 Stormwater Master Plan and contains updated basin plans for Battle Creek, Mill Creek, and Pringle Creek. A consultant has been selected and a scope of work is being developed for the next update to the master plan.
RC 1-2: Develop and maintain watershed management plans by developing a prioritized schedule and implementing watershed management plans based on available funding. Develop the Pilot Pringle Creek Watershed Management Plan as a model for the City’s other prioritized urban watersheds. Identify capital improvement needs and potential “early action” activities and projects to ensure that the plan has a strong implementation component.	Complete a hydromodification study and retrofit plan by November 1, 2014. Incorporate recommendations and early action items of watershed management plans with completion of hydromodification study and retrofit plan. Develop strategy for completing future watershed management plans by November 1, 2014.	Report on completion of hydromodification study. Report on completion of retrofit plan. Track implementation actions of Pringle Creek Watershed Management Plan. Report on strategy for completing future watershed management plans.	Completed: The Hydromodification Assessment and Stormwater Retrofit Plan were completed and submitted to DEQ on October 28, 2014. Ongoing: During the reporting period 2019/2020, City staff utilized the stormwater retrofit prioritization tool (completed in 2017/2018) when preparing the annual Capital Improvement Plan (CIP). City Council adopted the CIP in June 2020, which includes a total of approximately \$3.05 M for stormwater-related projects, of which \$198,730 is allocated specifically for implementing the Stormwater Retrofit Plan.
RC 1-3: City staff will continue to update the official “waterways” map for use by City staff in applying various regulations and standards. As studies are performed that warrant the revision of the designated waterways, including ground truthing, that information will be incorporated into the update process.	Compile database of maps and waterways references. Complete field ground-truthing by end of FY 2011-12. Update map by end of FY 2012-13.	Track completion of ground-truthing and map updates.	Completed: All waterway layers were consolidated into one "channels" feature layer in SDE (Spatial Database Engine) as part of the Stormwater utilities migration from Hansen to Infor Public Sector (IPS). This consolidated layer is the master data set for all waterways. Ongoing: Regular maintenance is performed, and any updates have been applied to the Channels data as part of our asset management system.
RC 1-4: City staff will meet a minimum of once per year to discuss coordination of efforts relating to stormwater. Topics may include the following, as they are applicable: grant funding, outreach, program review, annual report, monitoring, sharing of data, adaptive management, review/update of documents and programs, training needs, documentation of protocols, coordination of databases, involvement of inspections, maintenance, and operations in plan review and program development, checklists, effective Erosion Prevention and Sediment Control Program including enforcement, strategizing/addressing hotspots, plan review, stormwater BMPs, and development of written enforcement strategy. Provide factsheets/manuals to new City employees to inform them about the City’s efforts for pollution prevention. At least annual trainings will be provided to specified City employees involved in MS4-related activities regarding the permit, including its intentions and their responsibilities in relation to the MS4 permit. Feedback for improving processes will be encouraged and brought to the coordination meeting(s). Training needs will be determined by City staff meeting mentioned above. Consider adding stormwater pollution prevention training as an action item of the FY 2011-12 Environmental Action Plan that addresses pollution prevention on a city-wide level.	Conduct annual formal coordination meetings for stormwater, more often if necessary. Conduct annual training of employees involved in MS4-related positions, more often if necessary.	Prepare an annual meeting summary. Track changes made to the implementation of the stormwater program based on coordination discussions. Track major items of coordination. Track training attendance. Share and document training suggestions for MS4 implementation changes.	Ongoing: The natural resources group has been meeting monthly to discuss policies, projects, and programs. This group focused on habitat restoration, and many of the projects from last year continued into this year: upland tree planting and streamside restoration with Friends of Trees, pollinator garden in parks, an updated oak savannah management plan and MOU that was finalized in late 2020, first year treatment of and second year planning for the treatment of Ludwigia in Minto Slough, and continued discussion of an Integrated Pest Management Plan and Policy. An herbicide application app is being created to help track the City's use of pesticides and to seek alternatives to them. The application is being tested. The IPM is in draft form and has been approved by upper management to share with departments citywide for feedback. Homelessness continues to be an issue in the parks and along streams. Many City internal and external partners meet to clean camps and \$300,000 has been dedicated for park improvements/restoration in the future at Wallace Marine Park and Cascade Gateway Park. Both locations are located along waterways. The City began celebrations for being a Tree City USA for its 45th consecutive year. The first celebratory event was a tree-themed poster contest. A poe-tree contest and trivia night will occur in the next fiscal year. The City has also continued its Climate Action Planning process with several virtual open houses to get the public's input. Solicitation of input for the plan will occur through the fall of 2021. The Public Works Department adopted or updated new policies, plans, and procedures to achieved APWA accreditation. A CIP funded project is planned to start next reporting year on Shelton Ditch, putting together designs and permitting information for addressing Erosion along the streambanks. Staff continued to participate in Oregon Association of Clean Water Agencies (ACWA) Stormwater subcommittees this last year (see RC1 Task 8). City staff attended the virtual Stormwater Summit in May 2020. City staff attends the City of Keizer’s Stormwater Advisory Committee, which meets monthly or as needed. All employees that are involved in MS4 related activities watch the rain check video for pollution prevention at municipal operations on an annual basis.

Task Description	Measurable Goals	Tracking Measures	FY 2020-2021 Activities
<p>RC 1-5: Coordinate with other agencies such as NGOs, private environmental groups, and watershed councils.</p>	<p>Develop a list of contacts and identify issues of coordination.</p>	<p>Document any MOAs.</p>	<p>Ongoing: The City works with many partner organizations. One MOU was created with the Glenn-Gibson Watershed Council. No MOAs were created. A list of coordinated efforts follows.</p> <p>Clean Rivers Coalition: Roy Iwai, Water Resources Specialist, roy.iwai@multco.us Salem staff sits on the steering committee of the Clean Rivers Coalition, a multiagency outreach group. The highlights for the year include the following:</p> <ul style="list-style-type: none"> Phase IV “Implementation” of the Meyer Memorial Trust Grant was completed in December 2020. This phase included the campaign name, brand framework, brand identity, and style guide. In September 2020, the EPA awarded \$174,045 to the CRC to implement the “Pesticide Reduction Outreach” campaign, a focused campaign targeting household pesticides, the priority pollutants identified through the Willamette River Initiative grant project. The following were done under this grant: <ul style="list-style-type: none"> The CRC held a Community Based Social Marketing training by Doug McKenzie-Mohr in January 2021 with 94 participants in virtual attendance. The training was followed by a new forum in February 2021 to identify the behavior change actions to address with Community Based Social Marketing techniques and to identify the tools needed to successfully implement the campaign. In May 2021, the Latinx focus group and workshop were conducted and Lara Media presented the findings to the CRC in June. The group also went through the selection process to hire a consultant for pesticide reduction videos and Columbia River project. MetroEast was awarded the contract for both projects. Video creation will occur in FY 2021-22. <p>Friends of Trees: Logan Luvray, Green Space Manager, LoganL@friendsoftrees.org The City of Salem contracted with FOT again this year to assist with riparian and upland tree plantings. The group hosted one crew lead training event and nine events, one of which was a mulching event. This year, 89 volunteers contributed 326.75 hours to plant 59 small-stock trees, 1,585 small-stock shrubs, and 178 large-stock trees.</p> <p>Mid-Willamette Outreach Group Staff attends monthly meetings to coordinate on stormwater outreach issues and events.</p> <ul style="list-style-type: none"> On January 26, 2020, the Mid-Willamette Outreach Group (MWOG) hosted their annual Erosion Control and Stormwater Management Summit (Summit). Event registration totaled 106. The Water Festival was held outdoors and in-person at Lamb Elementary. Two teachers participated for a total of 65 students. <p>Salem Environmental Education: Jon Yoder, President, joyoder@wildblue.net Staff sits on the board and attends regular board meetings that provides overall direction for the organization. In-person outreach has been limited this year due to COVID.</p> <p>Outdoor School Coalition: Jon Yoder, Chair, joyoder@wildblue.net Outreach and Education staff coordinated with the Outdoor School Committee to create lessons and activities for outdoor school for Salem/Keizer students. The scheduled outdoor school events were cancelled this year due to COVID. Next anticipated date for Outdoor School is October 2021.</p> <p>Glenn-Gibson Creeks Watershed Council: Kenneth Bierly, bierlykenneth@gmail.com Staff attended virtual monthly meetings. Items of coordination include reviewing quarterly newsletters, the Oak Savannah Memorandum of Understanding (MOU) and Management Plan, Oak Savannah maintenance, beaver issues, invasive knotweed treatment, and grant support.</p> <p>Claggett Creek Watershed Council: Mark Caillier, markcaillier@claggettcwc.org Staff attended virtual monthly meetings and coordinated a partnership with the watershed council and City Parks to create a pollinator garden in a north Salem park.</p>
<p>RC 1-6: The City will work with Marion and Polk Counties and the City of Keizer to coordinate stormwater management programs and activities within the greater Salem-Keizer Urban Growth Boundary. Coordination may include the establishment of appropriate intergovernmental agreements (IGAs) regarding potential uniform stormwater design standards, operations and maintenance activities, and public education and involvement efforts within the UGB.</p>	<p>Review and update the October 2000 SKAPAC Stormwater Management Agreement by the end of the permit term to reflect each jurisdiction’s respective MS4 Permit and SWMP.</p>	<p>Report on significant coordination activities or programs.</p> <p>Report on completion of SKAPAC Agreement and other IGAs.</p>	<p>Ongoing: Stormwater staff continued to work with Marion County, the Marion Soil and Water Conservation District, the City of Keizer, the City of Albany, and the City of Corvallis through the Mid-Willamette Valley Outreach Group (MWOG) to coordinate outreach pertaining to Erosion Prevention and Sediment Control and Low Impact Development practices (see RC 5 and CON 1). There were no new IGAs developed during this reporting period.</p>

<u>Task Description</u>	<u>Measurable Goals</u>	<u>Tracking Measures</u>	<u>FY 2020-2021 Activities</u>
RC 1-7: Evaluate existing detention facilities and potential new detention sites for potential conjunctive uses (as water quality facilities and for retrofitting opportunities). Continue to perform facility site searches to locate ponds, wetlands, vegetated swales, and other water quality facilities as existing water quantity and quality facilities are evaluated and potential new sites are identified. Coordinate with RC1-1 and RC1-2.	<p>Complete a retrofit plan before end of year four of the MS4 permit cycle.</p> <p>Develop a strategy to identify and prioritize potential retrofit projects by November 1, 2013.</p> <p>Identify a minimum annual budget for stormwater retrofit projects as part of the retrofit strategy by November 1, 2014.</p>	<p>Report on available budget and completion of retrofit project efforts.</p>	<p>Completed: The Stormwater Retrofit Plan was completed and submitted to DEQ on October 28, 2014.</p> <p>Ongoing: During Reporting Year 2017/2018 a prioritization tool was refined and went into use for ranking potential retrofits so they could be placed into the City's Capital Improvement Program (CIP). For FY 20-21, \$100,000 was budgeted for completion of a retrofit project out of the CIP. Additional money is allocated within the Stormwater Program budget for small-scale retrofit projects that can be done in-house or cost less than \$45,000.</p> <p>Completed: During reporting year 2020/2021, one major retrofit was completed that converted an existing earthen back up detention basin into a detention basin with flow through treatment in a water quality swale.</p>
RC 1-8: The City will continue to be an active member of the Oregon Association of Clean Water Agencies (ORACWA). The City will use this medium to obtain copies of materials that have been produced by others. City staff will stay current on latest available educational and technical guidance materials.	<p>Attend a minimum of one stormwater-related workshop or conference annually. Attend groundwater-related workshops and conferences as funds allow.</p> <p>Make information obtained at these events available to other City staff.</p>	<p>Report on City participation with ORACWA events.</p>	<p>Ongoing: Public Works staff continued to actively participate in Oregon Association of Clean Water Agencies through attendance at regularly scheduled meetings for the Stormwater, Pretreatment, and Water Quality Committees. Staff have also engaged with the Willamette River Mercury TMDL process, and the MS4 phase 1 permit renewal efforts. Staff attended the annual Stormwater Summit in May that was held virtually, and the Annual Conference that was held virtually in July.</p> <p>Information acquired through ACWA meetings/events is routinely passed on to other City staff, and as much as possible staff that don't normally attend meetings are included on meetings that have information relevant to them.</p>

Table 3. RC2—Capital Improvements

Task Description	Measurable Goals	Tracking Measures	FY 2020-2021 Activities
RC 2-1: Implement stormwater projects (including stormwater conveyance, quantity, quality, and stream/habitat improvement) based on priorities established under the Capital Improvement Program (CIP) and the Stormwater Master Plan consistent with available funding.	<p>Include a funding line item for CIPs in proposed stormwater budget.</p> <p>Review and prioritize CIPs and budget annually.</p> <p>Implement CIPs based on prioritization and available funding.</p>	<p>Track number and description of projects completed.</p> <p>Report updated CIP list annually.</p>	<p>Five projects have been documented for both RC 2.1 and RC 2.2.</p> <p>1. MCCC South Open Space Wetlands - Construction of 23 acres of open wetland. Grading is complete. Irrigation and planting will be completed by Fall 2021.</p> <p>2. 2020 Stormwater Improvements - Replacement and improvements to the existing stormwater system on Cedar Way SE from Summer Street SE to Pheasant Avenue SE, and Pheasant Avenue SE from Cedar Way SE, south to termination; including the installation of catch basins; the installation of manholes; and installation of new 10-inch PVC and Ductile Iron storm lines. The installation of a rain garden at the Salem Municipal Airport; including the installation of an irrigation system; the installation of catch basins; the installation of 10-inch PVC and Ductile Iron storm lines. The existing storm lines were replaced or abandoned.</p> <p>3. Fairview and 12th – Installation of new storm drainage pipe to collect stormwater.</p> <p>4. Camelia Drive Storm Drainage Improvements - Construction of storm drainage improvements between Madrona Avenue S and Camellia Drive S for the stormwater from Madrona Avenue S that is currently flowing overland towards an existing public storm drain system located on private property at 3600 Camellia Drive S. The Project replaced a deteriorating open channel with a storm drain pipe between Madrona Avenue S and the existing public storm drain system to better capture and route the stormwater runoff from Madrona Avenue.</p> <p>5. Shelton Ditch Bank Stabilization - Design has begun for the construction of stream bank stabilization and mitigation measures in multiple areas along the Shelton Ditch corridor.</p>
RC 2-2: Continue to coordinate capital improvement projects with the Water Resources Section to integrate multiple resource agency permitting needs. The review is intended to identify integrated opportunities and permitting needs to meet water quality-related requirements.	<p>Review and integrate multiple resource agency permitting needs, including MS4 permit requirements, into 100 percent of CIP projects.</p>	<p>Track number of projects reviewed.</p> <p>Track number of projects permitted.</p>	<p>See above for information.</p>
RC 2-3: The City continues to acquire physical access-easements for public and private stormwater facilities. This is done by identifying existing facilities for which easements, rights-of-way, or permit-of-entry agreements are needed for stormwater facilities; and developing a plan for acquiring the same, given current funding limitations.	<p>Within one year of completion of the hydromodification study and retrofit plan, prioritize easement acquisitions for stormwater facilities.</p> <p>Following prioritization, identify funding source(s) for inclusion in budget.</p>	<p>Report on easement acquisition and prioritization process.</p>	<p>Completed: The Retrofit Plan and Hydromodification Assessment that were submitted to DEQ by the November 1, 2014, deadline identified prioritized areas for stormwater improvement projects.</p> <p>Prioritization: The Stormwater Master Plan update specifies projects to be constructed, many of which may require acquisition of easements. As needed, easement acquisitions will be prioritized and pursued as projects are funded. Easement acquisition costs will be factored in and budgeted for along with all other associated project costs.</p>

Table 4. RC3—Update of Stormwater Design Standards

Task Description	Measurable Goals	Tracking Measures	FY 2020-2021 Activities
RC 3-1: Continue to encourage the use of structural BMPs for stormwater quality improvement and flood peak reduction opportunities. Develop stormwater quality design and associated maintenance standards for new and redevelopment. Continue to evaluate opportunities to provide incentives for alternative stormwater management practices, including Low Impact Development (LID). Maintain and update the Stormwater Management Design Standards after they are developed.	<p>Develop incentives for LID and other stormwater quantity and quality management practices.</p> <p>Develop updated stormwater design standards to include structural stormwater quality BMPs.</p> <p>Maintain Stormwater Management Design Standards and update as needed.</p>	<p>Document revisions made to Stormwater Management Design Standards.</p> <p>Document the development of any incentives for implementation of LID techniques.</p>	Completed. Incentives for Low Impact Development (LID) have been incorporated into Salem's Stormwater Utility in the form of credits that allow the impervious surface-based portion of the utility fee to be reduced based on the presence of stormwater quality and quantity facilities on the ratepayer's property. The first phase of the Stormwater Utility fee was implemented in January 2013 and the utility was fully implemented January 1, 2016. Stormwater Design Standards were approved as Administrative Rules completed in late 2013 and have been effective since January 1, 2014. The new standards are consistent with stormwater regulations and include design criteria for green stormwater infrastructure.
RC 3-2: Continue to implement process to identify and remove barriers for implementing LID techniques. Update the Stormwater Management Design Standards and associated Salem Revised Code (SRC) provisions as appropriate.	<p>Within three years of implementing the revised stormwater design standards, review and, as appropriate, modify design standards and SRC to minimize barriers to implementation of LID techniques.</p>	<p>Document the review of design standards and SRC to minimize barriers to implementation of LID techniques.</p>	Completed. Barriers to implementing Low Impact Development techniques have been identified and modified through Ordinance 34-13, which was adopted by Salem City Council on November 4, 2013. Updating the Stormwater Management Design Standards related to LID techniques was completed in late 2013 and new standards became effective on January 1, 2014 (see RC3-1).
RC 3-3: City staff is implementing the Water Quality Development Standards set forth by SRC Chapter 141 for all development requiring a Willamette Greenway Permit.	<p>Implement Water Quality Development Standards in Willamette Greenway.</p>	<p>Track number of Willamette Greenway Permits issued, and description of water quality measures employed.</p> <p>Track number of new facilities constructed.</p>	<p>Ongoing: Willamette Greenway permits are processed as either conditional uses or as administrative conditional uses, depending on their location. Greenway permits are tracked through AMANDA, the City's permit tracking system. Requirements from SRC 71 (Stormwater Code) and associated Design Standards for use in the Greenway are incorporated as appropriate.</p> <p>Permitted and constructed: One greenway permit was issued, and one facility was constructed in FY 20/21. The greenway permit and the facility constructed are related; a digital sign at 110 Wallace Rd NW.</p>
RC 3-4: Continue to review all residential, commercial, and industrial plans submitted for City-issued building permits for compliance with the City's Stormwater Management Design Standards. Conduct inspections of completed projects prior to the City's acceptance of those projects and project close-out to ensure work was done in accordance with approved plans. Maintain database of plans reviewed and final inspections conducted. See IND1-Task 2 for standards specific to industrial facilities.	<p>Review all residential, commercial, and industrial plans submitted for City-issued permits for compliance with the City's Stormwater Management Design Standards and associated SRC provisions.</p> <p>Conduct inspections once construction is completed to ensure work was done in accordance with approved plans.</p>	<p>Maintain database of plans reviewed and final inspections conducted.</p>	<p>Ongoing: All residential, commercial, and industrial plans submitted for City-issued permits are reviewed by Public Works staff for compliance with Stormwater Design Standards. Construction of stormwater-related facilities are inspected by Plumbing Inspectors within Community Development and/or Public Works to ensure that work was done in accordance with approved plans. All plan reviews and inspections are tracked in AMANDA, the City's permit tracking database.</p>

Table 5. RC4—Operations and Maintenance

Task Description	Measurable Goals	Tracking Measures	FY 2020-2021 Activities
RC 4-1: Continue with the existing street sweeping schedule for all areas, maintaining the record of observations, quantity, and quality of material collected in the daily log books. Collect and compile this information for making recommendations for modified methods, schedules, and for NPDES MS4 permit annual reporting and overall program evaluation.	<p>Review street sweeping program annually for effectiveness and any necessary revisions to sweeping schedule.</p> <p>Continue sweeping City streets on four zone schedule, sweeping heaviest zone eight times per year and lightest zone two to three times per year.</p> <p>Continue sweeping City-owned parking lots as needed.</p>	<p>Record quantity of material collected during sweeping operations.</p> <p>Record number of curb-miles of streets swept.</p> <p>Track and report changes made to sweeping schedule, if any.</p>	<p>Ongoing: The City now utilizes 3 (increased from 2) regenerative air sweepers during this reporting year to sweep residential and collector streets that have been categorized as having High, Medium, or Light debris accumulation. Previously only 2 operators swept residential & collector streets. The Heavy debris accumulation zone contains 19 routes and is swept 13 times per year. The Medium debris accumulation zone contains 15 routes and is swept 8 times per year. The Light debris accumulation zone contains 8 routes and is swept 6 times a year. A fourth zone that encompasses the Central Business District (CBD) and Capitol Mall is swept at night on a weekly basis. Heavy debris areas within the CBD are also swept three times per week during summer and twice per week in fall through spring. Arterial streets are swept at night, approximately every four weeks. A third machine is operated during peak leaf season or when one of the other machines is broken down. Three operators sweep residential and collector streets during the day and two operators sweep arterial streets during the night. City-owned parking lots are swept on an as-needed basis. The City does not sweep any commercial parking lots.</p> <p>Stats: During this reporting year the City swept a total of 14,485 miles, collected approximately 1,800 tons of street sweeping debris and removed approximately 4,500 cubic yards of leaves.</p>
RC 4-2: The City will continue to perform de-icing operations in a way that minimizes stormwater pollution such as conducting annual inspections and training to ensure proper operation of the de-icing chemical storage facility, utilization of the expanded covered storage areas for de-icing materials, maintaining proper function of sediment traps and catch basins in the storage yard, and coordinating de-icing activities with Airport Operations and their 1200-Z permit. The City is also looking for ways to improve current operations by investigating and evaluating potential cost-effective recycling opportunities for used de-icing sand material.	<p>Continue current de-icing operations to prevent stormwater pollution.</p> <p>Investigate potential cost-effective recycling opportunities for de-icing sand material.</p>	<p>Document review of recycling opportunities.</p> <p>Document dates of activities for annual inspections and training.</p> <p>Document de-icing quantities applied annually.</p>	<p>Ongoing: We experienced 25 responses to light snow and/or ice two of which included plowing or sanding. We applied 15,386.8 gallons of Freezgard Zero liquid deicer (magnesium chloride based) and 456 yards cubic yards of sanding rock was placed during FY 2020-21.</p> <p>Training: Annual training for snow and ice operators occurred on October 30, 2020. Our annual equipment inspection and set up for snow and ice season began in September 2020 using Epoke sanders and concluded in October 2020. Our quantities of deicer materials utilized during snow and ice season are maintained in our Units of Accomplishment database annually.</p> <p>Reuse: Currently sanding rock is re-used as fill for old gravel pits that are no longer in use, and not disposed of in a landfill.</p>
RC 4-3: Continue to review and update the O&M practices and activity schedules defined in the Drainage Program Evaluation Notebook (DPEN) (including updating GIS database). Utilize Hansen IMS data to develop and refine work programs. This review will serve as a basis for budgeting and allocating resources; scheduling work; and reporting on and evaluating the performance and costs for the overall O&M program and specific activities.	<p>Update DPEN and IMS database activities and schedules.</p> <p>Create line items in budget for specific O&M activities.</p> <p>Review and update O&M practices and activity schedules every three years.</p>	<p>Track revisions made to O&M practices and activity schedules.</p>	<p>Ongoing: DPEN is not used; IPS is the database that provides work orders, scheduling, and data tracking. Program also tracks Service Requests (customer complaints) called in through Dispatch. These requests are either taken care of immediately, or TV cleaning work orders are created as follow up.</p> <p>Budgeted: The O&M line item budgets for storm sewer pipe cleaning, Stormwater Open Channel System Maintenance, Stormwater Pipe Inspection, and Stormwater Pipe Maintenance equates to \$5,108,197. The budget for all operational line items can be found in Table 17.</p> <p>Reviewed: O&M stormwater practices, policies, and procedures were reviewed in the previous two years at the City of Salem worked towards becoming accredited by the American Public Works Association (APWA).</p>
RC 4-4: Continue to improve the O&M training program and activities especially with regards to safety and protection of water quality.	<p>Conduct O&M safety meetings twice per month.</p> <p>Attend ACWA committee meetings and workshops as scheduled.</p> <p>Conduct weekly tailgate meetings with Operations crews.</p>	<p>Document reviews and modifications to the O&M training program.</p> <p>Record O&M training activities completed.</p> <p>Document ACWA meetings and workshops attended.</p>	<p>Trained: Staff completed National Association for Sewer Services Companies (NASSCO) training to comply with the national TV inspection codes. Staff continued education on stormwater and safety related topics. Tailgate meetings with updates on safety and related topics were held weekly.</p> <p>ACWA: Staff participated in monthly meetings of the Stormwater Committee, Water Quality Committee, and periodic meetings for MS4 Phase I Working Group. Staff also attended ACWA Summer Conference virtually.</p>
RC 4-5: Integrated Pest Management (IPM) Program: Salem Parks Operations Division will continue their program for careful	<p>Review and refine IPM Program during the MS4 permit cycle.</p>	<p>Document revisions made to IPM Program.</p>	<p>Updating: Representatives from Stormwater Operations, Parks Operations, and Parks Planning Groups continued in their work as a task force to update the City's</p>

<u>Task Description</u>	<u>Measurable Goals</u>	<u>Tracking Measures</u>	<u>FY 2020-2021 Activities</u>
monitoring and management of pesticides, herbicides and fertilizers, and will provide public information. Review and refine the IPM Program during the permit cycle, ensuring proper handling and storage of pesticides, herbicides, and fertilizers.	routine inspections of storage facilities for proper storage of materials and chemicals.	Document inspections of storage facilities.	<p>Integrated Pest Management Policy and Plan. A policy has been drafted and is awaiting review by other departments. An operations guidance manual for Public Works employees is currently being drafted. Pesticide procurement will be through the City’s central stores. This will enable better tracking of inventory and streamline purchasing.</p> <p>Documenting: An electronic pesticide application reporting form was created using Survey123 to allow for centralized reporting. This form will be available for all City departments once finalized.</p> <p>Ongoing: City staff conduct quarterly safety inspections that include the inspections of facilities that contain pesticides and other potentially hazardous materials. Any improper storage is documented in these inspections and provided to the safety committee for resolution.</p>
RC 4-6: Continue the storm sewer cleaning and TV inspection program, concentrating on known areas of localized flooding complaints (this alerts the City to locations of debris build-up and minimizes erosion potential) and persistent operation and maintenance problems, and looking for potential illicit discharges and seepage from sanitary sewers, see ILL2. Also focus on significant industrial/commercial areas where potential illicit discharges may be of concern.	<p>Concentrate storm sewer cleaning and TV inspection on areas with historical problems and high potential for illicit discharges.</p> <p>Inspect 120,000 LF of conveyance system annually.</p>	<p>Track number of inspections; identify areas with persistent O&M problems.</p> <p>Track number of cross-connections found.</p> <p>Track length of conveyance system cleaned and inspected.</p>	<p>Ongoing: Stormwater continued focusing on older infrastructure for inspections to locate needed repairs. Ten mainline repairs were identified and addressed. Additionally, more cleaning and root cutting was performed in these areas to minimize the potential for winter flooding. This is continuing work.</p> <p>Stats: Six cross-connections were found. Crews inspected 203,779 lineal feet and cleaned 76,286 lineal feet of line.</p>
RC 4-7: Continue supporting annual Stream Cleaning Program. More than one half of the stream miles in the City of Salem are inspected annually by walking each stream segment. Using summer interns the City inspects the riparian areas and streams, picks up litter and garbage, inspects for illicit discharges (ILL2), addresses potential conveyance concerns, and evaluates areas for stream restoration.	<p>Walk 50 percent of the waterways within the City each year for stream cleanup and enhancement.</p> <p>Complete one stream restoration project each year.</p>	<p>Track length of waterways walked each year.</p> <p>Document stream restoration projects completed each year.</p> <p>Document the amount of litter and garbage removed each year.</p>	<p>Ongoing: For reporting year 2020-21, stream crew interns inspected and cleaned 61.5 miles of stream channel within the City limits, removing 9,242 pounds of trash and removing 68 cubic yards of green debris. A restoration project along Glenn Creek on City owned stream bank was conducted, which included removing invasive species such as ivy and blackberry, adding erosion control matting, and planting native shrubs and ferns. The restoration site will be expanded in the coming years to continue the restoration of this bank and keep invasive species away from the native plants that have established.</p>
RC 4-8: Continue to regularly inspect and maintain public structural stormwater control facilities. Coordinate with RC4 Task 9.	Regularly inspect all public detention and water quality facilities.	<p>Track number of public facilities inspected and maintained.</p> <p>Track amount of sediment and debris removed from all facilities.</p>	<p>Ongoing: This reporting year, 477 publicly owned stormwater facilities were inspected using ESRI Collector app and Survey123; 29 work orders were needed for detention basins and flow control structures, and 103 work orders were needed for water quality and manufactured treatment technology.</p> <p>Ongoing: Staff tracked sediment and debris removal in the City’s asset management database, IPS. Crews removed 5,164 cubic feet of sediment and debris from water quality facilities and detention basins during this reporting year.</p>
RC 4-9: Develop and implement a long-term maintenance strategy for public and private stormwater control facilities. This strategy will identify procedures and/or priorities for inventorying, mapping, inspecting, and maintaining facilities.	Document and implement a long-term maintenance strategy for public and private stormwater control facilities during the MS4 permit cycle.	<p>Track number of private facilities located, mapped, and inspected.</p> <p>Track progress toward developing a facility long-term maintenance strategy.</p>	<p>Ongoing: Facilities located, mapped, and inspected include the following: - 1,299 total stormwater facilities inspections (804 privately owned and 495 public) - 54 previously unidentified stormwater facilities discovered in the field - 166 work orders were needed (for 24 Detention Basins, 108 Flow Control Structures, 12 WQ Facilities, and 22 Manufactured Treatment Facilities).</p> <p>The strategy this year was to continue with inspections and consider how best to prioritize water quality benefits when future private facility work is done. Private facilities with broken and/or clogged flow control structures will likely yield the highest water quality benefit per unit time/cost and may be the first focus.</p>

<u>Task Description</u>	<u>Measurable Goals</u>	<u>Tracking Measures</u>	<u>FY 2020-2021 Activities</u>
RC 4-10: Ditch maintenance is performed to assure adequate conveyance, and consists of two components: 1) Ditch Cleaning – Cleaning consists of removal of sediment in the bottom of roadside ditches only as needed for proper conveyance, with limited vegetation disturbance and the use of straw wattles to reduce sedimentation and erosion within the ditch; and 2) Ditch Mowing – Mowing is typically conducted by inmate crews using hand-held equipment. Vegetation cutting facilitates conveyance and reduces the risk of potential fires in summer months.	Regularly inspect and maintain 100 percent of City ditches using appropriate water quality BMPs.	Track length of ditch maintenance performed (cleaning and mowing). Track amount of sediment and debris removed	Ongoing: Continued yearly inspections of all roadside drainage ditches during mowing process. Visual inspections determine whether ditches need cleaning. Straw wattles are placed periodically in cleaned ditches for erosion prevention. Drainage ditches are mowed twice yearly to reduce fire risk in summer and flooding risk during the winter. Stats: Staff mowed 130,914 linear feet and cleaned 107,901 linear feet of ditch. Amount of sediment and natural debris removed was just over 9,800 cubic yards.
RC 4-11: Public catch basins are cleaned on a regular basis with a Vactor truck. During catch basin cleaning activities, inspections are done and repairs are scheduled if needed.	Clean and inspect 75 percent of catch basins annually. Periodically analyze the material removed from the catch basins.	Track the number and percent of catch basins cleaned annually. Report on any analysis of removed material.	Ongoing: Staff cleaned at total of 13,076 catch basins (78%), yielding the removal of 243 cubic yards of sediment/debris from these structures using a Vactor truck and/or hand tools.
RC 4-12: Continue to refine the maintenance program for public and private stormwater detention and water quality facilities. The City maintains an informational packet outlining ownership and maintenance responsibilities and compliance assurance procedures to encourage owners of private detention and water quality systems to perform maintenance. Coordinate with RC 4 Task 9.	Maintain informational package for ownership maintenance responsibilities for detention and water quality facilities. Implement maintenance activities and requirements identified in long-term maintenance strategy (RC4 Task 9).	Track number of information packets distributed regarding private stormwater control facilities. Track maintenance requirements of long-term maintenance strategy.	Ongoing: The City provides informational packets and letters to private residents as needed/requested. All new private stormwater facilities that are being constructed have a Private Stormwater Facility Agreement (PSFA) that is part of the recorded property deed. For the reporting year, 23 new PSFAs were recorded. The strategy this year was to continue with inspections and consider how best to prioritize water quality benefits when future private facility work is done. Private facilities with broken and/or clogged flow control structures will likely yield the highest water quality benefit per unit time/cost and may be considered the first focus.

Table 6. RC5—Public Education and Participation

<u>Task Description</u>	<u>Measurable Goals</u>	<u>Tracking Measures</u>	<u>FY 2020-2021 Activities</u>
RC 5-1: Develop and implement a public outreach and education strategy with goals, objectives, identified target audiences, partners, identified target contaminants, and messaging. Conduct a public education program effectiveness evaluation of outreach procedures/efforts. Adjust the program based on the results in year five. (See Table A.1 – Public Outreach Program Matrix, June 2008).	Create two public education campaigns from the Public Outreach Program Matrix. Support outreach and educational activities for other divisions. Conduct an effectiveness evaluation of the outreach program before the end of year four of the MS4 permit cycle.	Document public outreach and involvement activities for two (2) education campaigns. Document outreach activities for other divisions. Document the results of the effectiveness evaluation and subsequent changes to the outreach procedures/efforts.	Ongoing: The City continues to conduct outreach campaigns created throughout this permit cycle. In addition, the newest campaign is being developed. A social marketing proposal targeting heavy metal toxins was revised based on target audience survey results that was conducted in 2020. The draft was created based on the survey results and re-edited after staff attended a community based social marketing training. The draft marketing proposal is in internal review and pending approval. The City also created an Epic Orca Exhibit for its youth environmental program and for use at school and community events. The exhibit is designed to bring awareness to the plastic pollution problem, salmon as a keystone species, and climate change. Other outreach campaigns include the Free Tree Program that took place in spring 2021 targeting temperature by increasing riparian plantings, 195 Salem residents picked up 761 plants; promotion of the Capital Canine Club; update to the Storm Drain Marking program; and monthly thematic Facebook posts on the City of Salem's Facebook page. Ongoing: Outreach and support of other divisions included promotion of the Mayor's Monarch Pledge to provide pesticide reduction information in coordination with the Parks Planning and Natural Resources Section and the Fall Leaf Haul for nutrient and composting information. Completed: The effectiveness evaluation was completed and submitted to DEQ prior to November 1, 2014
RC 5-2: Coordinate activities of various groups within the Public Works Department and other City departments' assigned	Quarterly meetings of various groups assigned responsibility for public outreach and citizen contacts on stormwater matters.	Document quarterly meetings and outcomes.	Ongoing:

<u>Task Description</u>	<u>Measurable Goals</u>	<u>Tracking Measures</u>	<u>FY 2020-2021 Activities</u>
responsibility for public outreach and citizen contacts on stormwater matters.			<p>Fall Leaf Haul and Fall seasonal messaging: Staff coordinated with street sweeping crews to provide messaging regarding keeping leaves out of the storm drains and to promote the Fall Leaf Haul. Outcome: water bill inserts and promotion on social media and radio. Cross promoted with City communications team.</p> <p>Annual Streamside Mailer: Staff met to discuss content for the annual streamside mailer. Outcome: the annual streamside mailer was sent to over 1,800 streamside residents in June 2021. These topics were provided in this year's mailer: assessing tree damage after the ice storm, requesting stream access for the stream crew, the Free Tree Program, resources for streambank erosion, minimizing flood risks, Community Alert system sign ups, and about the Clean Streams Initiative.</p> <p>Ludwigia treatment in the Willamette Slough: Staff met multiple times during the fiscal year to discuss and coordinate outreach for the treatment of Ludwigia in the Willamette Slough. The first treatment was scheduled for early July and the second for September. Staff also coordinated with the Technical Services group to provide drone imagery pre and post treatment for each year. Outcome: Developed and implemented a communications strategy regarding the habitat improvement project. Drone footage is available for comparison and Technical Services story map of the project is in review.</p> <p>Integrated Pest Management: Staff continues to work on an Integrated Pest Management Plan. This past year, staff have met to create a draft policy to be approved by department directors. Staff is also working to create an app that will help track how pests, including plants, animals, and fungus, are treated. App is ready for in-field testing. The app will be available to City staff and hired contractors and includes tracking of non-pesticide treatments as well.</p> <p>Communications Team: Staff attends communication team meetings and has provided a calendar of stormwater topics to the citywide group to assist with communicating messages throughout the year.</p>
RC 5-3: Increase the use of community partnerships to carry out outreach goals.	Develop one new partnership per year to carry out outreach goals.	Document partnerships and outcomes of partnership activities.	Completed: This year we partnered with a local Salem nursery, 13th Street Nursery, in spring 2021 to offer the Free Tree Program at their location allowing residents to pick up plants locally at the nursery.
RC 5-4: Investigate the use of a stormwater utility to provide an adequate funding base to support expanded public outreach (see RC6-2).	Develop a yearly public education budget. Document public education and outreach needs in the Stormwater Utility Implementation Plan.	Document public education budget and expenditures. Document Utility implementation plan showing public education and outreach needs.	Budgeted: The items budgeted for in FY 2020-21 for Natural Resources Outreach and Education, which includes personnel services, materials, and services totals \$596,547. This funding covers staff that provide services for education and outreach related to the City's regulatory permits and plans as well as the Youth Environmental Education Program (YEEP).

Table 7. RC6—Stormwater Management Program Financing

<u>Task Description</u>	<u>Measurable Goals</u>	<u>Tracking Measures</u>	<u>FY 2020-2021 Activities</u>
RC 6-1: In conjunction with the updated Stormwater Master Plan (RC1-1), review and update the Stormwater System Development Charge (SDC) methodology to address both stormwater quantity and quality.	Adopt updated Stormwater SDC methodology by the end of the MS4 permit cycle.	Report on update to Stormwater SDC methodology.	Adopted: A review and update of the Stormwater System Development Charge (SDC) methodology was conducted independent of the Stormwater Master Plan. A committee consisting of two City Councilors and representatives of the development community, home builders, and residents met regularly in 2017 and 2018. The committee recommended to Council that major amendments to the Stormwater SDC methodology should be postponed until after completion of the Stormwater Master Plan. City Council adopted the SDC methodology update on February 25, 2019, under resolution 2019-7.
RC 6-2: Implement a new stormwater utility capable of generating stormwater fees historically paid for by water and/or sewer utility customers. The new utility will include incentives to encourage users to implement alternative stormwater management practices such as LID.	Adopt new stormwater utility by the end of the MS4 permit cycle.	Report on adoption of new stormwater utility.	Adopted: The Stormwater Utility was adopted by Salem City Council in December 2010 and the first of four annual phases implementing the stormwater fee took place in January 2013. The stormwater fee is now fully implemented. The fee structure includes credits that provide for reductions in the impervious surface-based portion of the utility fee for ratepayers who have stormwater treatment and/or flow control facilities on their property. Generally, the credit is higher for facilities that are categorized as green stormwater infrastructure than for more traditional stormwater facilities.
RC 6-3: Identify and pursue grant opportunities for stormwater quality projects, including potential retrofit and LID project opportunities.	Pursue grant opportunities as staff resources allow.	Track number of grants applied for each year. Track number of grants received each year.	Ongoing: The City did not apply for nor receive any grants for stormwater quality projects this fiscal year.

Table 8. RC7—Maintain and Update GIS System

Task Description	Measurable Goals	Tracking Measures	FY 2020-2021 Activities
RC 7-1: Continue maintenance of the GIS database and Hansen IMS database. These ongoing updates will also reflect completion of any stormwater Master Plan capital improvement projects, new facilities added to the system, potential “hot-spots” for illicit discharges, refinement of data for the existing system, updated information on wetlands, perennial streams, waterways, and floodplain/floodway designations, and information updated on a periodic basis for the City’s Urban Growth Boundary. The GIS database will be accessible by City departments for review purposes.	Continue performing database updates annually. Create record of GIS maintenance activities.	Record maintenance / updates made to database.	Update as needed: All stormwater layers are consolidated in the Spatial Database Engine (SDE) and updated as required. All edits are tracked internally in the database with who last updated and created an asset and corresponding dates. In addition, a log of incoming plan sets is maintained by Technical Services that are entered into GIS. Since GIS and IPS are now synced only tracking one system is required rather than both. The Stormwater GIS data has been made available to City departments via multiple sources including Salem Maps Online, GeoPlanIT, and the GeoWorks web mapping applications.
RC 7-2: Integrate the information in GIS and IMS. The City plans to integrate the data from both the GIS and Hansen IMS databases so that information in the Hansen IMS database can be visualized using the GIS system.	Create an action plan for how the GIS and IMS system will be integrated and updated. Implement action plan to integrate GIS and IMS.	Track completion of action plan items. Track implementation status of database integration.	Completed: All pertinent stormwater GIS layers were consolidated into feature layers in SDE (Spatial Database Engine) as part of the Stormwater utilities migration from Hansen to Infor Public Sector (IPS). SDE and IPS assets are fully synchronized.

Table 9. RC8—City Stormwater Grant Program

Task Description	Measurable Goals	Tracking Measures	FY 2020-21 Activities
RC 8-1: Expand matching grant program for watershed protection and preservation to allow for funding of stormwater-related activities, such as promoting water-wise landscaping, reduction of stormwater discharges, restoring riparian areas, stormwater quantity reduction, stormwater quality/treatment, etc.	Continue to fund \$50,000 grant program. Expand matching grant program for watershed protection. Promote the grant program in conjunction with RC5 outreach activities.	Maintain a list of grant awards tracking funding and projects.	Budgeted: The City of Salem provided \$50,000 for the grant program in FY 2020-21. Awarded: Five grants were awarded, but only three were finalized in the fiscal year: 1. streamside erosion control project that was carried over from the previous year, 2. knotweed treatment project, and 3. Ludwigia pull project. One grant remains available for match funding for a Willamette River Watershed Assessment, and the other grant funds remain available for North Santiam Watershed fire recovery efforts. Completed: The grant does provide for watershed protection projects. Limited: Grant funding awarded reached the amount available early in the fiscal year so no further outreach was conducted.

Table 10. RC9—Legal/Ordinances

Task Description	Measurable Goals	Tracking Measures	FY 2020-2021 Activities
RC 9-1: In process of revising the Stormwater Management Design Standards (RC 3 Task 1) and developing a stormwater-dedicated chapter to the SRC (RC 9 Task 3), coordinate with Community Development’s effort to adopt a Unified Development Code (UDC). It is envisioned that the stormwater dedicated SRC would be integrated into the UDC framework.	Adopt the UDC and integrate stormwater-related revisions to the SRC by the end of the MS4 permit cycle.	Report on progress for adoption of UDC and integration of stormwater related SRC.	Completed: City staff incorporated selected chapters of the Salem Revised Code (SRC) into a single, Unified Development Code (UDC). Led by the Community Development Department, the effort involved grouping related sections and subsections of existing chapters of the SRC into the more cohesive UDC format. The new Unified Development Code went into effect May 14, 2015.
RC 9-2: Continue to enforce the SRC and review and revise it as necessary to reflect the updated Stormwater Management Design Standards that principally focus on requirements associated with on-site water quality facilities for new development or redevelopment (RC3).	Revise SRC (as needed).	Track any MS4 stormwater pertinent revisions made to the SRC.	Ongoing: Salem Revised Code (SRC) Chapter 20J (Administrative Rule Making and Contested Case Procedures) contains provisions for enforcement proceedings and civil penalties. Subsections in SRC Chapter 70 (Utilities General) were adopted by City Council in December 2012 that clarify inspection procedures for enforcing the Utility Code

<u>Task Description</u>	<u>Measurable Goals</u>	<u>Tracking Measures</u>	<u>FY 2020-2021 Activities</u>
			and establishes operation and maintenance requirements for owners/operators of private stormwater facilities.
RC 9-3: Develop a new SRC chapter dedicated solely to stormwater management. It is currently envisioned that this will be done after the City's renewed MS4 Permit is issued, and in conjunction with implementation of the new stormwater utility and updated Stormwater SDC Methodology (RC6) and the updated Stormwater Master Plan (RC1).	Adopt the new SRC chapter for stormwater by the end of the MS4 permit cycle.	Report on adoption of the new SRC chapter for stormwater, and processes/milestones en route to formal adoption of the SRC revisions.	Completed: A new chapter of the Salem Revised Code (SRC) specific to stormwater was adopted in December 2013 and became effective January 1, 2014. An update to the City's Public Works Design Standards was completed in December 2013 and became effective January 1, 2014.

Table 11. ILL1—Spill Prevention and Response Program

Task Description	Measurable Goals	Tracking Measures	FY 2020-2021 Activities
ILL 1-1: Continue to review and refine the existing spill prevention and emergency response program to protect ground and surface water quality. New activities will be proposed and implemented as appropriate, and coordination and cooperation among other relevant agencies and ODOT will be maintained and improved. This review will be coordinated with the deicing activities of Airport Operations and their 1200-Z permit, and possibly the Oregon Air National Guard.	Continue to implement the spill prevention and emergency response program and review and revise as needed.	Document refinements to cleanup procedures for vehicular accidents and structural fires.	Ongoing: During FY 2020-21, Salem Fire continued to respond to emergencies related to vehicular crashes, structural fires, and hazardous materials incidents utilizing Salem Fire Standard Operation Guideline (SOG) Tactical Guideline #4.16 – Minor Spill Response. This Tactical Guideline provides guidance on Best Management Practices (BMP) for preventing discharge into storm drains. Salem Fire will continue to respond to any spill or leak of de-icing material at the Salem Airport. Salem Fire continues to use Standard Operation Guideline (SOG) #2.6.3 – Live Fire Training, to incorporate best management practices related to the prevention and/or control of materials related to firefighter training. This guideline includes site surveys and procedures to eliminate runoff/discharge from firefighter training exercises into storm drain systems.
ILL 1-2: Continue to coordinate timely responses to, and clean-up of emergency response sites and structural fires among Fire, Building and Safety, Development Services, and Environmental Services staff. The Fire Department has the lead role for response at emergency response and structural fire sites and all major vehicular accidents. Environmental Services (ES) staff will provide assistance when requested by the on-scene incident commander. One of the ES responsibilities is to make sure that the cleanup activities are conducted in an environmentally sensitive manner.	Develop a review schedule with a checklist for the spill response plan.	Track the number and category of spill events responded to, including an estimate of the amount of spilled materials collected and any associated enforcement actions.	Ongoing: The Fire Department staff respond to the following: Chemical leaks or spills = 51 Vehicle accidents =654 Fuel or oil spills =148 Salem Fire continues to respond hazardous/chemical spills as requested by our emergency dispatch center. If spills and/or leaks are beyond our capability or exceed the amount of equipment carried on our response vehicles, the Fire Department incident commander will request assistance from Environmental Services.
ILL 1-3: Continue to conduct daily City vehicle and equipment inspections for leaks and repairs as needed. Staff will review current procedures on an ongoing basis and implement improvements as necessary.	Continue to implement the daily equipment inspection program.	Report revisions to the daily inspection program.	Ongoing: City staff continued to conduct daily inspections of City vehicles and equipment in FY 2020-21. These inspections are documented on weekly inspection sheets that are routinely submitted to Section Supervisors. Per City policy, if a leak/repair is identified, the vehicle/equipment is promptly turned into Fleet for repairs.
ILL 1-4: Develop an updated Operations Pollution Prevention Plan; incorporating new/expanded/relocated Operations-oriented facilities.	Update Operations Pollution Prevention Plan by the end of the MS4 permit cycle. Implement updated Operations Prevention Plan upon completion.	Track progress toward updating Operations Pollution Prevention Plan. Track implementation of Operations Pollution Prevention Plan.	Ongoing: Stormwater Staff continue to implement the Operations Pollution Prevention Plan, which includes training that is provided to all new employees and monthly inspections of the Shops complex using an electronic field data collection form and a smartphone or tablet. Staff will make revisions and updates to the Operations Pollution Prevention Plan as needed to address any changes or new technologies.

Table 12. ILL2—Illicit Discharge Elimination Program

Task Description	Measurable Goals	Tracking Measures	FY 2020-2021 Activities
ILL 2-1: Continue to respond to reports of unusual discharges or suspicious water quality conditions within the stormwater system and urban streams. Where able, identify sources/causes and implement appropriate corrective actions. Utilize database to document associated activities.	Respond to reports of illicit discharges and suspicious water quality conditions. Maintain database to document unusual/suspicious discharges, sources found, and corrective actions taken.	Track calls and mitigation actions taken in database.	Ongoing: Environmental Services continues to provide staff to respond, 24/7, to reports of unusual discharges or suspicious water quality conditions. Staff responded to 309 water quality related responses during the reporting year. All responses and corrective measures are tracked in the database. A summary of enforcement actions and inspections is provided in Section 4 of this report. Stats: There were three (3) violations during this reporting period.
ILL 2-2: Environmental Services staff will continue inspections of the City’s wastewater users, through the pretreatment program, verifying the proper handling and disposal of both wastewater and stormwater.	Inspect City’s wastewater users for proper management of wastewater and stormwater.	Track number of inspections and associated findings.	Ongoing: During the reporting year Environmental Services staff continued to inspect wastewater users for proper handling and disposal of wastewater and stormwater. Staff completed the following inspections and business contacts during the reporting year: Business Inspections = 248 New Businesses Identified = 32
ILL 2-3: Work with Wastewater Collection Services to identify and correct cross-connections between the sanitary sewer and stormwater systems.	Review stormwater and ambient stream monitoring data to identify possible cross-connection discharges into the stormwater system. Maintain communications with Wastewater Collections and other City staff to identify any system cross connection problems.	Document number of cross-connections identified, and corrective actions taken.	Ongoing: Wastewater Collections also provide smoke and dye inspection of lines to identify cross connections. Six cross-connections were identified during the reporting year. Four have been are corrected. Two are in the process of being corrected and are not spilling. We have them temped to the sanitary.
ILL 2-4: Develop and update a storm sewer outfall dry weather inspection and monitoring prioritization plan.	Prioritize outfalls for storm sewer outfall inspection and monitoring and inspect annually. Coordinate prioritization process with ILL 2 Task 5.	Document review of outfall monitoring plan. Document priorities established for monitoring and inspection. Track dry weather inspections conducted and results of inspection.	Ongoing: The RY 2020-21 dry weather outfall screening effort recorded 124 outfall inspections (outfall structures or the first available upstream manhole), 109 of which had observable flow. Of these inspections, 39 are inspections associated with outfalls identified as priority outfalls in the City’s Dry Weather Outfall and Illicit Discharge Screening Plan and 85 are deemed secondary outfalls. Outfalls with chlorine detections are investigated further as resources allow. For further information on the results of the inspections refer to Attachment 1. Stats: Of the 124 total outfall inspections, 105 outfalls were tested for chlorine including 29 that had some amount of chlorine present and 30 that received additional analytical sampling for field and/or laboratory parameters.
ILL 2-5: Identify and map contaminated sites in the GIS system. With input from other City departments, identify a list of areas where there either has been a substantial spill or there is the potential for a spill or illicit discharge. These areas are identified based on activities on site, history of problems, or specific industry, for example. These areas will be mapped in the GIS system for use across City departments.	Continue to identify and map contaminated sites in the GIS system.	Track number of contaminated sites added to the GIS system.	Linked: The City of Salem Geoworks is linked to the Oregon Department of Environmental Quality Facility Profiler database which adds new sites to the GIS mapping system used throughout the City. A variety of sources/activities can lead to site contamination (leaks from storage tanks and process lines, releases during loading or off-loading activities, or discharges during accidents or emergencies).

Table 13. ILL3—Illegal Dumping Control Program

Task Description	Measurable Goals	Tracking Measures	FY 2020-2021 Activities
ILL 3-1: Continue to sponsor the Adopt-a-Street Program. The program is an effective way to get residents involved in keeping the community’s streets clean and consequently preventing trash and debris from entering the storm drainage system.	Continue to support the Adopt-a-Street Program.	Record the miles of adopted streets, number of participating groups, and volume of litter collected through the Adopt-a-Street Program.	Ongoing: It’s been another interesting year for the Adopt a Street program. With the relaxing of Covid-19 restrictions on group size, stay at home orders, and so on; the groups have been back out doing their clean-ups. This has resulted in an average amount of garbage collected for the year. Stats: Miles of adoptable streets: 112.55 Miles of streets adopted (including pending): 108.29 Number of groups: 99 Number of volunteers: 1,763 Pounds collected in 2020: 17,371 New applications: The online application continues to bring in a lot of applications, and we have had a large turnover of streets to new groups this year. A few groups pulled out during the restrictions of Covid-19, but the online applications have made it very easy for people to apply. We received 31 new applications.
ILL 3-2: Continue to provide the 24-hour Public Works Dispatch Reporting Center to receive and respond to calls regarding illegal dumping and other environmental complaints/problems and responses thereto. Continue to advertise hotline on City website, utility bill inserts, business cards, public brochures, and consumer confidence reports. As circumstances warrant, publicly report illicit discharges through use of various media outlets.	Continue to operate the 24-hour Public Works Dispatch Reporting Center. Assign reports to appropriate City staff for action, including actions taken under ILL2-1.	Record number and types of reported illegal dumping incidents. Track media outreach when a discharge warrants.	Ongoing: Environmental Services provides staff to respond, 24/7, to reports of illegal dumping and environmental complaints received through both the Public Works Dispatch Center and 911 Dispatch Center. Stormwater provides public education and outreach to inform the public of environmental issues. Actions taken when responding to calls includes the completion of “Service Requests,” a computerized record of calls received, and actions taken. This database is in the Public Works Dispatch Center. Staff responded to 309 incidents during this reporting period.
ILL 3-3: Continue to support the Adopt-a-Stream program, which involves teachers and students in gathering water quality data from streams, thereby providing water resource education to students through experience. The City supports the program by facilitating projects and providing technical assistance and resources.	Continue to support the Adopt-A-Stream Program.	Maintain a descriptive list of adopt a stream program projects, objectives, outcomes upon completion, and number of participants.	On Hold and Restructuring: Due to Covid-19 restrictions, staff did not promote the Adopt-A-Stream program. However, staff was busy restructuring the program for the upcoming school year to include the crayfish study, pre/post teaching, data analysis through Stream Webs, and data collection apps. (technology).
ILL 3-4: Continue to support Marion County in their efforts to provide convenient alternatives for legal disposal of household hazardous wastes and other recyclable materials.	Continue to support Marion County in providing alternatives for household hazardous waste disposal.	Document frequency and type of support activities.	Ongoing: Promotion of Marion County related services included waste reduction, recycling, household hazardous waste, and composting, and was done virtually via newsletters and Facebook social media posts. Newsletter: December 2020 – waste reduction and clothing waste reduction. Facebook: July 2020 – composting August 2020 – clothing waste reduction December 2020 – waste reduction January 2021 – household hazardous waste April 2021 – recycling May 2021 – composting Promotion was also conducted over two radio stations and included the following: December 2020 (one week) -- electronic waste recycling January 2021 (one week) – Watershed Enhancement (WE) pledge

<u>Task Description</u>	<u>Measurable Goals</u>	<u>Tracking Measures</u>	<u>FY 2020-2021 Activities</u>
ILL 3-5: Continue to support the annual yard debris cleanup effort.	Support the annual yard debris cleanup effort.	Record amount of debris cleaned up and level of participation.	<p>Ongoing: Two Leaf Haul Events were held during 2020:</p> <p>November 21: Cubic yards of leaves collected = 350 Number of volunteers at site = 0 (closed to volunteers due to COVID) Number of volunteer hours = 0</p> <p>December 12: Cubic yards of leaves collected = 275 Number of volunteers at site = 16 Number of volunteer hours = 48</p> <p>TOTALS Cubic yards of leaves collected = 625 Number of volunteers at site = 16 Number of volunteer hours = 48</p> <p>Approximately 16 volunteers picked up 251 bags of leaves from the homes of 8 senior citizens.</p>

Table 14. IND1—Industrial Stormwater Discharge Program

<u>Task Description</u>	<u>Measurable Goals</u>	<u>Tracking Measures</u>	<u>FY 2020-2021 Activities</u>
IND 1-1: Environmental Services will inspect stormwater systems while conducting inspections of City-permitted industrial wastewater users, and work with DEQ to coordinate the permitting and compliance processes for industrial users in the Salem area, including DEQ-issued 1200-Z permitted sources, underground storage tank (UST) removal, and site remediation permits issued by DEQ for sources/sites within the City. Coordination options include receiving information on proposed 1200-Z permits, commenting on proposed permits, and meeting periodically with DEQ on coordination efforts.	<p>Inspect stormwater systems while conducting inspections of City-permitted wastewater users.</p> <p>Develop process to coordinate with DEQ on industrial permits within the City.</p>	<p>Track coordination efforts with DEQ.</p> <p>Include stormwater observations as appropriate on inspection reports and follow-up actions.</p>	<p>Ongoing: Environmental Services continues to inspect area stormwater systems as part of facility inspections performed under the industrial pretreatment program. Inspection records are maintained in the Environmental Services database. Salem is not a permitting agent for DEQ's 1200-Z program but has been developing a process (consistent with the MS4 permit) to notify DEQ when a site in Salem is undergoing development which may be subject to State permitting. Environmental Services notified the facility owner or contact person by letter. Regional staff for the DEQ Western Region were contacted by email with a scanned copy of the letter that was sent to the facility. Refer to ILL2 Task 2 for a total of facility inspections, and IND1 Task 2 for a total of facility plans reviewed.</p>
IND 1-2: During plan review, review industrial facilities for the potential of requiring pretreatment of stormwater prior to discharge based on the industrial activities of the specific facility. Conduct inspections of industrial facilities requiring stormwater pretreatment to ensure structural controls have been built according to approved plans.	<p>Review industrial plans as necessary for additional stormwater treatment.</p> <p>Conduct inspections once construction is completed to ensure work was done in accordance with approved plans.</p>	Maintain database of plans reviewed and final inspections conducted.	<p>Ongoing: Environmental Services staff reviewed 41 industrial and commercial plans</p>
IND 1-3: Surveys are sent to applicable business classes (restaurants, metal finishers/platers, radiator shops, dry cleaners, printing shops, photo processors, etc.) as part of the pretreatment business survey database, part of the industrial pretreatment program for wastewater. Customers will be surveyed on major on-site activities to identify potential locations for public education, future sampling, and tracking down illicit discharges. Illicit stormwater discharges from these business groups are address in ILL2.	<p>Send surveys to new customers as accounts are opened.</p> <p>Enter survey results into database – on-going as surveys are returned.</p>	<p>Track number of surveys sent out.</p> <p>Track number of surveys returned and entered into database.</p> <p>Track targeted public education activities for specific industries.</p>	<p>Ongoing: Environmental Services continues to send or deliver surveys to newly identified targeted businesses. Businesses failing to return the survey were visited by an inspector to obtain the necessary information.</p> <p>Number of grease surveys sent: 3 Number of grease surveys returned: 2 Number of dental surveys sent: 11 Number of dental surveys returned: 8</p> <p>Public Works Day was cancelled for 2020 due to Covid-19. Environmental Services provided no other outreach.</p>
IND 1-4: Continue the semi-annual Technical Bulletin for the City's industrial users and produce other materials for these users. This activity is principally associated with the City's wastewater Pretreatment Program but will be used as a vehicle to address stormwater related issues as well.	Produce two technical bulletins for industrial users each year.	Track published technical materials prepared for industrial users each year.	<p>Continued: Targeted and individualized (email and/or direct phone call) communication with permitted industrial users continued during FY 2020-21 in order to better ensure compliance with pretreatment and stormwater regulations. This form of communication has proven more effective than continued production of technical bulletins.</p>

Table 15. CON1—Construction Site Control Program

Task Description	Measurable Goals	Tracking Measures	FY 2020-2021 Activities
CON 1-1: Continue implementation of the Erosion Prevention and Sediment Control program for developments that meet or exceed the threshold indicated in SRC Chapter 75, which includes the submission of erosion prevention and sediment control plans with structural and non-structural BMPs. Review program experiences annually and implement improvements as appropriate including Code amendments if needed.	Implement SRC 75. Conduct annual program reviews. Implement appropriate improvements and/or Code amendments. Perform plan reviews for erosion control requirements.	Track number of erosion control plans reviewed for compliance with SRC 75.	Ongoing: SRC 75 continues to be used as the basis for plan review, inspection procedures, and enforcement. Completed: An annual internal program review was completed previously. Reviewed: Eighteen Capitol Improvement and 164 Development ESPC plans were reviewed by City staff. In addition, 563 single family applications were reviewed.
CON 1-2: Continue to train and educate City staff and private contractors about stormwater pollution at construction sites, with an emphasis on prevention and control BMPs. Provide notice to construction site operators concerning where education and training to meet erosion and sediment control requirements can be obtained.	Provide annual erosion control training to City staff and private contractors.	Track education and training programs conducted and number of staff/public trained.	Conducted: With partners of the Mid-Willamette Valley Outreach Group, the annual Mid-Willamette Erosion Control and Stormwater Management Summit training was conducted on January 26, 2021, to provide training for regional area contractors and design consultants. Continue: Continue outreach of Home Builders, Contractors, and Material Suppliers concerning standard construction specifications and standard drawing updates. Certification: All inspectors maintain a Certified Erosion and Sediment Control Lead (CESCL) certificate, per DEQ requirement.
CON 1-3: Document and streamline site plan review, inspection, and enforcement procedures for the construction site runoff control program.	Complete documentation of site plan review, inspection, and enforcement procedures before the end of year four of the MS4 permit cycle.	Track completion of documented procedures.	Ongoing: Use of Survey 123 software to preform field inspections and document record keeping that streamlined these processes. Ongoing: Site plan review procedures and checklists are in place and actively used. Staff continues to update the checklists as procedures change. Ongoing: Inspection procedures and reports are in place and actively being followed by Public Works Inspectors. Training and accountability on inspection documentation details and photo integration is ongoing. Ongoing: Enforcement procedures are adopted and implemented when appropriate. Training on procedures and practices is ongoing.
CON 1-4: Continue to review and update the Erosion Prevention and Sediment Control Technical Guidance Handbook.	Update Technical Guidance Handbook before the end of year four of the MS4 permit cycle.	Track updates made to the Technical Guidance Handbook.	No change: No change from previous year cycle report. City Design Standard, Standard Construction Specifications, and Standard Drawings for erosion prevention and sediment control have been implemented and are continued to be followed for all design and construction activities. These three items have systematically replaced the need for the Technical Guidance Handbook.
CON 1-5: Continue to coordinate with the City’s 1200-CA Permit for City construction projects subject to its program.	Requirements for 1200-CA compliance incorporated into City construction plans, specifications, and contract documents. Make erosion prevention and sediment control a key agenda item at all pre-construction conferences. Include inspection of all site erosion prevention and sediment control measures as part of City projects.	Track renewal of 1200-CA permit.	No change: No change from previous year cycle report. 1200 CA Permits are included in City contract documents. 1200 CA Permit and EPSC enforcement is key discussion point at pre-construction conferences. Inspector inspects all City 1200 CA permitted projects. Continue implementation of Survey 123 software to track and record erosion control 1200CA inspection.

Table 16. MON1—Monitoring

Task Description	Measurable Goals	Tracking Measures	FY 2020-2021 Activities
MON 1-1: Continue to install and maintain flow and water quality monitoring stations in City waterways to support selection of capital improvement projects, update the hydrologic-hydraulic computer model, and help direct policies to protect the health of these water bodies. The actual rate of installation and the total number of stations will be based on the maintenance requirements of the stations, available funding, and coordination with urban watershed assessments/plans.	<p>Install additional monitoring stations.</p> <p>Monitor the station alarms in conjunction with the illicit discharge control program (ILL2, Task 1).</p> <p>Follow up on potential hotspots or problem areas as may be identified through data analyses.</p>	<p>Track number of additional monitoring stations implemented.</p>	<p>Updated: Following the progress made last year in updating station alarm functionality and reducing erroneous alarms, the Stream Quality Alarm (SQA) System went online in 2021. When an alarm is triggered, City of Salem Dispatch is notified, the alarm is recorded in IPS, and Environmental Services is dispatched to investigate the cause of the alarm and to determine whether an illicit discharge is responsible. No alarms due to illicit discharges were detected in FY 2020-21.</p> <p>Stats: No new monitoring stations were installed during FY 2020-21.</p> <p>No hotspot or problem areas were identified using the continuous instream monitoring stations this year. Any calls received from the public with concerns about water quality were given to Environmental Services to follow up on, and data was analyzed to see if any noticeable changes occurred. Several pollution concerns were reported by Stormwater staff to Environmental Services staff, found during site visits and field observations, and then followed up upon.</p>
MON 1-2: Continue the urban stream and Willamette River water quality sampling program, with emphasis on reviewing and evaluating sampling data to prioritize investigations and improvement/maintenance projects. This sampling augments the monitoring plan included in the City’s 2008 NPDES MS4 Permit Renewal application.	<p>Update database for collected data.</p> <p>Review collected data for purposes of trending and benchmarking by the end of the permit term.</p> <p>Follow-up on potential hotspots or problem areas as may be identified by the data review.</p>	<p>Document findings regarding trends.</p>	<p>Ongoing: Data is entered into an Excel database as soon as possible after laboratory results are received. Containing all data from 2001 thru present, the Excel database allows for fast data analysis, reporting, and formatting data for import into Aquarius.</p> <p>Data are verified at least twice, once before it is entered into the database, and again on a yearly basis when all data goes under a thorough review before being included in the annual report. The City will continue to update, and compute trends analyses as needed.</p> <p>Every year staff produce an Attachment of Monitoring Data that is included in the Annual Report submission. This summarizes the data for the year and documents any water quality exceedances. This provides a visual comparison of stream health from year to year, and helps staff target where issues may be occurring.</p> <p>Of note: One sampling location, CLA10, was identified as exceeding the E. coli single sample water quality criteria of >406 organisms per 100ml for 10 of the 12 sampling events during 2020-21. Upstream/Up pipe investigations, including extensive TV inspections and targeted E. coli sampling have taken place to determine a point source. No anthropogenic sources have been identified; however, a suspected point source was found that may be linked to the feeding of local wildlife and feral cats. The city is working with the homeowner to limit the source and is developing a plan to perform QPCR analysis to confirm that the source of E. coli is not anthropogenic. Additionally, the City is also looking into deploying game cameras to observe animal activity in the creek.</p>
MON 1-3: Continue to implement all components (MS4 outfall, instream, pesticide, and macro-invertebrate) of the City’s “Surface Water and Stormwater Monitoring Plan.”	<p>Implement the City’s Stormwater Monitoring Plan, including MS4 outfall, instream, pesticide, and macro-invertebrate monitoring components.</p>	<p>Provide summary statistics for sampling results from each wet-weather season.</p> <p>Track any modifications to the monitoring plan.</p>	<p>Ongoing: The City continues to collect data as part of the monitoring requirements listed in Table B-1 of the City’s NPDES MS4 permit. Because the permit was administratively extended, the City will continue to implement its “Surface Water and Stormwater Monitoring Plan” and report all results as part of the Annual Report. No changes or modifications were made to that monitoring plan. Attachment 1 contains summary statistics for all sampling that was conducted during FY 2020-21.</p> <p>The City began brainstorming possible modifications to the monitoring plan based on the anticipated changes in the upcoming 4th MS4 NPDES Permit. Potential changes are related to Mercury sampling and potential BMP sampling in place of MS4 In-Pipe sampling.</p>

3 PROGRAM EXPENDITURES AND FUNDING SOURCES

Stormwater-related program costs in Salem were historically funded through wastewater rates comprised of a water consumption (flow) component and a fixed user charge. In December 2010, Salem City Council approved the adoption of a separate stormwater service charge or utility. Implementation of the stormwater utility was initiated on January 1, 2013 and completed over a period of four rate cycles.

The stormwater utility was developed to provide an equitable way of paying for Salem's stormwater programs by more accurately and fairly linking the stormwater impacts of the ratepayer's property to the rate paid by each ratepayer. The stormwater service charge is based on each property's impervious surface and an assessment of stormwater programmatic costs that are shared equally among all ratepayers. Additionally, properties that take steps to reduce their impervious surface areas, or that have onsite facilities that reduce stormwater impacts, have an opportunity to reduce their stormwater service charge. There currently is no mechanism for residential ratepayers to reduce their stormwater service charge.

Table 17 provides a summary of the total stormwater program budgeted per result area for the reporting year FY 2020-21 as well as the budgeted items for upcoming FY 2021-22.

Table 17. Stormwater Budgeting		
Operational Task/Result Area	FY 21-22 Budgeted Items	FY 20-21 Budgeted Items
Chemical Handling and Disposal	105,777	99,988
Code Compliance - PW	128,900	123,890
Environmental Compliance for Outside Departments/Agencies	221,369	226,179
Environmental Monitoring	1,539,132	1,402,719
Floodplain Management and Regulatory Compliance	360,529	410,840
Flow Monitoring	249,206	259,928
Green Stormwater Infrastructure Maintenance	587,022	429,590
Mapping and Data Management	309,534	297,166
Natural Areas Management	406,750	379,714
Natural Resources Education and Outreach	575,067	596,524
Operational and Technology Transfers - Infrastructure	241,790	245,380
Public Works Dispatch	143,630	151,933
Storm Sewer Pipe Cleaning	585,195	666,182
Stormwater Construction	0	6,967,310
Stormwater Facility Inspections	254,957	167,618
Stormwater Open Channel System Maintenance	2,267,203	2,305,634
Stormwater Pipe Inspection	917,992	678,792
Stormwater Pipe Maintenance	1,277,008	1,457,589
Stormwater Quality Monitoring	188,337	181,069
Utility Billing and Customer Service	949,039	956,817
Stormwater Infrastructure Planning	1,058,758	1,058,546
Hazardous Materials/Emergency Management; Street Sweeping Services	0	1,229,710

Debt Service - Stormwater Utility	0	358,844
Total	12,367,195	20,651,962

4 ENFORCEMENT ACTIONS, INSPECTIONS, AND PUBLIC EDUCATION

Environmental Services staff responded to **309 water-quality-related incidences** during the reporting and reported **three** violations during this reporting period. Actions taken related to these violations are shown in the chart below.

Name	Date	Violation	Action Taken	Discharge	SRC
Goodfellows Cars and RVs	07-02-2020	Illicit Discharge Violation	Warning	Vehicle Washwater	71.050
Private Residence	01-25-2021	Prohibited Discharge to the Storm Sewer	Warning	Dumpster	71.050
N&J Concrete LLC	03-08-2021	Prohibited Discharge to the Storm Sewer	Citation	Cement washing to storm catch basin	71.050

Erosion control and 1200-CA Permit requirements are an integral part of all City-issued construction plans and specifications. The City of Salem continues to coordinate efforts with Department of Environmental Quality (DEQ) staff regarding 1200-C permitted sites. This reporting year, 6,379 erosion control-related inspections were conducted by Public Works Inspectors on 929 projects and with 433 enforcement actions.

5 PLANNING, LAND USE CHANGES, AND DEVELOPMENT

The City of Salem Public Works Department Stormwater Management Design Standards (Design Standards) were revised in FY 2013-14 to reflect the post-construction requirements presented in the MS4 Permit. Before these updates were adopted via the City's relatively new administrative rule process, a new stand-alone stormwater chapter (SRC 71) was developed and approved. This new stormwater dedicated chapter was adopted by City Council in December 2013. SRC 71 and the updated Design Standards became effective on January 1, 2014. The Design Standards will continue to be revised as new information becomes available.

5.1 Planning

Salem is engaged in a comprehensive plan update called *Our Salem*; the updated comprehensive plan will guide development in the Salem area. *Our Salem* is a multi-year project consisting of three phases. The first phase of the project focused on examining the existing conditions of the city and evaluated how Salem could grow under current policies. It resulted in a report card that evaluates whether we are heading in the right direction given current policies. It also resulted in a greenhouse gas (GHG) inventory. The second phase – underway now – focused on community-wide visioning. It resulted in a vision for future growth and development in the Salem area. The vision, which included goals and maps, will lay the foundation for the final phase of the *Our Salem* project, the update to the Salem Area Comprehensive Plan. The Vision can be found online here: <https://www.cityofsalem.net/CityDocuments/our-salem-vision-2021.pdf> More information can be found at <https://www.cityofsalem.net/our-salem>.

Updates to UDC range from minor housekeeping amendments to policy related changes that respond to concerns from the community and changes in State law, including housing and tree preservation.

5.2 Land Use Changes

Two annexations became effective from July 1, 2020 through June 30, 2021.

Location and Description	Number of Acres
3880 Croisan Creek Road S	2.65 acres
2527 and 2547 Robins Lane SE	47.32 acres
Total Acres	49.97

5.3 New Development

The City of Salem has continued to see a steady stream of new projects at all phases of development. During the FY 2020-21 reporting period completed projects resulted in approximately 1,781,830 sq ft of commercial impervious area and 1,348,503 sq ft of new impervious surface from the construction of new residences added for a total of almost 72 acres. The list below includes development projects and their status between for the reporting year.

	Address	Description	Status
Commercial/ Industrial Development			
City of Salem Police Facility	333 Division Street NE	Approx. 104,000 SF new police facility	Complete
Cheese Manufacturing Facility	3310 Portland Road NE	Total impervious area of 35,725 SF for building and parking	Complete
Roofing Contractor Building	4910 Turner Road SE	12,000 SF building and 3,800 buildings	Complete
Gensco	3790 Fairview Industrial Drive SE	Warehouse 54,445 SF, parking and loading	Complete
Oxford Industrial	1850 Oxford Street SE	18,460 SF buildings, 9,777 parking	Complete
North Salem High School	765 14th Street NE	61,674 SF addition	Complete
Vehicle storage	1885 Fisher Road NE	Auto inventory storage lot	Complete
Hotel	390 Hawthorne Avenue SE	82-room hotel	Complete
Subaru	920 Auto Group Avenue NE	75,000 SF auto dealer, sales lot, parking lot, a 2,100 SF car wash, 1,200 SF pavilion	Complete
Union Gospel Mission Men's Shelter Relocation	777 Commercial Street NE	Relocation of UGM Men's shelter with maximum capacity of 300 overnight occupants	Complete
Cascadia Industrial Complex	3992 Fairview Industrial Drive SE	Two warehouse buildings; 28,775 SF and 41,000 SF	Complete
Willamette Town Center Retail	799 Lancaster Drive NE	12,176 SF retail building, drive-through lane, parking lot modification	Complete
Keizer Mist	3139-3159 Broadway Street NE	New car wash and convenience store	Near Completion

	Address	Description	Status
McKay High School	2440 Lancaster Drive NE	Approximately 95,000 SF of building additions, renovations, and site improvements.	Near Completion
South Salem High School	1910 Church Street SE	Addition to school, two new parking areas, and ped paths (215,915 impervious surface, plus 25,088 modulars)	Near Completion
Robins Lane Self Service Storage	2015 Robins Lane SE	245 self-service units	Near Completion
Credit union/office building	465 Division Street NE	Three story building, parking lot improvements	Near Completion
Mini-storage	2535 Salem Dallas Hwy NW	38,000 SF	Near Completion
River Bend Mixed-Use	1200 Block of River Bend Road NW	Two new retail buildings, approximately 11,250 SF	Near Completion
Holman Hotel	195 to 197 Commercial Street SE	New seven-story 127-room hotel with ground floor restaurant and above ground parking structure	Under Construction
North Salem High School Tennis Courts	1163 D Street NE	Tennis Courts and Parking Area	Under Construction
Oregon State Treasury Building	867 Hawthorne Avenue SE	Two-story office buildings; 35,000 SF and 24,000 SF in size	Under Construction
North Lot Investments Industrial Building	2192 Vista Avenue SE	40,000 SF industrial building with site improvements, parking areas and landscaping	Under Construction
Marietta	3311-3325 Marietta Street SE	Integrated phased development, five new buildings	Under Construction
YMCA	220 Cottage Street NE	5,223 SF YMCA and parking area	Under Construction
Turner Road - Roofing Contractor and retail	4910 Turner Road SE	Parking and vehicle use area expansion	Under Construction
Chang Tuh expansion	1965 Claxter Road NE	22,600 SF expansion of existing Chang Tuh food processing facility	Under Construction
Kuebler Gateway Shopping Center - Costco	2500 Block of Boone Road SE	Four new retail shell buildings, and 168,550 SF Costco building, with fuel station	Under Construction
New commercial and restaurant buildings	4741-4787 Lancaster Drive NE	3 new 2,950 SF commercial buildings & 1 new 2,300 SF brew pub/restaurant building	Under Construction
Three new hangars	3674 Airway Drive SE	Construction of three hangars on leased portion of the Salem Municipal Airport	Under Construction

	Address	Description	Status
New hangar	3986 Airway Drive SE	Construction of 8,000 SF hangar on leased portion of the Salem Municipal Airport	Under Construction
Sumpter Elementary School Expansion	525 Rockwood Street SE	Building addition and site improvements at Sumpter Elementary	Under Construction
SKSD Central Kitchen	3625 Fairview Industrial Drive SE	Expansion of a building and parking lot	Under Construction
Sprague High School	2373 Kuebler Road S	55,636 SF classroom addition	Under Construction
Stephens Middle School	4962 Hayesville Drive NE	3,940 cafeteria addition and 17,752 SF classroom addition	Under Construction
Office Building	425 Hawthorne Avenue SE	24,500 SF proposed office building	Under Construction
West Salem High School	1776 Titan Drive NW	67,000 SF school building additions	Under Construction
Outpatient Medical Office	5669 Commercial Street SE	12,916 SF outpatient medical use	Under Construction
Schirle Elementary School	4875 Justice Way S	8,900 SF school building additions	Under Construction
Yoshikai Elementary School	4900 Jade Street NE	12,904 SF school building additions	Under Construction
Replacement of manufactured dwelling display lot	1968 Commercial Street NE	Replacement of manufactured dwelling display, new patios, expansion of parking area	Under Construction
New building for surgery center	1460 Commercial Street SE	New 4,417 SF building and site improvements	Under Construction
Myers Elementary School	2160 Jewel Street NW	Building additions and site improvements	Under Construction
Woodmansee Park Aquifer Storage improvements	4629 Sunnyside Road SE	Water treatment facility and other improvements associated with water facility	Under Construction
Salem Hospital Expansion	890 Oak Street SE	Seven Story, 201,000 SF patient care wing expansion	Under Construction
Fairview Industrial Complex	3750 Fairview Industrial Drive SE	Two warehouse buildings; 37,210 SF and 24,400 SF	Permits in Review
Boise Cascade North Block	295 Commercial Street SE	New mixed-use building consisting of post-acute rehabilitation facility and ground floor commercial space	Permits in Review
New hotel	5550 Commercial Street SE	New 4-story, 56-room hotel	Permits in Review

	Address	Description	Status
Existing building, change of use	1516 Commercial Street NE	Change of use in existing building and new parking area 2,200 SF in size	Permits in Review
Office	4880 Turner Road SE	New 3,536 SF office, parking area, and site improvements	Permits in Review
Pump Station for Northstar Subdivision	5690 49th Avenue NE	New pump station for subdivision, with approx. 7,556 SF of new impervious area	Permits in Review
Future Commercial/Industrial Projects			
Liake Plaza - Mixed Use	4700 Block of Liberty Road S	Future mixed-use project. 26 dwelling units and 10,716 SF of retail/office	Land Use Approved
Montgomery	3770 and 3772 Fairview Industrial Drive SE	8,490 sf building and 7,150 SF building and parking for contractors, private street	Land Use Approved
Mixed use	2499 Wallace Road NW	CPC-ZC for future mixed-use development	Land Use Approved
New office/retail	2020 State Street	New office and retail on 0.63-acre size	Land Use Approved
Gas Service Station and Convenience Store	3100 Block of Lancaster Drive SE	Approximately 74,879 SF of new impervious area	Land Use Approved
New Parking Area	3500 Brady Court NE	Development of new 25,000 SF parking area	Land Use Approved
Kelly's Home Center Expansion	3850 Hagers Grove Road SE	21,000 SF building addition, including parking area and site improvements	Land Use Approved
Shipping Container Sales	5191 Portland Road NE	Shipping container sales and storage use, approx. 28,935 SF of impervious area	Land Use Approved
State of Oregon - Green Lot Parking Improvement	890 Union Street NE	Reconfiguration and expansion of existing parking area	Land Use Approved
Flex space industrial tilt-up building	3755 Cascadia Canyon Avenue SE	New 30,650 SF and 45,990 SF industrial flex space buildings	Land Use Approved
Restaurant	2460 Mission Street SE	1,999 SF drive-through restaurant	Land Use Approved
New warehouse	3113 Blossom Drive NE	9,000 SF warehouse building and site improvements for landscape contractor use	Land Use Approved
New warehouse	2720 Cherry Avenue NE	4,500 SF warehouse building and site improvements for plumbing contractor	Land Use Approved

	Address	Description	Status
Modular building and site improvements	3674 12th Street SE	Modular bldg, playground, pathways for child day care center, 8,696 SF impervious	Land Use Approved
Expansion of Mark Nelson Oil	1977 Claxter Road NE	Expansion of off-street parking and vehicle use area	Land Use Approved
Slovic Church Expansion	1776 Davis Road S	New 18,631 SF accessory building and parking area expansion	In Review
Walmart Expansion	1940 Turner Road SE	New 35,000 SF building addition and site improvements	In Review
Bus storage for Salem-Keizer Schools	5260 Gaffin Road SE	Bus storage facility with approximately 610,000 SF of impervious area	In Review
PacTrust Industrial Buildings	3565 and 3595 Aumsville Highway SE	Development of two buildings 70,550 SF and 52,650 SF and site improvements	In Review
Residential Care Facility	901 Front Street NE	Two buildings, a 48-unit memory care facility and a 69-unit assisted living facility	In Review
	3850 Mainline Drive SE	Construction of two new shell buildings 7,200 SF and 2,700 SF	In Review
Blanchet Catholic School Expansion	4374 Market Street NE	7,200 SF classroom addition	In Review
Hope Plaza	454 Church Street NE	Three-story mixed-use building with retail, office, and 20 residential units	In Review
Sherwin Williams	4555 Liberty Road S	New 3,400 SF retail building in existing shopping center	In Review
Addition to Kingwood Bible Church	1125 Elm Street NW	1,835 SF addition to existing church and proposed site improvements	In Review
New office building City of Salem Shops Complex	1457 23rd Street SE	New 50,000 SF office building for City of Salem Shops Complex	In Review
Airport Hangar	2990 25th Street SE	4,800 SF airport hangar	In Review
Expansion of car museum	3950 Fairview Industrial Drive SE	3,300 SF building addition, 1,200 SF new building, expanded off-street parking area	In Review
Multi-Family Residential			
Captial Manor	1955 Salem Dallas Highway NW	Demolition of existing dwellings, zone change, construction of multi-family	Complete
Orchard Heights Apartments	1800-2000 Block of Linwood Street NW	312-Units	Complete

	Address	Description	Status
River Bend Apartments	1200 Block of River Bend Road NW	48-Units	Complete
Claxter Court	4265 Claxter Court NE	102-Units	Complete
Willow Tree Place Apartments	3210 Lansing Avenue NE	96-Units	Complete
Nishioka Building	260 State Street	New 148-unit studio/microunit apartment/mixed-use building	Complete
Boone Ridge Retirement Community	2950 Boone Road SE	142-unit independent retirement facility	Complete
Park Place Apartments	1038 Park Avenue NE	New 8-unit apartment development	Complete
The Grove at Fairview	2110 Strong Road SE	180-Units	Near Completion
North Campus Apartments	900 Block of Park Avenue NE	246-unit multiple family residential apartment complex	Under Construction
Northstar Apartments	4485 Kale Street NE	324-unit apartment complex	Under Construction
Market Streets Apartments	4072-4098 Market Street NE	28-unit apartment complex	Under Construction
Fairgrounds Apartments	1795 Fairgrounds Road NE	Six-unit apartment complex	Under Construction
Triplex	1802 Rees Hill Road SE	Triplex	Under Construction
Triplex	1810 Rees Hill Road SE	Triplex	Under Construction
8-Unit Apartment	467 16th Street SE	New eight-unit apartment complex with site improvements	Under Construction
Liberty Road Apartments	5871 Liberty Road S	66-unit apartment complex	Permits In Review
Cascade Vista Apartments	4700 Block of Center Street NE	New 120-unit apartment complex with site improvements	Permits In Review
Future Multi-Family Projects			
Waln Creek Apartments	5600 Block of Woodside Drive SE	24-unit apartment complex	Land Use Approved
Rushing Mixed Use	5775 Commercial Street SE	Mixed-use 71-unit multi-family with 15,000 SF of commercial space	Land Use Approved
Charlene's House Apartments	5611 Woodside Drive SE	New 18-unit apartment development	Land Use Approved

	Address	Description	Status
6-unit Apartments	1610 Lancaster Drive SE	New 6-unit apartment building, approx. 8,785 SF new impervious surface	Land Use Approved
The Grove Phase 2	2110 Strong Road SE	New 183-unit apartment complex	Land Use Approved
Crown Point Apartments	3230 Boone Road SE	Fifteen building, 210-unit apartment complex	Land Use Approved
10-unit Apartments	226 Salem Heights Avenue SE	New 10-unit apartment building with site improvements	Appealed
177-unit Apartments	2499 Wallace Road NW	New 177-unit apartment complex in MU-II zone	In Review
7-unit Apartments	2633 12th Street SE	New seven-unit apartment complex with site improvements	In Review
8-unit Apartments	1523 Jonmart Avenue SE	New eight-unit apartment complex with site improvements	In Review
Subdivisions			
Whispering Heights	2960 Michigan City Lane NW	110-Lot Phased Subdivision	Phase 1 and 2 recorded, houses under construction
9th Court Addition	5320 Sunnyside Road SE	11-Lots	Complete, houses under construction
Illahe Forest	3800 Block of Illahe Hill Road S	11-Lots	Complete, houses under construction
Rainier Ridge	197 Rainier Drive SE	34-Lots	Complete, houses under construction
Dogwood Heights	3700 & 3800 Blocks of Dogwood Drive S	46-Lots	Phase 1 recorded, Under Construction
Springwood Estates Phase 1	600 Block Mildred Lane	48-Lots	Complete, houses under construction

	Address	Description	Status
Legacy Heights	2250 Old Strong Road SE	73-lot single-family residential phased subdivision together with common space and 5 large lots within the Village Center area of the Fairview Refinement Plan II refinement plan	Plat recorded
Boone Wood	1395 Boone Road SE	12-Lots	Plat recorded
North Campus	Corner of D Street and Park Avenue NE	45-Lots	Plat in Review
Anthony Place	5775 Commercial Street	5-Lots	Plat in Review
Talloc Subdivision	6994 Sunnyside Road	24 Lots	Plat in Review
East Park	4700-4800 Block of Auburn Road NE	659-units/lots	Plat in Review
Devin Estates	6179 Devin Road SE	86-Lots	Under Construction
Northern Quail Estates	5500 Block Skyline Road	22 Lots	Under Construction
Wren Heights	575 Salem Heights Ave	34-Lots	Under Construction
Grantham Crest	6719 Devon Avenue SE	82-Lots	Under Construction
Landau Estates	5800 Block Battle Creek Road	27-Lots	Land Use Approved
Bell Plaine	4560 Center Street	24-Lots	Land Use Approved
Coburn Grand View Estates	4400 Block of Battle Creek Road SE	177-lot phased subdivision	Land Use Approved
Springwood Estates Phase 2	500 Block of Mildred Lane SE	To divide approximately 7.35 acres into 36-lots	Land Use Approved
Sunset Square	1020 Arthur Street NW	4-lot subdivision	Land Use Approved
Valley View Crossing	2230 Doaks Ferry Road NW	27-lot subdivision	Appealed
Titan Village	Doaks Ferry/Orchard Heights	To divide approximately 11.85 acres into 30-Lots	Tentative Review
Strong Height Subdivision	3990 Strong Road SE	29-lot subdivision	Tentative Review
Four Creeks Subdivision	Fabry Road SE and Battle Creek Road SE	To divide approximately 68.09 acres into 227-lots	Tentative Review

	Address	Description	Status
Meyer Farm Subdivision	4540 Pringle Road SE	138-lot phased subdivision	Tentative Review
Faby Ext. Subdivision	NW Corner Landau ST/Battle Creek Road	231-Lots	Tentative Review

Attachment 1

**City of Salem
National Pollutant Discharge Elimination System
(NPDES) Municipal Separate Storm Sewer System (MS4)**

**Summary of Water Quality Data
For Reporting Year 2020/2021**

Prepared by:
City Salem Public Works Department
Stormwater Services
Stormwater Monitoring Staff

November 1, 2021

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1.0 Introduction

This document provides all monitoring data collected for the reporting year of July 1, 2020, to June 30, 2021 (RY 2020/2021), in accordance with the City of Salem's NPDES MS4 permit requirements listed in Schedule B(5)(f)&(g). A background narrative for each monitoring element for which data were collected and a brief summary of results for RY 2020/2021 is provided below, and all collected data are provided in the attached tables and figures.

2.0 Monitoring Elements

Specific details for each monitoring element can be found in the City's *Stormwater and Surface Water Monitoring Plan*. Progress toward meeting the monitoring requirements defined in Table B-1 of the City's MS4 Permit are summarized in Table 1. Monitoring site locations are described in Table 2 and denoted in Figure 1, and the parameters analyzed for each monitoring element are listed in Table 3.

2.1 Monthly Instream Monitoring

Sampling of designated urban streams for the Monthly Instream¹ monitoring element is conducted on a predetermined monthly schedule at 24 different locations. This monitoring element includes the collection of grab samples and field measurements on 11 of Salem's MS4 stormwater runoff receiving streams and the Willamette River. Ten of these streams are paired with upstream (at or near where the stream enters the City's jurisdiction) and downstream (at or near where the stream exits the City's jurisdiction or enters a receiving stream) site locations. The eleventh stream, the West Fork Little Pudding River, only has a downstream site location, because the West Fork Little Pudding River starts in the greater Salem area and runs dry during the summer months. The Willamette River has three sites located upstream, mid-way, and downstream of city limits.

The general locations of all sites are provided in Table 2 and Figure 1.

A general suite of water quality parameters are collected for each site, with additional water quality parameters analyzed for the sites within the Pringle Creek Watershed (PRI1, PRI5, CLA1, and CLA10), West Fork Little Pudding River (LPW1), and the Willamette River (WR1, WR5, and WR10).

Water quality parameters collected include:

- Temperature
- Turbidity
- Specific Conductivity
- pH
- Dissolved Oxygen (DO)
- Nitrate + Nitrite as Nitrogen (NO₃+NO₂-N)
- *Escherichia coli* (*E. coli*)
- Biochemical Oxygen Demand (BOD_{stream})

¹ Identified as "Urban Streams monitoring" in the City of Salem Stormwater Management Plan 2010.

- Zinc -total recoverable and dissolved (CLA1, CLA10, PRI1, PRI5 only)
- Copper -total recoverable and dissolved (CLA1, CLA10, PRI1, PRI5 only)
- Lead -total recoverable and dissolved (CLA1, CLA10, PRI1, PRI5 only)
- Hardness (CLA1, CLA10, PRI1, PRI5 only)
- Total Suspended Solids (TSS) (LPW1, WR1, WR5, WR10 only)
- Alkalinity (WR1, WR5, WR10 only)
- Ammonia (WR1, WR5, WR10 only)
- Total Phosphorus (TP) (WR1, WR5, WR10 only)
- Total Solids (TS) (WR1, WR5, WR10 only)
- Total Dissolved Solids (TDS) (WR1, WR5, WR10 only)

Data for this monitoring element are provided in Tables 5 through 8, and Figures 2 and 3.

The 2019-2020 reporting period saw two less sampling events due to COVID 19 lockdowns.

These missed sampling events occurred during the winter months, which resulted in skew in the statistics depending on the parameter in question. For this reason, many of the general observations below will reference the 2018-2019 reporting year statistics as well.

Some general observations from this reporting period compared to the last two reporting periods include:

- **E. coli** – there were 14 more exceedances this year compared to last year, however there were two more sampling events than in 2019-20. A better comparison would be 2018-19, which had the same # of sampling events, and saw 11 less exceedances than 2020-21.
- **Dissolved Oxygen** – Average DO medians were .3 mg/L higher than 2019/2020 but were .6 mg/L lower than 2018-2019.
- **Copper** – there was one Total Cu exceedance this year, while last year there was one Total Cu and one Dissolved Cu exceedance
- **Lead** – there were no Lead exceedances for the 2020/2021 reporting year, no change from 2019/2020 or 2018/2019.
- **Zinc** – 2020/21 saw three Total Zinc exceedances and two Dissolved Zinc exceedances. There were no Zinc exceedances for the 2019/2020 or 2018/2019 reporting year.
- **Nitrate & Nitrite** – Average Nitrate and Nitrite levels were higher this year than the last two years with an average median value of 0.9 mg/L. Both 2018/2019 and 2019/2020 saw average medians of 0.6 mg/L.
- **BOD** – no significant change from the past two reporting years was seen.
- **Specific Conductivity** – Average specific conductivity levels were slightly higher for the third year in a row.
- **pH** – Average pH medians decreased .3 pH units from the past two years.
- **Turbidity** – Average turbidity levels decreased slightly when compared to the last two years.
- **Temperature** – Average median temperature for 2020/2021 was 13.1 deg C, 2.6 deg C higher than the average median of 10.5 deg C in 2018/2019. 2019/2020 saw an average median of 13.3 deg C, however December and March sampling events were missed which biases that result high.
- **Rainfall** – 2020/2021 saw less precipitation than last year, with 4 out of 12 sampling days having measurable rainfall in the preceding 24 hours compared to 7 of 10 from last year. Note: In 2019/2020, two sampling events with preceding rainfall occurred in April

and May 2020, when the sampling route was split between two sampling days due to staffing shortages related to COVID-19. In both cases, one day saw preceding rain, while the other day saw dry conditions. Consequently, two of the seven “rainy” sampling days only affected half of the sampling sites.

2.2 Continuous Instream Monitoring

The City maintains a network of Continuous Instream water quality monitoring stations and stream gauging stations on seven different urban streams within the city. There are currently ten water quality and stream gauging stations and four established stream gauge-only stations (SHE3, PRI4, WAL3, and LPW1) within city limits. Figure 1 identifies the location of each of the existing stations.

The monitoring stations for this monitoring element are positioned in an upstream/downstream configuration. The upstream stations are adjacent to where the stream enters the City and the downstream stations are either above the confluence with another stream or where the stream exits the City’s jurisdictional boundary.

Continuous data collected includes:

- Turbidity
- Specific Conductivity
- Temperature
- pH
- DO
- Stage

All data are recorded in 15-minute intervals. All continuous statistical data summaries presented in the various tables and figures were computed using grade A and/or grade B data.

Qualifications for what constitutes grade A and grade B data are provided in Table 9, and monthly medians for collected data are summarized in Table 10. Plots of continuous data are provided in Figures 4 through 6. There were no significant changes in data trends or exceedances from last year.

An error was caught in the statistical computation workflow for the 2016-17, 2018-19, and 2019-20 annual reports. An incorrect timestamp setting in the statistical software affected several end results which were then reported in the submitted annual reports. The following statistics were recalculated, with the results being attached in Appendix B.

- 2016/17 Continuous Medians for Temperature, pH, Specific Conductivity, Dissolved Oxygen and Turbidity
- 2016/17 Charts for Temperature 7 Day Moving Average Max, pH & Dissolved Oxygen Daily Means
- 2018/19 Continuous Medians for Temperature, pH, Specific Conductivity, Dissolved Oxygen and Turbidity
- 2018/19 Charts for Temperature 7 Day Moving Average Max, pH & Dissolved Oxygen Daily Means
- 2019/20 Continuous Medians for Temperature, pH, Specific Conductivity, Dissolved Oxygen and Turbidity

- 2019/20 Charts for Temperature 7 Day Moving Average Max, pH & Dissolved Oxygen Daily Means

The Continuous Instream monitoring element incorporates an alarm system that supports the City's Illicit Discharge Detection and Elimination (IDDE) program. The alarm system is used to record, notify, and prompt investigation of water quality abnormalities that may be indicative of illicit discharges. It serves as an important tool to aid in the elimination of periodic illicit discharges, helps to prioritize dry weather outfall screening activities (see section 2.6), and serves as an outreach/education opportunity for residents.

2.3 Instream Storm Monitoring

Instream Storm refers to the monitoring of MS4 receiving streams during defined storm events. Sampling occurs at three sites in the Pringle Creek Watershed (continuous instream monitoring sites PRI12, PRI3, and CLK1). Data collected are used to increase understanding of receiving waters within the Pringle Creek Watershed and help guide Salem's stormwater management strategies in watersheds throughout the city. This monitoring element was initiated this permit cycle and is expected to continue beyond the current MS4 permit; ultimately providing a dataset for long-term trending and spatial analyses.

Sampling consists of flow weighted composite samples, grab samples, and field measurements. Parameters include:

- *E. coli*
- Dissolved Oxygen
- pH
- Temperature
- Specific Conductivity
- Copper (Total Recoverable and Dissolved)
- Zinc (Total Recoverable and Dissolved)
- Lead (Total Recoverable and Dissolved)
- Hardness
- Ammonia Nitrogen (NH₃)
- NO₃+NO₂-N
- Ortho Phosphorus
- Total Phosphorus (TP)
- BOD_{stream}
- TSS

Data for this monitoring element are provided in Table 11. For reporting year 2020/2021, staff captured two storm events.

2.4 Stormwater Monitoring

The City has collected water quality samples from a number of sites throughout the piped MS4 system since 1995. Three monitoring sites are identified in the current monitoring plan, one each for residential, commercial, and industrial land use. The commercial and industrial sites are new

sites for this permit cycle, but the residential site had been sampled previously during the last MS4 Permit and continued to be sampled through this permit cycle. Data from this monitoring element will be aggregated with previous data collected from similar land use types. The aggregated datasets will be used to characterize Salem's MS4 stormwater runoff pollutant concentrations by land use and compare them with the ACWA characterized land use concentrations.

Data for this monitoring element are provided in Table 12. For reporting year 2020/2021, staff captured one storm event.

2.5 Pesticide Monitoring

No samples for the pesticide monitoring element were collected for RY 2020/2021.

2.6 Priority Dry Weather Outfall/Manhole Screening

The RY 2020/2021 dry weather outfall screening effort included a total of 94 outfall inspections (outfall structures or the first available upstream manhole), 77 of which had observable flow. Of the 77 flowing outfalls, 18 of the 71 tested for the presence of chlorine tested positive, and 16 received analytical sampling. A total of seven pipesheds were investigated based on these outfall inspections, which resulted in the reporting of three water leaks, one of which was a leak at a private residence, to the Water Department. One water leak was observed in RY 2018/2019 but has not been located despite leak detection efforts by the Water Department. Of the 94 outfalls inspected, 35 were identified in the City of Salem's Dry Weather Outfall and Illicit Discharge Screening Plan. The additional outfalls were inspected based upon Stream Crew reports of dry-weather flow and two are outfalls that have been added for annual inspection based upon reports of dry weather flow. One of these outfalls has been characterized as being predominantly comprised of groundwater with minor contribution of municipal water sources that have yet to be located. One was determined to be a municipal water leak that has since been repaired. Two outfalls listed in the City of Salem's Dry Weather Outfall and Illicit Discharge Screening Plan are no longer inspected, outfall D48486207, which was determined to be a culvert structure above an existing priority outfall and D42456216, which requires confined space entry to sample.

In addition to the above, we have been collecting grab samples for E. coli analysis at four Dry Weather Outfall and Illicit Discharge Screening outfalls located within the Clark Creek basin. This effort is part of a larger investigation of "hotspots" within the Clark Creek Basin where dry weather monthly sample results consistently exceed the Oregon Department of Environmental Quality (ODEQ) acute single sample water quality criterion for E. coli of 406 MPN/100mL. Visual inspection and records review have yet to confirm the source(s) of this observed impairment. As a result, dry weather microbial source tracking is an ongoing activity at these sites. For further information on the results of the inspections and bacterial source tracking refer to **Appendix A**.

Stream Crew interns continued to be tasked with visually inspecting all outfalls encountered during their 60 miles of stream inspections. Only outfalls with dry weather flow are recorded at this time. Due to the increased reporting from this new workflow, the number of outfalls reported exceeded staff capacity for follow-up investigations. While the presence of chlorine was detected

during some of the inspections, physical characteristics did not indicate contribution from the sanitary sewer system or illicit dumping. Groundwater with some contribution of municipal water is thought to compromise flow in these outfalls and follow-up investigation is still needed.

The use of ArcGIS Online, Survey123, and Collector for ArcGIS have been critical technologies for increasing the scope and reach of this BMP. The use of these applications and workflows increases the number of outfall screenings requiring follow-up investigation by full-time staff, which stretches staff thin for this BMP. Adjustment of staff resources will need time to adapt to this new workflow.

Improvements that could be made to this BMP include the following:

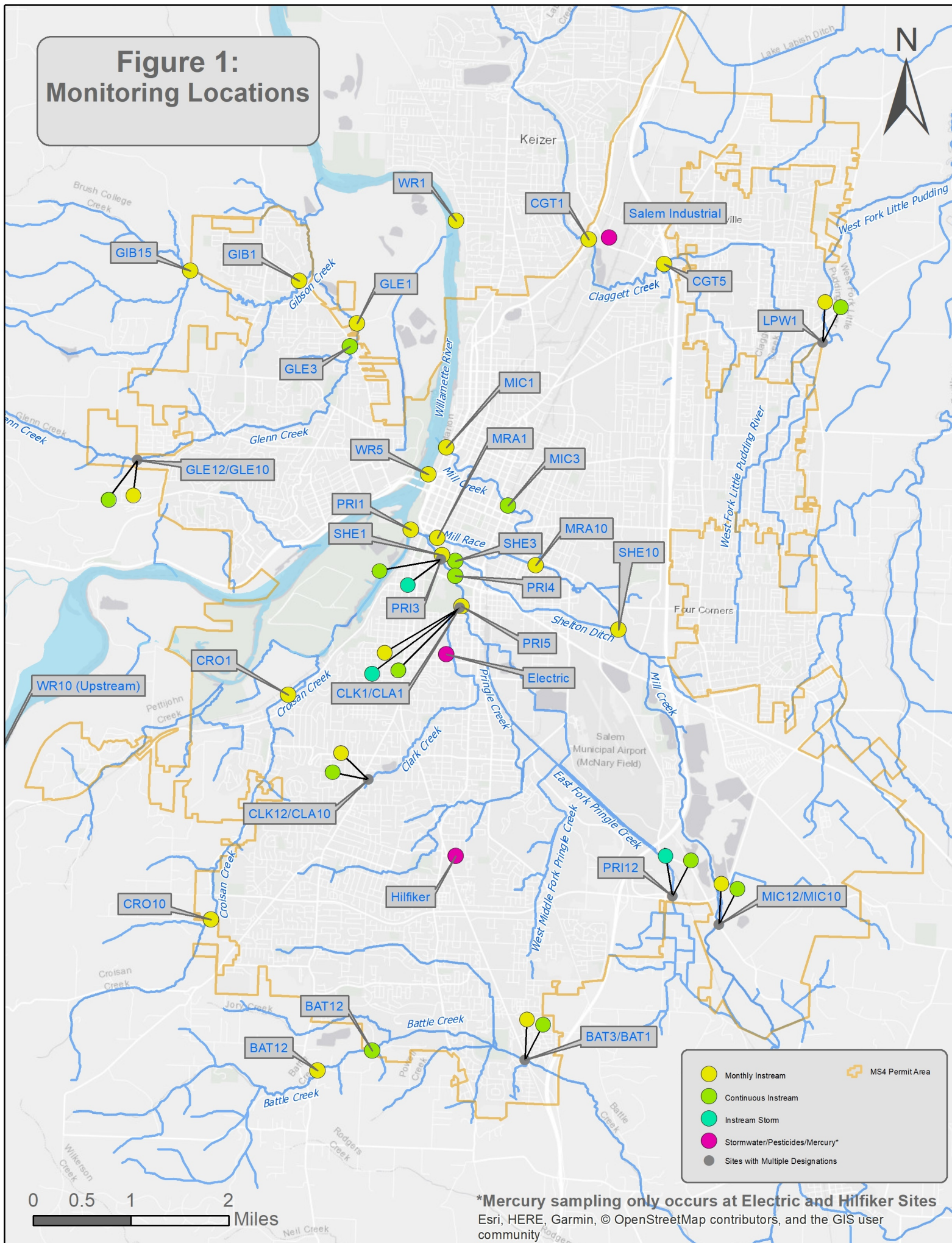
- Targeted outreach using areas defined by the same data inputs as used for the GIS process for prioritizing outfalls for inspection.
- Changing the field screening pollutant parameter action level for total chlorine from 0.0 (Any Presence) to 0.05 mg/L would limit the number of laboratory analyses and pipeshed investigations required by the current plan. Currently, low level detections of total chlorine, either due to naturally occurring chloramines, method interference, or small water leaks in pipes conveying mostly ground water result in time consuming pipeshed investigations or additional analytical sampling when total chlorine results are relatively low and no other field parameter thresholds have been exceeded. In such circumstances, isolating the source of such small amounts of chlorine is very difficult and time consuming. Allowing for a slightly higher action level for total chlorine and the ability of the investigator to exercise discretion based on the totality of circumstances as well as previous year's analytical results before prompting a pipeshed investigation would allow more time for investigators to inspect more outfalls each year and to spend more time investigating higher priority outfalls.
- Additional analytical discretion may also provide for a more efficient use of investigative resources in instances where delivery of laboratory samples limits time available for source tracking. Visual source tracking in conjunction with basic field analyses has proven to be a much more effective tool for identifying sources of dry weather flow than laboratory analysis of water chemistry.

Data for this monitoring element are provided as Appendix A at the end of this document.

3.0 Conclusion

The City continues to meet all monitoring requirements of its administratively extended MS4 Permit. Cumulatively, data collected throughout this MS4 Permit cycle will be used to meet monitoring objectives identified in the City's monitoring plan, while also supporting data analyses.

**Figure 1:
Monitoring Locations**

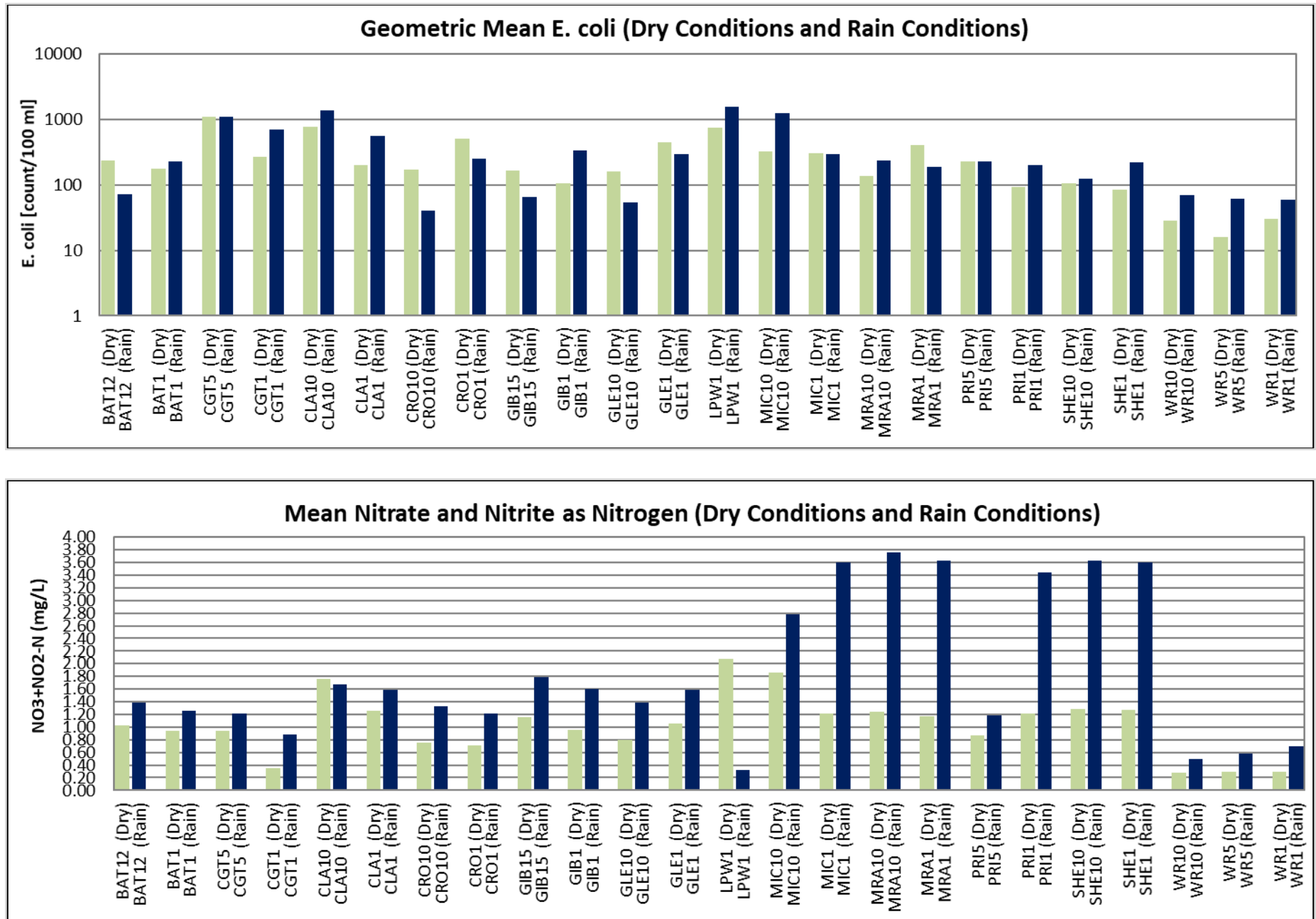


*Mercury sampling only occurs at Electric and Hilfiker Sites

Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community

Figure 2

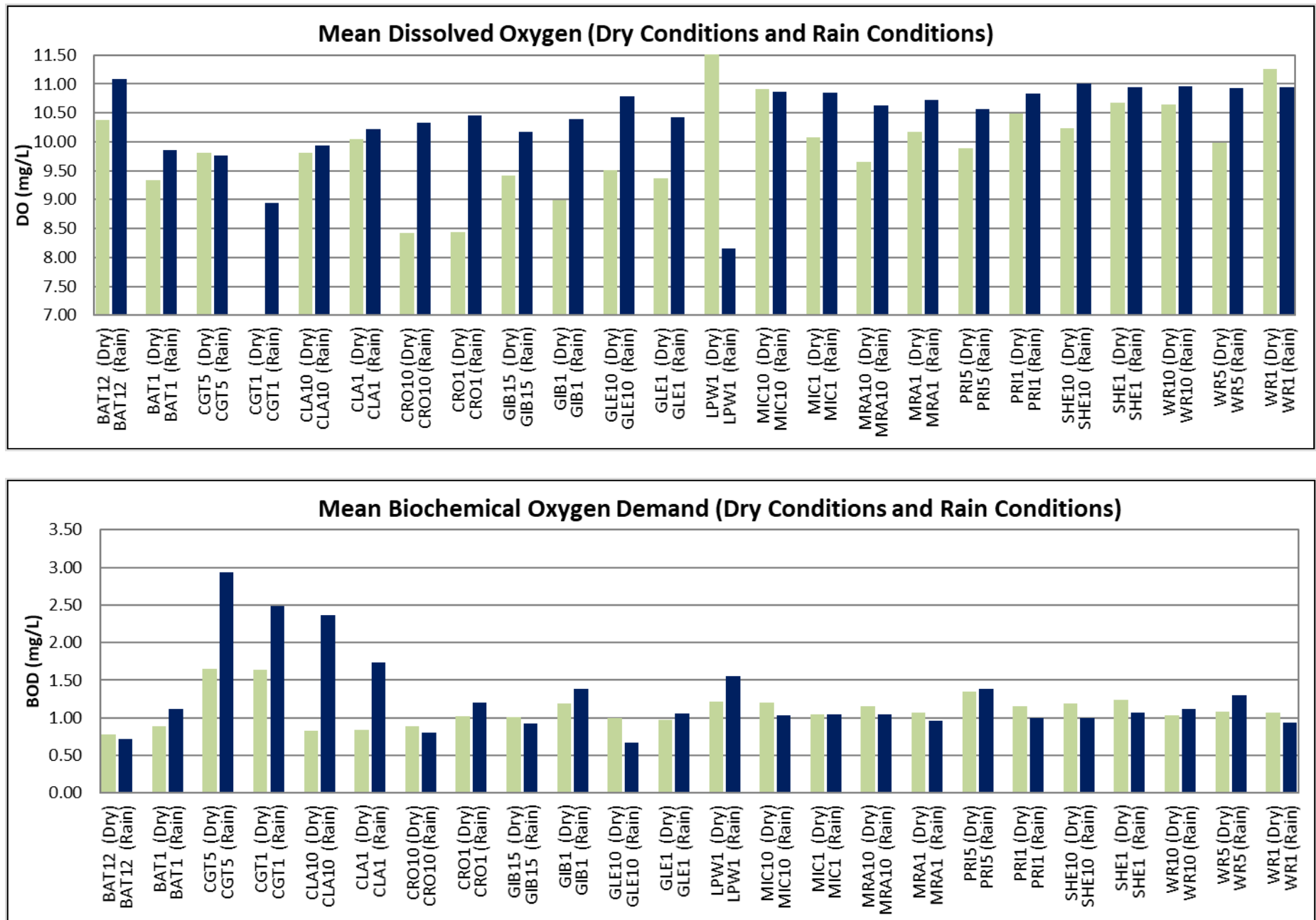
Monthly Instream Mean Value Comparison for Dry and Rain Conditions (Reporting Year 2020/2021)



Dry conditions defined as less than 0.05 inches of rainfall in the 24 hours prior to sample collection; rain conditions defined as greater than or equal to 0.05 inches of rainfall in the 24 hours prior to sample collection.

Figure 2

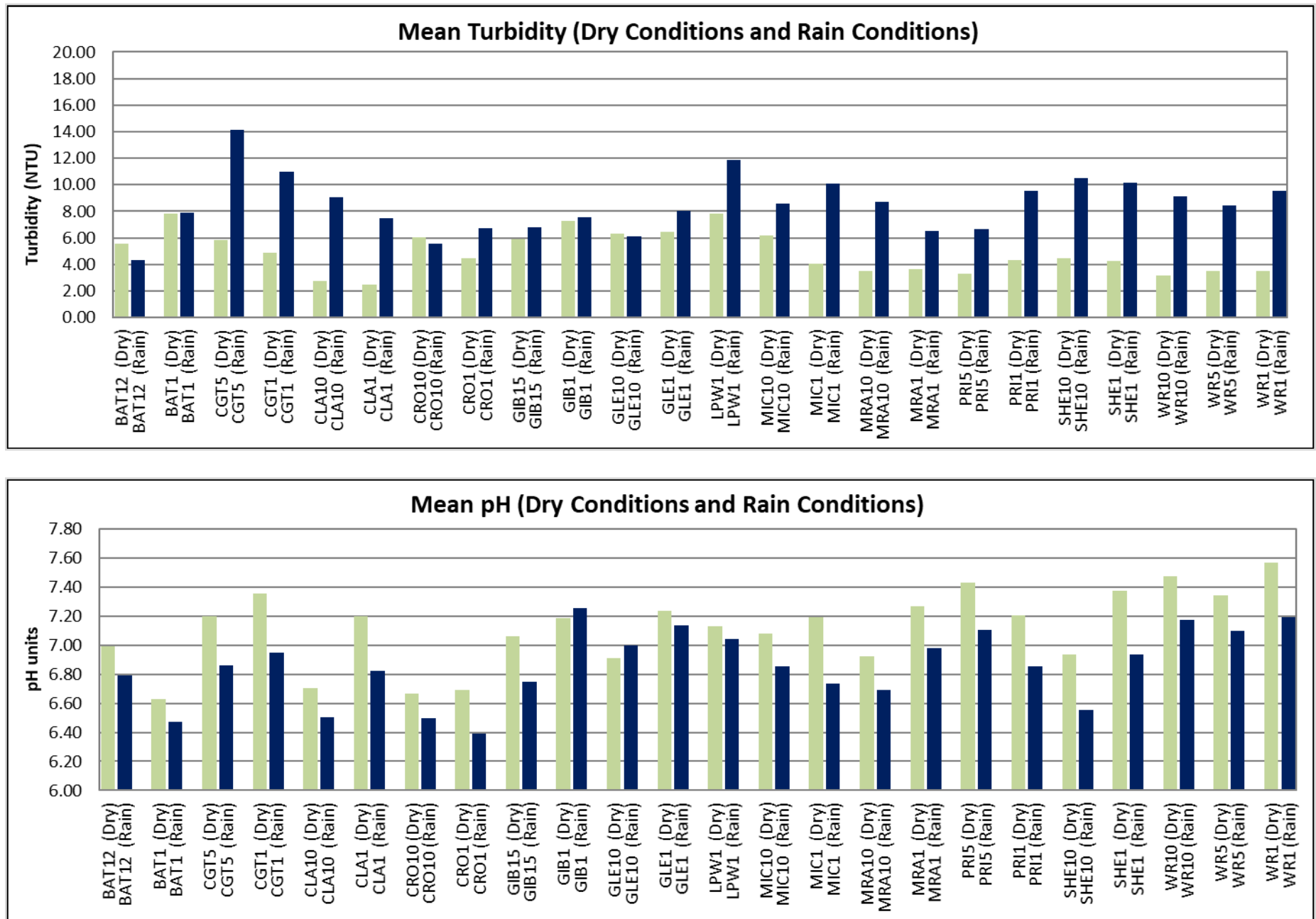
Monthly Instream Mean Value Comparison for Dry and Rain Conditions (Reporting Year 2020/2021)



Dry conditions defined as less than 0.05 inches of rainfall in the 24 hours prior to sample collection; rain conditions defined as greater than or equal to 0.05 inches of rainfall in the 24 hours prior to sample collection.

Figure 2

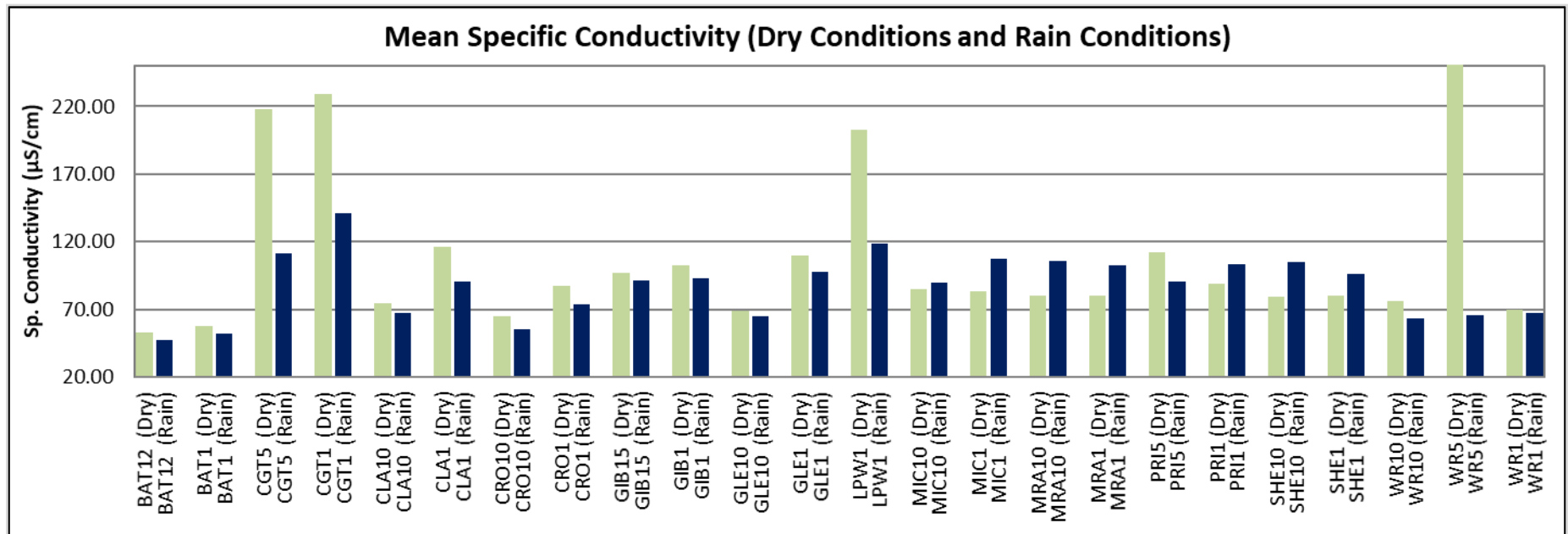
Monthly Instream Mean Value Comparison for Dry and Rain Conditions (Reporting Year 2020/2021)



Dry conditions defined as less than 0.05 inches of rainfall in the 24 hours prior to sample collection; rain conditions defined as greater than or equal to 0.05 inches of rainfall in the 24 hours prior to sample collection.

Figure 2

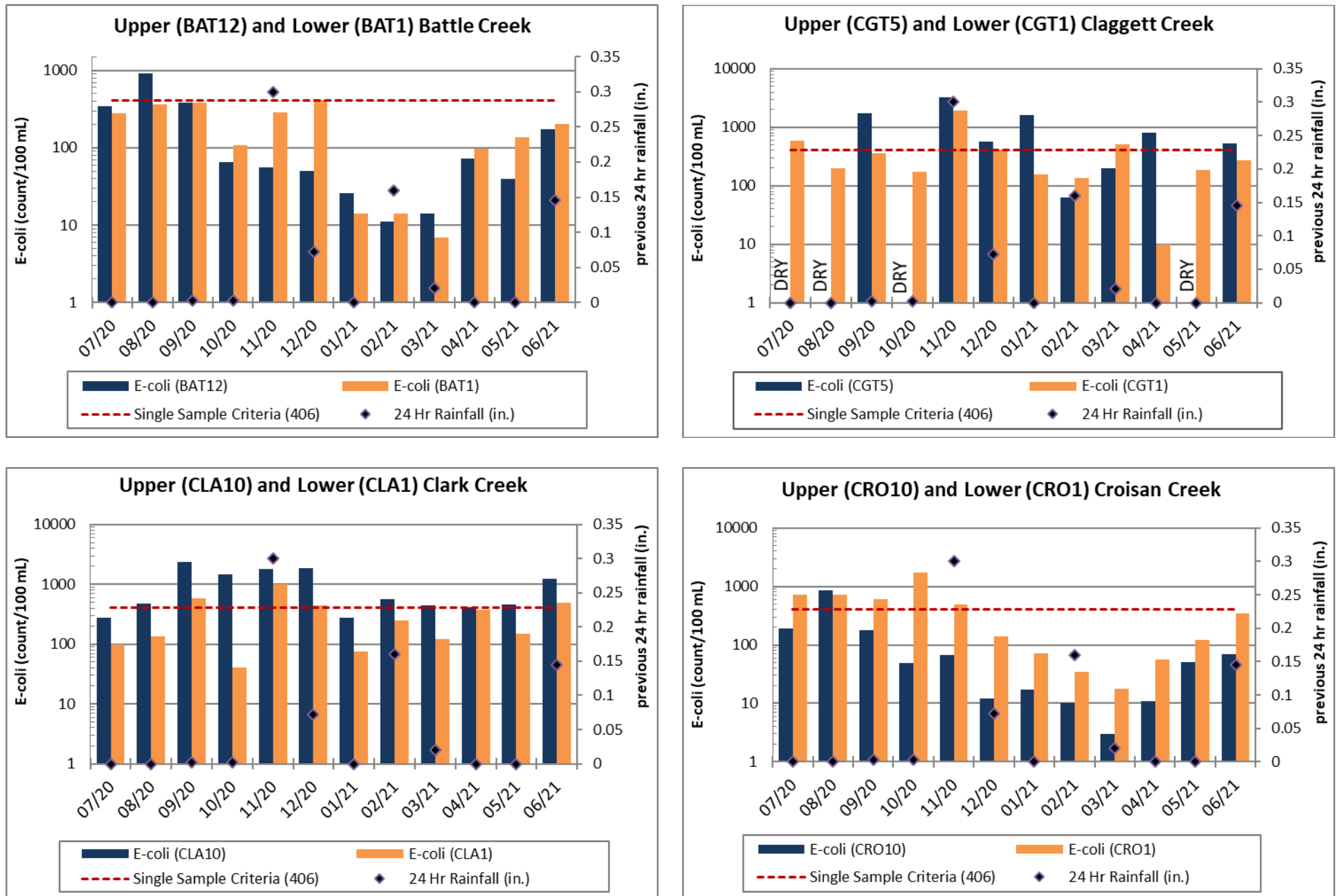
Monthly Instream Mean Value Comparison for Dry and Rain Conditions (Reporting Year 2020/2021)



Dry conditions defined as less than 0.05 inches of rainfall in the 24 hours prior to sample collection; rain conditions defined as greater than or equal to 0.05 inches of rainfall in the 24 hours prior to sample collection.

Figure 3

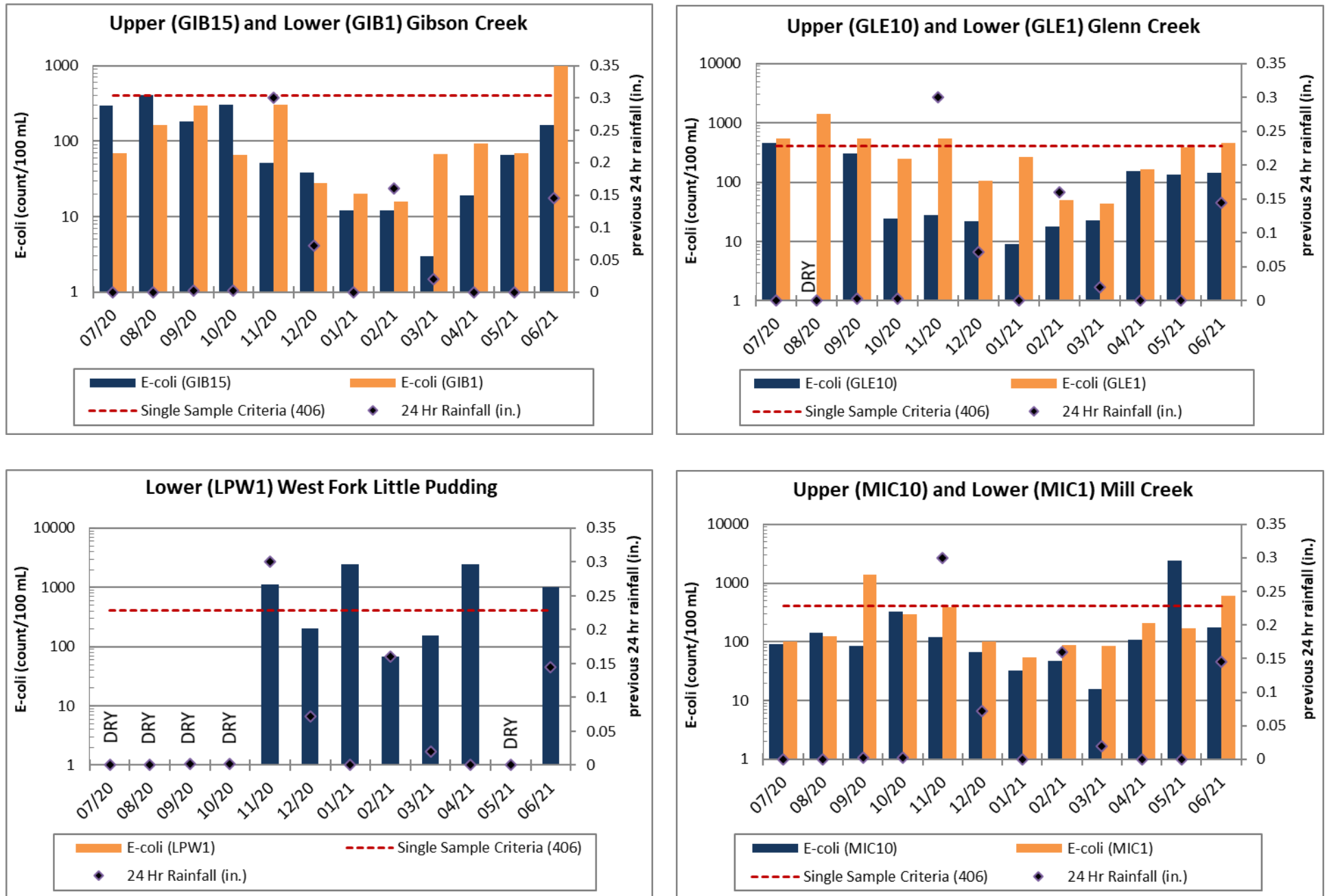
Monthly Instream E. Coli Upstream / Downstream Site Comparison (Reporting Year 2020/2021)



If 24 hour rainfall depth prior to sample collection differed between upstream and downstream sites, the average rainfall of the two sites was used.

Figure 3

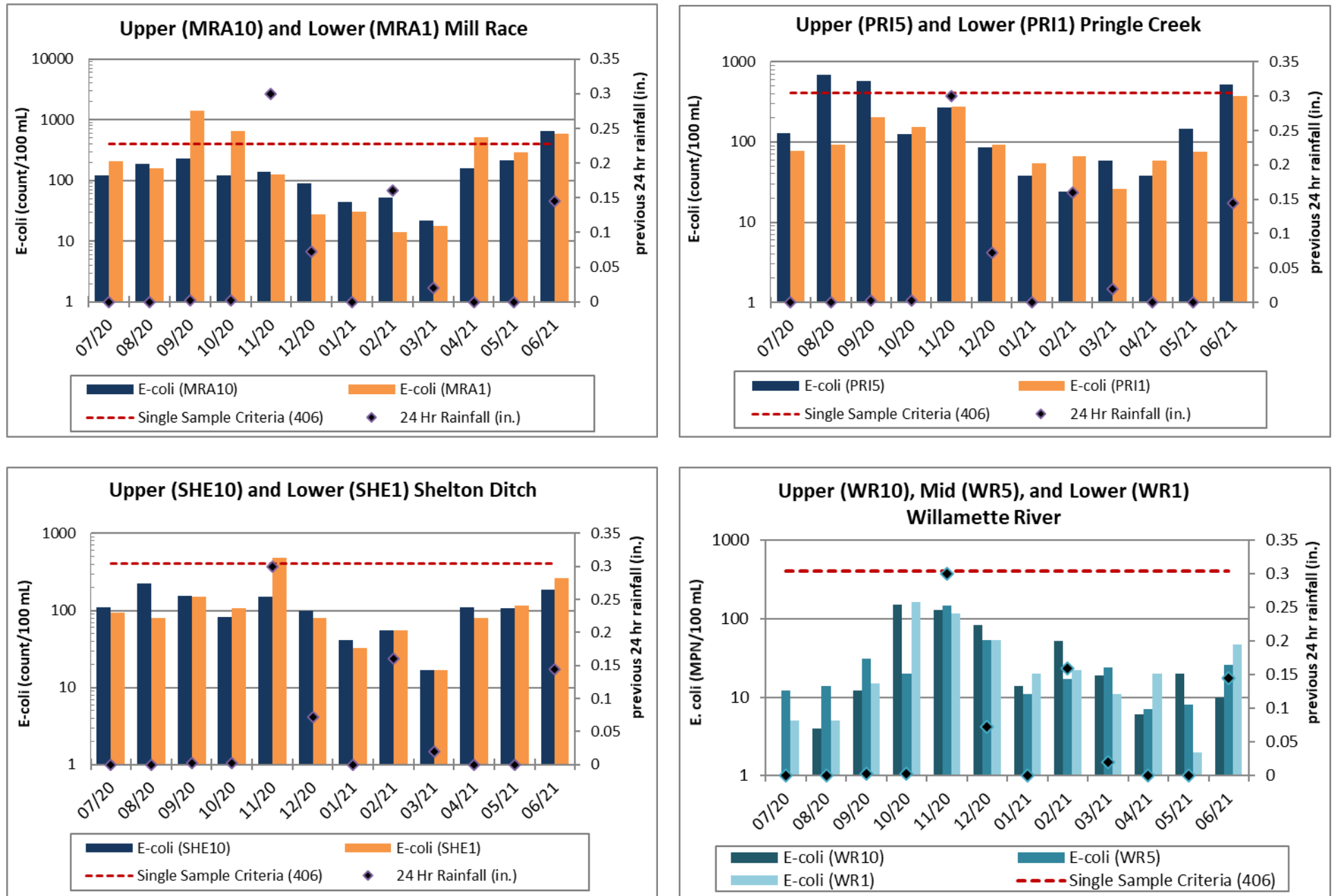
Monthly Instream E. Coli Upstream / Downstream Site Comparison (Reporting Year 2020/2021)



If 24 hour rainfall depth prior to sample collection differed between upstream and downstream sites, the average rainfall of the two sites was used.

Figure 3

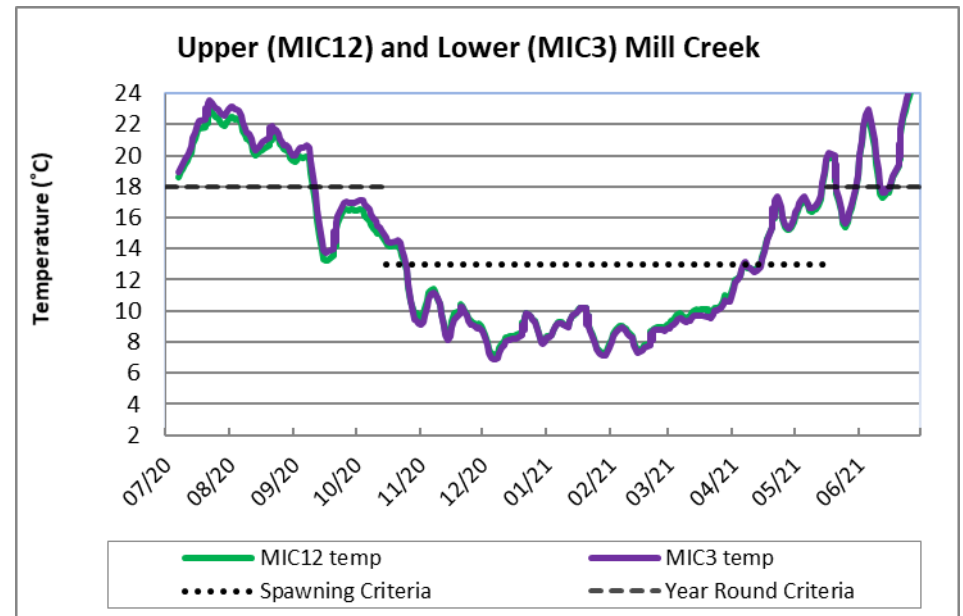
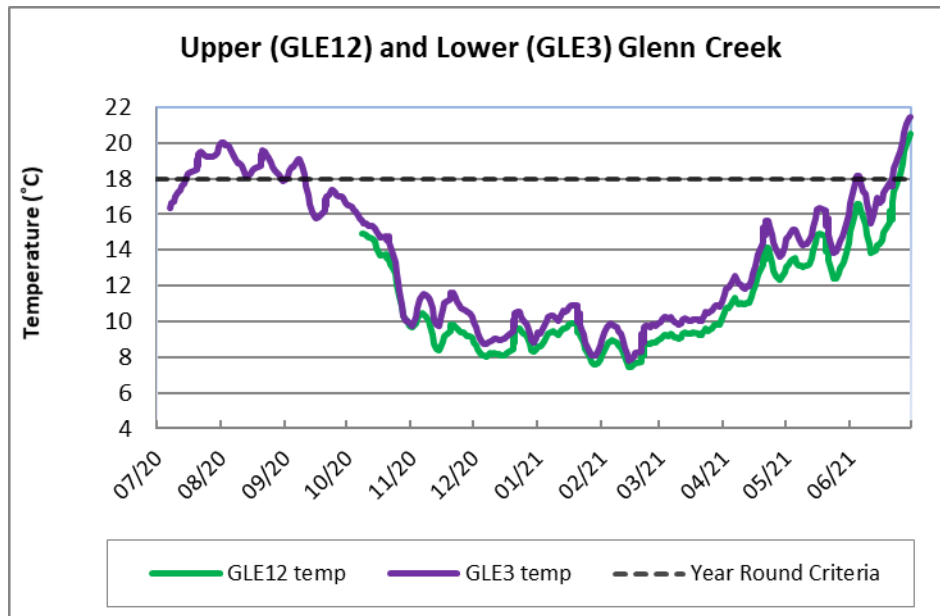
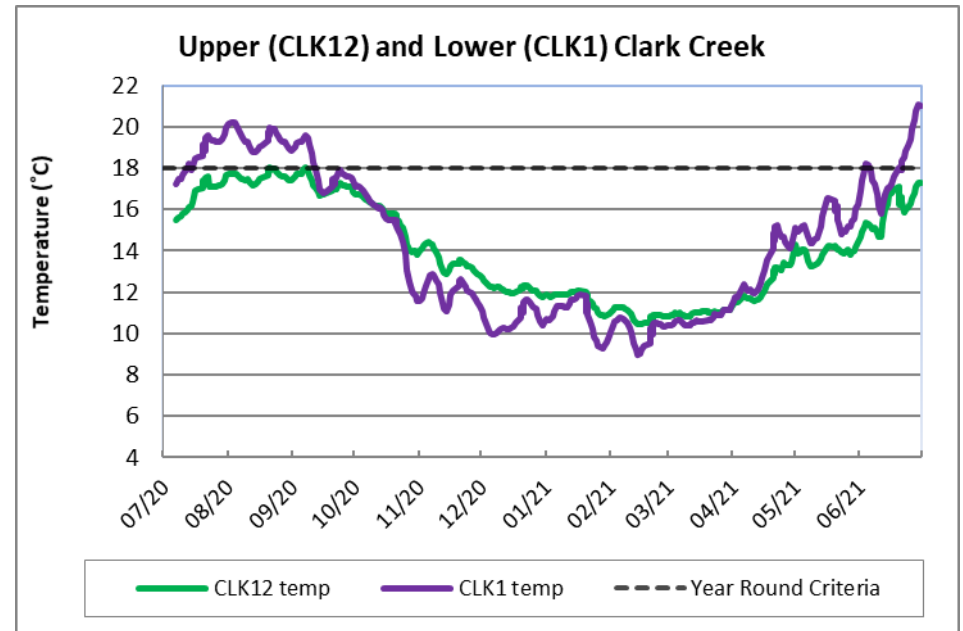
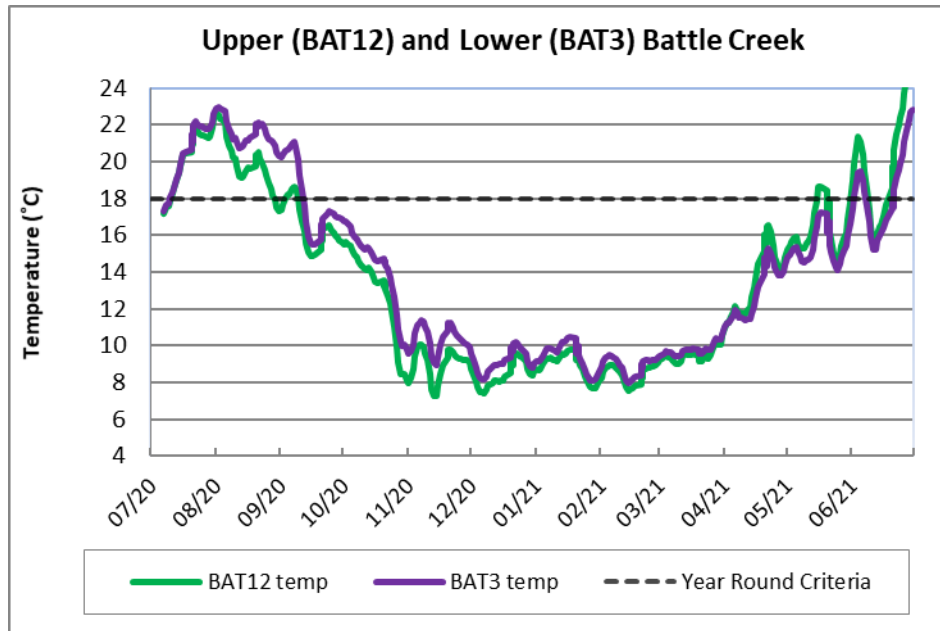
Monthly Instream E. Coli Upstream / Downstream Site Comparison (Reporting Year 2020/2021)



If 24 hour rainfall depth prior to sample collection differed between upstream and downstream sites, the average rainfall of the two sites was used.

Figure 4

Continuous Instream Temperature 7-Day Moving Average Maximum (Reporting Year 2020/2021)

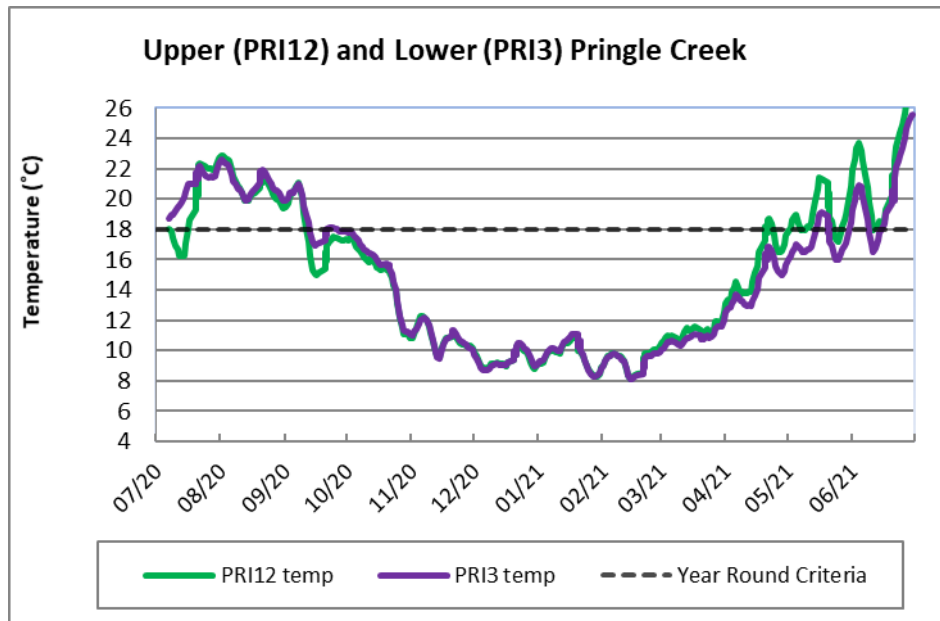


Presented temperature data consists of A grade data with greater than 80% of data points collected per day. Temperature criteria is defined in OAR 340--04100028 and OAR 340-0340, Tables 340A & B.

- Spawning Minimum Criteria for applicable streams may not exceed 7-day average maximum of 13 degrees C.
- Year Round Minimum Criteria may not exceed 7-day average maximum of 18 degrees C.

Figure 4

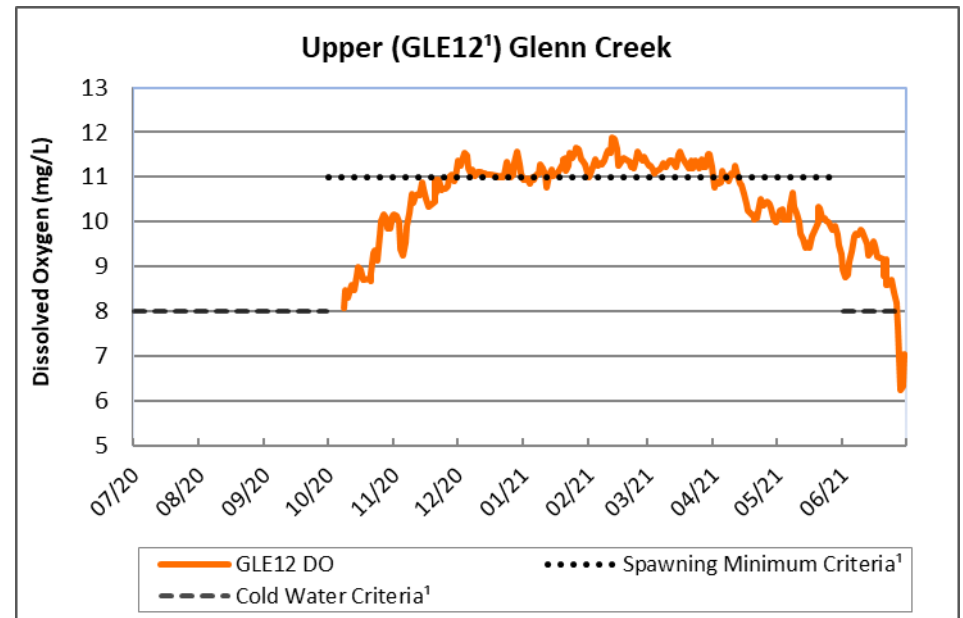
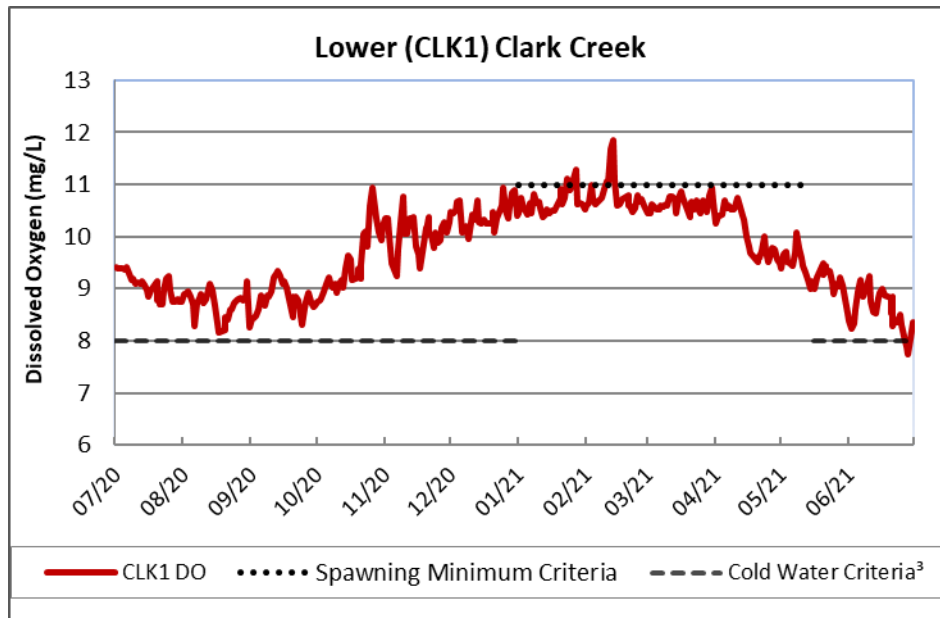
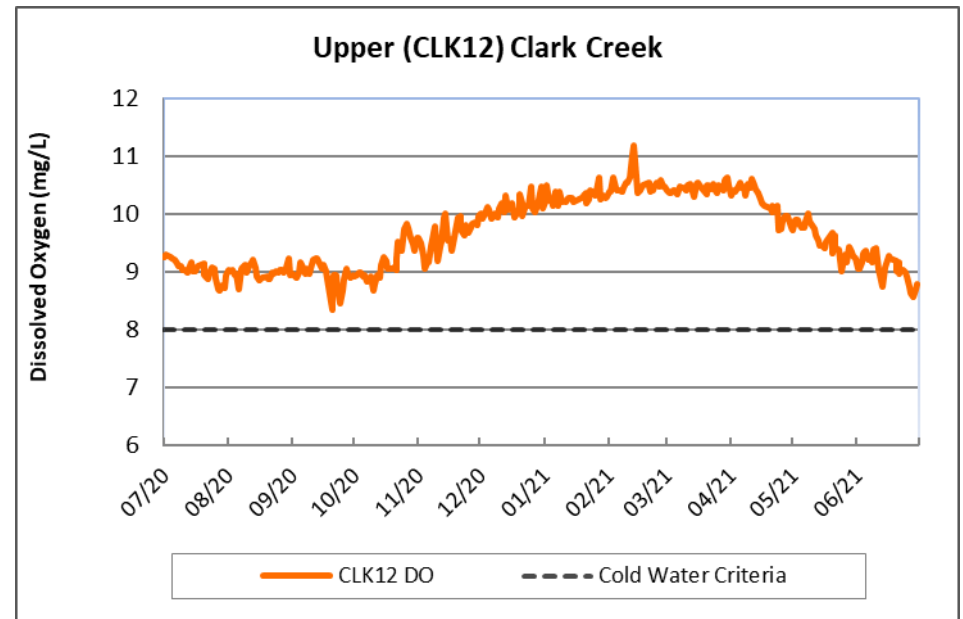
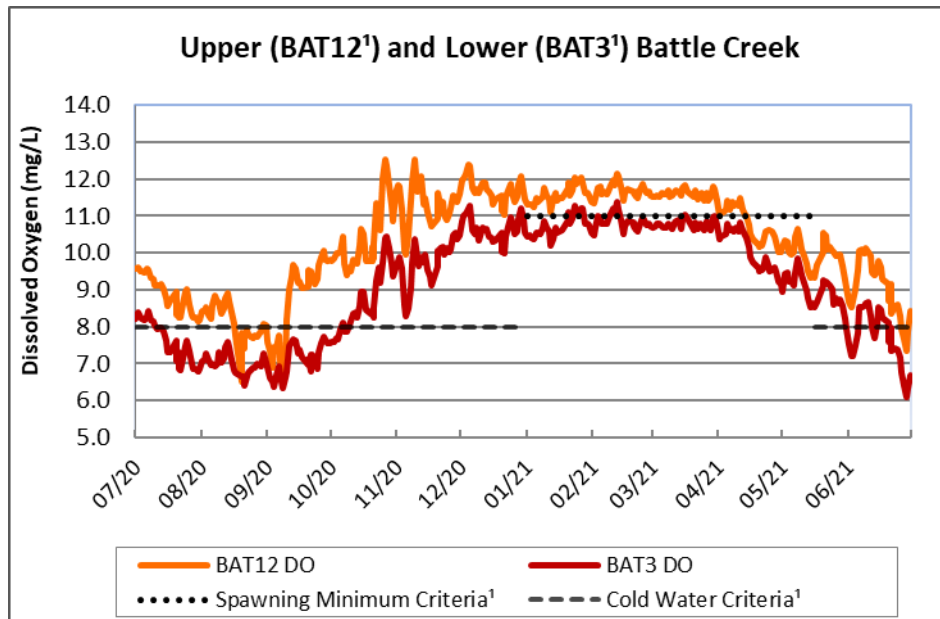
Continuous Instream Temperature 7-Day Moving Average Maximum (Reporting Year 2020/2021)



Presented temperature data consists of A grade data with greater than 80% of data points collected per day. Temperature criteria is defined in OAR 340--04100028 and OAR 340-0340, Tables 340A & B.

- Spawning Minimum Criteria for applicable streams may not exceed 7-day average maximum of 13 degrees C.
- Year Round Minimum Criteria may not exceed 7-day average maximum of 18 degrees C.

Figure 5
Continuous Instream Dissolved Oxygen Daily Mean (Reporting Year 2020/2021)

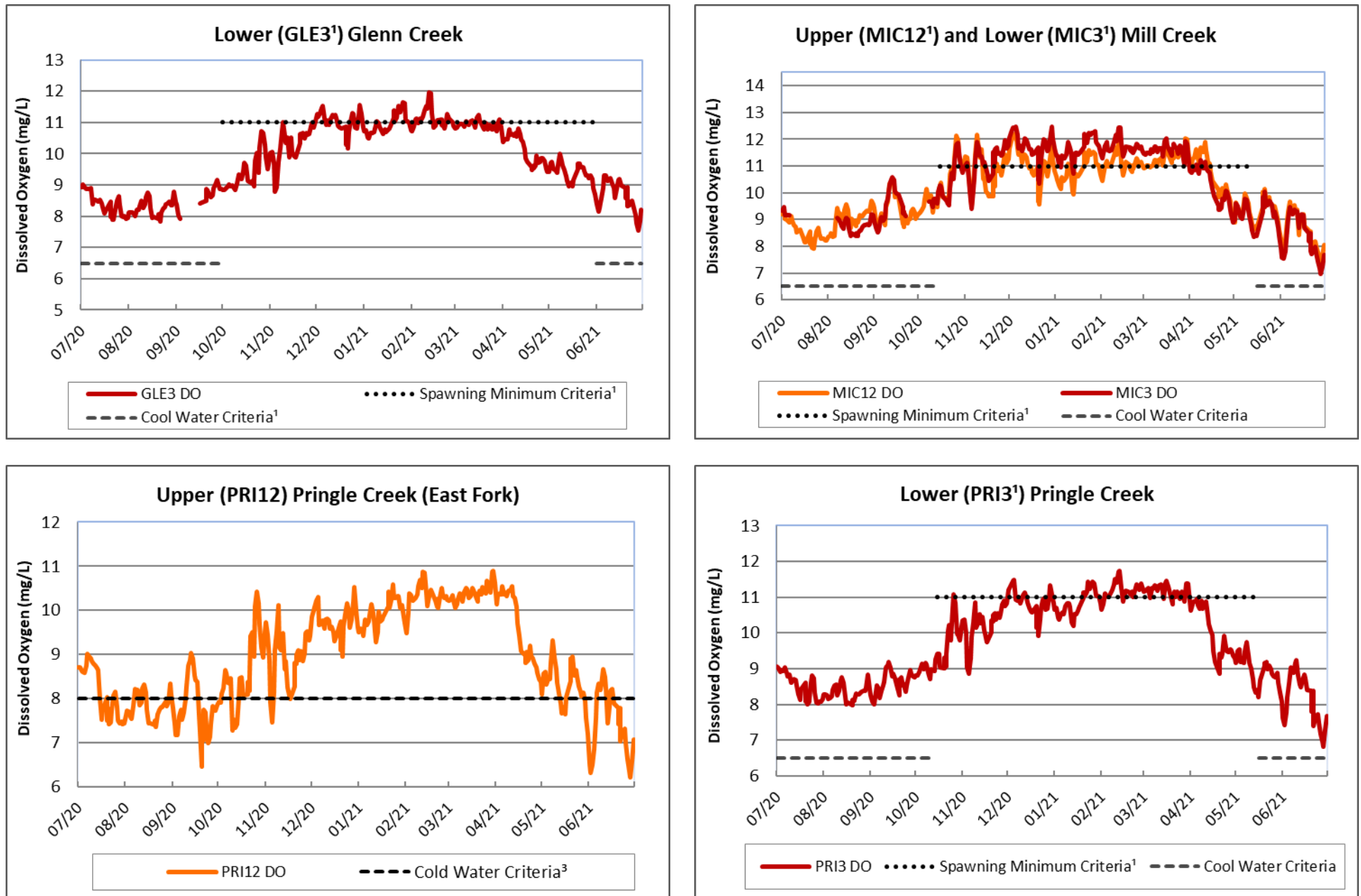


Presented DO data consists of A and B grade data with greater than or equal to 80% of data points collected per day. DO Criteria as defined in OAR 340-041-0016 and OAR 340-0340, Tables 340 A & B.

- Spawning Minimum Criteria for applicable streams may not be less than 11 mg/L.
- Oregon Cold Water Criteria for applicable streams may not be less than 8 mg/L.

¹ Oregon's 2012 Integrated Report Section 303(d) listed.

Figure 5
Continuous Instream Dissolved Oxygen Daily Mean (Reporting Year 2020/2021)

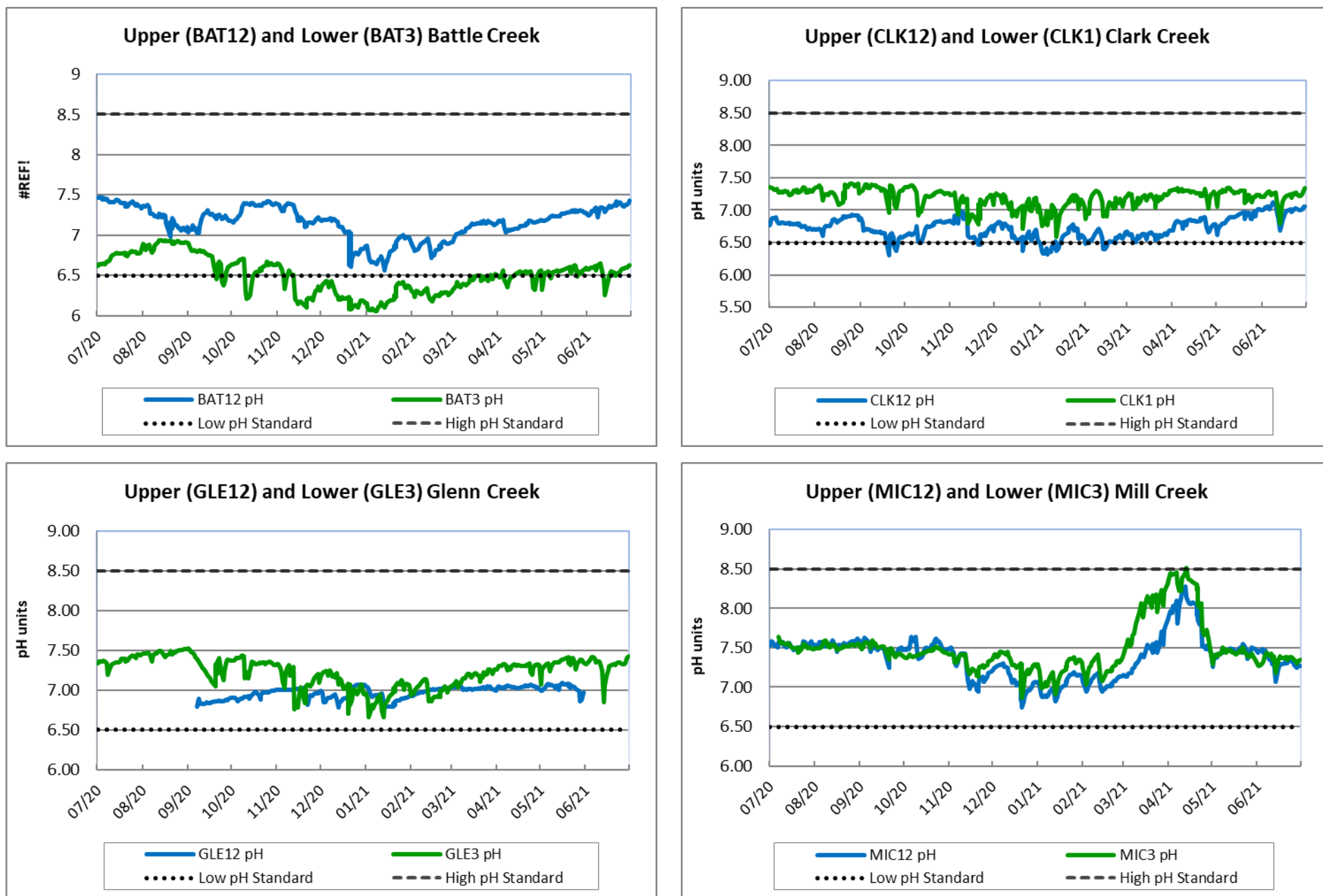


Presented DO data consists of A and B grade data with greater than or equal to 80% of data points collected per day. DO Criteria as defined in OAR 340-041-0016 and OAR 340-0340, Tables 340 A & B.

- Spawning Minimum Criteria for applicable streams may not be less than 11 mg/L.
- Oregon Cold Water Criteria for applicable streams may not be less than 8 mg/L.

¹ Oregon's 2012 Integrated Report Section 303(d) listed.

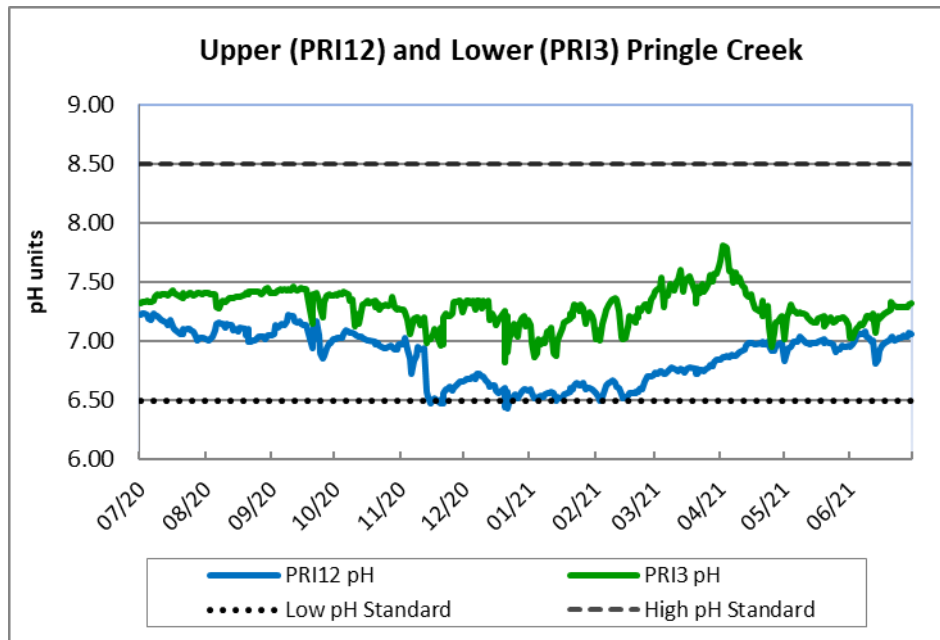
Figure 6
Continuous Instream pH Daily Mean (Reporting Year 2020/2021)



Presented pH data consist of A and B grade data with greater than or equal to 80% of data points collected per day.

As defined in OAR 341-041-0035 Water Quality Standards for the Willamette Basin, pH should not fall outside the ranges of 6.5 to 8.5 pH units.

Figure 6
Continuous Instream pH Daily Mean (Reporting Year 2020/2021)



Presented pH data consist of A and B grade data with greater than or equal to 80% of data points collected per day.

As defined in OAR 341-041-0035 Water Quality Standards for the Willamette Basin, pH should not fall outside the ranges of 6.5 to 8.5 pH units.

Figure 7
Total Rainfall by Month Across Salem (Reporting Year 2020/2021)

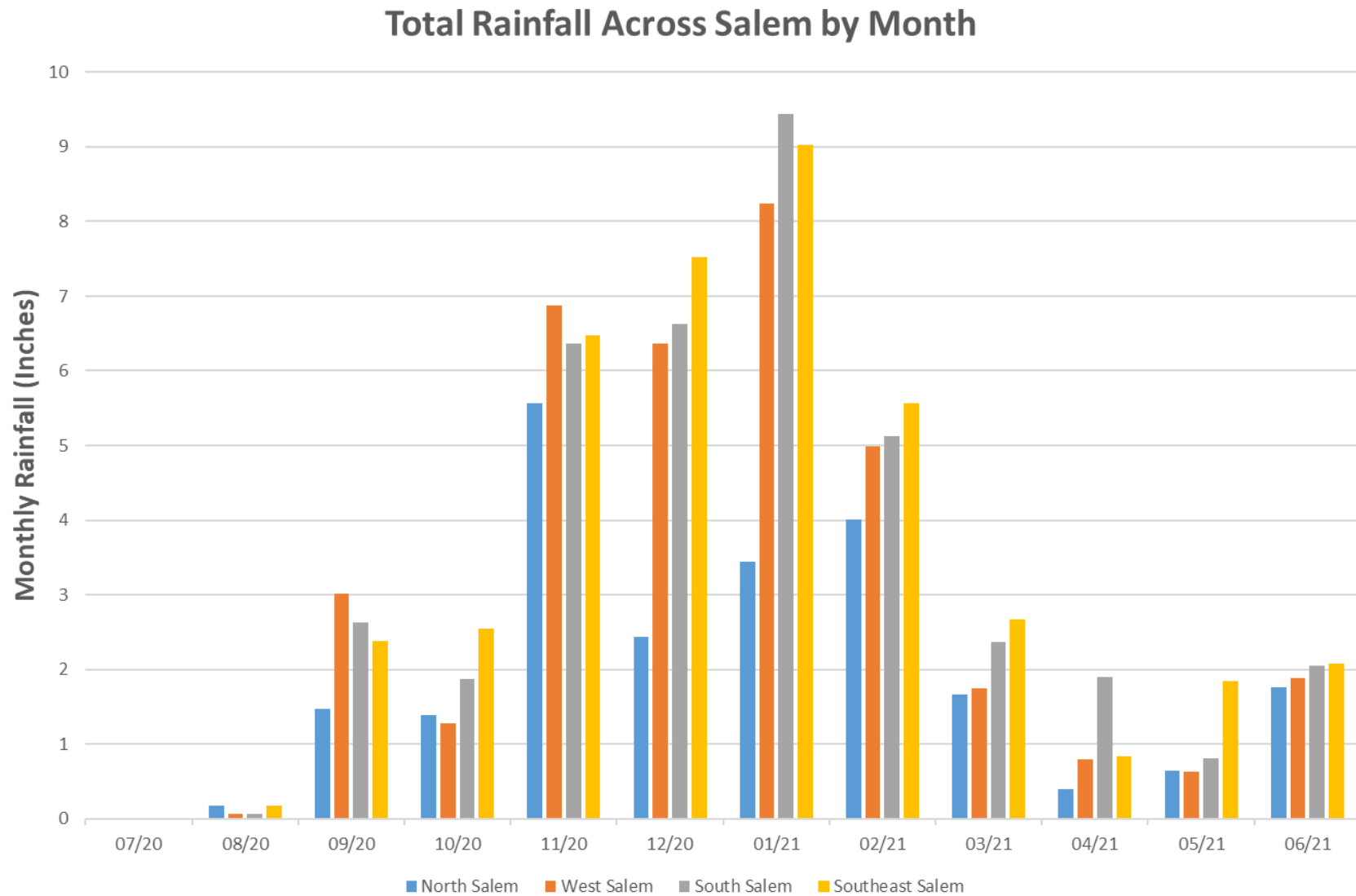


Table 1.
Completion of Table B-1 Environmental Monitoring Elements

Monitoring Type	# of sites	Total Events Needed	2011 / 2012	2012 / 2013	2013 / 2014	2014 / 2015	2015 / 2016	2016 / 2017	2017 / 2018	2018 / 2019	2019 / 2020	2020 / 2021
Monthly Instream	21	48 / site	12 ¹	12 ¹	12 ¹	12 ¹	12 ¹	12 ¹	12 ¹	12 ¹	10 ³	12 ¹
Continuous In-stream	10	On going	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Instream Storm	3	25 / site	6	6	5	4	4	1	2	5	3	2
Stormwater (MS4)	3	15 / site	4	4	4	1	2	1	0	4	2	1
Pesticides	3	4 / site	1	2	0	1	0	0	1	0	0	0
Mercury	2	2 / site / year	2	1	1	COMPLETE ²						
Macroinvertebrates	3	2 / site	1	1	0	0	0	0	1	0	0	0

¹ Due to no flow or access issues, several of the sites had less than 12 data collection events; however, all sites are on track to meet the minimum permit requirements.

² Following Table B-1 Special Condition #6 of the City's NPDES MS4 permit, the City requested and received approval from Department to eliminate the mercury and methyl mercury monitoring requirement after completing the required two years of monitoring.

³ Due to staffing issues related to COVID19 and flood threat, only 10 data collection events occurred.

Table 2.
Site Locations for Each Monitoring Element

Monthly Instream	
Site ID	Site Location
BAT 1	Commercial St SE
BAT 12	Rees Hill Rd SE
CGT 1	Mainline Dr NE
CGT 5	Hawthorne St NE @ Hyacinth St NE
CLA 1	Bush Park
CLA 10	Ewald St SE
CRO 1	Courthouse Athletic Club
CRO 10	Ballantyne Rd S
GIB 1	Wallace Rd NW
GIB 15	Brush College Rd NW
GLE 1	River Bend Rd NW
GLE 10	Hidden Valley Dr NW
LPW 1	Cordon Rd NE
MIC 1	Front St Bridge
MIC 10	Turner Rd SE
MRA 1	High St SE
MRA 10	Mill Race Park
PRI 1	Riverfront Park
PRI 5	Bush Park
SHE 1	Church St SE
SHE 10	State Printing Office
WR1	Sunset Park (Keizer)
WR5	Union St. Railroad Bridge
WR10	Halls Ferry Road (Independence)

Continuous Instream	
Site ID	Site Location
BAT3	Commercial St SE
BAT12	Lone Oak Rd SE
CLK1 ¹	Bush Park
CLK12	Ewald St SE
GLE3	Wallace Rd NW
GLE12	Hidden Valley Dr NW
LPW1 ²	Cordon Rd
MIC3	North Salem High School
MIC12	Turner Rd SE
PRI3 ¹	Pringle Park
PRI4 ²	Salem Hospital Footbridge
PRI12 ¹	Trelstad Ave SE
SHE3 ²	Winter St. Bridge
WAL3 ²	Wiltsey Rd SE

Stormwater / Pesticides / Mercury	
Site Id	Site Location
Electric ³	Electric St. SE and Summer St. SE
Hilfiker ³	Hilfiker Ln. SE and Commercial St. SE
Salem Industrial	Salem Industrial Dr. NE and Hyacinth St. NE

¹ Instream Storm sampling done at these sites. ² Stage-only gauging station. ³ Mercury monitoring conducted at these sites.

BAT = Battle Creek, CGT = Claggett Creek, CLA / CLK = Clark Creek, CRO = Croisan Creek, GIB = Gibson Creek, GLE = Glenn Creek, MIC = Mill Creek, MRA = Mill Race, PRI = Pringle Creek, SHE = Shelton Ditch, LPW = West Fork Little Pudding River, WR = Willamette River

Table 3.
Parameters for Each Monitoring Element

Parameter	Units	Monitoring Element			
		Instream Storm	Stormwater	Monthly Instream	Continuous Instream
Alkalinity	mg/L			x¹	
Biological Oxygen Demand (BOD _{stream})	mg/L	x		x	
Biological Oxygen Demand (BOD _{5day})	mg/L		x		
Specific Conductivity (Sp. Cond)	µS/cm	x	x	x	x
Copper (Total Recoverable and Dissolved)	mg/L	x	x	x²	
Dissolved Oxygen (DO)	mg/L	x	x	x	x
<i>E. coli</i>	MPN/100 mL	x	x	x	
Hardness	mg/L	x	x	x²	
Lead (Total Recoverable and Dissolved)	mg/L	x	x	x²	
Ammonia Nitrogen (NH ₃ -N)	mg/L	x	x	x¹	
Nitrate and Nitrite (NO ₃ -NO ₂)	mg/L	x	x	x	
pH	S.U.	x	x	x	x
Total Dissolved Solids (TDS)	mg/L			x¹	
Temperature	°C	x	x	x	x
Total Phosphorus (TP)	mg/L	x	x	x¹	
Ortho Phosphorus	mg/L	x	x		
Total Solids (TS)	mg/L			x¹	
Total Suspended Solids (TSS)	mg/L	x	x	x^{1, 3}	
Turbidity	NTU			x	x
Zinc (Total Recoverable and Dissolved)	mg/L	x	x	x²	

¹ Willamette River sites only (WR1, WR5, and WR10).

² Pringle Creek Watershed sites only (PRI1, PRI5, CLA1, and CLA10).

³ West Fork of Little Pudding River site only (LPW 1).

Table 4.
Water Quality Criteria for Monitored Streams

Parameter	Season	Criteria	Applicable Waterbody
Dissolved Oxygen	January 1-May 15	Spawning: Not less than 11.0 mg/L or 95% saturation	Battle Creek*, Claggett Creek*, Clark Creek* ³ , Croisan Creek*, Glenn Creek*, West Fork Little Pudding River*
	October 1- May 31	Spawning: Not less than 11.0 mg/L or 95% saturation	Gibson Creek* [□]
	October 15 - May 15	Spawning: Not less than 11.0 mg/L or 95% saturation	Mill Creek*, Pringle Creek* ¹ , Shelton Ditch*, Willamette River* ⁵
	Year Around (Non-spawning)	Cold water: Not less than 8.0 mg/L or 90% saturation	Battle Creek*, Croisan Creek*, Clark Creek, Glenn Creek* ⁴ , Pringle Creek ²
		Cool water: Not less than 6.5 mg/L	Claggett Creek*, Glenn Creek*, Mill Creek, Pringle Creek ¹ , Shelton Ditch, West Fork Little Pudding River, Willamette River* ⁶
pH	Year Around	Must be within the range of 6.5 to 8.5 pH units	All Monitoring Streams
Temperature	October 15 - May 15	Salmon and steelhead spawning: 13°C 7-day average maximum	Mill Creek, Shelton Ditch
	October 1- May 31	Salmon and steelhead spawning: 13°C 7-day average maximum	Gibson Creek [□]
	Year Around (Non-spawning)	Salmon and trout rearing and migration: 18°C 7-day average maximum	All Monitoring Streams
E. coli	Fall-Winter-Spring	30 day log mean of 126 E. coli organisms per 100 ml (or) no single sample > 406 organisms per 100 ml	All Monitoring Streams
	Summer	30 day log mean of 126 E. coli organisms per 100 ml (or) no single sample > 406 organisms per 100 ml	All Monitoring Streams
Biological Criteria	Year Around	Waters of the state must be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities.	Claggett Creek*, Clark Creek* ³ , Croisan Creek*, Glenn Creek*, Pringle Creek Trib*, Willamette River*
Copper	Year Around	Freshwater Acute and Chronic Criteria: 18 and 12 µg/L respectively with values calculated for a hardness of 100 mg/L	Pringle Creek*
Lead	Year Around	Freshwater Acute and Chronic Criteria: 82 and 3.2 µg/L respectively with values calculated for a hardness of 100 mg/L	Pringle Creek*, Willamette River*
Zinc	Year Around	Freshwater Acute and Chronic Criteria: 120 and 110 µg/L respectively with values calculated for a hardness of 100 mg/L	Pringle Creek*

Note: All waterbodies in this table are included under the Willamette Basin or Molalla-Pudding Subbasin TMDL for Temperature and E. coli.

* Oregon's 2012 Integrated Report Section 303(d) listed.

¹ Applies to Pringle Creek from river mile 0 to 2.6.

³ Applies to Clark Creek from river mile 0 to 1.9.

⁵ Applies to Willamette River from river mile 54.8 to 186.5

□ Gibson Creek is referred as Gibson Gulch in Oregon's 2012 Integrated Report.

² Applies to Pringle Creek from river mile 2.6 to 6.2.

⁴ Applies to Glenn Creek from river mile 4.1 to 7.

⁶ Applies to Willamette River from river mile 50.6 to 186.5

Table 5.
Median Values for Monthly Instream Sites (RY 2020/2021)

Site ID	Number of Samples	Temperature (C)	DO (mg/L)	Sp. Cond (µS/cm)	Turbidity (NTUs)	pH (S.U.)	E. Coli (MPN/100 mL)	NO ₃ NO ₂ (mg/L)	BOD _{stream} (mg/L)
BAT1	12	12.8	9.7	53.3	7.6	6.6	169.5	0.95	0.94
BAT12	12	11.6	10.7	48.3	4.9	6.9	61.0	0.89	0.70
CGT1	12	16.1	8.4	217.5	5.8	7.1	236.0	0.44	1.76
CGT5	8	10.5	10.7	169.5	8.3	6.9	683.5	0.97	1.40
CLA1	12	12.5	9.9	102.8	2.8	7.2	198.5	1.26	0.76
CLA10	12	12.8	9.8	73.4	3.4	6.5	523.5	1.60	0.83
CRO1	12	11.8	9.8	77.0	4.9	6.5	242.5	0.63	0.98
CRO10	12	12.4	9.6	55.3	5.1	6.6	49.5	0.65	0.83
GIB1	12	13.2	9.5	98.1	6.5	7.2	69.5	0.95	1.18
GIB15	12	12.7	9.4	89.9	5.9	6.9	59.0	1.47	0.96
GLE1	12	12.9	9.6	103.6	6.6	7.2	324.0	1.10	0.89
GLE10	11	11.6	10.3	61.5	5.5	6.9	28.0	0.77	0.82
LPW1	7	8.2	9.1	167.5	10.8	6.8	1011.0	1.40	1.27
MIC1	12	14.3	9.9	91.8	5.0	7.0	148.0	0.97	0.98
MIC10	12	13.8	10.6	81.8	6.1	7.0	99.0	1.10	1.06
MRA1	12	14.0	9.9	87.6	4.2	7.1	185.5	0.92	0.99
MRA10	12	14.2	9.5	86.7	4.4	6.8	131.0	0.96	1.10
PRI1	12	14.1	10.5	88.6	5.3	7.1	85.0	0.94	1.02
PRI5	12	13.6	9.9	93.2	3.7	7.4	126.5	0.77	1.11
SHE1	12	14.1	10.6	82.5	4.8	7.3	86.5	0.98	1.14
SHE10	12	14.0	10.2	85.3	5.0	6.8	109.0	1.03	1.01
WR1	12	15.3	11.4	68.7	3.8	7.4	20.0	0.27	0.90
WR10	12	14.5	11.2	67.9	2.4	7.4	16.5	0.25	0.98
WR5	12	14.0	10.2	67.8	3.6	7.3	18.5	0.25	1.03

Table 6.
Number of Water Quality Criteria Exceedances for Monthly Instream Sites (RY 2020/2021)

Site ID	Number of Samples	Dissolved Oxygen	pH	E. Coli ⁵			Copper ⁶		Lead ⁶		Zinc ⁶	
				Total #	Dry ²	Rain ³	Total	Dissolved	Total	Dissolved	Total	Dissolved
BAT 1	12	3	5	1	0	1						
BAT 12	12	2	0	1	1	0						
CGT 1	12	7	1	4	2	2						
CGT 5 ⁴	8	1	0	6	3	3						
CLA 1	12	1	0	4	1	3	0	0	0	0	2	1
CLA 10	12	0	4	10	6	4	1	0	0	0	1	1
CRO 1	12	4	6	5	4	1						
CRO 10	12	4	5	1	1	0						
GIB 1	12	6	0	1	0	1						
GIB 15	12	7	0	1	1	0						
GLE 1	12	3	0	5	2	3						
GLE 10 ⁴	11	3	0	1	1	0						
LPW 1 ⁴	7	3	2	4	2	2						
MIC 1	12	2	1	2	1	1						
MIC 10	12	1	3	1	1	0						
MRA 1	12	NA	0	4	3	1						
MRA 10	12	NA	3	1	0	1						
PRI 1	12	3	0	0	0	0	0	0	0	0	0	0
PRI 5	12	3	0	3	2	1	0	0	0	0	0	0
SHE 1	12	3	0	1	0	1						
SHE 10	12	3	3	0	0	0						
WR1	12	2	0	0	0	0						
WR10	12	2	0	0	0	0						
WR5	12	3	0	0	0	0						

Note: Copper, lead, and zinc collected at Pringle Creek Watershed sites only (PRI1, PRI5, CLA1, and CLA10).

NA = Not available (No dissolved oxygen water quality criteria associated with this waterbody).

¹ No year-round dissolved oxygen water quality criteria associated with this waterbody

³ Rain is ≥ 0.05 inches of rainfall in previous 24 hours.

⁵ Single sample criterion of > 406 organisms per 100 mL used.

² Dry is < 0.05 inches of rainfall in previous 24 hours.

⁴ Unable to sample all 12 due to lack of flow/too high of flow.

⁶ Exceedences calculated based on hardness concentration for each event.

Table 7.
Monthly Instream Data - Battlecreek (RY 2020/2021)

Site Name: BAT1		Site Description: Commercial St							
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/21/2020 12:20	20.7		60.6	10.9	6.84	276	0.381	0.99	0.000
8/19/2020 12:20	19.8	6.64	71.5	13.3	6.77	365	0.292	1.34	0.000
9/22/2020 10:35	15.8	7.45	69.5	10.5	6.86	387	0.557	0.98	0.003
10/20/2020 11:05	13.1	8.64	60.9	6	6.58	109	0.594	0.79	0.003
11/17/2020 11:10	11.7	9.13	55.2	8.7	6.53	285	1.046	1.64	0.300
12/15/2020 10:10	9	10.25	49.3	11.1	6.45	411	1.216	1.15	0.073
1/19/2021 10:25	7.7	11.16	50.5	7.9	6.3	14	2.158	0.64	0.000
2/23/2021 10:45	8.3	11.21	49.1	5.2	6.65	14	1.809	0.72	0.160
3/16/2021 10:55	6.7	11.59	49.1	1.5	6.33	7	1.885	0.57	0.020
4/20/2021 11:15	12.5	10.24	48.9	5.1	6.45	96	0.97	0.93	0.000
5/18/2021 10:45	13.2	9.66	51.3	7.3	6.89	138	0.69	0.82	0.000
6/15/2021 10:11	14.2	8.86	55.4	6.6	6.25	201	0.931	0.94	0.145
Median	12.80	9.66	53.25	7.60	6.56	169.50	0.95	0.94	

Site Name: BAT12		Site Description: Rees Hill Rd.							
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/21/2020 12:00	19.5		54.2	6.2	7.4	345	0.475	0.67	0.000
8/19/2020 11:40	16.8	7.32	65.9	13.4	7	921	0.555	1.08	0.000
9/22/2020 10:05	14.6	9.41	66.4	3.7	7.18	387	0.396	0.78	0.003
10/20/2020 10:40	11.3	10.52	53.4	4.4	7.05	66	0.471	0.85	0.003
11/17/2020 10:50	10.2	10.73	48.5	5.4	6.85	56	1.112	0.96	0.300
12/15/2020 9:55	8	11.69	45.7	4.7	6.53	50	1.52	0.7	0.073
1/19/2021 10:10	7.3	12	49.1	5.6	6.54	26	2.527	0.66	0.000
2/23/2021 10:30	7.9	11.91	47.3	2.3	6.92	11	2.303	0.55	0.160
3/16/2021 10:35	5.8	12.41	46.7	1.1	6.75	14	2.005	0.62	0.020
4/20/2021 10:45	11.8	10.65	44.4	5.4	6.76	72	1.162	0.92	0.000
5/18/2021 10:25	12.9	10.37	46.2	4.8	7.26	39	0.668	0.69	0.000
6/15/2021 9:55	14.3	9.99	48	5	6.86	172	0.628	0.66	0.145
Median	11.55	10.65	48.25	4.90	6.89	61	0.89	0.70	

Note: Data in red exceed applicable water quality criteria (see Table 4). Single sample criterion (406 organisms/100 mL) used for E. Coli.

Table 7.
Monthly Instream Data - Claggett Creek (RY 2020/2021)

Site Name:		CGT1							
Site Description:		Mainline Dr S							
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/21/2020 13:20	24.8		238.2	2.9	7.45	583	< 0.050	1.64	0.000
8/19/2020 13:33	23.4	4.88	247.3	3.7	7.35	197	< 0.050	1.88	0.000
9/22/2020 11:50	18.6	3.89	231.5	4.5	7.17	355	0.062	2.14	0.003
10/20/2020 12:45	15.2	4.49	235	3.3	7.05	173	0.087	1.38	0.003
11/17/2020 12:40	11.5	8.89	101.9	20.5	6.95	1935	0.86	3.93	0.300
12/15/2020 11:38	8.1	8.36	129.6	9.7	6.78	414	0.651	3.04	0.073
1/19/2021 11:30	7.9	9.2	203.4	7.2	6.84	156	1.511	1.19	0.000
2/23/2021 12:00	9.3	10.47	164.7	7.5	7	135	1.03	1.52	0.160
3/16/2021 12:10	9.3	10.5	190.1	5.8	6.98	504	0.772	1.06	0.020
4/20/2021 12:30	16.9	8.80	250.4	5.7	8.8	10	0.23	1.92	0.000
5/18/2021 12:15	18.5	6.5	240.5	5.7	7.19	187	0.055	1.9	0.000
6/15/2021 11:55	18.9	8.05	166.8	6.3	7.07	275	0.983	1.45	0.145
Median	16.05	8.36	217.45	5.75	7.06	236	0.71	1.76	

Site Name:		CGT5							
Site Description:		Hawthorne Ave							
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/21/2020 13:10	No Flow								0.000
8/19/2020 13:15	No Flow								0.000
9/22/2020 11:30	16.7	3.28	220	10.4	6.98	1726	< 0.050	3.37	0.003
10/20/2020 12:15	No Flow								0.003
11/17/2020 12:25	11.9	8.87	58.9	17.1	6.72	3255	0.421	5.54	0.300
12/15/2020 11:10	8.6	10.2	110.9	20	6.84	573	1.044	3.96	0.073
1/19/2021 11:15	7.2	11.59	204.3	4.9	6.8	1597	2.769	0.87	0.000
2/23/2021 11:50	9	12.10	157.6	13.4	6.95	63	1.355	1.25	0.160
3/16/2021 12:00	8	13.21	181.3	3.5	7.42	201	0.903	0.84	0.020
4/20/2021 12:15	15.9	11.13	265.8	4.5	7.6	794	< 0.050	1.54	0.000
5/18/2021 12:00	No Flow								0.000
6/15/2021 11:36	16.6	7.85	119.1	6.1	6.93	529	2.034	0.99	0.145
Median	10.45	10.67	169.45	8.25	6.94	668	1.20	1.40	

Note: Data in red exceed applicable water quality criteria (see Table 4). Single sample criterion (406 organisms/100 mL) used for E. Coli.

Table 7.
Monthly Instream Data - Clark Creek (RY 2020/2021)

Site Name: CLA1 Site Description: Bush Park									
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/21/2020 11:43	18	8.87	99.7	2.4	7.28	98	0.878	1.01	0.000
8/19/2020 10:55	18		107.3	3.2	7.36	135	0.764	1.37	0.000
9/22/2020 9:25	16.47	8.92	211.3	1.79	7.31	583	0.946	0.84	0.003
10/20/2020 9:50	13.9	9.7	97.5	1.1	7.33	41	0.869	0.68	0.003
11/17/2020 9:40	12.3	9.69	82.1	11.8	6.73	1012	1.506	4.26	0.300
12/15/2020 9:20	10	10.57	76.4	10.6	6.86	448	1.276	1.5	0.073
1/19/2021 9:45	9.1	11.28	107	5.1	7.22	75	2.384	0.62	0.000
2/23/2021 10:00	9.5	11.10	103.9	4.5	7.21	249	2.06	0.63	0.160
3/16/2021 10:00	7.8	11.51	103.8	1.6	7.24	122	1.827	0.58	0.020
4/20/2021 10:00	11.9	10.06	103.5	2.5	7	379	1.243	1.05	0.000
5/18/2021 10:30	12.7	9.93	102	2.2	6.85	148	1.19	0.59	0.000
6/15/2021 9:25	15	9.51	98.6	3	6.5	495	1.478	0.57	0.145
Median	12.50	9.93	102.75	2.75	7.22	198.5	1.26	0.76	

Site Name: CLA1 Site Description: Bush Park							
Collection Date/Time	Total Cop- per (mg/L)	Dissolved Copper (mg/L)	Total Lead (mg/L)	Dissolved Lead (mg/ L)	Total Zinc (mg/L)	Dissolved Zinc (mg/L)	Hardness
7/21/2020 11:43	< 0.0025	< 0.0025	< 0.0005	< 0.0005	0.0103	0.0057	30
8/19/2020 10:55	< 0.0025	< 0.0025	< 0.0005	< 0.0005	0.0068	0.0037	37
9/22/2020 9:25	0.00111	0.000865	<0.0002	0.00011	0.00473	0.00729	28.7
10/20/2020 9:50	0.000807	0.000705	<0.0002	<0.000106	0.00452	0.00937	29.2
11/17/2020 9:40	0.00445	0.002379	0.00117	0.00017	0.0423	0.03069	25.2
12/15/2020 9:20	0.00331	0.00159	0.000778	<0.000106	0.058	0.05	24.3
1/19/2021 9:45	0.000805	0.000503	0.000273	<0.000106	0.0143	0.0101	36.1
2/23/2021 10:00	0.000719	0.000479	0.000367	<0.000106	0.0162	0.0141	34.3
3/16/2021 10:00	0.000641	0.000558	0.000135	<0.000106	0.0155	0.0147	33.6
4/20/2021 10:00	0.00074	0.000935	0.000226	<0.000106	0.0105	0.00973	34.7
5/18/2021 10:30	0.000803	0.000739	0.00017	<0.000106	0.0107	0.00925	33.5
6/15/2021 9:25	0.00114	0.000812	0.000247	<0.000106	0.0123	0.011	32
Median	NA	NA	NA	NA	0.0115	0.0099	33

Note: Data in red exceed applicable water quality criteria (see Table 4). Single sample criterion (406 organisms/100 mL) used for E. Coli.

NA= Medians not calculated for copper and lead due to the large number of censored values.

Table 7.
Monthly Instream Data - Clark Creek (RY 2020/2021)

Site Name: CLA10									
Site Description: Ewald Ave									
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/21/2020 11:05	16.8		70.5	3.3	6.95	272	1.44	0.85	0.000
8/19/2020 10:14	17	9.01	72.4	3.5	6.98	474	1.344	1.17	0.000
9/22/2020 9:07	16.2	8.96	73.7	3.3	6.83	2382	1.28	0.92	0.003
10/20/2020 9:35	14.6	9.43	74.3	2.2	6.92	1467	1.439	0.65	0.003
11/17/2020 9:40	12.8	9.37	53.6	16	6.56	1785	1.068	6.3	0.300
12/15/2020 9:00	10.7	10.42	63	13.7	6.53	1850	1.339	1.89	0.073
1/19/2021 9:10	10.9	10.47	82.2	2	6.4	279	2.996	0.59	0.000
2/23/2021 9:10	10.5	10.58	78.7	2.1	6.48	573	2.547	0.59	0.160
3/16/2021 9:20	9.6	10.7	75.9	0.3	6.36	448	2.041	0.64	0.020
4/20/2021 9:30	11.6	10.23	72.1	3.5	6.53	410	1.807	0.98	0.000
5/18/2021 9:30	12.8	9.82	73	4	6.65	457	1.752	0.8	0.000
6/15/2021 9:00	14.3	9.37	75	4.3	6.45	1236	1.767	0.67	0.145
Median	12.80	9.82	73.35	3.40	6.55	524	1.60	0.83	

Site Name: CLA10							
Site Description: Ewald Ave							
Collection Date/Time	Total Cop- per (mg/L)	Dissolved Copper (mg/L)	Total Lead (mg/L)	Dissolved Lead (mg/ L)	Total Zinc (mg/L)	Dissolved Zinc (mg/L)	Hardness
7/21/2020 11:05	< 0.0025	< 0.0025	< 0.0005	< 0.0005	0.0067	0.0054	19
8/19/2020 10:14	< 0.0025	< 0.0025	< 0.0005	< 0.0005	0.0047	0.0039	20
9/22/2020 9:07	0.000773	0.000475	<0.0002	<0.000106	0.00705	0.0096	19.7
10/20/2020 9:35	0.00109	0.000277	<0.0002	<0.000106	0.00675	0.00637	19.9
11/17/2020 9:40	0.00442	0.00256	0.000913	0.0001439	0.0221	0.0163	16.1
12/15/2020 9:00	0.00317	0.00135	0.000781	<0.000106	0.625	0.615	18.7
1/19/2021 9:10	0.000286	<0.000211	0.000126	<0.000106	0.00944	0.00839	24.8
2/23/2021 9:10	0.0004	0.000212	0.0002	<0.000106	0.0106	0.0111	21.7
3/16/2021 9:20	0.000369	0.000377	0.000139	<0.000106	0.0103	0.00979	22
4/20/2021 9:30	0.000331	0.000242	0.000133	<0.000106	0.0279	0.0283	21.3
5/18/2021 9:30	0.000422	0.000281	0.000191	<0.000106	0.0125	0.0108	21.1
6/15/2021 9:00	0.00057	0.000421	0.000254	<0.000106	0.0179	0.0172	21.7
Median	NA	NA	NA	NA	0.0105	0.0103	20.55

Note: Data in red exceed applicable water quality criteria (see Table 4). Single sample criterion (406 organisms/100 mL) used for E. Coli.

NA= Medians not calculated for copper and lead due to the large number of censored values.

Table 7.
Monthly Instream Data - Croisan Creek (RY 2020/2021)

Site Name: CRO1		Site Description: River Rd S							
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/21/2020 11:25	18.2	5.45	100.5	4.7	7.04	727	0.338	1.15	0.000
8/19/2020 10:41	18	4.24	104.2	7.5	6.93	727	0.248	1.42	0.000
9/22/2020 9:30	15.2	6.02	112.5	4.4	6.74	613	0.42	1.09	0.003
10/20/2020 9:55	12.1	8.17	97.5	3.9	6.73	1733	0.359	1.08	0.003
11/17/2020 10:05	10.6	9.93	74.5	8.6	6.41	488	1.292	2.46	0.300
12/15/2020 9:15	8.1	11.09	70.9	6.6	6.32	140	1.331	0.92	0.073
1/19/2021 9:30	7.2	11.76	63.8	6.6	6.37	72	2.055	0.93	0.000
2/23/2021 9:50	7.7	11.71	63.9	6.5	6.41	34	1.576	0.78	0.160
3/16/2021 9:45	5.9	12.12	68	1.8	6.3	18	1.25	0.77	0.020
4/20/2021 9:55	11.4	10.17	71.4	3.4	6.62	56	0.581	1.02	0.000
5/18/2021 9:50	12.1	9.6	79.5	3.2	6.82	122	0.455	0.74	0.000
6/15/2021 9:20	13.7	9.08	85.6	5.1	6.41	345	0.682	0.67	0.145
Median	11.75	9.77	77.00	4.90	6.52	243	0.63	0.98	

Site Name: CRO10		Site Description: Ballantyne Rd.							
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/21/2020 11:45	18.6	6.28	71.5	8.2	6.83	194	0.33	0.83	0.000
8/19/2020 11:04	17.3	2.63	80	12.9	6.71	866	0.318	1.18	0.000
9/22/2020 9:45	14.8	7.26	86.9	7.7	6.9	178	0.301	0.95	0.003
10/20/2020 10:20	12.3	8.74	70.2	4.9	6.42	49	0.369	0.61	0.003
11/17/2020 10:25	10.4	9.63	63.6	5.8	6.43	67	1.612	1.02	0.300
12/15/2020 9:30	7.9	10.92	53.2	4.4	6.32	12	1.423	0.81	0.073
1/19/2021 9:50	7.6	11.35	52	5.2	6.44	17	1.86	0.87	0.000
2/23/2021 10:05	7.9	11.56	50.1	3.4	6.73	10	1.778	0.65	0.160
3/16/2021 10:15	6.6	11.69	50.9	1.7	6.48	3	1.543	0.72	0.020
4/20/2021 10:15	12.4	9.89	52.4	3.7	6.75	11	0.777	1.11	0.000
5/18/2021 10:05	13.1	9.5	54.8	4.1	6.82	50	0.523	0.82	0.000
6/15/2021 9:36	13.8	9.19	55.8	8.5	6.52	70	0.482	0.73	0.145
Median	12.35	9.57	55.30	5.05	6.62	50	0.65	0.83	

Note: Data in red exceed applicable water quality criteria (see Table 4). Single sample criterion (406 organisms/100 mL) used for E. Coli.

Table 7.
Monthly Instream Data - Gibson Creek (RY 2020/2021)

Site Name: GIB1		Site Description: Wallace Rd.							
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/21/2020 12:34	19.6	6.37	120	5.8	7.19	69	0.37	1.21	0.000
8/19/2020 11:50	19.8		124.9	7.2	7.15	166	0.357	1.45	0.000
9/22/2020 10:40	16.3	6.41		6.55	7.05	299	0.336	1.54	0.003
10/20/2020 10:50	12.8	7.96	117.2	6.7	7.12	66	0.42	1.24	0.003
11/17/2020 10:55	11.4	9.89	98.1	10.8	7.2	304	1.653	2.39	0.300
12/15/2020 10:05	7.8	11.49	92.5	6.4	7.23	28	1.657	0.91	0.073
1/19/2021 10:35	7.7	11.78	77.2	18	7.26	20	2.501	0.9	0.000
2/23/2021 11:00	8.3	11.60	79.2	5.3	7.34	16	2.309	0.87	0.160
3/16/2021 10:50	6.4	11.94	84.7	4.3	7.2	68	1.879	1.01	0.020
4/20/2021 10:50	13.6	9.45	93.2	5.2	7.35	93	1.125	1.01	0.000
5/18/2021 11:35	13.7	9.07	100.1	4.4	7.16	70	0.662	1.15	0.000
6/15/2021 10:25	15.4	8.58	102.4	7.7	7.25	980	0.773	1.35	0.145
Median	13.20	9.45	98.10	6.48	7.20	69.5	0.95	1.18	

Site Name: GIB15		Site Description: Brush College Rd.							
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/21/2020 12:51	20.3	7.43	104.3	8.7	7.32	299	0.447	0.97	0.000
8/19/2020 12:00	18.4		121.2	6.8	7.37	411	0.192	1.34	0.000
9/22/2020 10:50	16.14	7.84		3.92	7.34	185	0.324	1.33	0.003
10/20/2020 11:00	12.4	8.69	113	4.3	7	308	0.568	1.06	0.003
11/17/2020 11:10	10.1	9.36	102.8	8.2	6.68	52	1.937	1.21	0.300
12/15/2020 10:25	7.7	10.96	88	7.3	6.68	38	1.734	1.05	0.073
1/19/2021 10:50	8.3	11.5	78.8	10	6.7	12	2.554	0.62	0.000
2/23/2021 11:10	8.6	11.33	78.6	5.4	6.91	12	2.419	0.67	0.160
3/16/2021 11:00	7	11.53	84.5	4.2	6.92	3	2.242	0.95	0.020
4/20/2021 11:00	12.9	9.67	85.7	4.3	6.85	19	1.764	0.94	0.000
5/18/2021 11:45	14	9.29	89.9	4.9	7.01	66	1.203	0.88	0.000
6/15/2021 10:35	15.3	9.01	95.1	6.3	6.71	162	1.088	0.77	0.145
Median	12.65	9.36	89.90	5.85	6.92	59	1.47	0.96	

Note: Data in red exceed applicable water quality criteria (see Table 4). Single sample criterion (406 organisms/100 mL) used for E. Coli.

Table 7.
Monthly Instream Data - Glenn Creek (RY 2020/2021)

Site Name:		GLE1							
Site Description:		River Bend Rd.							
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO₃-NO₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/21/2020 12:22	18.8	7.53	126.1	9.6	7.36	548	0.628	0.86	0.000
8/19/2020 11:35	18.3	7.7	128.7	6.5	7.42	1414	0.63	1.23	0.000
9/22/2020 10:30	16.31	8.14		7.45	7.26	548	1.113	1.2	0.003
10/20/2020 10:40	13	8.87	121.1	4.2	7.25	249	0.508	0.82	0.003
11/17/2020 10:30	11.8	9.83	96.6	15.2	7.22	548	1.637	2.09	0.300
12/15/2020 9:55	9	10.98	102.3	5.1	7.12	104	1.542	0.63	0.073
1/19/2021 10:25	7.5	11.74	81.9	6.7	7.06	261	2.484	0.93	0.000
2/23/2021 10:45	8.4	11.51	85.7	4.9	7.21	50	2.112	0.74	0.160
3/16/2021 10:40	6.7	11.86	92.4	3.5	7.15	43	1.644	0.87	0.020
4/20/2021 10:35	12.7	9.66	103.6	6.3	7.1	167	0.789	0.93	0.000
5/18/2021 11:20	13.1	9.45	113.7	7.5	7.3	387	0.593	0.91	0.000
6/15/2021 10:15	14.7	9.4	108.2	6.9	7	461	1.082	0.76	0.145
Median	12.85	9.56	103.60	6.60	7.22	324	1.10	0.89	

Site Name:		GLE10							
Site Description:		Hidden Valley Dr.							
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO₃-NO₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/21/2020 13:08	18.7	5.88	107.5	11.9	6.87	461	0.339	1.58	0.000
8/19/2020 12:15	No Flow								0.000
9/22/2020 11:10	15.88	7.36		3.82	6.67	308	0.069	1.24	0.003
10/20/2020 11:15	12.9	9.52	80.5	0.9	7.02	24	0.108	0.64	0.003
11/17/2020 11:25	10.1	10.34	72.3	5.1	7.15	28	1.546	0.82	0.300
12/15/2020 10:45	7.9	11.29	63.9	5.5	6.89	22	1.499	0.8	0.073
1/19/2021 11:15	8.2	11.52	55.9	8.9	6.68	9	2.272	0.9	0.000
2/23/2021 11:25	8.3	11.61	55.3	5	7.2	18	2.053	0.61	0.160
3/16/2021 11:15	7	11.88	55.3	7.1	7.15	23	1.514	0.88	0.020
4/20/2021 11:15	11.6	10.2	55.5	4.7	6.9	153	0.77	0.89	0.000
5/18/2021 12:00	11.8	10.26	59	7.1	7.08	135	0.512	0.81	0.000
6/15/2021 10:50	13.4	9.9	68.1	8.8	6.75	144	0.471	0.45	0.145
Median	11.60	10.26	61.45	5.50	6.90	28.00	0.77	0.82	

Note: Data in red exceed applicable water quality criteria (see Table 4). Single sample criterion (406 organisms/100 mL) used for E. Coli.

Table 7.
Monthly Instream Data - West Fork Little Pudding River (RY 2020/2021)

Site Name: LPW1										
Site Description: Cordon Rd.										
Collection Date/ Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/ cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/ L)	BOD (mg/ L)	Rainfall previous 24 hrs	TSS
7/21/2020 13:00	No Flow								0.000	
8/19/2020 13:00	No Flow								0.000	
9/22/2020 11:15	No Flow								0.003	
10/20/2020 12:00	No Flow								0.003	
11/17/2020 12:00	11.5	8.6	84.1	12.1	6.54	1120	0.522	2.51	0.300	16.20
12/15/2020 10:55	7.5	9.12	122.9	14.3	6.42	201	1.398	1.22	0.073	18.40
1/19/2021 11:00	6.1	11.36	228.7	14.1	6.48	2420	4.286	0.85	0.000	26.20
2/23/2021 11:25	8.2	12.98	167.5	6	6.76	69	2.202	1.27	0.160	4.20
3/16/2021 11:45	6.6	12.32	204.1	6.6	6.85	155	1.975	0.95	0.020	10.80
4/20/2021 11:55	14	7.12	295.7	10.8	6.94	>2420	0.062	1.45	0.000	11.60
5/18/2021 11:50	No Flow								0.000	
6/15/2021 11:09	16.4	5.51	109.7	10.5	6.82	1011	0.913	2.04	0.145	8.00
Median	8.20	9.12	167.50	10.80	6.76	1011	1.40	1.27		11.6

Note: Data in red exceed applicable water quality criteria (see Table 4). Single sample criterion (406 organisms/100 mL) used for E. Coli.

Table 7.
Monthly Instream Data - Mill Creek (RY 2020/2021)

Site Name: MIC1		Site Description: Front St.							
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/21/2020 10:25	21.4	8.95	59.9	4.3	7.51	102	0.373	0.89	0.000
8/19/2020 9:20	19.9	8.77	62.6	3.3	7.42	124	0.341	1.24	0.000
9/22/2020 8:30	16.2	9.42	71.4	5.4	7.29	1414	0.477	0.74	0.003
10/20/2020 8:40	13.7	10	90	2.4	7.39	291	0.941	0.91	0.003
11/17/2020 8:50	10.9	10.46	140.8	11.8	6.97	388	5.44	1.43	0.300
12/15/2020 8:20	8.2	11.78	118.6	12.1	6.87	102	4.786	0.85	0.073
1/19/2021 8:35	7.1	12.33	103.1	6.8	7.05	54	3.625	0.97	0.000
2/23/2021 8:25	8.3	11.65	96.3	10.2	6.8	88	3.182	0.82	0.160
3/16/2021 8:25	7.1	11.93	113.5	2.3	6.92	84	2.624	1.19	0.020
4/20/2021 8:30	14.8	9.53	93.5	4.5	7.07	210	0.817	1.43	0.000
5/18/2021 8:55	15.1	9.74	72.6	3.3	6.9	172	0.476	0.99	0.000
6/15/2021 8:25	16.3	9.48	74.7	6.3	6.3	613	0.99	1.06	0.145
Median		14.25	9.87	91.75	4.95	7.01	148	0.97	0.98

Site Name: MIC10		Site Description: Turner Rd							
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/21/2020 12:40	21.2		60	4.8	7.62	90	0.423	1.16	0.000
8/19/2020 12:45	19.4	9.69	55	3	7.6	141	0.272	1.19	0.000
9/22/2020 10:55	15.8	9.7	60.6	7.3	7.17	84	0.409	0.93	0.003
10/20/2020 11:45	13.2	10.45	117.2	6.2	7.2	328	1.246	2.31	0.003
11/17/2020 11:30	10.6	10.14	139.3	11.5	6.46	121	5.726	1.22	0.300
12/15/2020 10:35	8.1	11.1	115.4	11.8	6.49	66	5.016	0.81	0.073
1/19/2021 10:43	6.8	11.69	97.2	6	6.47	33	4.409	0.82	0.000
2/23/2021 11:05	8	11.53	87.6	9.8	6.7	48	3.072	0.85	0.160
3/16/2021 11:20	6.6	13.18	102.3	1.7	6.92	16	2.519	0.96	0.020
4/20/2021 11:35	14.5	12.14	76	5.2	7.62	108	0.961	1.59	0.000
5/18/2021 11:30	14.3	10.64	65	5.4	7.22	>2420	0.548	1.25	0.000
6/15/2021 10:38	15.9	9.97	72.3	7.2	6.87	178	0.95	0.9	0.145
Median		13.75	10.64	81.80	6.10	7.05	99	1.10	1.06

Note: Data in red exceed applicable water quality criteria (see Table 4). Single sample criterion (406 organisms/100 mL) used for E. Coli.

Table 7.
Monthly Instream Data - Mill Race (RY 2020/2021)

Site Name: MRA1		Site Description: High St.							
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/21/2020 11:13	22.4	8.81	56.4	2.9	7.61	210	0.328	0.93	0.000
8/19/2020 10:15	20.3		57.8	2.4	7.5	161	0.321	1.1	0.000
9/22/2020 8:45	16.32	9.17		5.82	7.4	1414	0.492	0.91	0.003
10/20/2020 9:25	13.5	10.01	82.8	2.5	7.34	649	0.911	0.94	0.003
11/17/2020 9:15	10.3	9.92	130.1	8.1	7.12	126	5.5	1.39	0.300
12/15/2020 8:55	7.6	11.47	118.6	9.3	6.98	28	4.88	0.77	0.073
1/19/2021 9:25	6.1	12.13	103.5	6.2	6.88	31	3.97	1.05	0.000
2/23/2021 9:25	7.4	11.84	92.8	4.3	6.72	14	3.218	0.65	0.160
3/16/2021 9:35	5.6	11.96	103.3	4.1	7.01	18	2.254	0.96	0.020
4/20/2021 9:35	14.4	9.48	87.6	2.1	7.14	517	0.65	1.54	0.000
5/18/2021 9:40	15	9.63	67.6	3.2	7.26	291	0.401	1.1	0.000
6/15/2021 9:00	16.3	9.65	70.3	4.4	7.09	579	0.935	1.01	0.145
Median		13.95	9.92	87.60	4.20	7.13	185.5	0.92	0.99

Site Name: MRA10		Site Description: 19th St.							
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/21/2020 10:28	21.5	8.48	56.5	3.3	7.42	122	0.341	1.14	0.000
8/19/2020 9:40	19.8		57.7	2.8	7.11	185	0.315	1.4	0.000
9/22/2020 8:15	15.89	8.71		4.92	7.25	231	0.5	1.08	0.003
10/20/2020 9:00	13.3	9.48	81.5	2.2	7.11	120	0.901	0.96	0.003
11/17/2020 8:45	10.6	10.24	140.9	10.1	7.05	140	5.875	1.24	0.300
12/15/2020 8:30	8	11.65	117.4	10.7	6.8	91	5.001	0.83	0.073
1/19/2021 8:50	6.8	12.01	102.6	5.2	6.45	44	4.098	0.96	0.000
2/23/2021 8:55	7.9	11.66	90.8	8	6.7	52	3.115	0.99	0.160
3/16/2021 8:50	6.9	11.51	109.8	3.8	6.45	22	2.535	0.92	0.020
4/20/2021 8:45	15.2	8.56	86.7	2.7	6.78	156	0.826	1.65	0.000
5/18/2021 9:00	15.1	8.8	66.9	3.2	6.79	214	0.426	1.12	0.000
6/15/2021 8:30	16.3	8.98	73.5	6	6.22	649	1.024	1.13	0.145
Median		14.20	9.48	86.70	4.36	6.80	131	0.96	1.10

Note: Data in red exceed applicable water quality criteria (see Table 4). Single sample criterion (406 organisms/100 mL) used for E. Coli.

Table 7.
Monthly Instream Data - Pringle Creek (RY 2020/2021)

Site Name: PRI1									
Site Description: Waterfront Park									
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/21/2020 10:54	21.4	8.78	60.7	5.2	7.46	77	0.362	1.07	0.000
8/19/2020 9:55	20.2		62.4	3.7	7.35	93	0.362	1.21	0.000
9/22/2020 8:35	16.04	9.37	146.5	7.61	7.43	205	0.518	0.91	0.003
10/20/2020 9:15	13.3	10.18	83.5	2.5	7.27	155	0.875	0.83	0.003
11/17/2020 9:00	10.8	10.45	132.5	11.5	7.1	276	5.276	1.51	0.300
12/15/2020 8:45	8.2	11.59	114	11.2	6.82	93	4.583	0.68	0.073
1/19/2021 9:05	7	12.09	100.8	5.3	6.83	54	3.883	0.83	0.000
2/23/2021 9:10	7.9	11.80	89.8	9.1	6.6	66	2.924	0.69	0.160
3/16/2021 9:15	6.8	12.57	105.3	3.4	6.98	26	2.369	0.96	0.020
4/20/2021 9:05	14.8	9.94	87.4	3.7	7.08	59	0.846	2	0.000
5/18/2021 9:20	14.8	10.47	68.6	3.4	7.22	76	0.451	1.42	0.000
6/15/2021 8:45	16.3	9.52	76.8	6.4	6.9	378	0.998	1.08	0.145
Median	14.05	10.45	88.60	5.25	7.09	85	0.94	1.02	

Site Name: PRI1							
Site Description: Waterfront Park							
Collection Date/Time	Total Cop- per (mg/L)	Dissolved Copper (mg/L)	Total Lead (mg/L)	Dissolved Lead (mg/ L)	Total Zinc (mg/L)	Dissolved Zinc (mg/L)	Hardness
7/21/2020 10:54	0.0025	< 0.0025	< 0.0005	< 0.0005	0.007	< 0.0025	22
8/19/2020 9:55	0.0025	< 0.0025	< 0.0005	< 0.0005	0.0043	< 0.0025	29
9/22/2020 8:35	0.0013	0.000781	0.000229	<0.000106	0.00234	0.00365	23.4
10/20/2020 9:15	0.00109	0.000507	<0.0002	<0.000106	0.00139	0.000547	28
11/17/2020 9:00	0.00293	0.0011	0.000402	<0.000106	0.00868	0.00437	44.4
12/15/2020 8:45	0.0015	0.000643	0.000334	<0.000106	0.00595	0.00289	39.7
1/19/2021 9:05	0.000577	0.000394	0.00014	<0.000106	0.0035	0.00184	37.1
2/23/2021 9:10	0.000695	0.000425	0.0002	<0.000106	0.00577	0.00204	31.8
3/16/2021 9:15	0.000996	0.000625	<0.000111	<0.000106	0.00425	0.0029	38.1
4/20/2021 9:05	0.000798	0.000631	<0.000111	<0.000106	0.00229	0.00118	34
5/18/2021 9:20	0.000746	0.000568	0.000143	<0.000106	0.00379	0.00205	26.2
6/15/2021 8:45	0.00112	0.000684	0.000242	<0.000106	0.00462	0.00204	28.1
Median	NA	NA	NA	NA	NA	NA	30.4

Note: Data in red exceed applicable water quality criteria (see Table 4). Single sample criterion (406 organisms/100 mL) used for E. Coli.

NA= Medians not calculated for copper and lead due to the large number of censored values.

Table 7.
Monthly Instream Data - Pringle Creek (RY 2020/2021)

Site Name: PRI5		Site Description: Bush Park							
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/21/2020 11:48	21.4	8.31	99	3	7.59	129	0.432	1.12	0.000
8/19/2020 11:00	19.9	8.34	110.2	4.1	7.51	687	0.383	1.66	0.000
9/22/2020 9:30	16.78	8.7	222.3	2.67	7.47	579	0.536	1.09	0.003
10/20/2020 10:00	13.6	9.79	94.8	2.6	7.45	124	0.562	1.03	0.003
11/17/2020 9:50	11.2	9.95	91.5	10.1	6.83	272	1.013	2.3	0.300
12/15/2020 9:25	8.7	11	91.2	6.4	7.17	86	1.337	1.07	0.073
1/19/2021 9:50	8.1	11.5	88.9	5.4	7.17	38	2.169	0.92	0.000
2/23/2021 10:05	8.5	11.92	87.5	5.4	7.25	24	1.688	0.82	0.160
3/16/2021 10:05	7.5	12.42	91.9	3	7.48	59	1.398	1.02	0.020
4/20/2021 10:05	13.6	10.25	94.7	2.2	7.4	38	0.861	1.21	0.000
5/18/2021 10:35	14.7	9.75	94.4	3.2	7.35	147	0.587	2.73	0.000
6/15/2021 9:35	16.6	9.42	91.5	4.8	7.18	517	0.687	1.36	0.145
Median	13.60	9.87	93.15	3.65	7.38	126.5	0.77	1.11	

Site Name: PRI5		Site Description: Bush Park					
Collection Date/Time	Total Cop- per (mg/L)	Dissolved Copper (mg/L)	Total Lead (mg/L)	Dissolved Lead (mg/ L)	Total Zinc (mg/L)	Dissolved Zinc (mg/L)	Hardness
7/21/2020 11:48	0.0034	< 0.0025	< 0.0005	< 0.0005	0.0188	0.0035	36
8/19/2020 11:00	< 0.0025	< 0.0025	< 0.0005	< 0.0005	0.0088	0.0068	33
9/22/2020 9:30	0.00121	0.000812	<0.0002	<0.000106	0.00346	0.00567	36.1
10/20/2020 10:00	0.00109	0.00107	<0.0002	<0.000106	0.00291	0.00595	32.7
11/17/2020 9:50	0.00268	0.00134	0.000691	0.00011	0.0202	0.0134	31.8
12/15/2020 9:25	0.00147	0.000823	0.00034	<0.000106	0.0216	0.0186	30.3
1/19/2021 9:50	0.000744	0.000548	0.000178	<0.000106	0.0106	0.00772	31.6
2/23/2021 10:05	0.000717	0.000481	0.0002	<0.000106	0.0109	0.00819	29.5
3/16/2021 10:05	0.000651	0.000525	0.000116	<0.000106	0.00976	0.00777	33.1
4/20/2021 10:05	0.000621	0.000505	<0.000111	<0.000106	0.00493	0.00386	33.9
5/18/2021 10:35	0.000771	0.000642	0.000151	<0.000106	0.00583	0.00326	34.3
6/15/2021 9:35	0.00107	0.000899	0.000206	<0.000106	0.00702	0.00509	33
Median	NA	NA	NA	NA	0.0093	0.0064	33.00

Note: Data in red exceed applicable water quality criteria (see Table 4). Single sample criterion (406 organisms/100 mL) used for E. Coli.

NA= Medians not calculated for copper and lead due to the large number of censored values.

Table 7.
Monthly Instream Data - Shelton Ditch (RY 2020/2021)

Site Name: SHE1 Site Description: Church St.									
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/21/2020 11:26	21.5	8.79	59	4.5	7.57	93	0.371	1.18	0.000
8/19/2020 10:40	19.6		59.4	3.9	7.49	80	0.349	1.39	0.000
9/22/2020 8:55	15.96	9.46		6.77	7.46	152	0.503	1.13	0.003
10/20/2020 9:35	13.3	10.27	82.5	2.6	7.41	107	0.924	1.15	0.003
11/17/2020 9:25	10.7	10.55	139.1	12.7	7.16	488	5.512	1.48	0.300
12/15/2020 9:05	8.1	11.65	116.3	11.6	6.86	80	4.797	0.95	0.073
1/19/2021 9:35	6.9	12.17	101.5	5.1	6.87	33	4.2	0.92	0.000
2/23/2021 9:35	7.9	11.90	55	9.5	6.71	56	3.045	0.8	0.160
3/16/2021 9:45	6.7	12.79	105.6	3.4	7.28	17	2.496	0.86	0.020
4/20/2021 9:45	14.9	10.59	86.7	3.9	7.46	79	0.897	2.06	0.000
5/18/2021 10:00	14.8	10.63	65.9	3.7	7.43	115	0.438	1.25	0.000
6/15/2021 9:10	16.2	9.68	74.5	6.8	7	261	1.037	1.05	0.145

Median	14.05	10.59	82.50	4.80	7.35	86.5	0.98	1.14	
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Site Name: SHE10 Site Description: Airport Road									
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/21/2020 9:48	21.1	8.81	58.4	4.6	7.52	110	0.396	1.43	0.000
8/19/2020 9:20	19.3	9.06	58.1	3.6	7.23	222	0.33	1.26	0.000
9/22/2020 8:05	15.92	9.44		6.86	7.42	156	0.474	0.91	0.003
10/20/2020 8:45	13.2	10.24	81.2	2.9	7.18	83	0.983	0.82	0.003
11/17/2020 8:30	10.6	10.73	140.5	13.1	6.84	150	5.252	1.21	0.300
12/15/2020 8:15	8.1	11.82	116.2	11.6	6.81	99	5.107	0.74	0.073
1/19/2021 8:35	6.9	12.13	101	5.3	6.56	41	4.005	0.75	0.000
2/23/2021 8:35	7.8	11.81	89.2	10.1	6.31	56	3.104	0.98	0.160
3/16/2021 8:25	6.6	12.08	105.6	3.4	6.14	17	2.641	0.89	0.020
4/20/2021 8:30	14.8	9.99	85.3	4.7	6.55	111	1.04	2.23	0.000
5/18/2021 8:45	14.7	10.16	65.3	4.4	6.86	108	0.47	1.24	0.000
6/15/2021 8:15	16.2	9.69	73.7	7.3	6.25	186	1.027	1.03	0.145

Median	13.95	10.20	85.30	5.00	6.83	109	1.03	1.01	
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Note: Data in red exceed applicable water quality criteria (see Table 4). Single sample criterion (406 organisms/100 mL) used for E. Coli.

Table 7.
Monthly Instream Data - Willamette River (RY 2020/2021)

Site Name: WR1									
Site Description: Sunset Park (Keizer)									
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/21/2020 13:40	24.1		70.4	0.7	7.87	5	0.127	0.91	0.000
8/19/2020 13:55	22.5	10.21	66.8	1.5	7.87	5	0.1	1.1	0.000
9/22/2020 12:10	17	9.9	66.7	3.8	7.49	15	0.144	0.97	0.003
10/20/2020 13:25	15	10.21	66.9	4.6	7.28	162	0.14	0.8	0.003
11/17/2020 13:05	10.1	10.44	60.6	15.6	7.08	115	0.724	1.33	0.300
12/15/2020 12:10	7.5	11.41	75.7	10.9	7.14	54	1.055	0.89	0.073
1/19/2021 12:15	7.4	11.45	62.6	10.3	6.79	20	0.717	0.81	0.000
2/23/2021 12:15	8.1	11.58	59.1	9.8	7.2	22	0.654	0.87	0.160
3/16/2021 12:30	9	11.95	81.1	3.7	7.48	11	0.718	0.76	0.020
4/20/2021 12:50	15.6	12.84	72.4	1.8	8.03	20	0.219	1.82	0.000
5/18/2021 12:35	17.2	12.3	72.2	1.8	7.75	2	0.215	1.36	0.000
6/15/2021 12:22	17.9	10.32	73.5	1.8	7.36	47	0.323	0.64	0.145
Median	15.30	11.41	68.65	3.75	7.42	20	0.27	0.90	

Site Name: WR1					
Site Description: Sunset Park (Keizer)					
Alkalinity (mg/L)	Ammonia (mg/L)	TP (mg/L)	TDS (mg/L)	TS (mg/L)	TSS (mg/L)
27	< 0.050	0.035	65	67	2.2
26	< 0.050	0.041	60	63	3.2
27	< 0.050	0.041	59	64	4.6
26	< 0.050	0.042	64	68	4.2
20	< 0.050	0.087	53	76	23.1
24	< 0.050	0.073	69	81	12
23	0.02	0.066	53	68	14.8
21	0.02	0.053	56	69	12.9
29	0.02	0.032	66	70	4
27	< 0.050	0.02	52	55	2.8
27	< 0.050	0.046	59	63	3.6
27	< 0.050	0.047	59	67	3.8
26.5	NA	0.044	59	67.5	4.1

Note: Data in red exceed applicable water quality criteria (see Table 4). Single sample criterion (406 organisms/100 mL) used for E. Coli.

Table 7.
Monthly Instream Data - Willamette River (RY 2020/2021)

Site Name: WR5									
Site Description: Union Street Railroad Bridge									
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/21/2020 10:40	22.1	8.73	67.8	1.3	7.43	12	0.115	1	0.000
8/19/2020 9:42	20.5	8.52	65.1	1.5	7.37	14	0.108	1.37	0.000
9/22/2020 8:45	16	9.45	65.2	2.6	7.43	31	0.135	0.98	0.003
10/20/2020 9:10	13.9	10.02	6437	4.5	7.48	20	0.12	0.77	0.003
11/17/2020 9:05	10.2	10.81	59.9	14.3	7.36	148	0.609	2.06	0.300
12/15/2020 8:38	7.3	11.86	74.3	9	7.03	54	0.845	1.25	0.073
1/19/2021 8:50	7.1	11.64	61.3	10.6	7.18	11	0.689	0.96	0.000
2/23/2021 8:45	7.7	11.69	59.7	7.9	6.98	17	0.626	0.8	0.160
3/16/2021 8:40	7.4	11.74	76.4	1.8	7.27	24	0.689	1	0.020
4/20/2021 8:50	14.1	10.34	67.7	1.4	7.32	7	0.215	1.48	0.000
5/18/2021 9:05	15.9	9.48	69.3	4.5	7.27	8	0.23	1.06	0.000
6/15/2021 8:40	16.9	9.32	69.3	2.6	7.03	26	0.271	1.1	0.145
Median	14.00	10.18	67.75	3.55	7.30	18.5	0.25	1.03	

Site Name: WR5					
Site Description: Union Street Railroad Bridge					
Alkalinity (mg/L)	Ammonia (mg/L)	TP (mg/L)	TDS (mg/L)	TS (mg/L)	TSS (mg/L)
26	< 0.050	0.031	60	63	2.6
28	< 0.050	0.044	59	63	4.4
26	< 0.050	0.046	61	66	4.8
25	< 0.050	0.043	57	63	5.6
20	< 0.050	0.099	56	82	26.2
24	< 0.050	0.069	68	81	12.8
24	0.023	0.062	56	70	13.7
22	0.02	0.052	62	72	10.4
28	0.024	0.032	63	67	4.2
25	< 0.050	0.019	54	58	4.5
25	< 0.050	0.046	58	62	4
26	< 0.050	0.045	63	66	3.4
25	NA	0.0455	59.5	66	4.65

Note: Data in red exceed applicable water quality criteria (see Table 4). Single sample criterion (406 organisms/100 mL) used for E. Coli.

Table 7.
Monthly Instream Data - Willamette River (RY 2020/2021)

Site Name: WR10									
Site Description: Halls Ferry Road (Independence)									
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/21/2020 13:33	22.6	9.49	67.9	1.8	7.85	1	0.124	1.06	0.000
8/19/2020 12:40	21.2		64.5	1.4	7.67	4	0.094	1.17	0.000
9/22/2020 11:35	16.21	9.65	136.1	1.71	7.45	12	0.119	0.82	0.003
10/20/2020 11:40	14.4	9.84	63.3	4.5	7.29	150	0.112	0.8	0.003
11/17/2020 11:50	9.9	10.57	57.4	14.3	7.24	130	0.505	1.35	0.300
12/15/2020 11:05	7.2	11.71	71.3	11.2	6.96	82	0.717	1.18	0.073
1/19/2021 11:45	7.1	11.5	61.8	10.2	6.74	14	0.605	0.87	0.000
2/23/2021 11:55	7.7	11.68	56.4	9.4	7	52	0.534	0.97	0.160
3/16/2021 11:40	7.9	11.59	76.1	2.9	7.24	19	0.676	0.99	0.020
4/20/2021 11:40	14.5	11.20	67.9	1.5	7.72	6	0.239	1.59	0.000
5/18/2021 12:20	16.9	11.25	69.5	1.4	7.81	20	0.266	0.94	0.000
6/15/2021 11:15	17.2	9.85	69.3	1.6	7.5	10	0.226	0.95	0.145
Median	14.45	11.20	67.90	2.35	7.37	16.5	0.25	0.98	

Site Name: WR10					
Site Description: Halls Ferry Road (Independence)					
Alkalinity (mg/L)	Ammonia (mg/L)	TP (mg/L)	TDS (mg/L)	TS (mg/L)	TSS (mg/L)
27	< 0.050	0.032	68	71	3.2
22	< 0.050	0.035	56	59	3
26	< 0.050	0.039	54	59	4.8
25	< 0.050	0.042	61	66	4.8
20	< 0.050	0.083	52	75	23.1
24	< 0.050	0.071	67	80	12.6
23	0.023	0.059	62	77	15
21	0.016	0.055	55	69	14.2
27	0.024	0.03	66	70	4
25	< 0.050	0.018	55	60	5.2
26	< 0.050	0.045	58	61	3.3
25	< 0.050	0.043	55	58	3.2
25	NA	0.0425	57	67.5	4.8

Note: Data in red exceed applicable water quality criteria (see Table 4). Single sample criterion (406 organisms/100 mL) used for E. Coli.

Table 8.
Monthly Instream Data - Duplicates (RY 2020/2021)

Site ID	Collection Date/Time	Temp (C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTUs)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	TSS	Total Copper (mg/L)	Dissolved Copper (mg/L)	Total Lead (mg/L)	Dissolved Lead (mg/L)	Total Zinc (mg/L)	Dissolved Zinc (mg/L)	Hardness
SHE10	07/21/2020 10:01	21.1	8.81	58.5	4.5	7.51	116	0.379	1.12								
MRA10	07/21/2020 10:30	21.6	8.49	56.5	3.4	7.42	115	0.331	1.02								
CRO1	07/21/2020 11:28	18.2	5.49	100.1	4.5	7.06	1046	0.34	0.94								
CLA10	08/19/2020 10:14	17	9.01	72.4	3.5	6.98	457	1.352	0.83		< 0.0025	< 0.0025	< 0.0005	< 0.0005	0.0058	0.0043	20
MRA1	08/19/2020 10:20	20.3		57.9	2.5	7.44	122	0.314	1.17								
CRO10	08/19/2020 11:06	17.3	1.85	79.8	11.5	6.7	1414	0.308	1.4								
SHE1	09/22/2020 09:00	15.96	9.46	138.5	6.6	7.45	142	0.379	0.99								
PRI5	09/22/2020 09:35	16.79	8.71	222.1	2.74	7.47	579	0.419	0.94		0.00114	0.000774	<0.0002	<0.000106	0.0033	0.0043	36.1
BAT12	09/22/2020 10:07	14.5	9.35	66.3	3.5	7.28	236	0.397	0.85								
CLA1	10/20/2020 09:55	14	9.66	97.5	1.1	7.32	110	0.854	0.69		0.00126	0.0012	<0.0002	<0.000106	0.00481	0.00438	29.9
BAT1	10/20/2020 11:10	13.1	8.61	60.9	6.1	6.56	124	0.613	0.63								
CGT1	10/20/2020 12:50	15.2	4.17	235	2.9	7.16	134	0.089	1.17								
PRI5	11/17/2020 09:55	11.2	9.94	91.1	7.7	6.81	299	0.987	2.31		0.00252	0.00135	0.00071	<0.000106	0.0186	0.0121	31.5
GLE1	11/17/2020 10:35	11.8	9.81	96.8	16.1	7.22	517	1.646	2.11								
MIC10	11/17/2020 11:35	10.6	10.12	139.3	10.5	6.53	133	5.859	1.06								
GIB1	12/15/2020 10:10	7.8	11.35	92.4	6	7.07	37	1.786	0.73								
CGT5	12/15/2020 11:14	8.6	10.17	109.9	20.1	6.87	857	0.902	3.62								
CGT1	12/15/2020 11:40	8.1	8.32	129.5	9.7	6.77	556	0.617	2.97								
GIB15	01/19/2021 10:55	8.3	11.49	78.8	9.5	6.7	10	2.614	0.64								
GLE10	01/19/2021 11:20	8.3	11.51	55.9	9	6.66	7	2.044	0.81								
MIC1	02/23/2021 08:30	8.2	11.68	95.6	9.9	6.8	83	3.159	1								
CLA10	02/23/2021 09:15	10.5	10.58	78.7	2.1	6.47	199	2.595	0.67		0.0004	0.000222	<0.0002	<0.000106	0.0118	0.0121	23.9
SHE10	03/16/2021 08:30	6.5	12.12	105.6	3.5	6.14	18	2.693	1.13								
MRA10	03/16/2021 08:55	6.9	11.5	109.8	3.8	6.5	30	2.598	1.1								
CRO1	03/16/2021 09:47	5.9	12.14	68.1	1.7	6.39	28	1.287	0.69								
PRI1	04/20/2021 09:10	14.8	9.94	87.4	3.7	7.08	115	0.889	2.09		0.00078	0.000699	<0.000111	<0.000106	0.00222	0.00111	33.5
CRO10	04/20/2021 10:18	12.5	9.87	52.4	3.6	6.7	7	0.721	1.23								
BAT12	04/20/2021 10:47	11.8	10.68	44.4	5.3	6.7	40	1.148	0.95								
MRA1	05/18/2021 09:45	15	9.62	67.6	3.2	7.29	236	0.435	1.07								
SHE1	05/18/2021 10:05	14.8	10.65	65.8	3.7	7.45	78	0.443	1.16								
BAT1	05/18/2021 10:47	13	9.63	51.4	6.6	6.86	111	0.665	0.76								
CLA1	06/15/2021 09:30	15	9.5	98.6	2.9	6.5	414	1.449	0.63		0.00122	0.000882	0.0002	<0.000106	0.0129	0.0113	31.5
MIC10	06/15/2021 10:39	15.9	9.98	72.3	7.1	6.93	190	0.974	0.92								
LPW1	06/15/2021 11:13	16.3	5.37	109.7	10	6.69	>2420	0.246	1.66	7.4							

Note: Duplicate field measurements and duplicate grab samples are taken at a minimum of 10 percent of the sites each month. These sites are selected prior to sampling.

Table 8.
Monthly Instream Data - Willamette River Duplicates (RY 2020/2021)

Site ID	Collection Date/ Time	Temp (C)	DO (mg/L)	Sp Cond (μ S/cm)	Turb (NTUs)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ - NO ₂ (mg/L)	BOD (mg/L)	Alkalini- ty (mg/ L)	Ammonia (mg/L)	TP (mg/L)	TDS (mg/L)	TS (mg/L)	TSS (mg/L)
WR1	01/19/2021 12:24	7.40	11.45	62.70	10.30	6.76	0	0.733	0.7	23	0.019	0.056	57	71	14
WR10	02/23/2021 12:00	7.7	11.69	56.7	9.3	6.99	62	0.513	0.68	21	0.015	0.056	53	67	14

Note: Duplicate field measurements and duplicate grab samples are taken at a minimum of 10 percent of the sites each month. These sites are selected prior to sampling.

Table 9.
Continuous Instream Grade A and Grade B Data Qualifications

Grade Values	Temperature (°C)	pH	Specific Conductivity (µS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)
A	$\pm < 0.5$	$\pm \leq 0.30$	$\leq 10\%$	$\pm \leq 3$ or 5% (whichever is greater)	$\pm \leq 0.3$
B	± 0.51 to 2.00	$\pm > 0.3$ to 0.50	$> 10\%$ to $\leq 15\%$	$\pm \leq 5$ or 30% (whichever is greater)	$\pm > 0.3$ to $\pm \leq 1.0$

Note: As stated in the "Continuous Water Quality Monitoring Program Quality Assurance Project Plan", data grades are a result of the absolute difference (value or percent) of station instrument reading and audit instrument reading at the time of site audit.

Table 10.
Monthly Median Values for Continuous Instream Data (RY 2020/2021)

Monthly Medians for Temperature at Continuous Instream Sites												
	Jul 2020	Aug 2020	Sep 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021
Station Name	Temperature (°C)	Temperature (°C)	Temperature (°C)	Temperature (°C)	Temperature (°C)	Temperature (°C)	Temperature (°C)	Temperature (°C)	Temperature (°C)	Temperature (°C)	Temperature (°C)	Temperature (°C)
BAT3	18.13	18.62	16.21	13.86	9.55	8.61	9.11	8.40	8.47	11.24	13.84	17.23
BAT12	17.27	17.02	15.05	12.11	8.43	7.98	8.62	7.89	7.88	10.87	13.61	17.29
CLK1	17.26	18.12	16.88	14.85	11.15	10.04	10.33	9.84	9.73	11.70	13.71	16.75
CLK12	15.81	16.73	16.40	15.20	12.83	11.69	11.24	10.57	10.37	11.46	12.94	15.00
GLE3	17.06	17.60	16.24	14.07	9.88	8.69	9.44	8.67	9.01	11.69	13.59	16.83
GLE12	NA	NA	NA	13.05	8.71	7.94	8.82	8.00	7.87	10.02	11.88	15.04
MIC3	20.33	19.96	15.82	13.90	8.65	7.80	8.48	8.11	9.06	13.10	15.82	20.65
MIC12	19.62	19.16	15.39	13.52	8.77	7.89	8.49	8.08	8.81	12.80	15.46	20.01
PRI3	19.02	19.22	17.19	14.89	9.90	8.72	9.45	8.82	9.53	12.81	15.38	19.00
PRI12	17.63	18.44	16.00	13.90	9.50	8.49	9.05	8.47	8.50	11.58	14.90	18.80

Monthly Medians for pH at Continuous Instream Sites												
	Jul 2020	Aug 2020	Sep 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021
Station Name	pH (S.U)	pH (S.U)	pH (S.U)	pH (S.U)	pH (S.U)	pH (S.U)	pH (S.U)	pH (S.U)	pH (S.U)	pH (S.U)	pH (S.U)	pH (S.U)
BAT3	6.75	6.90	6.74	6.62	6.29	6.22	6.19	6.27	6.44	6.50	6.56	6.56
BAT12	7.41	7.20	7.20	7.38	7.22	7.07	6.81	6.87	7.12	7.13	7.26	7.35
CLK1	7.30	7.30	7.33	7.26	7.15	7.11	7.04	7.13	7.20	7.26	7.25	7.24
CLK12	6.79	6.85	6.65	6.75	6.70	6.63	6.55	6.55	6.62	6.82	6.91	7.02
GLE3	7.37	7.47	7.36	7.35	7.12	7.08	6.95	7.01	7.18	7.30	7.35	7.34
GLE12	NA	NA	NA	6.85	6.92	7.00	6.94	6.89	6.98	7.01	7.03	7.04
MIC3	7.44	7.50	7.47	7.42	7.30	7.29	7.21	7.25	7.68	7.95	7.41	7.34
MIC12	7.45	7.45	7.45	7.45	7.17	7.08	7.02	7.06	7.27	7.55	7.37	7.25
PRI3	7.37	7.37	7.41	7.32	7.19	7.22	7.13	7.23	7.34	7.26	7.19	7.23
PRI12	7.13	7.04	7.10	6.96	6.64	6.60	6.57	6.59	6.74	6.94	6.97	7.02

Presented median values consist of A and B grade data only.

NA = 60% of the continuous record for a given month is not represented by A and B grade data.

Table 10.
Monthly Median Values for Continuous Instream Data (RY 2020/2021)

Monthly Medians for Turbidity at Continuous Instream Sites												
	Jul 2020	Aug 2020	Sep 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021
Station Name	Turbidity (NTU)	Turbidity (NTU)	Turbidity (NTU)	Turbidity (NTU)	Turbidity (NTU)	Turbidity (NTU)	Turbidity (NTU)	Turbidity (NTU)	Turbidity (NTU)	Turbidity (NTU)	Turbidity (NTU)	Turbidity (NTU)
BAT3	9.15	7.55	6.96	7.95	7.19	7.02	7.48	4.55	3.33	3.36	4.05	4.42
BAT12	5.88	4.65	4.13	4.46	4.81	5.01	5.49	5.31	2.97	4.07	5.79	5.51
CLK1	2.37	2.75	3.37	1.54	3.40	4.40	5.59	4.71	2.80	2.49	2.38	2.64
CLK12	1.92	2.14	2.94	2.80	3.32	3.17	3.61	3.31	2.76	3.03	3.47	3.73
GLE3	6.89	5.88	6.62	4.22	9.68	3.83	10.67	8.77	4.57	4.26	4.91	5.52
GLE12	NA	NA	NA	0.87	3.32	3.06	11.17	8.86	4.94	4.34	4.09	3.72
MIC3	3.01	2.73	4.43	3.54	5.32	9.80	9.75	9.19	4.27	3.24	4.19	4.40
MIC12	5.29	4.30	4.19	3.62	5.19	9.02	8.59	7.78	4.27	3.49	3.94	3.90
PRI3	3.00	3.77	5.01	3.05	5.35	7.15	8.16	6.69	3.63	2.43	2.63	2.26
PRI12	2.56	2.46	1.70	4.21	4.14	5.28	6.39	4.49	3.57	2.51	3.53	3.23

Monthly Medians for Specific Conductivity at Continuous Instream Sites												
	Jul 2020	Aug 2020	Sep 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021
Station Name	Specific Conductivity (µS/cm)	Specific Conductivity (µS/cm)	Specific Conductivity (µS/cm)	Specific Conductivity (µS/cm)	Specific Conductivity (µS/cm)	Specific Conductivity (µS/cm)	Specific Conductivity (µS/cm)	Specific Conductivity (µS/cm)	Specific Conductivity (µS/cm)	Specific Conductivity (µS/cm)	Specific Conductivity (µS/cm)	Specific Conductivity (µS/cm)
BAT3	58.21	66.80	69.06	59.39	54.65	50.11	50.34	49.16	48.49	48.18	51.35	54.28
BAT12	47.53	62.62	64.90	53.02	49.45	45.97	48.89	47.29	46.22	44.63	45.06	47.87
CLK1	102.49	99.31	100.04	96.36	95.73	100.65	102.86	103.60	101.10	104.39	101.08	97.74
CLK12	70.73	74.73	75.14	73.79	72.34	76.69	81.96	78.66	81.39	73.40	74.00	74.93
GLE3	126.15	127.33	120.53	120.49	102.65	97.97	83.65	84.05	89.90	97.33	106.96	116.89
GLE12	NA	NA	NA	78.64	69.89	60.87	56.18	55.46	55.13	55.51	59.05	68.90
MIC3	64.66	58.04	64.18	76.93	124.65	118.80	103.96	96.95	105.46	97.14	70.35	71.14
MIC12	59.09	52.11	57.09	73.07	120.20	115.87	97.82	91.89	99.60	85.61	64.33	61.74
PRI3	110.30	122.53	117.22	106.53	105.84	104.15	95.80	97.31	97.69	104.31	104.76	105.60
PRI12	83.87	72.77	77.18	108.93	129.09	111.68	89.38	85.73	89.72	95.55	83.03	76.53

Presented median values consist of A and B grade data only.

NA = 60% of the continuous record for a given month is not represented by A and B grade data.

Table 10.
Monthly Median Values for Continuous Instream Data (RY 2020/2021)

Monthly Medians for Dissolved Oxygen at Continuous Instream Sites												
	Jul 2020	Aug 2020	Sep 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021
Station Name	Dissolved Oxygen (mg/L)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (mg/L)
BAT3	7.67	6.96	7.13	8.45	9.92	10.61	10.68	10.83	10.74	10.11	9.02	7.77
BAT12	8.92	8.17	9.14	10.16	11.35	11.69	11.55	11.68	11.62	10.77	10.02	9.09
CLK1	9.04	8.75	8.81	9.29	10.04	10.39	10.63	10.70	10.58	10.04	9.33	8.59
CLK12	9.06	9.01	8.99	9.08	9.65	10.04	10.25	10.46	10.44	10.24	9.56	9.09
GLE3	8.39	8.25	8.47	9.23	10.48	11.04	10.87	11.08	10.91	10.09	9.44	8.65
GLE12	NA	NA	NA	8.72	10.63	11.12	11.16	11.37	11.28	10.58	10.01	9.07
MIC3	9.63	8.84	9.30	9.80	11.27	11.79	11.59	11.65	11.46	10.17	9.25	8.30
MIC12	8.51	8.89	9.31	10.12	10.83	11.12	10.81	11.05	10.86	10.13	9.30	8.63
PRI3	8.50	8.27	8.61	9.30	10.34	10.88	10.80	11.09	10.87	9.81	8.97	8.21
PRI12	8.27	7.80	7.75	8.48	8.94	9.75	9.91	10.21	10.23	9.62	8.38	7.49

Monthly Medians for Stage at Continuous Instream Sites												
	Jul 2020	Aug 2020	Sep 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021
Station Name	Stage (ft)	Stage (ft)	Stage (ft)	Stage (ft)	Stage (ft)	Stage (ft)	Stage (ft)	Stage (ft)	Stage (ft)	Stage (ft)	Stage (ft)	Stage (ft)
BAT3	4.02	3.95	3.95	4.13	4.55	4.85	5.37	5.20	4.62	4.28	4.15	4.07
BAT12	4.26	4.19	4.18	4.29	4.51	4.67	4.97	4.89	4.61	4.45	4.34	4.30
CLK1	3.76	3.74	3.79	3.95	4.17	4.33	4.40	4.36	4.19	3.92	3.91	3.87
CLK12	3.96	3.94	3.95	3.96	4.10	4.20	4.22	4.17	4.05	3.95	3.94	3.95
GLE3	3.91	3.89	3.97	4.07	4.43	4.55	4.70	4.63	4.34	4.16	4.10	4.07
GLE12	0.64	0.23	0.35	0.79	0.99	1.05	1.30	1.23	1.01	0.92	0.85	0.78
LPW1	NA	NA	NA	NA	NA	1.60	1.83	1.76	1.52	NA	NA	NA
MIC3	5.37	5.34	5.42	5.25	5.76	6.25	6.62	6.71	5.72	5.41	5.39	5.37
MIC12	7.05	7.09	7.00	6.79	7.30	7.82	8.23	8.24	7.36	6.97	6.97	6.92
PRI3	4.06	4.05	4.09	4.13	4.45	4.68	4.91	4.86	4.49	4.28	4.27	4.24
PRI4	7.34	7.31	7.37	7.41	7.76	7.99	8.16	8.15	7.82	7.51	7.44	7.42
PRI12	4.41	4.65	4.72	4.15	4.27	4.46	4.68	4.64	4.38	4.15	4.24	4.33
SHE3	6.21	6.26	6.26	6.12	6.44	6.77	7.05	6.98	6.41	6.18	6.20	6.17
WAL3	3.70	3.65	3.65	3.76	3.97	4.11	4.27	4.18	3.92	3.74	3.71	3.69

Presented median values consist of A and B grade data only.

NA = 60% of the continuous record for a given month is not represented by A and B grade data.

Table 11.
Instream Storm Monitoring Data (RY 2020/2021)

Site Name:		CLK1																	
Site Description:		Lower Clark Creek just upstream of confluence with Pringle Creek																	
Sample Collection Date/Time	E. Coli	Diss. Oxygen	pH	temp	Sp. Cond, field	Sp. Cond, comp	Cu	Cu diss	Zn	Zn diss	Pb	Pb diss	Hardness	NH3	NO ₃ -NO ₂	Ortho P	TP	BODs	TSS
mm/dd/yyyy HH:MM	MPN/100 mL	mg/L	S.U	°C	µS/cm	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
09/23/2020 18:15	6488	8.58	7.05	18.69	58.8														
09/24/2020 11:52						55.5	0.0141	0.00879	0.574	0.488	0.00337	0.00039	20	0.126	0.454	0.143	0.347	11	41.6
03/05/2021 09:25	921	10.9	6.8	9.3	80.9														
03/05/2021 09:30 DUP	1046	10.91	6.8	9.3	80.2														
03/06/2021 09:30						54.1	0.0109	0.00275	0.127	0.0464	0.00641	0.00011	24	0.114	0.844	0.025	0.231	4.2	76.5

Site Name:		PRI3																	
Site Description:		Lower Pringle Creek in Pringle Park, just upstream of confluence with Shelton Ditch																	
Sample Collection Date/Time	E. Coli	Diss. Oxygen	pH	temp	Sp. Cond, field	Sp. Cond, comp	Cu	Cu diss	Zn	Zn diss	Pb	Pb diss	Hardness	NH3	NO ₃ -NO ₂	Ortho P	TP	BODs	TSS
mm/dd/yyyy HH:MM	MPN/100 mL	mg/L	S.U	°C	µS/cm	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
09/23/2020 18:55	6867	8.17	7.21	18.06	87.6														
09/24/2020 12:19						73.8	0.0113	0.00536	0.158	0.0707	0.00459	0.00026	29	0.05	0.457	0.073	0.339	7.7	71.4
03/05/2021 09:55	119	11.67	7.07	9.1	93.6														
03/06/2021 09:50						79.6	0.00306	0.00126	0.0451	0.0175	0.0014	0.00011	30	0.05	1.32	0.01	0.094	3	23.8

Site Name:		PRI12																	
Site Description:		Upper East Fork Pringle Creek																	
Sample Collection Date/Time	E. Coli	Diss. Oxygen	pH	temp	Sp. Cond, field	Sp. Cond, comp	Cu	Cu diss	Zn	Zn diss	Pb	Pb diss	Hardness	NH3	NO ₃ -NO ₂	Ortho P	TP	BODs	TSS
mm/dd/yyyy HH:MM	MPN/100 mL	mg/L	S.U	°C	µS/cm	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
09/23/2020 19:35	2143	6.79	6.85	17.1	86.8														
09/24/2020 10:25						82.2	0.00206	0.00118	0.0185	0.00306	0.0003	0.00011	28	0.05	0.508	0.013	0.1	3	10.4
03/05/2021 10:20	28	10.62	6.93	8.3	84.2														
03/06/2021 10:20						68.7	0.00166	0.00067	0.0141	0.00507	0.00067	0.00011	27	0.05	1.931	0.01	0.074	1.5	19.8

Data in red exceed applicable water quality criteria (see Table 4).

NA= Median not calculated because ≥ 50% of values were censored values.

Table 12.
Stormwater Monitoring Data (RY 2020/2021)

Site Name:		Electric¹																	
Land use Type:		Residential																	
Sample Collection Date/Time	E. Coli	Diss. Oxygen	pH	temp	Sp. Cond, field	Sp. Cond, comp	Cu	Cu diss	Zn	Zn diss	Pb	Pb diss	Hardness	NH3	NO ₃ -NO ₂	Ortho P	TP	BOD5	TSS
mm/dd/yyyy HH:MM	MPN/100 mL	mg/L	S.U	°C	µS/cm	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
09/23/2020 19:09	3873	9.35	7.18	18.2	43.9														
09/23/2020 07:14 DUP	3448	9.33	7.12	18.4	43.9														
09/24/2020 10:55						72.6	0.0097	0.00778	0.0413	0.031	0.00091	0.0002	26	0.05	0.845	0.165	0.28	13.3	16.2

¹Due to the velocity and lift of water coming through the pipe at this site, the flow module is unable to detect the height of the water and often doesn't sample; therefore a time paced sampling method is utilized.

Site Name:		Hilfiker																	
Land use Type:		Commercial																	
Sample Collection Date/Time	E. Coli	Diss. Oxygen	pH	temp	Sp. Cond, field	Sp. Cond, comp	Cu	Cu diss	Zn	Zn diss	Pb	Pb diss	Hardness	NH3	NO ₃ -NO ₂	Ortho P	TP	BOD5	TSS
mm/dd/yyyy HH:MM	MPN/100 mL	mg/L	S.U	°C	µS/cm	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
09/23/2020 18:30	1515	7.15	6.64	18.1	29.7														
09/24/2020 11:23						34.2	0.0141	0.00692	0.0901	0.0407	0.00461	0.00018	12	0.258	0.181	0.115	0.351	9.1	50

Site Name: Salem Industrial																			
Land use Type:		Industrial																	
Sample Collection	E. Coli	Diss.	pH	temp	Sp. Cond.	Sp. Cond.	Cu	Cu diss	Zn	Zn diss	Pb	Pb diss	Hardness	NH3	NO ₃ -NO ₂	Ortho P	TP	BOD5	TSS
mm/dd/yyyy HH:MM	MPN/100 mL	mg/L	S.U	°C	µS/cm	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
09/23/2020 19:54	13000	7.99	6.75	17.8	44														
09/24/2020 12:49						65.2	0.00611	0.00462	0.069	0.0559	0.00063	0.00011	25	0.05	0.521	0.8	0.926	4.4	16.4

¹Due to the velocity and lift of water coming through the pipe at this site, the flow module is unable to detect the height of the water and often doesn't sample; therefore a time paced sampling method is utilized.

Appendix A: Dry Weather Outfall Screening Results RY 2020/2021

Dry Weather Outfall Screening Results RY 2020/2021																							
Basin	Asset ID	Date	Flow Estimate (gpm)	Flow Pattern	Physical Characteristics (odor, color, floatables, stains, pool quality, etc.)	Ch Test trip?	Analytical Sampling	Free Cl Test Strip	Total Cl Test Strip	Cl Colorimeter	Temperature (C)	Receiving Water Temperature (C)	Specific Conductivity (µS/cm)	pH (S.U.)	Turbidity (NTU)	Fluoride	Detergents/Surfactants (mg/L)	Ammonia (mg/L)	Potassium (mg/L)	Sodium (mg/L)	E. coli (MPN/100mL)	Inspection Comments	Investigation Comments
Battle Creek	88724	10/6/2020	1-5 gpm	Steady		Yes	None	0	0														
Battle Creek	Private	10/6/2020	1-5 gpm	Steady		Yes	None	0	0														
Battle Creek	37502	7/7/2021	1-5 gpm	Steady		Yes	None			0													
Battle Creek	35917	7/12/2021	1-5 gpm	Steady		Yes	None	0	0														
Battle Creek	Private	7/19/2021	< 1 gpm	Steady		Yes	None	0	0														
Battle Creek	36579	7/20/2021	< 1 gpm	Steady		Yes	None	0	0														
Battle Creek	Private	8/24/2021	1-5 gpm	Steady		Yes	None	0	0														
Clark Creek	19952	8/11/2021	10-25 gpm	Steady		Yes	None	0	0-0.5														
Clark Creek	20166	8/11/2021	5-10 gpm	Steady		Yes	None	0	0														
Clark Creek	D39460252	9/3/2021	5-10 gpm	Steady		Yes	Lab and Field Sampling	0	0		17.7	17.7	73.9	7.5	1.4								Ongoing Investigation: BacT Source Tracking
Clark Creek	D42466417	9/3/2021	0 gpm	No Flow		No	None																Ongoing Investigation: BacT Source Tracking
Clark Creek	D42468244	9/3/2021	> 25 gpm	Steady		Yes	Lab and Field Sampling	0	0	0.01	17.9	14.9	115.6	7.8	1.6	0.1							Ongoing Investigation: BacT Source Tracking
Clark Creek	D42468PVT	9/3/2021	< 1 gpm	Intermittent		Yes	Lab and Field Sampling	0	0	0	17.3	14.7	149.4	7.74	2.2	0.2							Very slow trickle flowing from pipe.Ongoing Investigation: BacT Source Tracking
Croisan Creek	89674	8/5/2021	< 1 gpm	Intermittent	Color: Orange Poor Pool Quality: Biofilm	Yes	None	0	0-0.5														
Gibson Creek	37881	10/1/2020	< 1 gpm	Steady		Yes	Field Sampling	0	0-0.5	0	13.6	16.7	124.1	5.92	3.5								
Gibson Creek	8593	7/16/2021	1-5 gpm	Steady		Yes	None	0	0														
Gibson Creek	37871	7/20/2021	1-5 gpm	Steady		Yes	None	0	0														
Gibson Creek	37932	7/20/2021	< 1 gpm	Steady		Yes	None	0	0														
Gibson Creek	38238	7/22/2021	1-5 gpm	Steady		Yes	None	0	0														
Gibson Creek	114734	7/22/2021	1-5 gpm	Steady		Yes	None	0	0														
Gibson Creek	37881	7/23/2021	< 1 gpm	Intermittent		Yes	None	0	0														
Gibson Creek	37881	7/23/2021	5-10 gpm	Steady		Yes	None	0	0														
Gibson Creek	8603	8/11/2021	1-5 gpm	Steady		Yes	None	0	0														
Gibson Creek	8153	8/12/2021	< 1 gpm	Steady		Yes	None	0	0														
Gibson Creek	3410	8/16/2021	1-5 gpm	Steady		Yes	None	0	0														
Little Pudding River	37635	8/16/2021	< 1 gpm	Steady		Yes	None	0	0														
Lower Claggett Creek	D51488203	8/9/2021	0 gpm	No Flow		No	None																
Lower Claggett Creek	D51488236	8/9/2021	0 gpm	No Flow		No	None																
Lower Claggett Creek	D54494201	8/9/2021	0 gpm	No Flow		No	None																
Lower Claggett Creek	D54494201	8/9/2021	0 gpm	No Flow		No	None																
Mill Creek	Private	10/5/2020	< 1 gpm	Steady		Yes	None	0	0														
Mill Creek	Private	10/8/2020	1-5 gpm	Steady		Yes	None	0	0														
Mill Creek	19539	10/28/2020	5-10 gpm	Steady	Odor: Sewage Color: Brown Turbidity: Cloudy Floatables: Brown clusters of material flows out and breaks up on impact	Yes	None	0	0														
Mill Creek	18666	7/26/2021	1-5 gpm	Steady		Yes	None	0	0														
Mill Creek	12426	7/28/2021	< 1 gpm	Steady		Yes	None	0	0	0													
Mill Creek	87736	7/29/2021	1-5 gpm	Steady		Yes	None	0	0														
Mill Creek	D42478237	8/3/2021	0 gpm	No Flow		No	None																
Mill Creek	D54470205	8/3/2021	0 gpm	No Flow		No	None																
Mill Creek	D45476207	8/5/2021	5-10 gpm	Steady		Yes	Field Sampling	0	0	0	16.8	21.4	280	7.33	0.8							Conductivity is usually high. Source of water is wetland at State Penitentiary (yeah that's a long way from here). Pipeshed investigation not necessary	
Mill Creek	D45476217	8/5/2021	1-5 gpm	Steady		Yes	Field Sampling	0	0	0.02	22.9	21.8	273	7.83	0.8							Grabbed sample from main flow running out of pipe. Conductivity usually slightly elevated. Pipeshed has been characterized. No investigation needed.	
Mill Creek	D45476217	8/5/2021	< 1 gpm	Steady		Yes	Field Sampling	0	0	0.02	22.8	21.8	286.4	7.82	1.1							Grabbed sample from water running out from underneath pipe. Conductivity usually slightly elevated. Pipeshed has been characterized. No investigation needed.	
Mill Creek	D45468241	8/20/2021	10-25 gpm	Steady		Yes	None	0	0	0.03	19.7	17.9	123.8	7.64	4.2	0							
Mill Creek	37229	8/24/2021	< 1 gpm	Intermittent		Yes	None	0	0														
Mill Creek	D45474225	9/8/2021	> 25 gpm	Steady		Yes	Lab and Field Sampling	0	0	0	15.4	18.3	286.1	7.34	0.1	0.2	0					Suspect water leak from 12th ST. High SpCond may be due to groundwater infiltration.	
Mill Creek	D51470205	9/8/2021	0 gpm	No Flow		No	None															Outfall in backwater. Opened next MH up from outfall and that was in backwater as well.	
Pringle Creek	28774	10/9/2020	< 1 gpm	Steady		Yes	None	0	0														
Pringle Creek	38162	8/5/2021	< 1 gpm	Steady		Yes	None	0	0														
Pringle Creek	27312	8/9/2021	< 1 gpm	Steady		Yes	None	0	0-0.5														
Pringle Creek	28322	8/9/2021	10-25 gpm	Steady		Yes	None	0	0-0.5														

Dry Weather Outfall Screening Results RY 2020/2021																							
Basin	Asset ID	Date	Flow Estimate (gpm)	Flow Pattern	Physical Characteristics (odor, color, floatables, stains, pool quality, etc.)	Ch Test trip?	Analytical Sampling	Free Cl Test Strip	Total Cl Test Strip	Cl Colorimeter	Temperature (C)	Receiving Water Temperature (C)	Specific Conductivity (µS/cm)	pH (S.U.)	Turbidity (NTU)	Fluoride	Detergents/Surfactants (mg/L)	Ammonia (mg/L)	Potassium (mg/L)	Sodium (mg/L)	E. coli (MPN/100mL)	Inspection Comments	Investigation Comments
Pringle Creek	28517	8/9/2021	< 1 gpm	Steady		Yes	None	0	0														
Pringle Creek	28517	8/9/2021	1-5 gpm	Steady		Yes	None	0	0														
Pringle Creek	28774	8/9/2021	1-5 gpm	Steady		Yes	None	0	0														
Pringle Creek	D42468235	8/20/2021	0 gpm	No Flow		No	None																
Pringle Creek	D45464207	8/20/2021	1-5 gpm	Steady		Yes	None	0	0	0.07	19.4		96.1	7.79	2.1	0.1							
Pringle Creek	D45464207	8/20/2021	< 1 gpm	Steady		Yes	None	0	0	0.19	18.8		97.1	7.16	15.7	0.1							
Pringle Creek	D45466212	8/20/2021	< 1 gpm	N/A		No	None					22.3											
Pringle Creek	D48460229	8/20/2021	0 gpm	N/A		No	None																
Pringle Creek	17830	8/23/2021	5-10 gpm	Steady		Yes	None	0	0														
Pringle Creek	18042	8/23/2021	< 1 gpm	Steady		Yes	None	0	0														
Pringle Creek	54456	8/23/2021	1-5 gpm	Steady		Yes	None	0	0														
Pringle Creek	D48464203	9/1/2021	< 1 gpm	Steady		Yes	None	0	0		18.5	17.4	249.1	6.95	1.3								
Pringle Creek	D48464249	9/1/2021	< 1 gpm	N/A		No	None					17.5											
Pringle Creek	D39456229	9/8/2021	10-25 gpm	Steady		Yes	Field Sampling	0	0	0.02	17.1		73.4	6.95	0.7	0.1							
Upper Claggett Creek	D51486201	8/9/2021	5-10 gpm	Steady		Yes	Field Sampling	0	0	0.06	18		78.8	6.63	5.3	0.6							Potential drinking water distribution system discharge/leak. Pipeshed investigation pending further investigation at 3415/3413 Duncan Av NE. Could hear water running into the catch basin (3479), but were unable to open the grate and/or sample due to a car being parked over it. Storm cleanout 3814 was dry, it appears that the leak is likely somewhere in between these two assets. Made contact with the resident at 3413 Duncan Ave, asking if she had noticed any higher usage on her water bill, as the water meter at the curb was continually running when checked during the investigation. The resident was not aware of any such usage/higher billing. Ongoing investigation.
Upper Claggett Creek	D51486216	8/9/2021	< 1 gpm	Steady		Yes	Lab and Field Sampling	0	0	0.06	18.6	17.6	77.6	6.97	4.6	0.6	1-1.5	0.06					Potential irrigation and/or drinking water distribution system discharge/leak. Pipeshed investigation ended at manhole at the intersection of 25th St NE + Englewood Av NE. Chlorine strip results for water sample taken at the manhole were Free Cl: ~1.0 ppm and Total Cl: ~1.0 ppm.
Upper Claggett Creek	4824	8/10/2021	1-5 gpm	Steady		Yes	None	0	0														
Upper Claggett Creek	D51476217	8/10/2021	> 25 gpm	Steady		Yes	Field Sampling	1	1		18.4		62.9	6.23	3.1								
Upper Claggett Creek	D54482579	8/10/2021	1-5 gpm	Steady		Yes	Field Sampling	0	1		19.7		64.9	6.63	1.8								
Upper Claggett Creek	D54486217	8/10/2021	> 25 gpm	Steady		Yes	Field Sampling	0	0	0.06	19.5		184	7.34	2.8	0.5							Suspect irrigation and/or drinking water distribution discharge/leak from two potential sources. 1) Irrigation water discharge from leaking apartment building irrigation system that was currently undergoing repairs at the time of the outfall inspection and resulting pipeshed investigation. 2) Potential irrigation or drinking water discharge/leak on or in area adjacent to Willamette Towne Center. Willamette Towne Center discharge/leak. Ongoing investigation.
Upper Claggett Creek	80338	8/11/2021	1-5 gpm	Steady		Yes	Field Sampling	0-0.5	0	0.51			66.5	6.68	0.6	0.7							Ongoing Investigation
Upper Claggett Creek	D51484231	8/11/2021	10-25 gpm	Steady		No	None																
Upper Claggett Creek	4824	8/12/2021	< 1 gpm	Steady		Yes		0	0														
Upper Claggett Creek	D54474564	8/12/2021	1-5 gpm	Steady		Yes	None	0	0	0.03						0.5							Ongoing Investigation
Waln Creek	35072	7/8/2021	5-10 gpm	Steady		No	None																
Waln Creek	34648	7/16/2021	1-5 gpm	Steady		Yes	None	0	0	0													
Waln Creek	33798	8/2/2021	< 1 gpm	Steady		Yes	None	0	0														

Dry Weather Outfall Screening Results RY 2020/2021																							
Basin	Asset ID	Date	Flow Estimate (gpm)	Flow Pattern	Physical Characteristics (odor, color, floatables, stains, pool quality, etc.)	Ch Test trip?	Analytical Sampling	Free Cl Test Strip	Total Cl Test Strip	Cl Colorimeter	Temperature (C)	Receiving Water Temperature (C)	Specific Conductivity (µS/cm)	pH (S.U.)	Turbidity (NTU)	Fluoride	Detergents/Surfactants (mg/L)	Ammonia (mg/L)	Potassium (mg/L)	Sodium (mg/L)	E. coli (MPN/100mL)	Inspection Comments	Investigation Comments
Waln Creek	33306	8/4/2021	< 1 gpm	Intermittent		Yes	None	0	0														
Waln Creek	Private	8/4/2021	< 1 gpm	Intermittent		Yes	None	0	0	0													
Willamette Bank	D42480205	9/1/2021	0 gpm	No Flow		No	None																
Willamette Bank	D42480215	9/1/2021	0 gpm	Steady		No	None																
Willamette Bank	D42480223	9/1/2021	1-5 gpm	Steady		Yes	None	0	0		15.6	18.6	212.7	7.52	1.3								
Willamette Bank	D42482212	9/1/2021	> 25 gpm	Steady		Yes	None	1.0-2.0	1.0-2.0	1.07	18.7	17.1	66.1	7.47	1.3	0.7	0						Traced partial source of potential illicit drinking water discharge occurring at business located at 1291 Madison St NE.Reported to and inspected by ES. Ongoing Investigation
Willamette Bank	D42482213	9/1/2021	0 gpm	No Flow		No	None																
Willamette Bank	D42482223	9/1/2021	5-10 gpm	Steady		Yes	None	0	0	0.03	18.7	17.2	149	7.8	3.7	0.6	0						Ongoing Investigation
Willamette Bank	D42482230	9/1/2021	0 gpm	No Flow		No	None																
Willamette Bank West	D39478271	10/1/2020	1-5 gpm	Steady		Yes	Field Sampling	0	0-0.5	0.03	17.4		108.2	7.3	1.9								
Willamette Bank West	D42476279	10/1/2020	0 gpm	No Flow		No	None																
Willamette Bank West	D39478271	8/19/2021	1-5 gpm	Steady		Yes	None	0	0	0.04	21.2		88.3	7.47	1.6	0.3							Ongoing Investigation
Willamette Bank West	D42476279	8/19/2021	0 gpm	No Flow		No	None																
Willamette Bank West	D30470203	9/8/2021	0 gpm	Steady		No	None																
Willamette Bank West	D36472203	9/8/2021	10-25 gpm	Steady		Yes	Lab and Field Sampling	0	0-0.5	0.06	20.4		73	7.18	0.5	0.7	0						
Willamette River	D42482201	9/2/2021	> 25 gpm	Steady		No	None																
Willamette River	D48478202	9/2/2021	1-5 gpm	Steady	Color: Gray Turbidity: Cloudy	No	None																
Willamette Slough East	D39470220	10/1/2020	5-10 gpm	Steady		Yes	Field Sampling	0	0-0.5	0.04	17.7		74.7	7.27	1.7								

Clark Creek Special Project: Microbial Source Tracking

Dry Weather Microbial Source Tracking Results		
Site ID	Date	E. coli (MPN/100mL)
CLK10	9/22/2020	2382
D39460209	9/29/2020	1211
Stanley DOWN	10/8/2020	4106
Stanley UP	10/8/2020	4611
3855-A	10/15/2020	1872
3855-B	10/15/2020	1664
3855-C	10/15/2020	120
3855-D	10/15/2020	275
3825	10/27/2020	397
3855 B	10/27/2020	226
3855 C	10/27/2020	216
3855 D	10/27/2020	41
3855 E	10/27/2020	30
3855 F	10/27/2020	<10
26463	4/13/2021	1658
26505	4/13/2021	932
26525	4/13/2021	399
3845	4/13/2021	990
5855	4/13/2021	1266
CLK12	4/13/2021	404
CLK12.1	4/13/2021	359
CLK13	4/13/2021	10

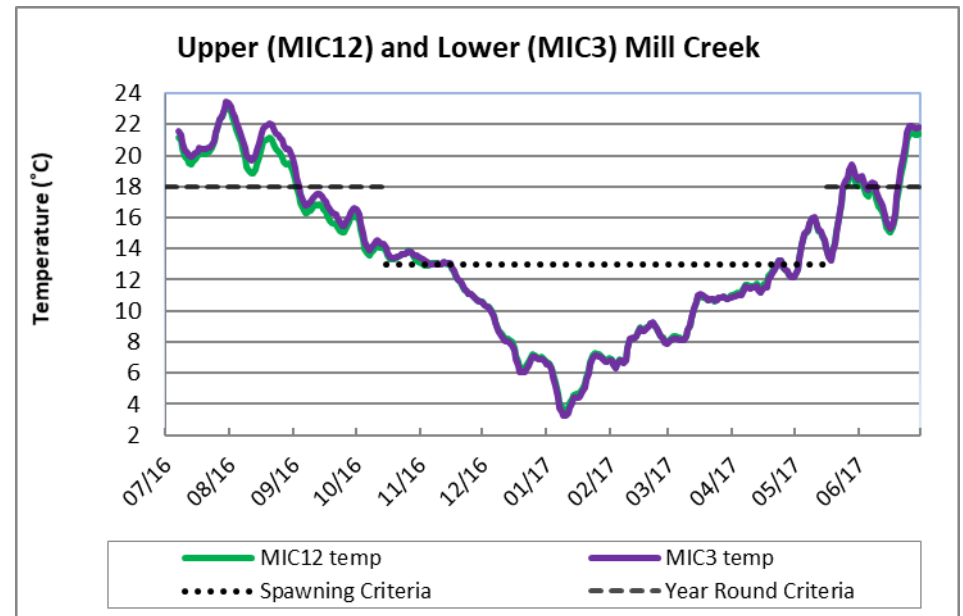
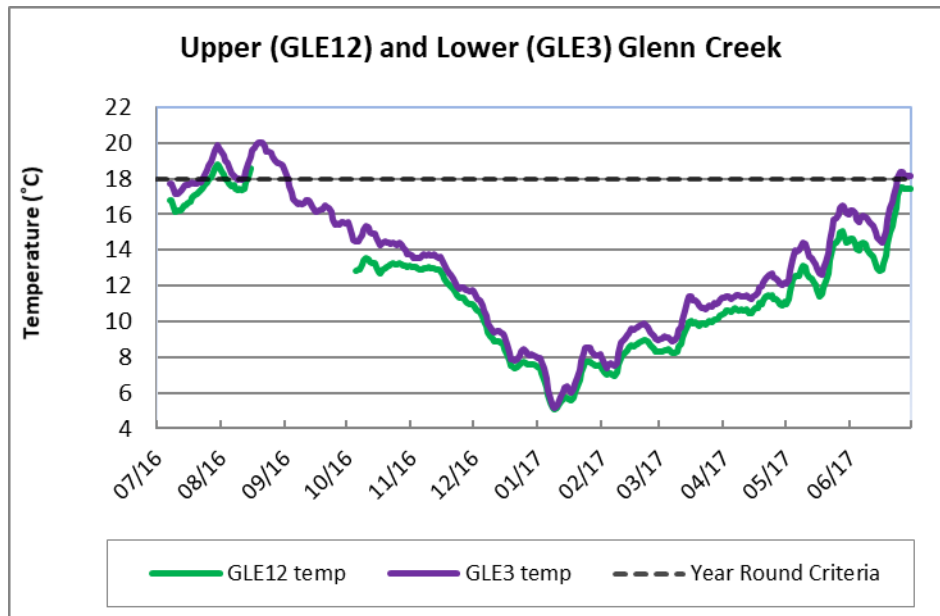
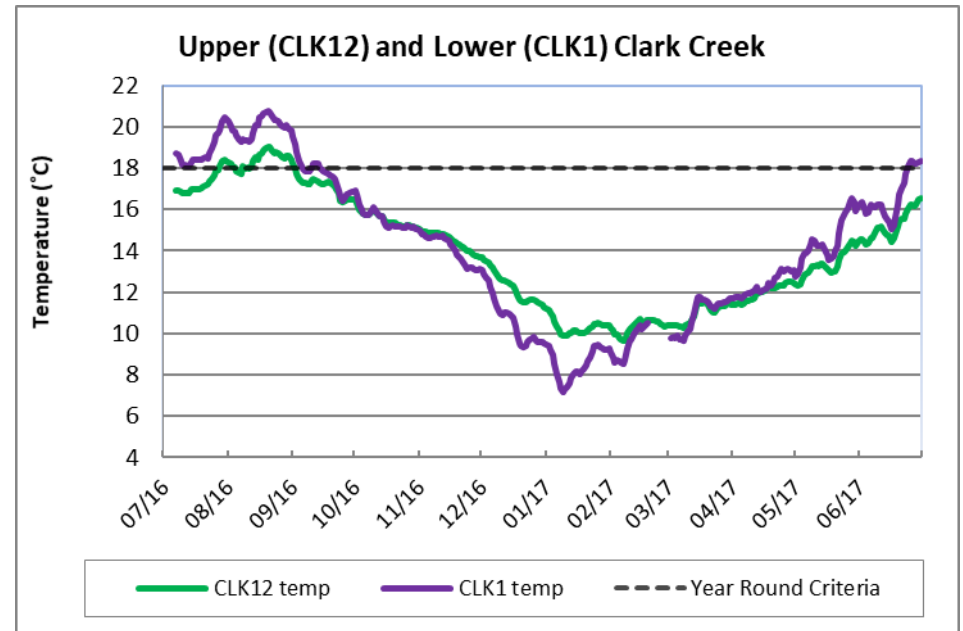
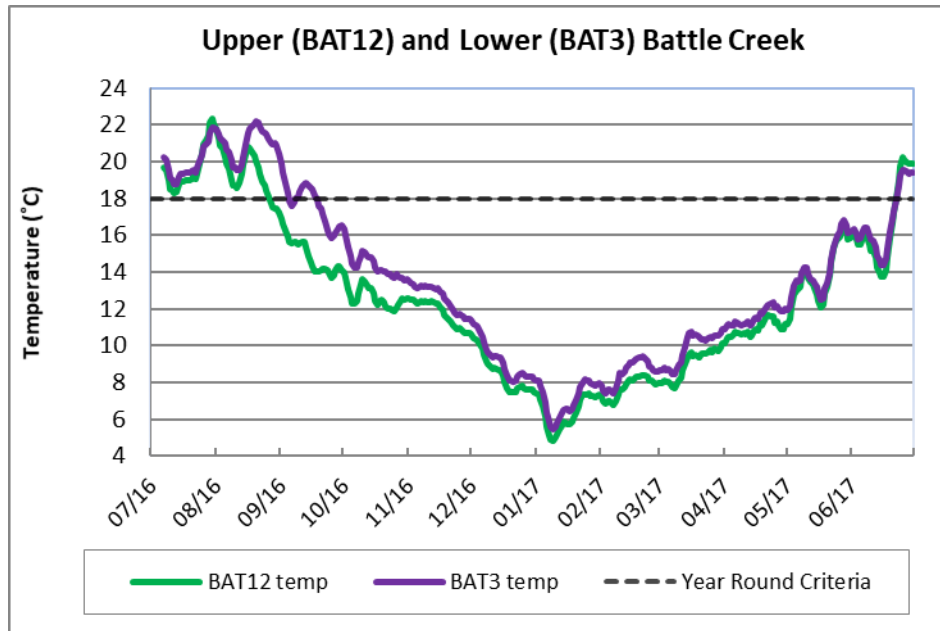
Clark Creek Siphon Sample Results		
Site ID	Date	E. coli (MPN/100mL)
10170098 DWN	12/11/2020	40
10170098 UP	12/11/2020	42
115682 DWN	12/8/2020	39
115682 UP	12/8/2020	33
115797 DWN	12/8/2020	26
115797 UP	12/8/2020	26
117923 DWN	12/8/2020	24
117923 UP	12/8/2020	33
118152 DWN	12/8/2020	60
118152 UP	12/8/2020	40
119780 DWN	12/11/2020	219
119780 UP	12/11/2020	260
122457 DWN	12/8/2020	36
122457 UP	12/8/2020	27
122480 DWN	12/8/2020	29
122480 UP	12/8/2020	48
ODF DWN	12/8/2020	25
ODF UP	12/8/2020	29

ODEQ acute single sample water quality criterion for E. coli is 406 MPN/100mL

Appendix B: Revised Figures and Charts 2017 through 2020

Figure 1

Continuous Instream Temperature 7-Day Moving Average Maximum (Reporting Year 2016/2017)

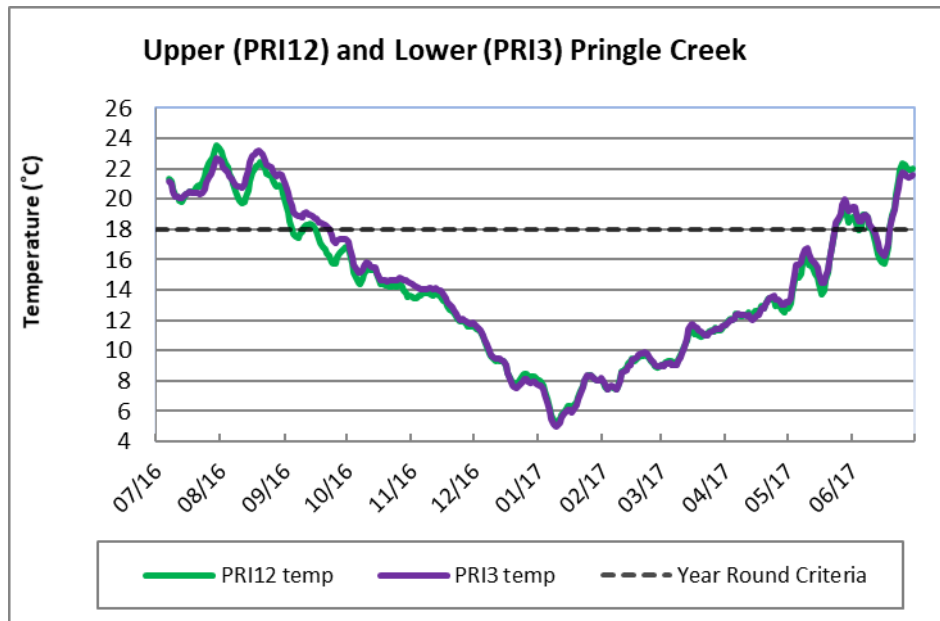


Presented temperature data consists of A grade data with greater than 80% of data points collected per day. Temperature criteria is defined in OAR 340--04100028 and OAR 340-0340, Tables 340A & B.

- Spawning Minimum Criteria for applicable streams may not exceed 7-day average maximum of 13 degrees C.
- Year Round Minimum Criteria may not exceed 7-day average maximum of 18 degrees C.

Figure 1

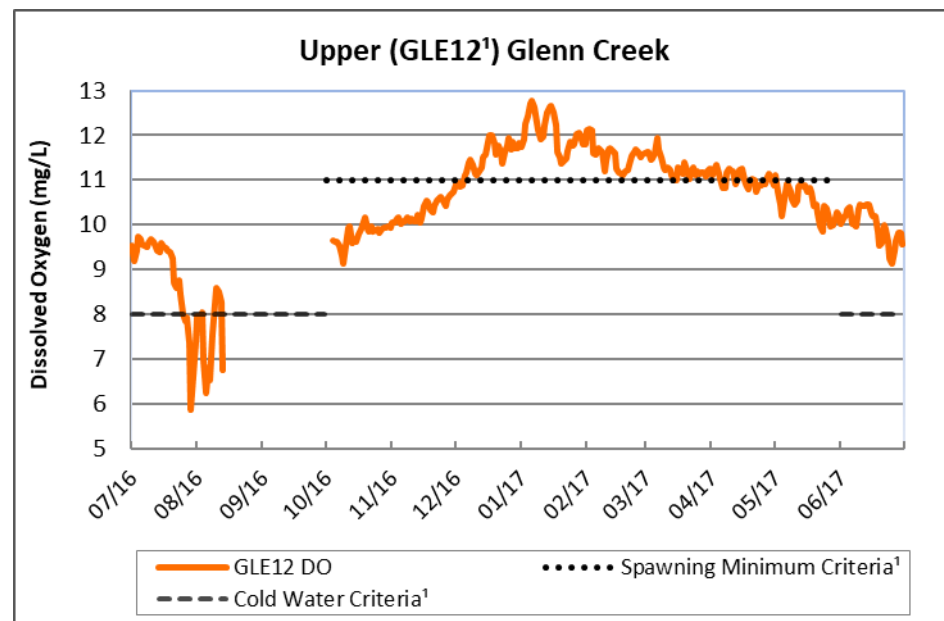
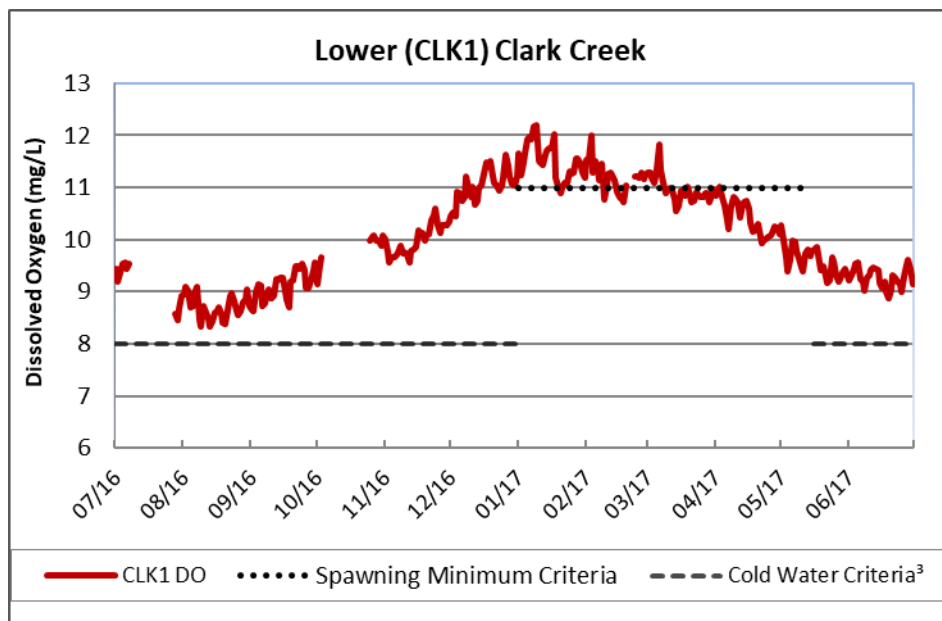
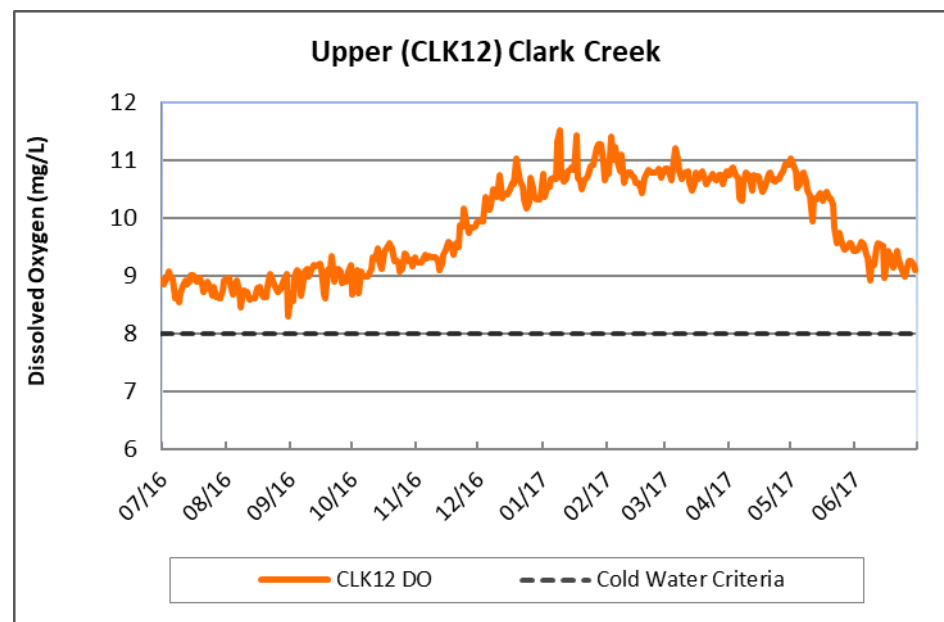
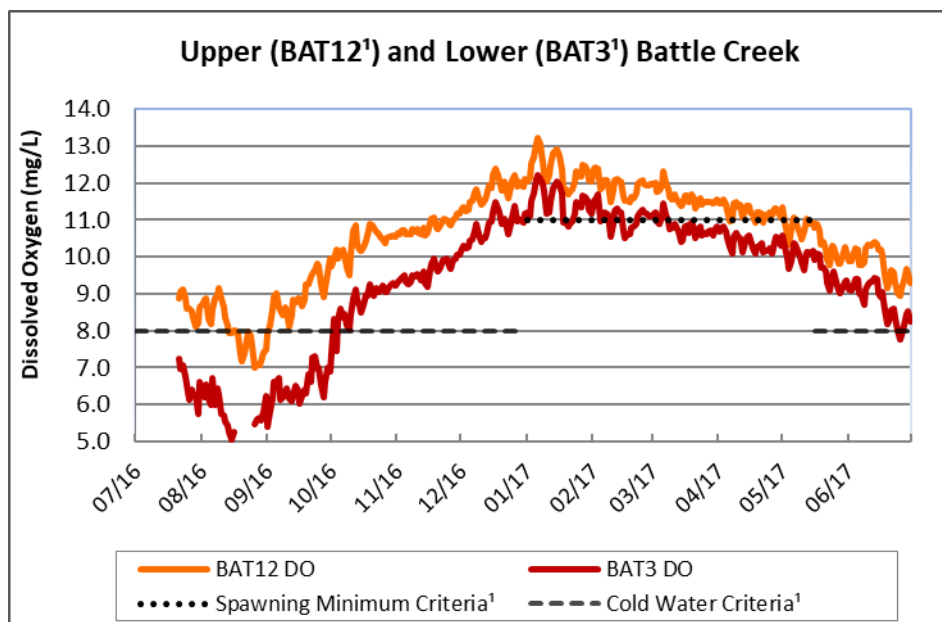
Continuous Instream Temperature 7-Day Moving Average Maximum (Reporting Year 2016/2017)



Presented temperature data consists of A grade data with greater than 80% of data points collected per day. Temperature criteria is defined in OAR 340--04100028 and OAR 340-0340, Tables 340A & B.

- Spawning Minimum Criteria for applicable streams may not exceed 7-day average maximum of 13 degrees C.
- Year Round Minimum Criteria may not exceed 7-day average maximum of 18 degrees C.

Figure 2
Continuous Instream Dissolved Oxygen Daily Mean (Reporting Year 2016/2017)

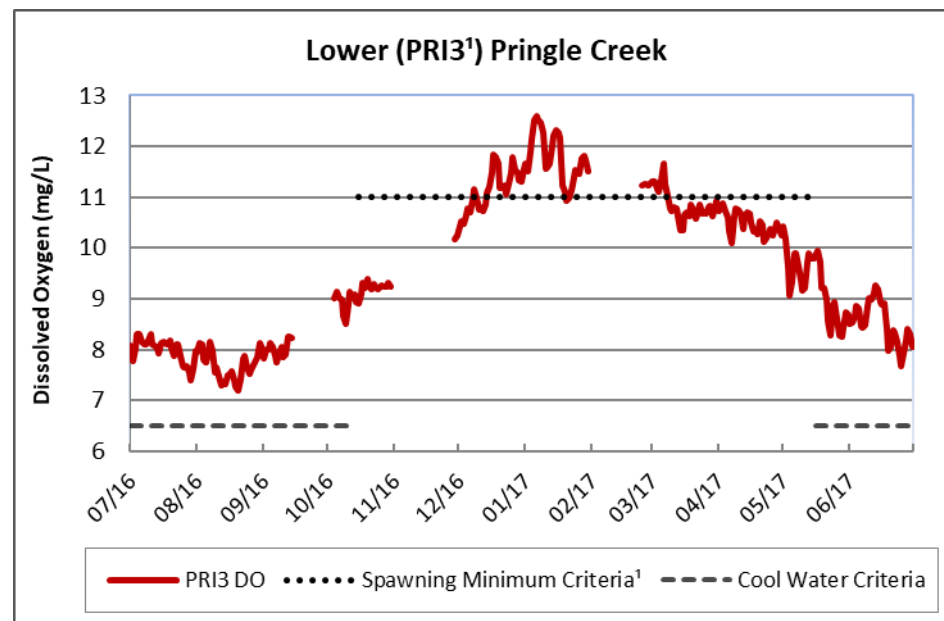
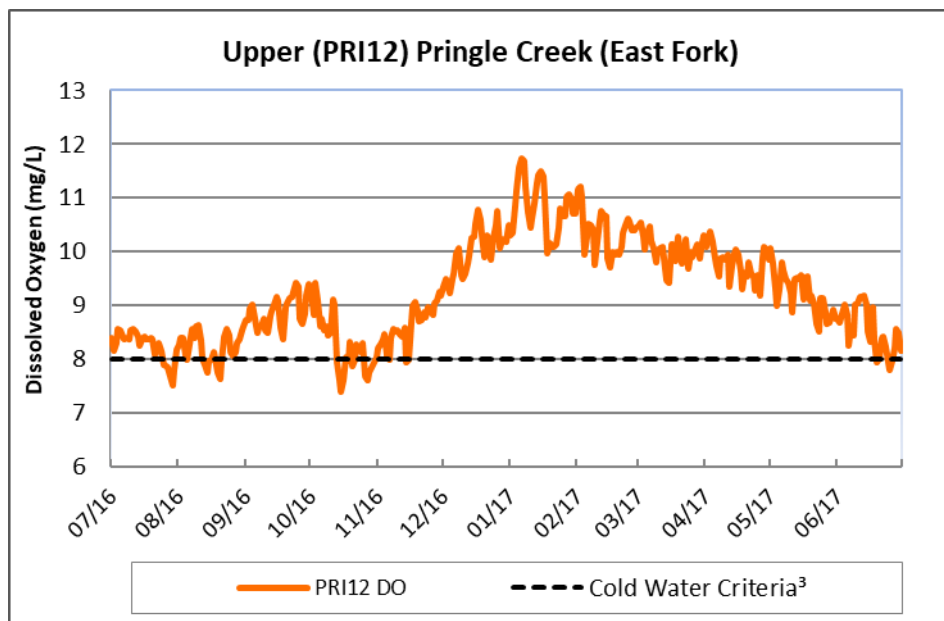
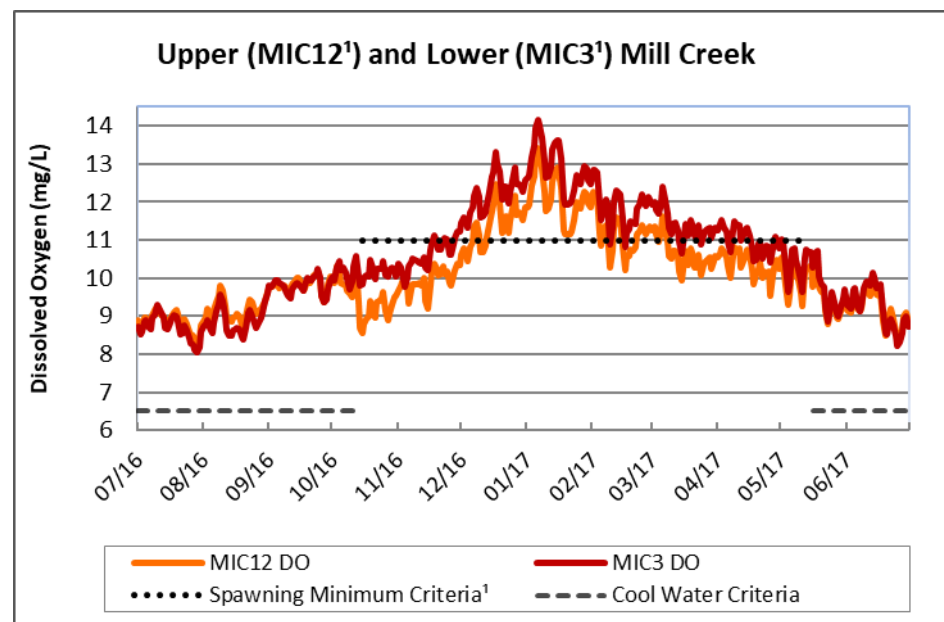
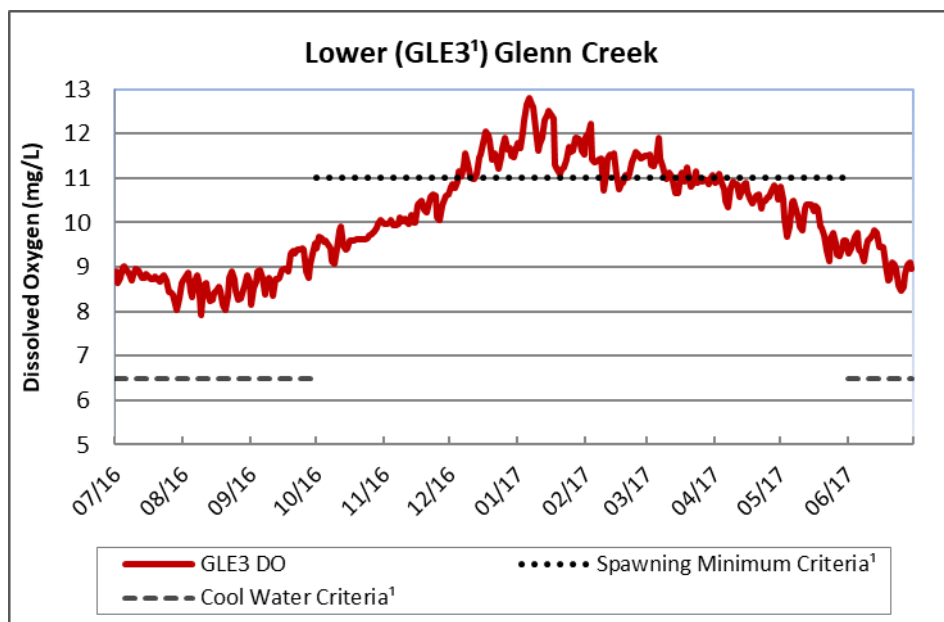


Presented DO data consists of A and B grade data with greater than or equal to 80% of data points collected per day. DO Criteria as defined in OAR 340-041-0016 and OAR 340-0340, Tables 340 A & B.

- Spawning Minimum Criteria for applicable streams may not be less than 11 mg/L.
- Oregon Cold Water Criteria for applicable streams may not be less than 8 mg/L.

¹ Oregon's 2012 Integrated Report Section 303(d) listed.

Figure 2
Continuous Instream Dissolved Oxygen Daily Mean (Reporting Year 2016/2017)

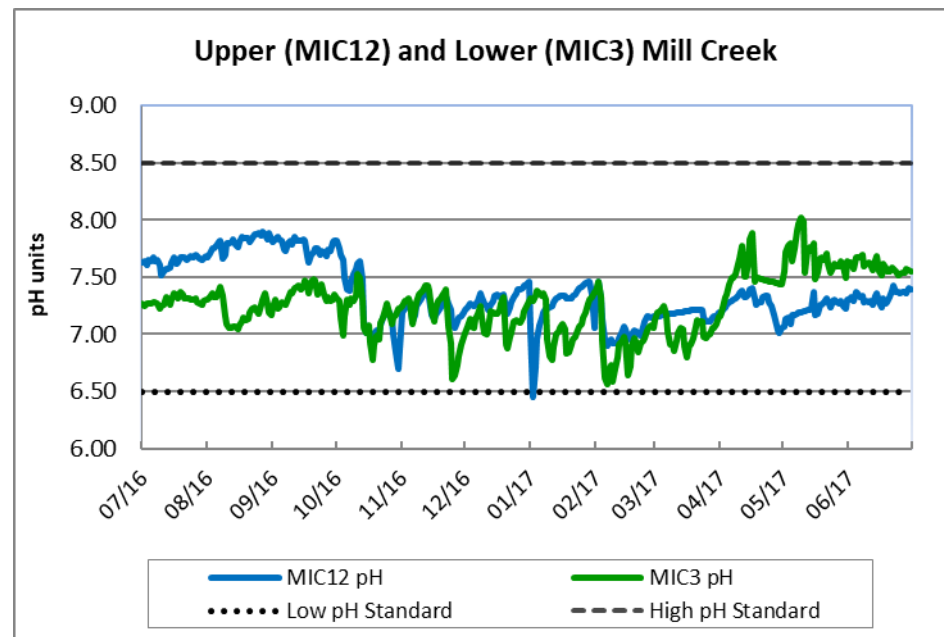
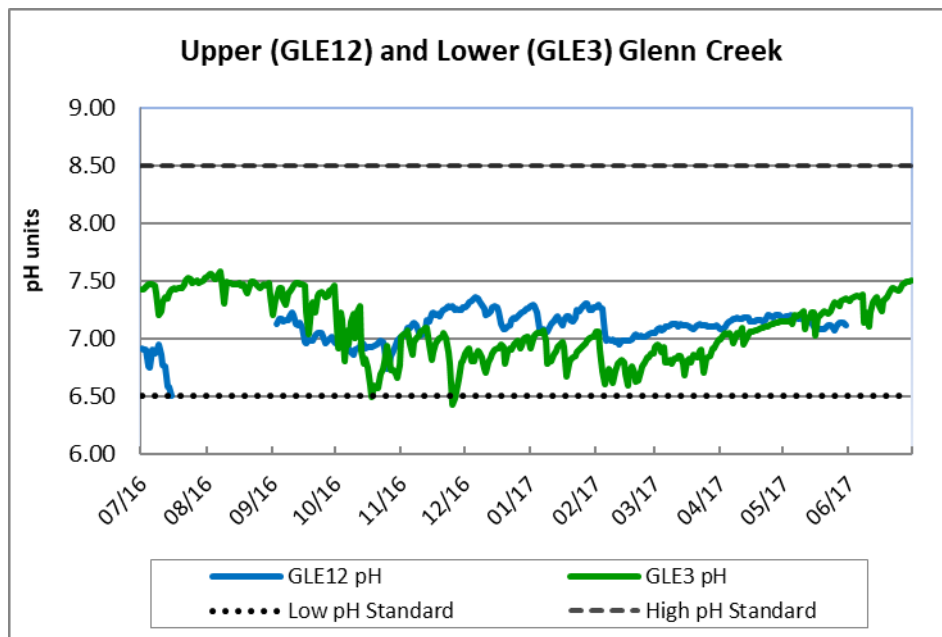
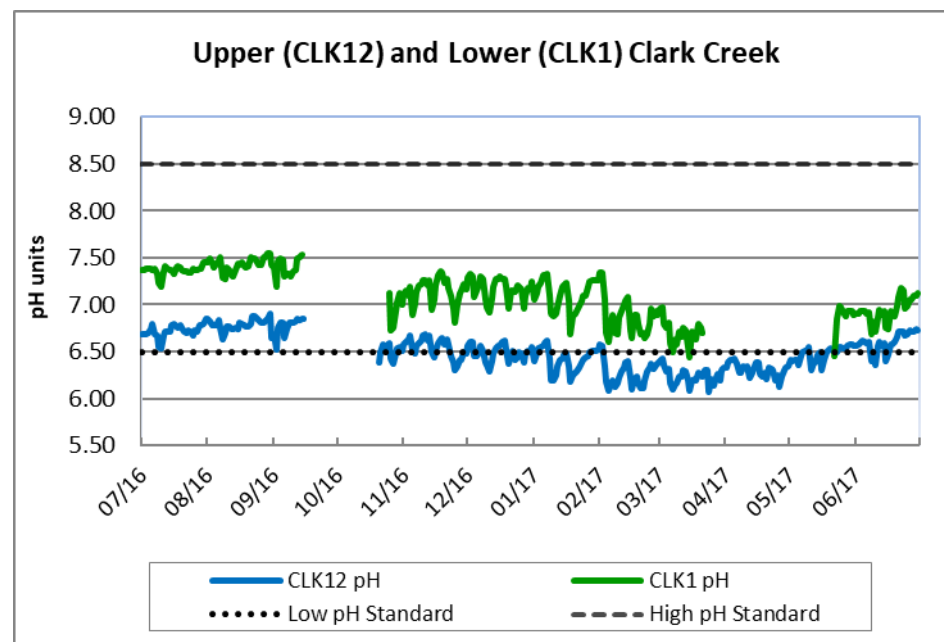
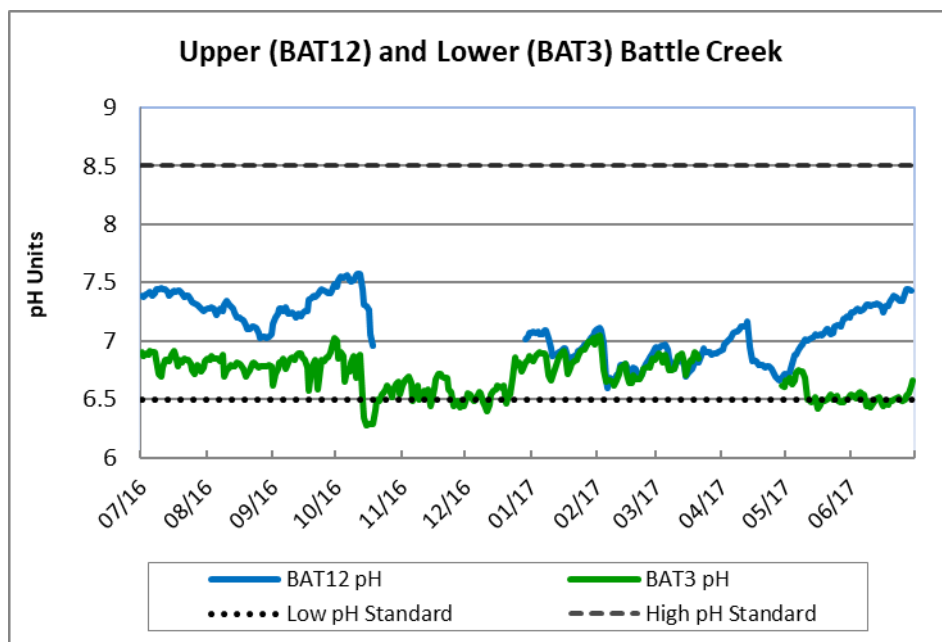


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¹ Oregon's 2012 Integrated Report Section 303(d) listed.

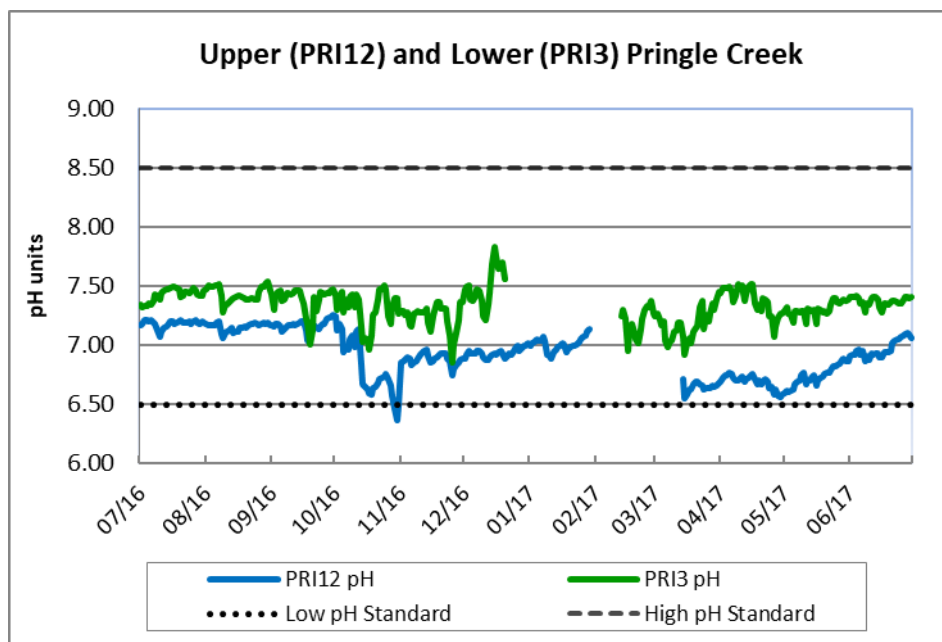
Figure 3
Continuous Instream pH Daily Mean (Reporting Year 2016/2017)



Presented pH data consist of A and B grade data with greater than or equal to 80% of data points collected per day.

As defined in OAR 341-041-0035 Water Quality Standards for the Willamette Basin, pH should not fall outside the ranges of 6.5 to 8.5 pH units.

Figure 3
Continuous Instream pH Daily Mean (Reporting Year 2016/2017)

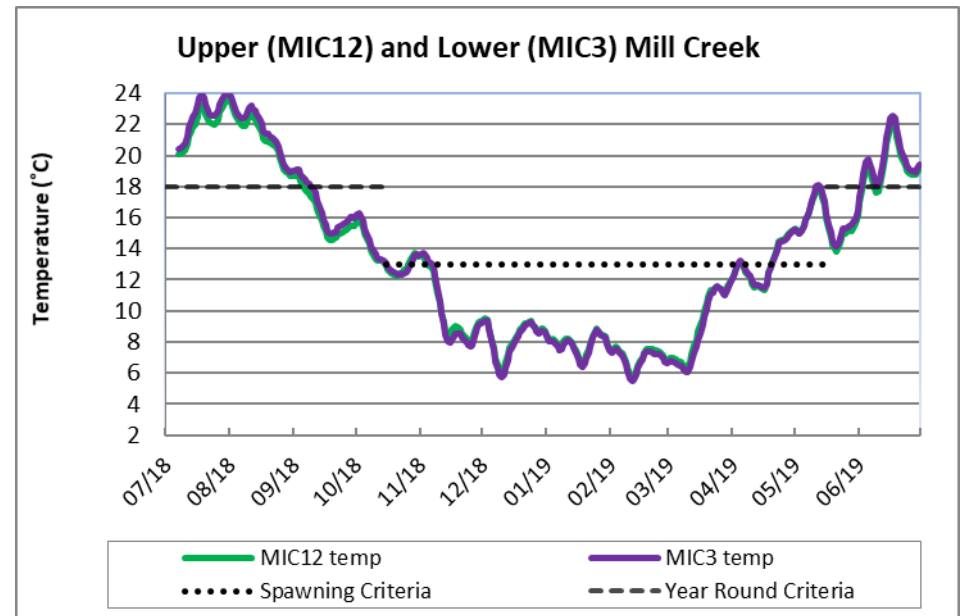
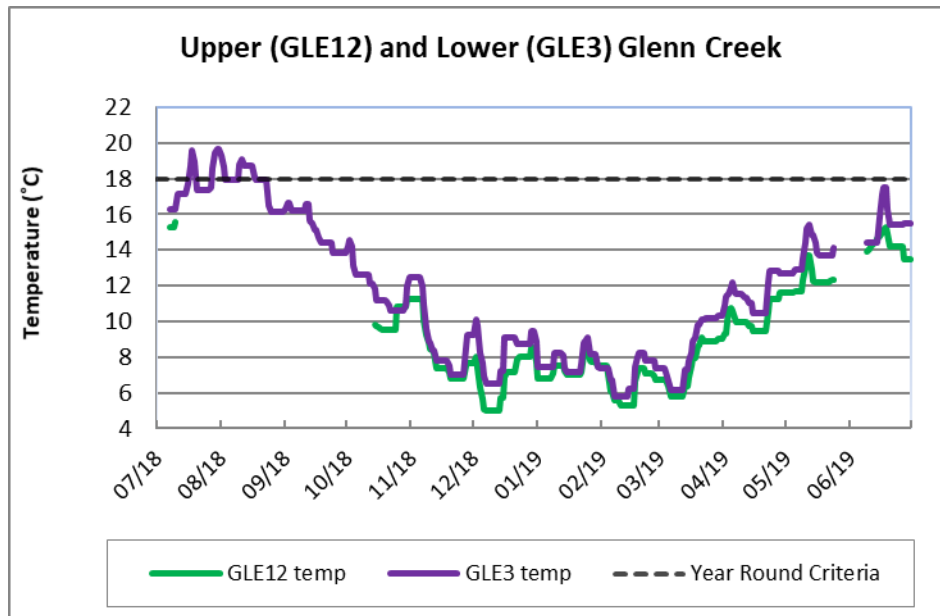
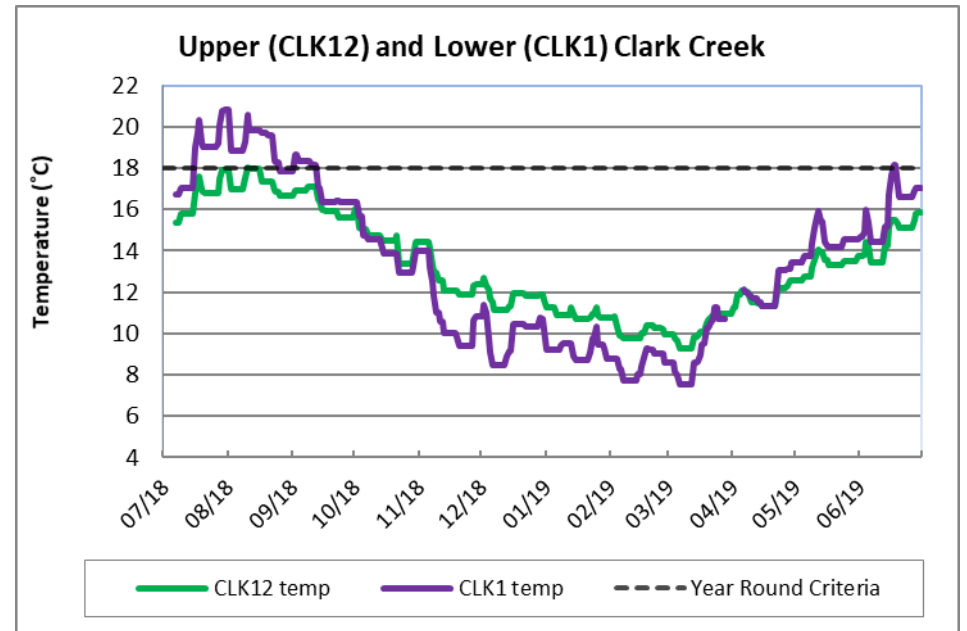
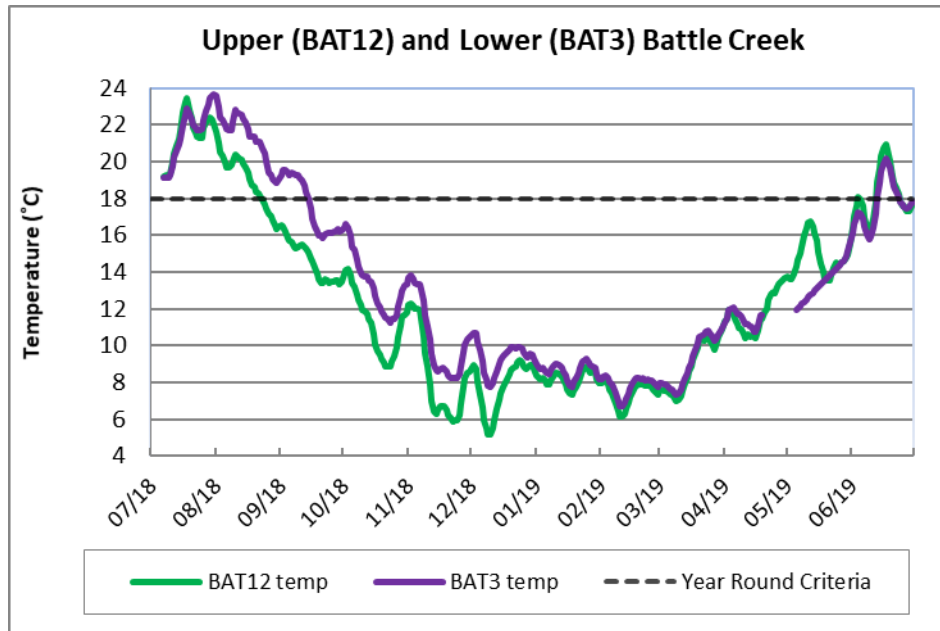


Presented pH data consist of A and B grade data with greater than or equal to 80% of data points collected per day.

As defined in OAR 341-041-0035 Water Quality Standards for the Willamette Basin, pH should not fall outside the ranges of 6.5 to 8.5 pH units.

Figure 4

Continuous Instream Temperature 7-Day Moving Average Maximum (Reporting Year 2018/2019)

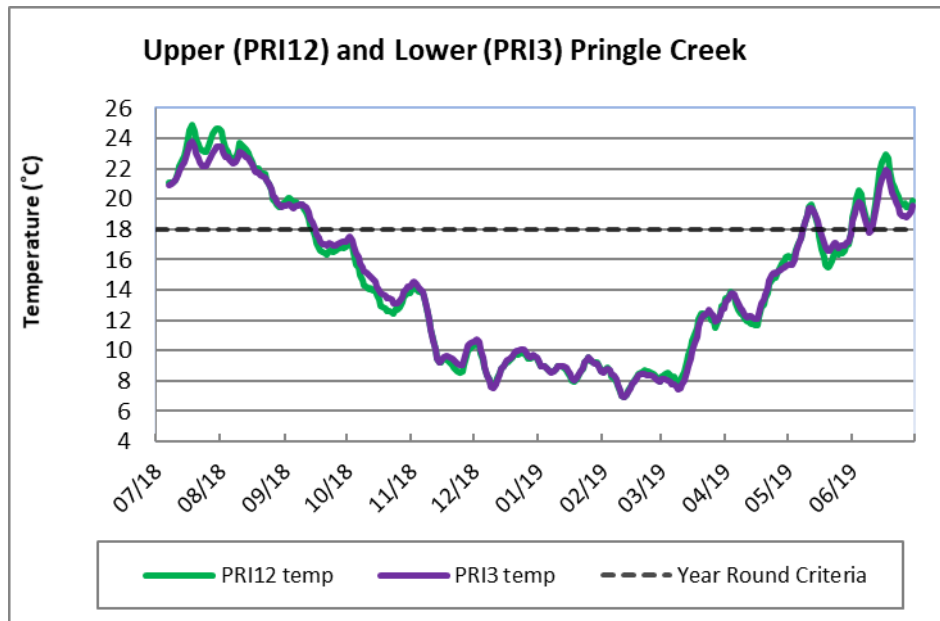


Presented temperature data consists of A grade data with greater than 80% of data points collected per day. Temperature criteria is defined in OAR 340--04100028 and OAR 340-0340, Tables 340A & B.

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- Year Round Minimum Criteria may not exceed 7-day average maximum of 18 degrees C.

Figure 4

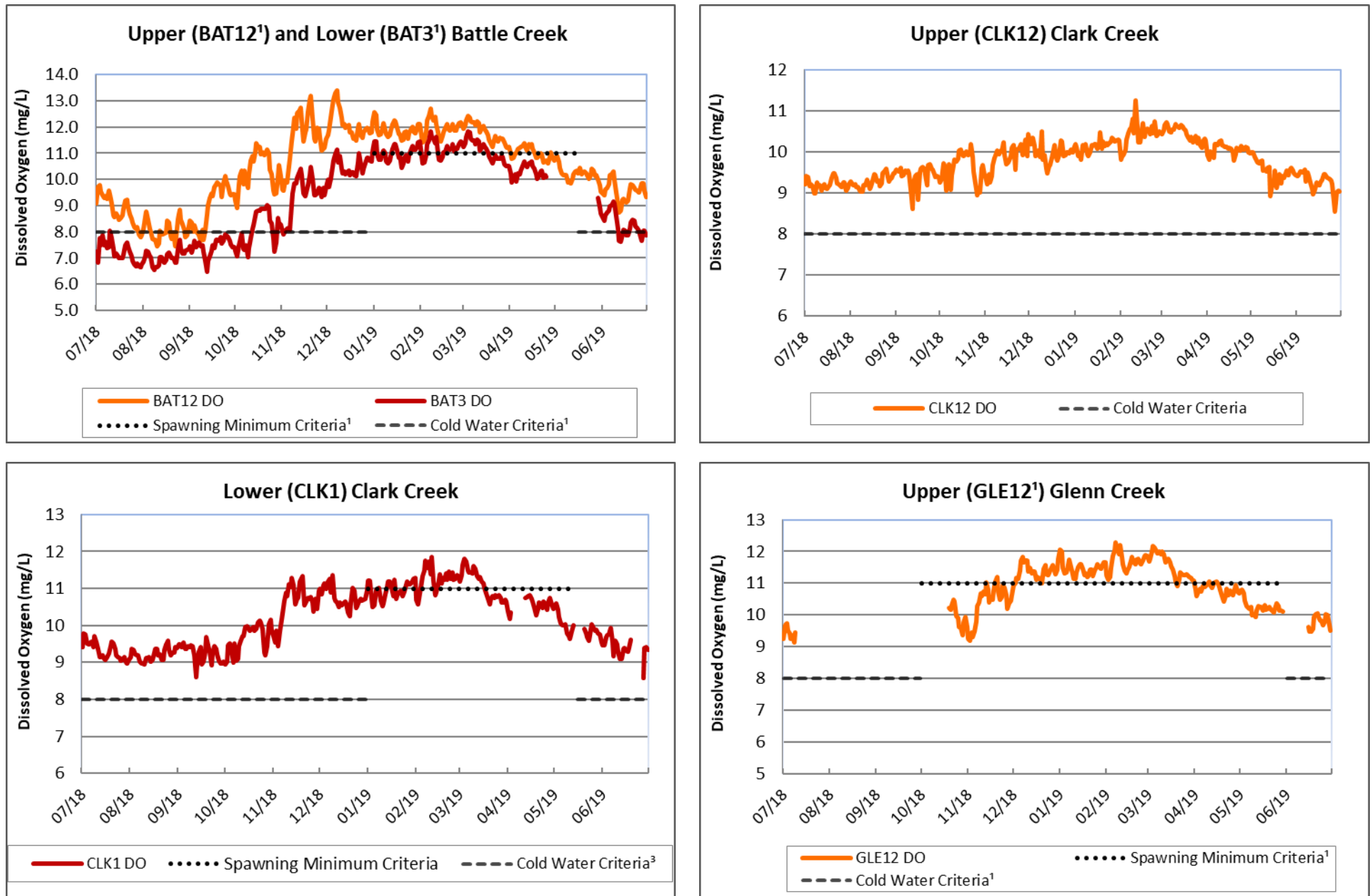
Continuous Instream Temperature 7-Day Moving Average Maximum (Reporting Year 2018/2019)



Presented temperature data consists of A grade data with greater than 80% of data points collected per day. Temperature criteria is defined in OAR 340--04100028 and OAR 340-0340, Tables 340A & B.

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- Year Round Minimum Criteria may not exceed 7-day average maximum of 18 degrees C.

Figure 5
Continuous Instream Dissolved Oxygen Daily Mean (Reporting Year 2018/2019)

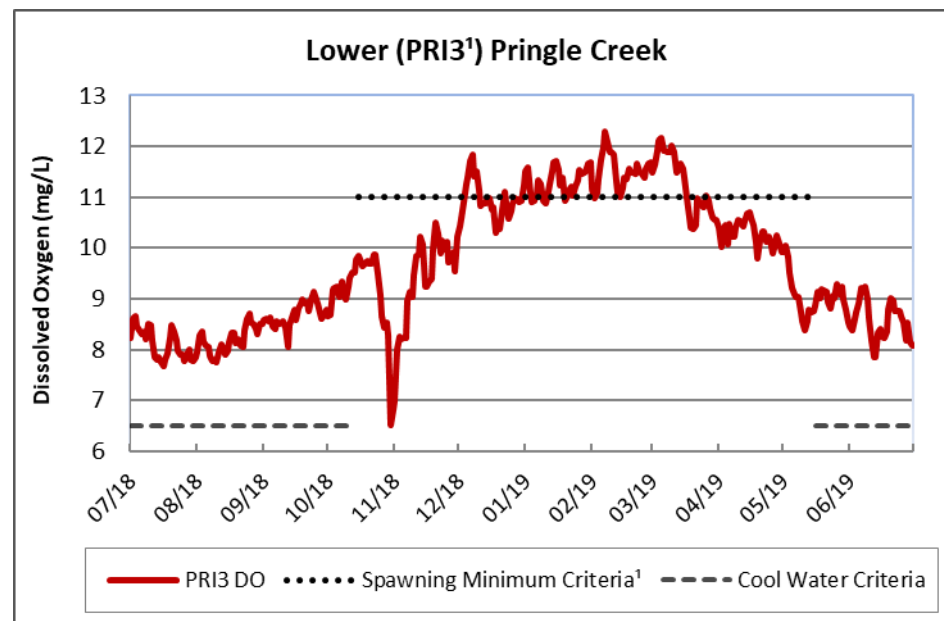
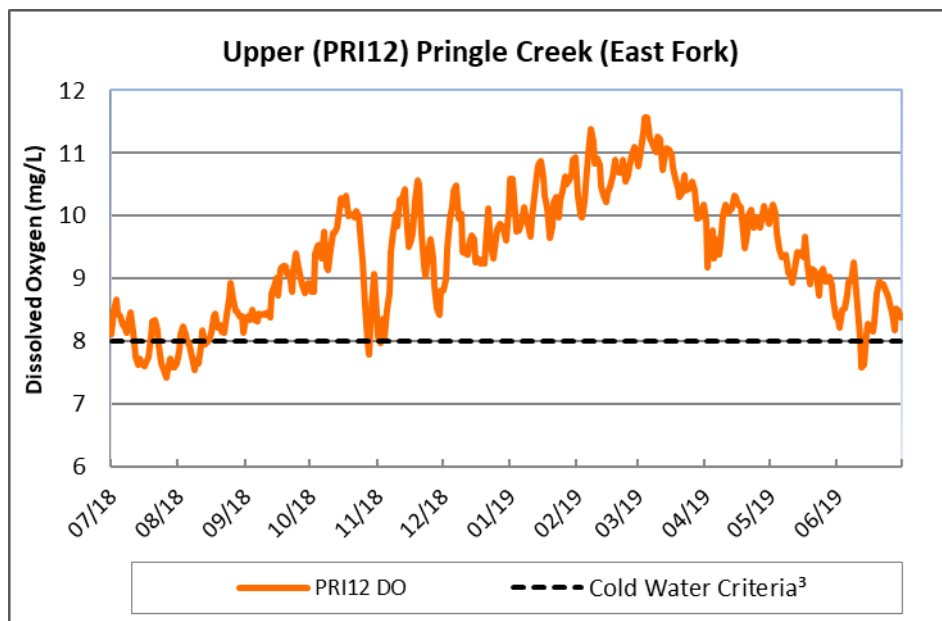
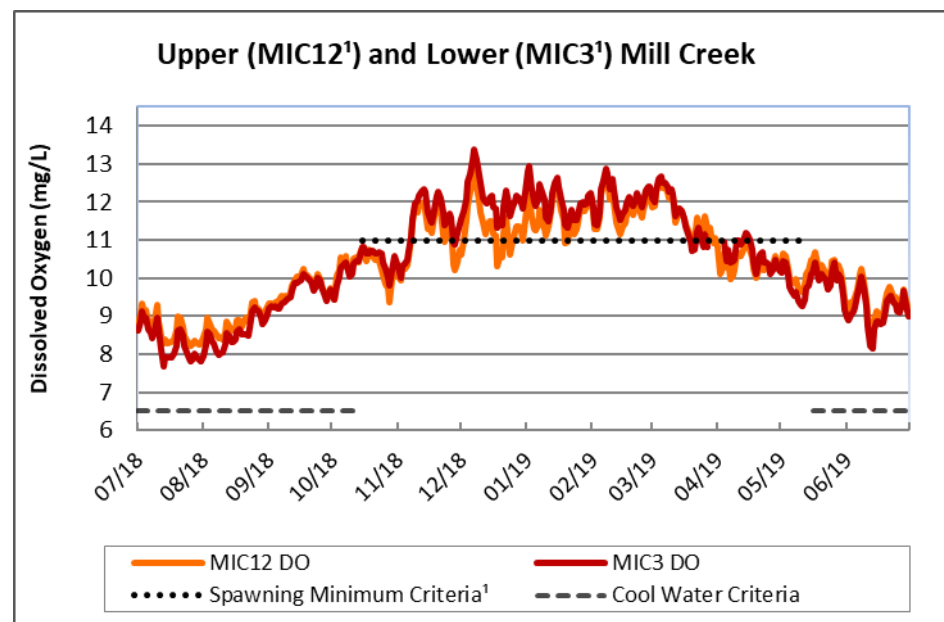
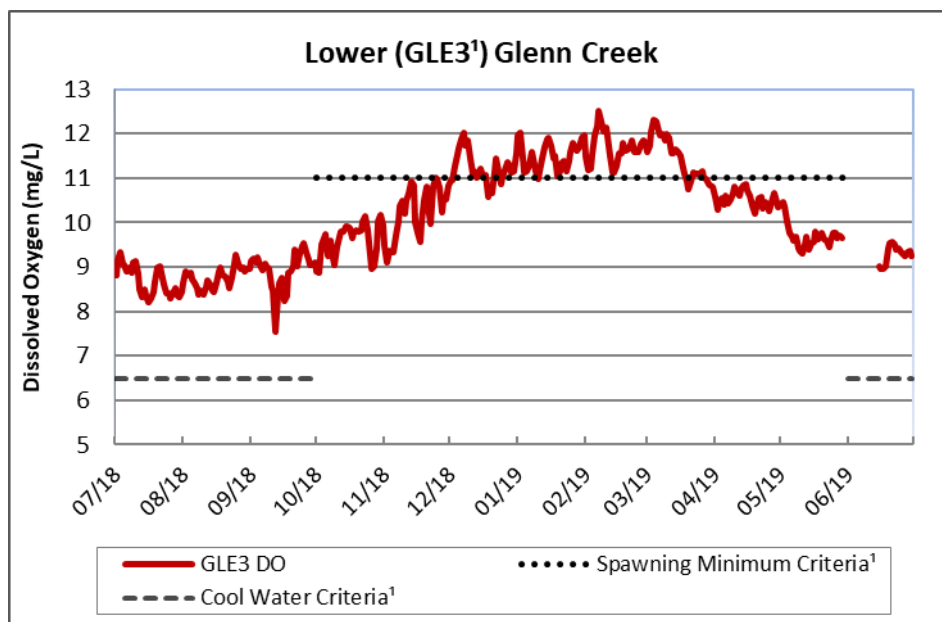


Presented DO data consists of A and B grade data with greater than or equal to 80% of data points collected per day. DO Criteria as defined in OAR 340-041-0016 and OAR 340-0340, Tables 340 A & B.

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¹ Oregon's 2012 Integrated Report Section 303(d) listed.

Figure 5
Continuous Instream Dissolved Oxygen Daily Mean (Reporting Year 2018/2019)

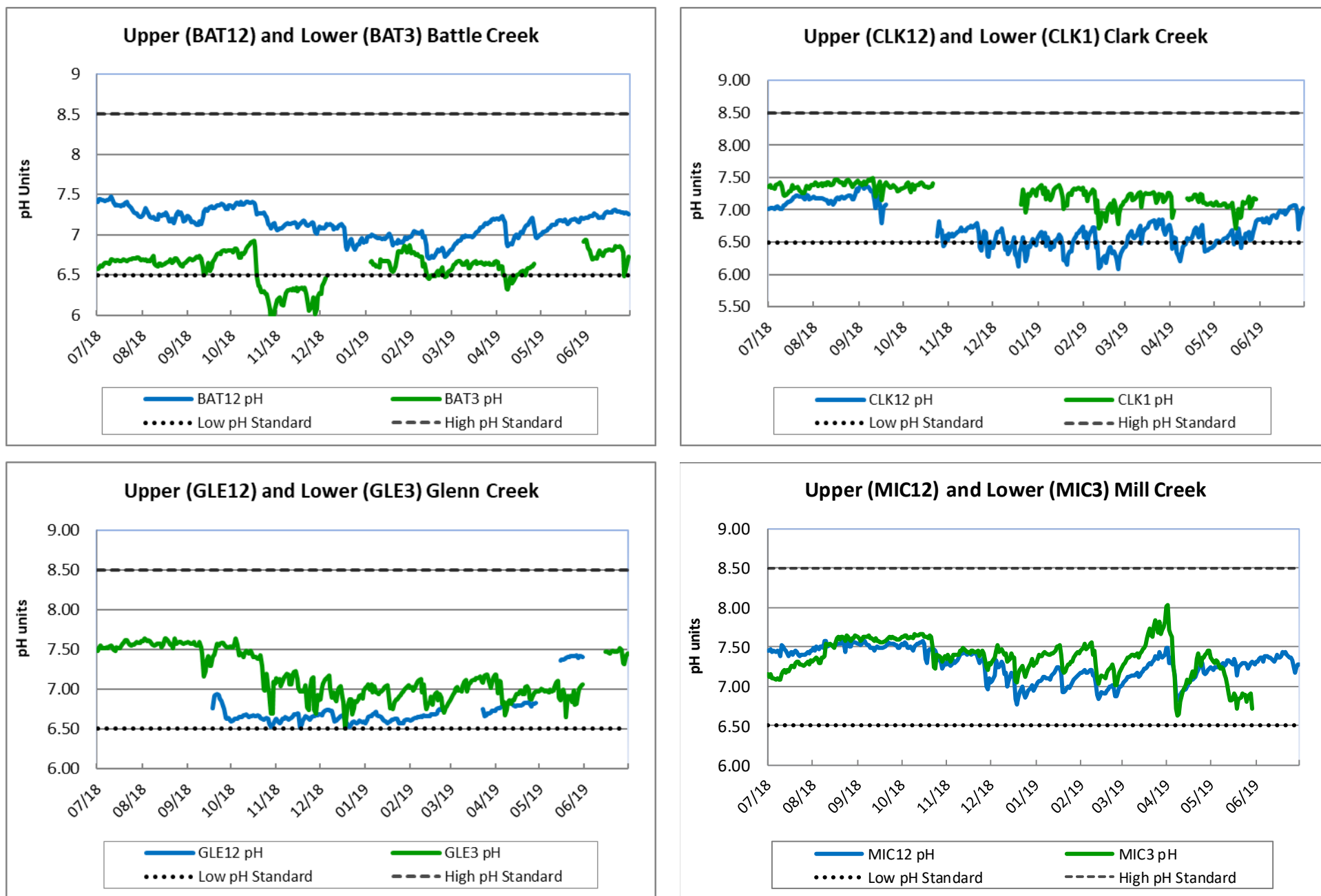


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¹ Oregon's 2012 Integrated Report Section 303(d) listed.

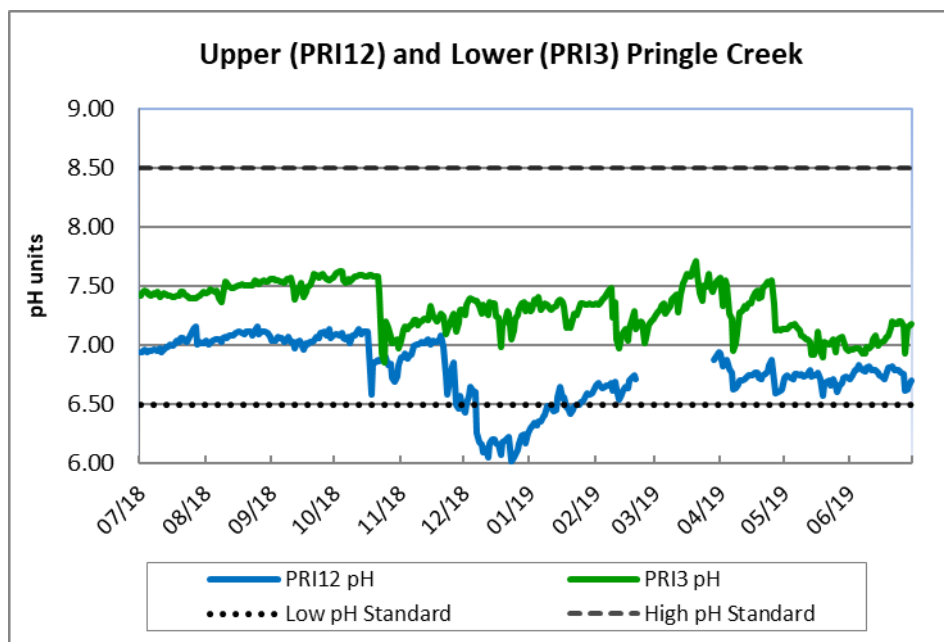
Figure 6
Continuous Instream pH Daily Mean (Reporting Year 2018/2019)



Presented pH data consist of A and B grade data with greater than or equal to 80% of data points collected per day.

As defined in OAR 341-041-0035 Water Quality Standards for the Willamette Basin, pH should not fall outside the ranges of 6.5 to 8.5 pH units.

Figure 6
Continuous Instream pH Daily Mean (Reporting Year 2018/2019)

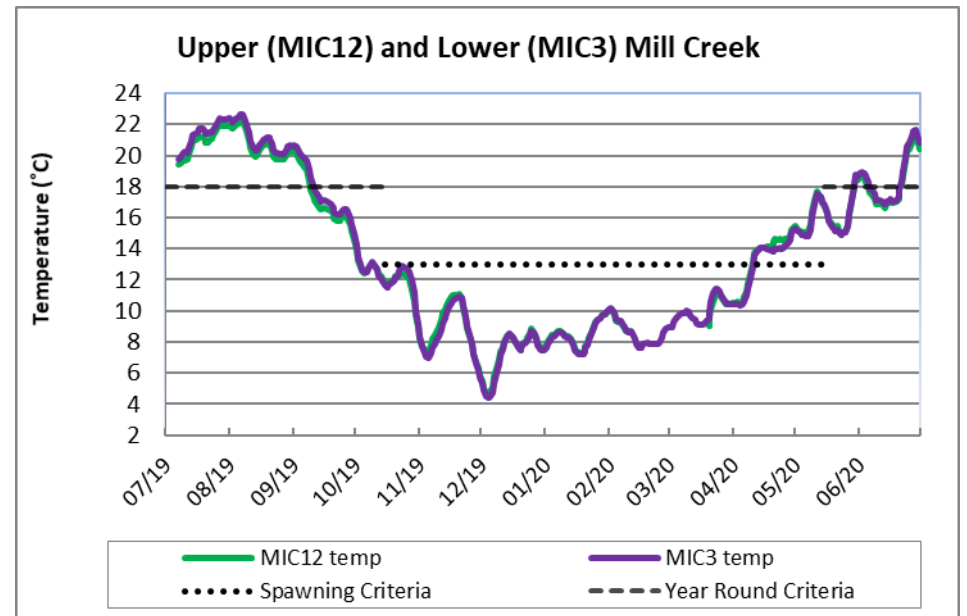
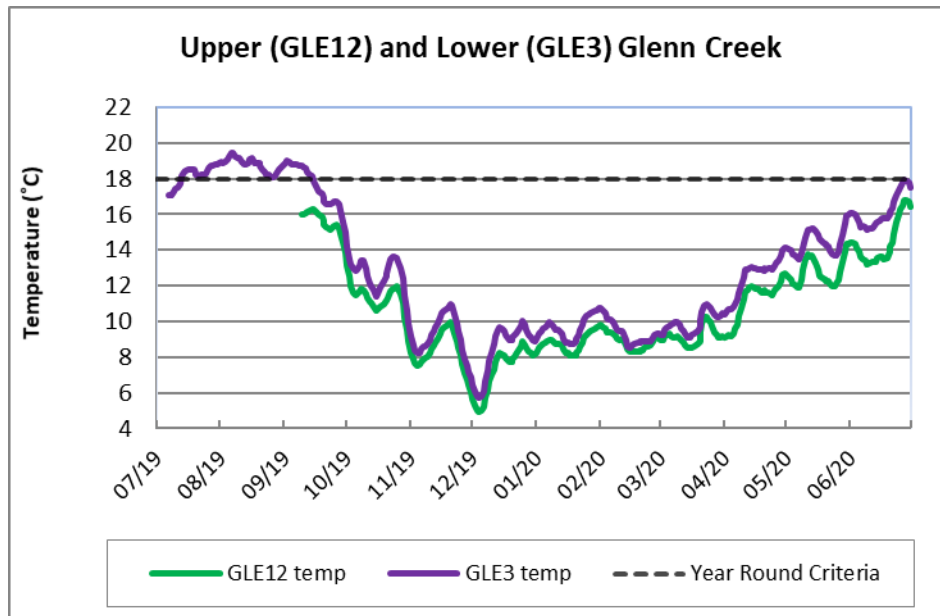
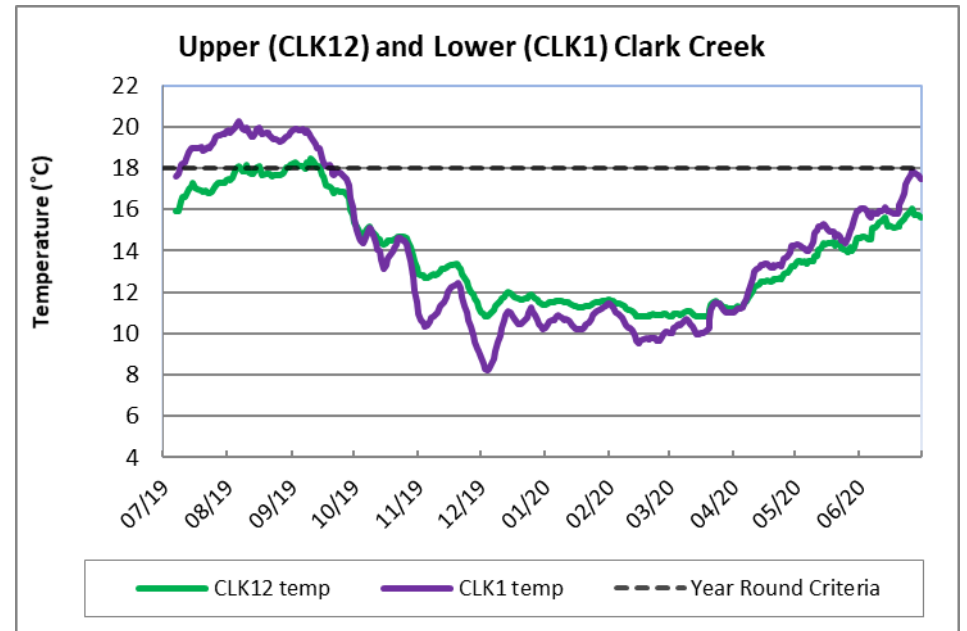
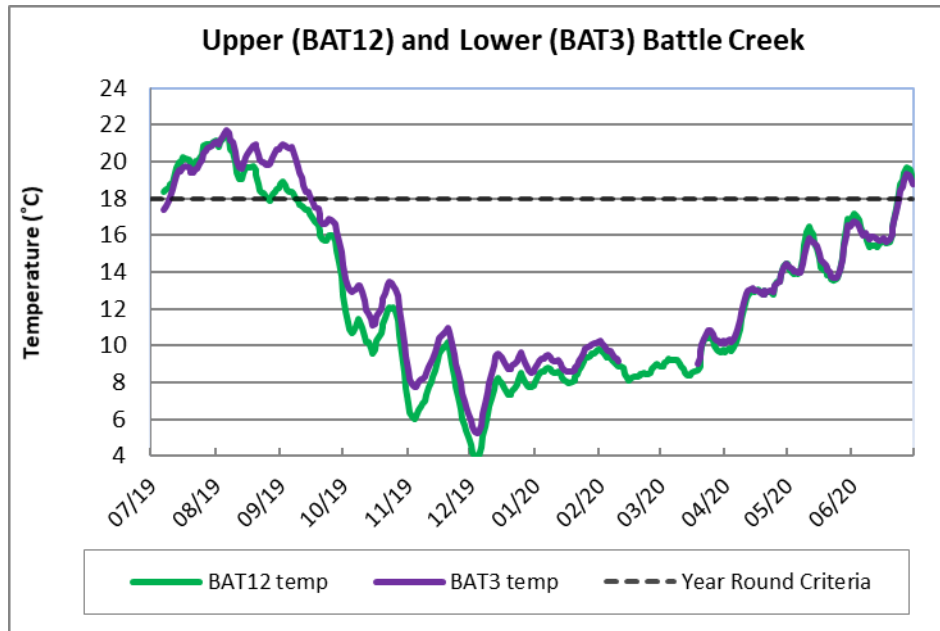


Presented pH data consist of A and B grade data with greater than or equal to 80% of data points collected per day.

As defined in OAR 341-041-0035 Water Quality Standards for the Willamette Basin, pH should not fall outside the ranges of 6.5 to 8.5 pH units.

Figure 7

Continuous Instream Temperature 7-Day Moving Average Maximum (Reporting Year 2019/2020)

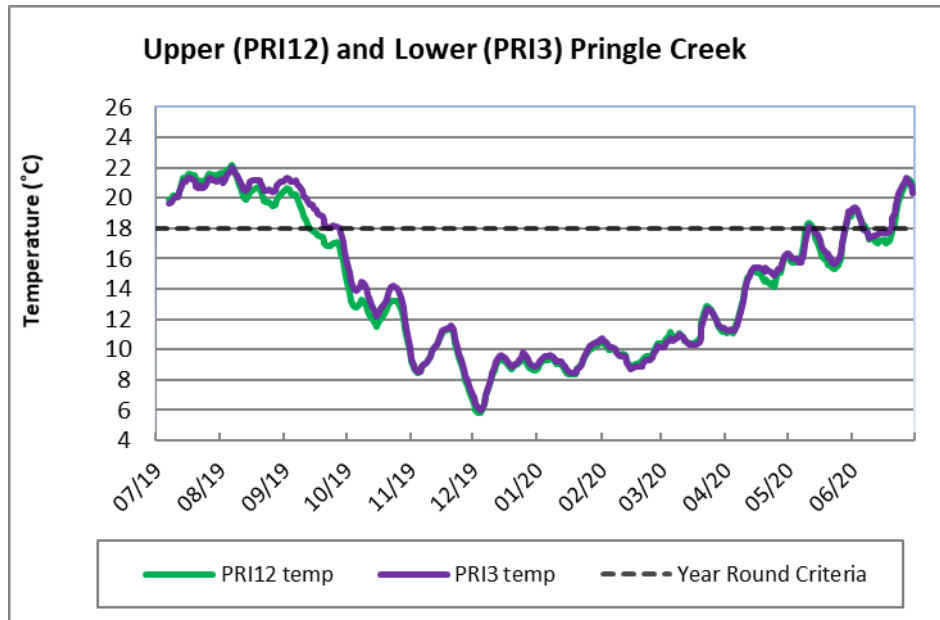


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- Year Round Minimum Criteria may not exceed 7-day average maximum of 18 degrees C.

Figure 7

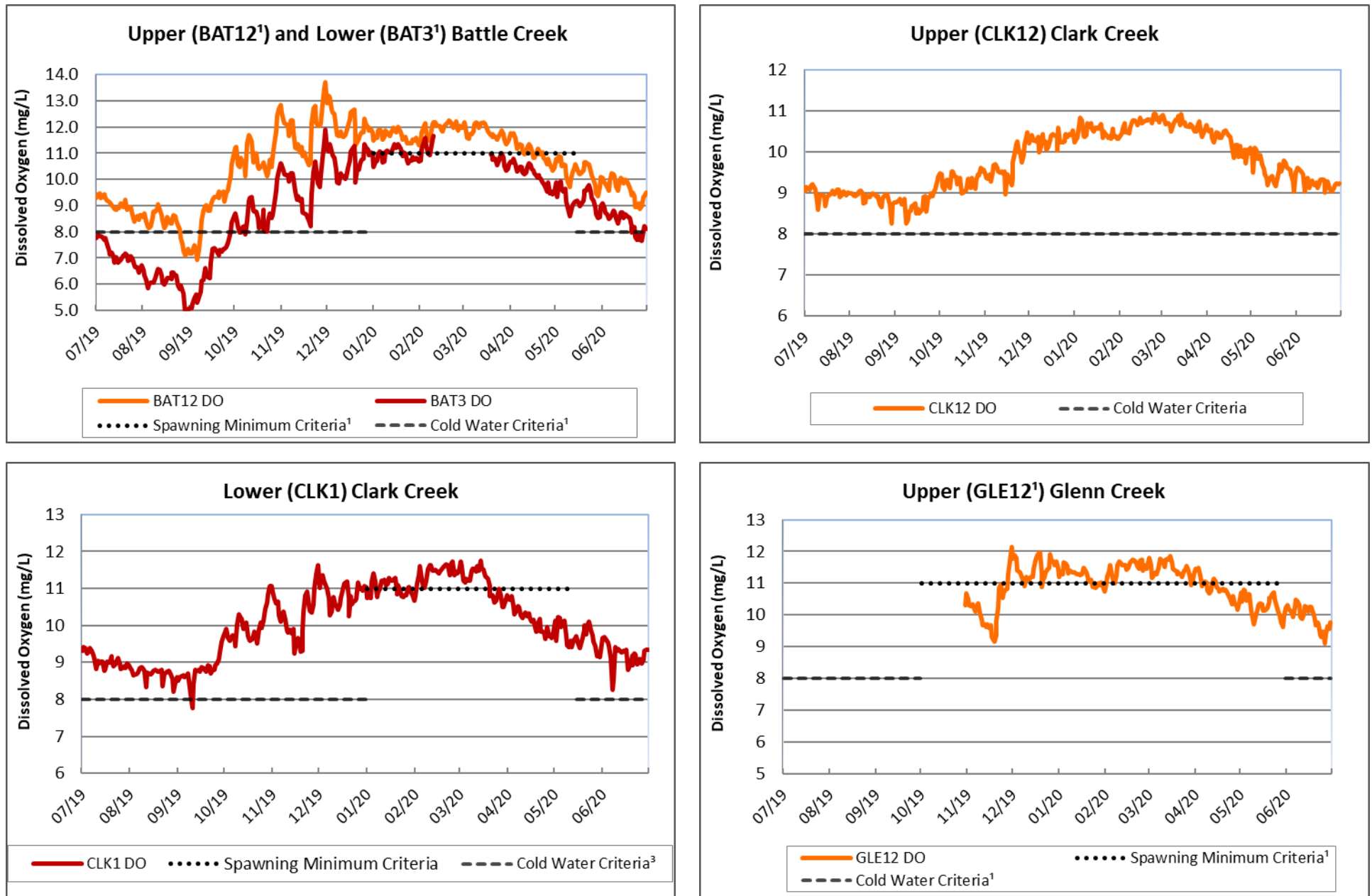
Continuous Instream Temperature 7-Day Moving Average Maximum (Reporting Year 2019/2020)



Presented temperature data consists of A grade data with greater than 80% of data points collected per day. Temperature criteria is defined in OAR 340--04100028 and OAR 340-0340, Tables 340A & B.

- Spawning Minimum Criteria for applicable streams may not exceed 7-day average maximum of 13 degrees C.
- Year Round Minimum Criteria may not exceed 7-day average maximum of 18 degrees C.

Figure 8
Continuous Instream Dissolved Oxygen Daily Mean (Reporting Year 2019/2020)

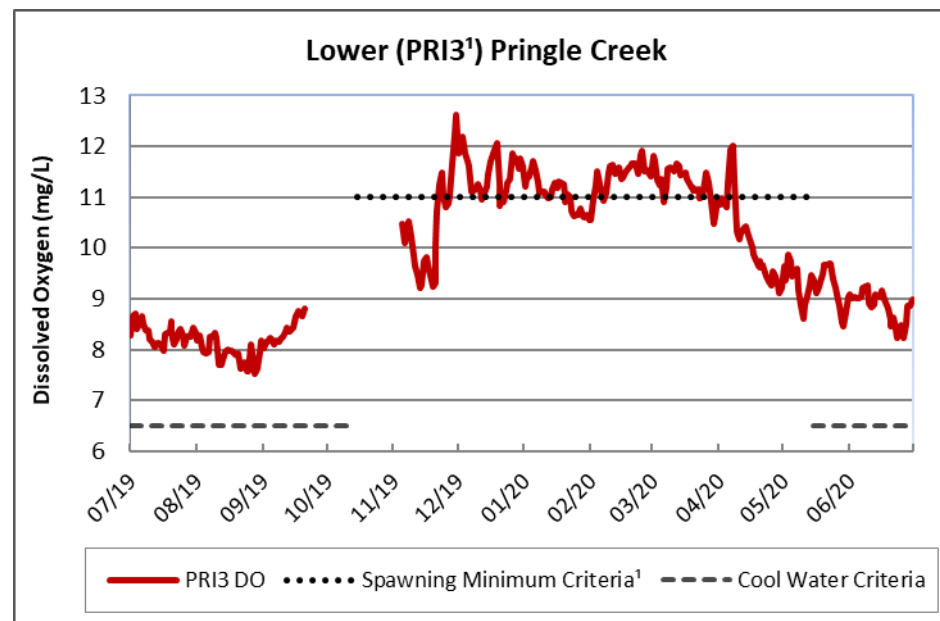
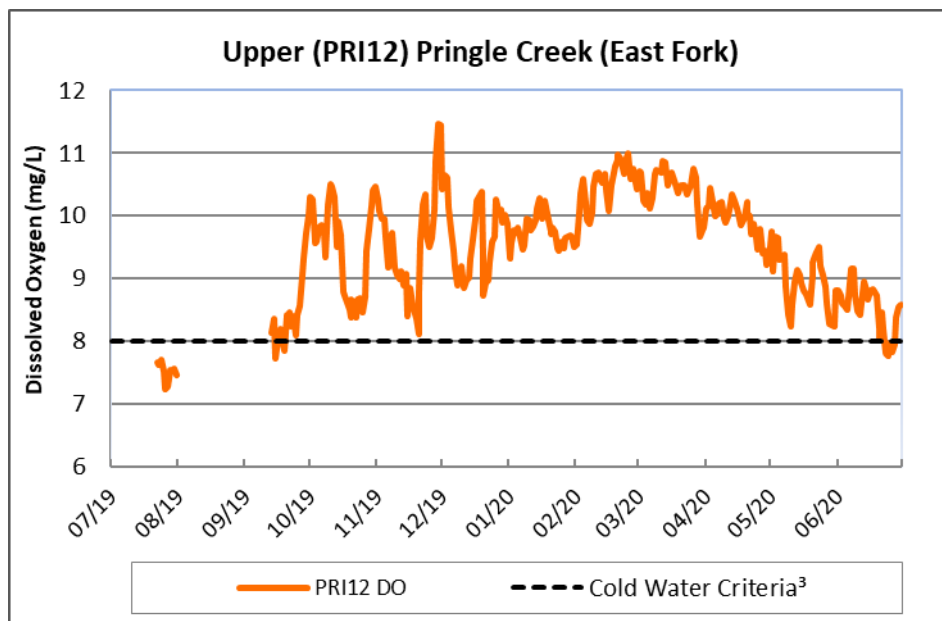
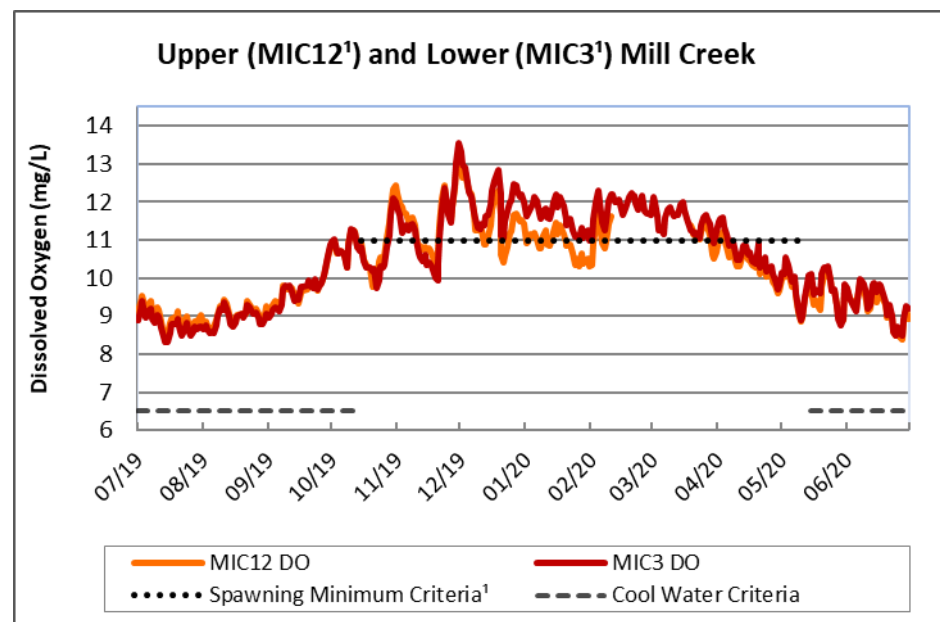
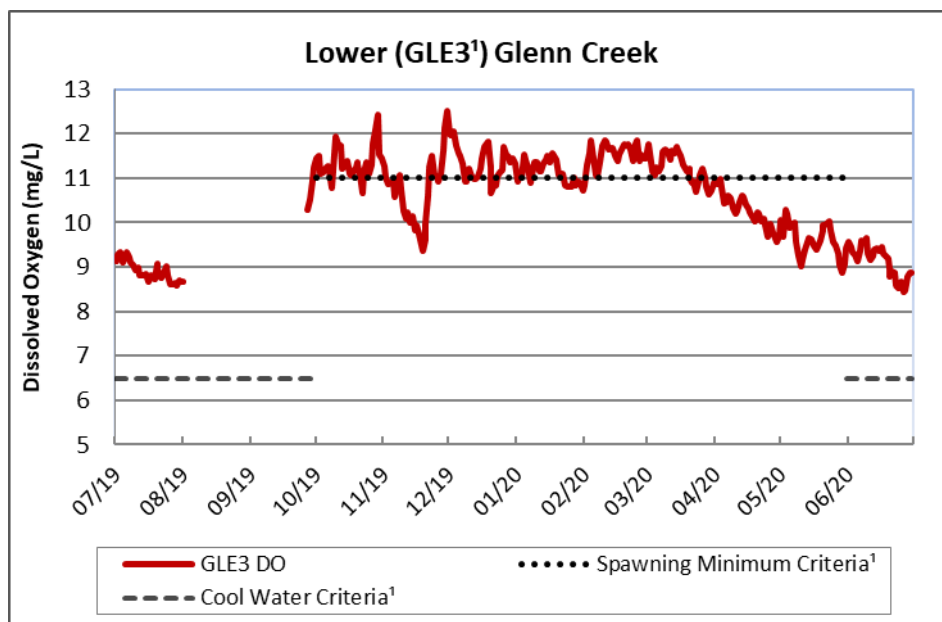


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¹ Oregon's 2012 Integrated Report Section 303(d) listed.

Figure 8
Continuous Instream Dissolved Oxygen Daily Mean (Reporting Year 2019/2020)

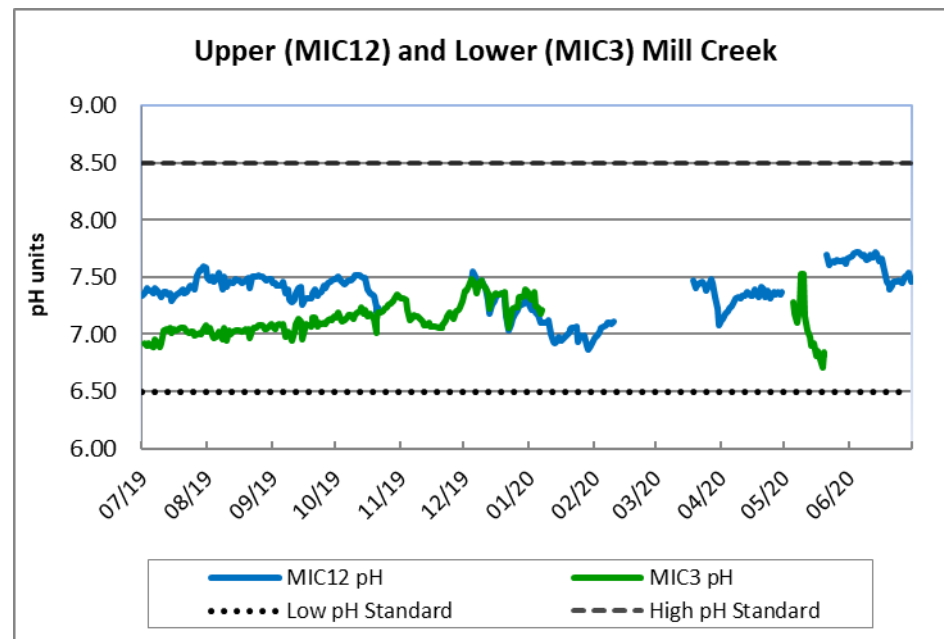
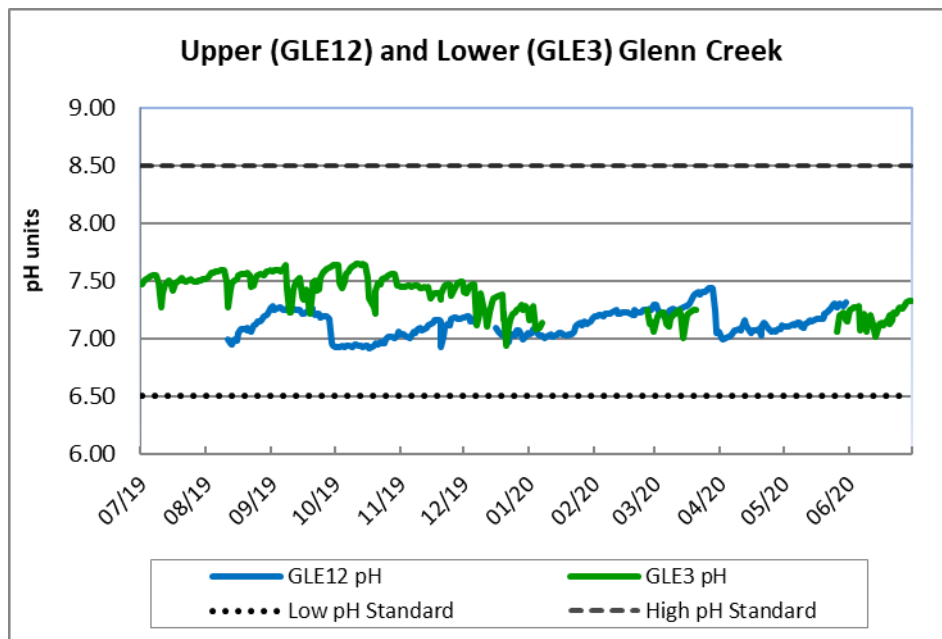
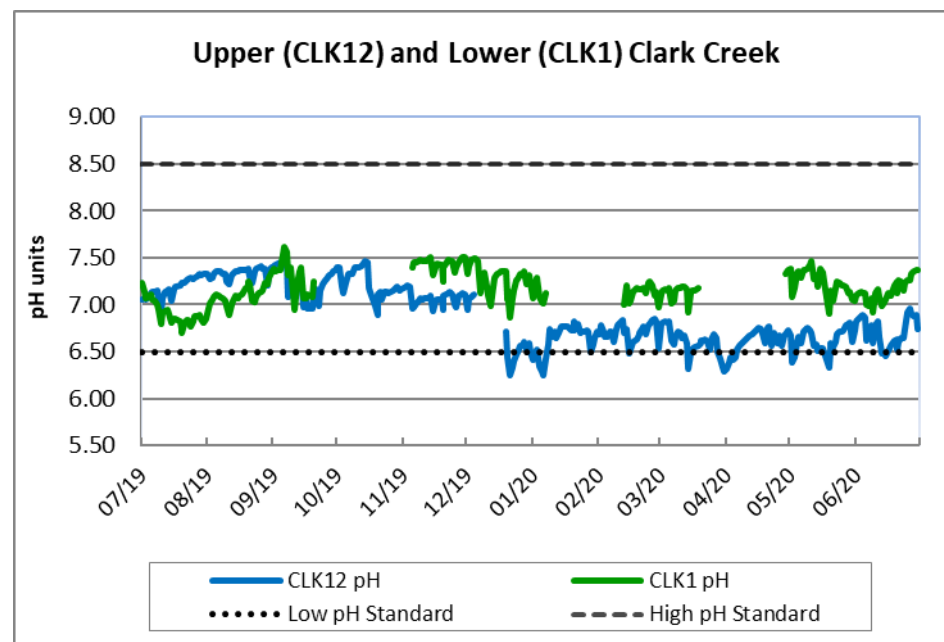
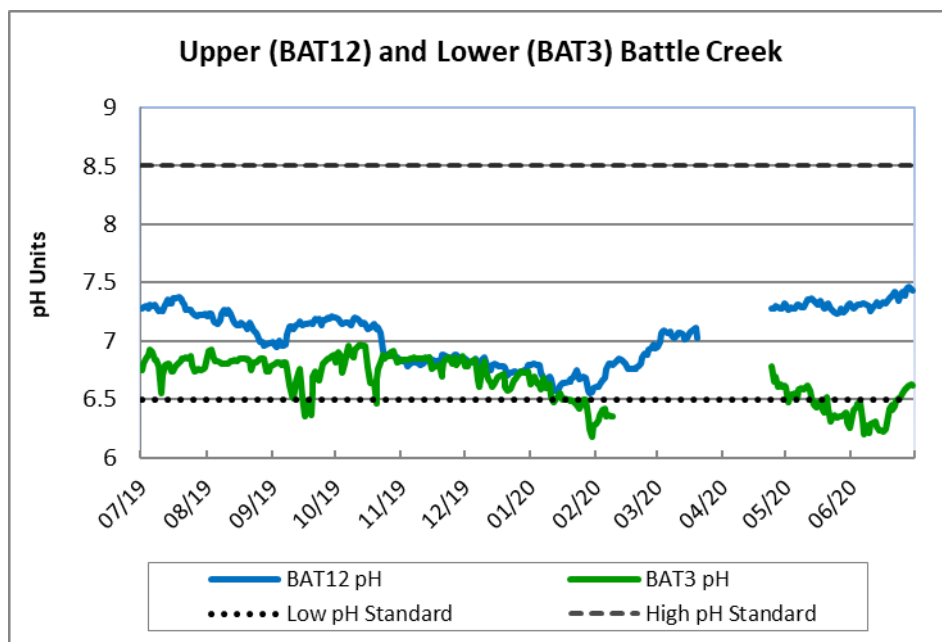


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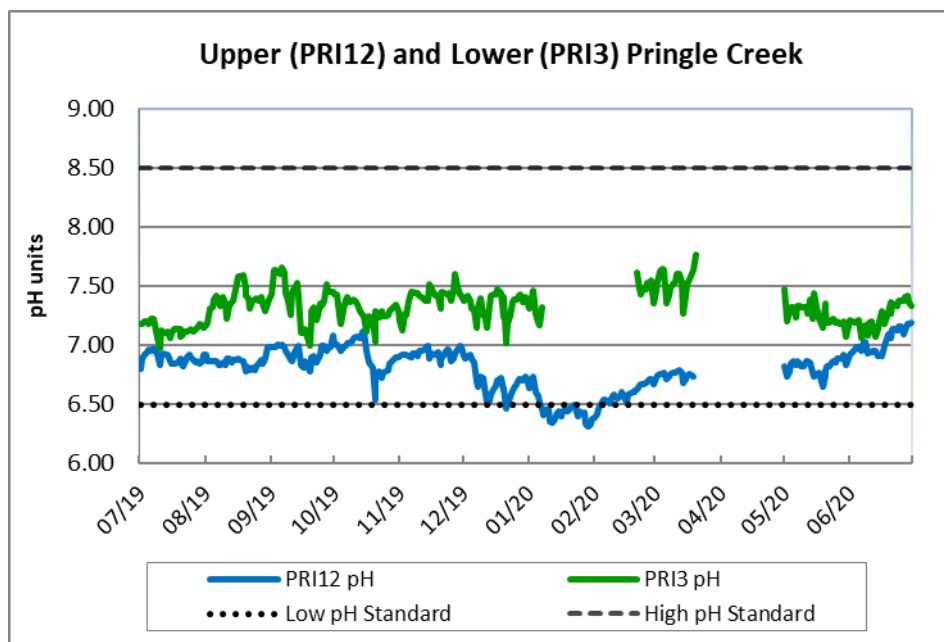
¹ Oregon's 2012 Integrated Report Section 303(d) listed.

Figure 10
Continuous Instream pH Daily Mean (Reporting Year 2019/2020)



Presented pH data consist of A and B grade data with greater than or equal to 80% of data points collected per day.

Figure 10
Continuous Instream pH Daily Mean (Reporting Year 2019/2020)



Presented pH data consist of A and B grade data with greater than or equal to 80% of data points collected per day.

Figure 11
Revised Statistics for RY 2016-17, 2018-19 and 2019-20

Date	Parameter	BAT3	BAT12	CLK1	CLK12	GLE3	GLE12	MIC3	MIC12	PRI3	PRI12
Jul 2016	Specific Conductivity (µS/cm)	57.72	53.65	97.00	72.00	118.00	79.00	58.27	57.26	97.93	61.45
Aug 2016	Specific Conductivity (µS/cm)	62.33	59.88	97.00	73.00	122.00	113.56	53.33	54.13	97.65	60.41
Sep 2016	Specific Conductivity (µS/cm)	61.32	62.36	106.77	75.00	121.00	104.07	55.02	52.59	97.77	62.27
Oct 2016	Specific Conductivity (µS/cm)	54.63	55.32	106.04	79.00	94.00	87.00	105.61	107.23	90.90	92.40
Nov 2016	Specific Conductivity (µS/cm)	48.91	47.52	105.10	78.00	90.00	65.00	100.33	95.00	98.36	95.44
Dec 2016	Specific Conductivity (µS/cm)	45.69	44.77	104.00	81.00	91.00	62.00	93.06	91.96	99.97	90.04
Jan 2017	Specific Conductivity (µS/cm)	46.96	43.67	102.00	76.00	86.00	58.16	87.79	85.11	98.00	86.70
Feb 2017	Specific Conductivity (µS/cm)	49.87	42.44	93.00	68.00	78.00	54.00	79.35	75.72	89.91	78.96
Mar 2017	Specific Conductivity (µS/cm)	44.13	41.52	79.00	76.00	82.00	57.00	80.25	78.71	89.02	79.02
Apr 2017	Specific Conductivity (µS/cm)	44.93	41.79	70.00	75.00	88.00	56.00	83.65	82.95	90.01	82.76
May 2017	Specific Conductivity (µS/cm)	47.31	43.97	81.00	75.00	93.00	61.00	76.35	73.17	98.74	83.43
Jun 2017	Specific Conductivity (µS/cm)	52.04	46.32	91.00	74.00	107.00	68.00	63.92	59.20	99.59	NA
Jul 2016	Dissolved Oxygen (mg/L)	7.25	9.14	9.19	8.87	8.73	9.29	8.70	8.79	8.00	8.12
Aug 2016	Dissolved Oxygen (mg/L)	5.55	8.01	8.73	8.81	8.53	6.92	8.85	9.04	7.70	8.18
Sep 2016	Dissolved Oxygen (mg/L)	6.47	8.97	9.12	9.03	8.93	8.18	9.80	9.68	8.84	8.86
Oct 2016	Dissolved Oxygen (mg/L)	8.90	10.39	9.92	9.20	9.61	9.80	10.13	9.45	9.14	8.12
Nov 2016	Dissolved Oxygen (mg/L)	9.60	10.81	9.99	9.41	10.17	10.29	10.64	9.95	9.33	8.66
Dec 2016	Dissolved Oxygen (mg/L)	10.83	11.82	11.04	10.37	11.42	11.52	12.24	11.41	11.15	10.02
Jan 2017	Dissolved Oxygen (mg/L)	11.48	12.27	11.47	10.74	11.85	12.01	12.80	12.07	11.72	10.80
Feb 2017	Dissolved Oxygen (mg/L)	11.10	11.93	11.19	10.76	11.37	11.57	11.94	11.20	11.21	10.36
Mar 2017	Dissolved Oxygen (mg/L)	10.79	11.60	10.93	10.74	11.04	11.24	11.36	10.61	10.79	10.02
Apr 2017	Dissolved Oxygen (mg/L)	10.39	11.23	10.41	10.71	10.67	11.00	10.96	10.31	10.43	9.73
May 2017	Dissolved Oxygen (mg/L)	9.81	10.58	9.58	10.33	9.97	10.54	10.00	9.71	9.35	9.16
Jun 2017	Dissolved Oxygen (mg/L)	8.88	9.86	9.27	9.34	9.28	10.06	9.24	9.27	8.57	8.53
Jul 2016	pH (S.U)	6.83	7.39	7.38	6.73	7.45	7.12	7.28	7.58	7.43	7.15
Aug 2016	pH (S.U)	6.80	7.18	7.44	6.79	7.47	6.76	7.22	7.70	7.44	7.13
Sep 2016	pH (S.U)	6.83	7.31	7.42	6.80	7.40	6.91	7.36	7.70	7.42	7.16
Oct 2016	pH (S.U)	6.60	7.24	7.12	6.49	6.80	7.06	7.19	7.18	7.35	6.73
Nov 2016	pH (S.U)	6.58	6.91	7.18	6.57	6.98	6.93	7.26	7.22	7.27	6.88
Dec 2016	pH (S.U)	6.57	6.94	7.20	6.50	6.90	7.19	7.13	7.31	7.40	6.93
Jan 2017	pH (S.U)	6.87	6.96	7.15	6.44	6.94	7.24	7.09	7.32	7.33	7.01
Feb 2017	pH (S.U)	6.73	6.77	6.86	6.24	6.75	7.18	6.91	7.02	7.25	7.04
Mar 2017	pH (S.U)	6.87	6.87	6.72	6.24	6.85	7.01	7.03	7.21	7.17	6.71
Apr 2017	pH (S.U)	6.94	6.87	6.58	6.32	7.05	7.10	7.50	7.24	7.38	6.69
May 2017	pH (S.U)	6.53	7.04	6.44	6.50	7.22	7.16	7.53	7.17	7.31	6.73
Jun 2017	pH (S.U)	6.50	7.32	6.92	6.61	7.37	7.14	7.54	7.27	7.37	6.96

Presented pH data consist of A and B grade data with greater than or equal to 80% of data points collected per day.

Figure 11
Revised Statistics for RY 2016-17, 2018-19 and 2019-20

Date	Parameter	BAT3	BAT12	CLK1	CLK12	GLE3	GLE12	MIC3	MIC12	PRI3	PRI12
Jul 2016	Temperature (°C)	17.88	16.77	17.39	16.14	16.93	15.64	19.87	19.33	19.39	18.80
Aug 2016	Temperature (°C)	18.66	16.57	18.19	16.97	17.54	15.65	19.48	18.44	19.99	18.51
Sep 2016	Temperature (°C)	15.67	13.19	16.31	16.02	15.19	13.74	15.60	14.95	17.18	15.29
Oct 2016	Temperature (°C)	13.34	11.95	14.60	14.95	13.61	12.59	13.19	12.96	14.22	13.47
Nov 2016	Temperature (°C)	11.91	11.04	13.47	14.07	12.30	11.55	11.90	11.72	12.72	12.15
Dec 2016	Temperature (°C)	8.35	7.60	9.58	11.49	8.14	7.59	6.76	6.98	8.11	8.13
Jan 2017	Temperature (°C)	6.69	5.98	8.13	9.93	6.75	6.18	5.20	5.35	6.63	6.41
Feb 2017	Temperature (°C)	7.86	7.21	9.28	10.06	8.20	7.66	7.36	7.39	8.41	8.00
Mar 2017	Temperature (°C)	9.16	8.40	10.40	10.61	9.73	8.97	9.53	9.41	10.18	9.54
Apr 2017	Temperature (°C)	10.32	9.54	11.29	11.23	10.84	9.79	11.01	10.84	11.61	10.69
May 2017	Temperature (°C)	12.75	12.07	13.40	12.47	13.41	11.72	14.85	14.28	15.14	13.47
Jun 2017	Temperature (°C)	15.25	14.78	15.25	14.20	15.25	13.50	17.27	16.60	17.41	16.30
Jul 2016	Turbidity (NTU)	14.10	3.10	2.30	1.80	4.40	7.10	2.78	4.31	2.23	3.30
Aug 2016	Turbidity (NTU)	15.79	0.48	2.50	2.10	4.30	5.76	2.36	3.14	2.58	3.08
Sep 2016	Turbidity (NTU)	22.89	0.27	1.90	2.80	3.90	4.50	2.76	3.54	2.46	4.20
Oct 2016	Turbidity (NTU)	14.66	5.36	2.20	3.20	10.40	7.13	7.87	9.76	10.57	10.58
Nov 2016	Turbidity (NTU)	8.28	4.68	3.10	2.20	6.70	10.90	7.92	6.59	9.86	5.47
Dec 2016	Turbidity (NTU)	8.01	4.10	3.50	2.00	7.00	10.00	6.43	6.17	7.78	5.41
Jan 2017	Turbidity (NTU)	8.36	2.69	6.60	1.70	8.20	9.10	6.11	5.87	6.93	6.43
Feb 2017	Turbidity (NTU)	18.99	10.40	10.80	5.40	14.90	19.15	14.65	16.94	10.14	11.58
Mar 2017	Turbidity (NTU)	9.35	4.47	7.00	2.50	11.20	10.20	12.70	12.25	8.19	8.10
Apr 2017	Turbidity (NTU)	7.08	3.21	3.90	1.40	7.70	9.10	6.96	7.20	5.13	5.15
May 2017	Turbidity (NTU)	6.10	3.67	2.20	1.10	5.90	7.60	4.63	5.22	3.06	4.39
Jun 2017	Turbidity (NTU)	6.93	4.44	2.40	1.50	5.90	6.80	4.37	5.38	3.38	4.76
Jul 2018	Specific Conductivity (µS/cm)	60.37	53.34	95.72	74.50	125.00	80.00	52.56	49.60	95.82	66.62
Aug 2018	Specific Conductivity (µS/cm)	63.67	59.82	96.98	75.54	126.00	94.94	48.19	47.31	96.44	63.37
Sep 2018	Specific Conductivity (µS/cm)	62.50	59.05	96.27	74.35	125.00	109.75	47.01	45.10	96.72	61.34
Oct 2018	Specific Conductivity (µS/cm)	60.32	56.66	92.93	70.55	119.00	116.00	53.24	49.53	96.16	65.03
Nov 2018	Specific Conductivity (µS/cm)	57.00	51.21	89.43	71.83	120.00	80.00	64.07	58.01	103.65	127.56
Dec 2018	Specific Conductivity (µS/cm)	51.31	48.49	93.35	73.44	101.00	73.00	117.80	115.54	96.44	105.92
Jan 2019	Specific Conductivity (µS/cm)	47.24	48.90	90.86	73.24	94.00	67.55	111.31	106.31	100.26	93.73
Feb 2019	Specific Conductivity (µS/cm)	47.62	51.11	92.96	76.64	93.00	63.00	96.30	91.96	92.43	82.93
Mar 2019	Specific Conductivity (µS/cm)	46.27	46.82	95.61	77.21	88.00	61.00	94.80	88.44	99.08	86.03
Apr 2019	Specific Conductivity (µS/cm)	45.11	47.46	94.97	76.47	78.00	62.00	90.16	86.02	95.36	81.71
May 2019	Specific Conductivity (µS/cm)	47.97	46.41	97.19	75.87	99.00	64.00	59.38	55.89	98.16	78.92
Jun 2019	Specific Conductivity (µS/cm)	51.68	45.30	99.33	74.87	113.67	64.84	57.02	52.62	101.46	73.68

Presented pH data consist of A and B grade data with greater than or equal to 80% of data points collected per day.

Figure 11
Revised Statistics for RY 2016-17, 2018-19 and 2019-20

Date	Parameter	BAT3	BAT12	CLK1	CLK12	GLE3	GLE12	MIC3	MIC12	PRI3	PRI12
Jul 2018	Dissolved Oxygen (mg/L)	7.24	8.86	9.31	9.23	8.68	9.57	8.25	8.61	8.11	7.99
Aug 2018	Dissolved Oxygen (mg/L)	7.00	8.00	9.21	9.30	8.76	9.93	8.51	8.81	8.20	8.17
Sep 2018	Dissolved Oxygen (mg/L)	7.48	9.24	9.31	9.48	9.00	10.23	9.65	9.72	8.68	8.79
Oct 2018	Dissolved Oxygen (mg/L)	8.15	10.42	9.68	9.62	9.67	10.38	10.42	10.21	9.29	9.49
Nov 2018	Dissolved Oxygen (mg/L)	9.55	11.65	10.69	9.90	10.32	10.50	11.54	11.14	9.63	9.40
Dec 2018	Dissolved Oxygen (mg/L)	10.45	11.95	10.72	9.93	11.19	11.38	12.04	11.27	10.90	9.62
Jan 2019	Dissolved Oxygen (mg/L)	10.99	11.85	10.96	10.15	11.50	11.44	11.99	11.61	11.28	10.26
Feb 2019	Dissolved Oxygen (mg/L)	11.19	11.96	11.25	10.40	11.67	11.69	12.02	11.82	11.50	10.63
Mar 2019	Dissolved Oxygen (mg/L)	11.13	11.80	11.09	10.46	11.41	11.54	11.53	11.81	11.44	10.75
Apr 2019	Dissolved Oxygen (mg/L)	10.36	11.05	10.56	10.08	10.54	10.83	10.71	10.42	10.29	9.67
May 2019	Dissolved Oxygen (mg/L)	9.50	10.23	9.83	9.55	9.66	10.22	9.87	10.13	9.02	9.16
Jun 2019	Dissolved Oxygen (mg/L)	8.25	9.60	9.45	9.32	9.27	9.56	9.15	9.39	8.56	8.46
Jul 2018	pH (S.U)	6.65	7.39	7.33	7.13	7.54	7.12	7.19	7.36	7.42	6.97
Aug 2018	pH (S.U)	6.65	7.22	7.41	7.18	7.58	6.94	7.52	7.42	7.49	7.06
Sep 2018	pH (S.U)	6.72	7.30	7.38	7.12	7.54	6.77	7.58	7.44	7.53	7.03
Oct 2018	pH (S.U)	6.73	7.33	7.40	6.33	7.41	6.68	7.58	7.41	7.55	7.01
Nov 2018	pH (S.U)	6.27	7.12	7.27	6.66	7.06	6.64	7.40	7.29	7.21	6.95
Dec 2018	pH (S.U)	6.48	7.06	7.14	6.50	6.93	6.64	7.30	7.04	7.31	6.20
Jan 2019	pH (S.U)	6.66	6.95	7.31	6.56	6.98	6.62	7.36	7.09	7.31	6.48
Feb 2019	pH (S.U)	6.55	6.81	7.08	6.38	6.91	6.62	7.22	6.99	7.21	6.65
Mar 2019	pH (S.U)	6.64	7.02	7.21	6.70	7.09	6.67	7.43	7.18	7.39	7.19
Apr 2019	pH (S.U)	6.55	7.05	7.15	6.48	6.93	6.78	7.11	7.11	7.34	6.73
May 2019	pH (S.U)	7.01	7.15	7.09	6.60	6.97	6.81	6.90	7.21	7.04	6.69
Jun 2019	pH (S.U)	6.78	7.24	NA	6.93	7.37	7.35	NA	7.27	7.04	6.75
Jul 2018	Temperature (°C)	18.83	17.95	17.99	16.21	17.73	14.96	21.03	20.24	20.46	19.69
Aug 2018	Temperature (°C)	18.54	16.89	18.39	16.81	17.46	13.44	19.93	19.38	19.88	18.97
Sep 2018	Temperature (°C)	15.45	13.26	16.23	15.76	14.79	11.54	15.23	14.73	16.78	15.38
Oct 2018	Temperature (°C)	11.94	9.95	13.85	14.27	12.04	10.60	12.33	12.24	13.38	12.34
Nov 2018	Temperature (°C)	9.01	6.96	10.82	12.38	9.07	8.13	8.48	8.71	9.49	8.98
Dec 2018	Temperature (°C)	8.94	7.63	10.29	11.75	9.07	7.57	7.96	8.02	9.00	8.71
Jan 2019	Temperature (°C)	8.08	7.62	9.42	10.85	8.16	7.59	7.20	7.34	8.21	8.04
Feb 2019	Temperature (°C)	7.21	6.94	8.53	9.98	7.31	6.78	6.36	6.38	7.45	7.20
Mar 2019	Temperature (°C)	8.07	7.54	9.42	10.08	8.74	7.38	8.77	8.49	9.42	8.17
Apr 2019	Temperature (°C)	10.85	10.14	11.96	11.46	11.40	9.96	12.43	11.87	12.40	11.15
May 2019	Temperature (°C)	15.03	13.07	13.84	13.08	13.79	11.99	14.76	14.09	15.69	14.10
Jun 2019	Temperature (°C)	16.16	15.62	15.67	14.44	15.33	14.57	18.26	17.75	17.77	16.92

Presented pH data consist of A and B grade data with greater than or equal to 80% of data points collected per day.

Figure 11
Revised Statistics for RY 2016-17, 2018-19 and 2019-20

Date	Parameter	BAT3	BAT12	CLK1	CLK12	GLE3	GLE12	MIC3	MIC12	PRI3	PRI12
Jul 2018	Turbidity (NTU)	8.47	3.62	3.30	5.51	8.50	7.40	4.49	9.00	2.12	3.14
Aug 2018	Turbidity (NTU)	9.84	2.18	3.79	5.31	8.80	8.43	3.35	5.66	2.17	2.62
Sep 2018	Turbidity (NTU)	9.72	2.69	3.42	3.21	8.40	9.27	3.30	5.12	4.02	2.44
Oct 2018	Turbidity (NTU)	11.25	3.21	3.88	3.30	8.10	9.69	2.77	5.16	4.67	2.48
Nov 2018	Turbidity (NTU)	11.03	3.75	2.10	2.46	4.60	2.70	2.77	5.32	7.02	3.49
Dec 2018	Turbidity (NTU)	7.18	4.91	3.12	2.70	8.40	7.50	9.36	10.76	6.52	6.25
Jan 2019	Turbidity (NTU)	5.81	4.28	2.76	2.20	6.60	7.90	11.07	5.51	4.86	4.92
Feb 2019	Turbidity (NTU)	11.20	4.53	5.25	3.08	10.00	11.80	24.95	10.54	9.07	10.76
Mar 2019	Turbidity (NTU)	5.09	3.68	2.78	1.86	6.50	8.28	4.88	4.73	3.88	3.46
Apr 2019	Turbidity (NTU)	12.07	3.93	6.82	2.38	9.10	10.20	5.39	6.10	4.63	5.98
May 2019	Turbidity (NTU)	6.43	3.64	8.74	2.05	6.30	8.20	4.23	6.75	3.51	4.07
Jun 2019	Turbidity (NTU)	8.07	4.65	2.78	2.00	5.38	6.30	4.25	5.59	2.35	4.90
Jul 2019	Specific Conductivity (µS/cm)	56.64	52.74	97.79	75.75	119.58	68.61	53.39	51.55	103.86	76.68
Aug 2019	Specific Conductivity (µS/cm)	63.06	58.43	97.49	77.85	124.33	78.64	54.33	47.29	110.80	68.79
Sep 2019	Specific Conductivity (µS/cm)	59.65	60.33	98.11	78.83	115.43	78.14	55.13	53.72	105.69	77.98
Oct 2019	Specific Conductivity (µS/cm)	56.78	52.04	93.18	74.36	114.17	73.20	65.18	56.02	102.11	110.35
Nov 2019	Specific Conductivity (µS/cm)	56.61	49.31	98.94	73.05	115.28	69.19	83.30	75.17	106.41	131.54
Dec 2019	Specific Conductivity (µS/cm)	52.31	48.57	100.58	75.67	95.26	65.67	112.21	103.34	106.80	125.14
Jan 2020	Specific Conductivity (µS/cm)	49.34	49.85	99.97	77.10	86.04	56.67	111.27	104.28	102.72	102.26
Feb 2020	Specific Conductivity (µS/cm)	47.60	48.21	103.67	76.54	86.26	55.00	111.39	93.93	106.45	100.67
Mar 2020	Specific Conductivity (µS/cm)	47.74	45.08	100.75	74.58	92.51	56.58	117.12	99.54	101.79	105.63
Apr 2020	Specific Conductivity (µS/cm)	46.38	42.33	104.19	77.22	93.12	59.51	103.34	78.76	103.16	97.01
May 2020	Specific Conductivity (µS/cm)	48.80	43.55	98.36	70.67	100.67	64.27	88.01	66.50	101.00	96.69
Jun 2020	Specific Conductivity (µS/cm)	51.74	44.18	99.06	70.54	107.46	70.07	73.17	60.67	104.02	91.25
Jul 2019	Dissolved Oxygen (mg/L)	7.08	9.01	9.03	9.02	8.92	9.98	8.77	8.93	8.28	7.92
Aug 2019	Dissolved Oxygen (mg/L)	6.12	8.33	8.71	8.93	8.80	10.10	8.93	8.93	7.89	7.67
Sep 2019	Dissolved Oxygen (mg/L)	6.84	9.14	8.77	8.81	10.36	10.18	9.67	9.62	8.65	8.34
Oct 2019	Dissolved Oxygen (mg/L)	8.58	10.79	9.91	9.30	11.30	10.30	10.62	10.67	9.96	9.50
Nov 2019	Dissolved Oxygen (mg/L)	9.93	11.91	10.28	9.57	10.77	10.19	11.27	11.45	10.53	9.52
Dec 2019	Dissolved Oxygen (mg/L)	10.77	11.89	10.87	10.27	11.33	11.40	12.01	11.48	11.44	9.61
Jan 2020	Dissolved Oxygen (mg/L)	10.88	11.63	10.94	10.39	11.08	11.24	11.61	10.90	11.05	9.71
Feb 2020	Dissolved Oxygen (mg/L)	11.54	11.97	11.44	10.71	11.53	11.49	11.90	11.55	11.31	10.49
Mar 2020	Dissolved Oxygen (mg/L)	11.22	11.78	11.18	10.66	11.23	11.41	11.47	11.33	11.05	10.41
Apr 2020	Dissolved Oxygen (mg/L)	10.16	11.04	10.14	10.27	10.21	10.79	10.54	10.41	9.77	9.81
May 2020	Dissolved Oxygen (mg/L)	9.28	10.33	9.69	9.59	9.62	10.30	9.81	9.63	9.34	8.99
Jun 2020	Dissolved Oxygen (mg/L)	8.41	9.66	9.27	9.27	9.17	9.97	9.32	9.32	8.88	8.50

Presented pH data consist of A and B grade data with greater than or equal to 80% of data points collected per day.

Figure 11
Revised Statistics for RY 2016-17, 2018-19 and 2019-20

Date	Parameter	BAT3	BAT12	CLK1	CLK12	GLE3	GLE12	MIC3	MIC12	PRI3	PRI12
Jul 2019	pH (S.U)	6.80	7.29	6.88	7.18	7.50	7.42	6.93	7.33	7.13	6.87
Aug 2019	pH (S.U)	6.82	7.13	7.09	7.35	7.56	7.18	6.95	7.38	7.36	6.85
Sep 2019	pH (S.U)	6.76	7.13	7.40	7.26	7.53	7.08	7.02	7.33	7.41	6.95
Oct 2019	pH (S.U)	6.86	7.12	7.39	7.19	7.55	7.23	7.19	7.31	7.30	6.94
Nov 2019	pH (S.U)	6.84	6.84	7.44	7.08	7.45	6.95	7.14	7.19	7.42	6.92
Dec 2019	pH (S.U)	6.71	6.78	7.31	6.57	7.29	7.10	7.35	7.28	7.37	6.68
Jan 2020	pH (S.U)	6.51	6.67	7.20	6.69	7.18	7.11	7.24	7.01	7.33	6.44
Feb 2020	pH (S.U)	6.42	6.80	7.05	6.73	7.28	7.05	7.27	7.12	7.54	6.57
Mar 2020	pH (S.U)	6.65	7.04	7.18	6.63	7.21	7.21	7.31	7.34	7.84	6.78
Apr 2020	pH (S.U)	6.76	7.27	7.33	6.65	7.14	7.30	7.35	7.27	7.75	6.78
May 2020	pH (S.U)	6.48	7.30	7.23	6.66	7.07	7.07	6.90	7.61	7.27	6.80
Jun 2020	pH (S.U)	6.41	7.34	7.15	6.73	7.22	7.16	NA	7.62	7.27	7.03
Jul 2019	Temperature (°C)	17.72	17.16	17.42	15.78	17.04	14.74	19.89	19.22	19.05	18.41
Aug 2019	Temperature (°C)	18.46	17.26	18.32	16.64	17.67	15.39	19.65	19.07	19.49	18.63
Sep 2019	Temperature (°C)	16.50	15.28	17.23	16.43	16.43	15.37	15.82	15.24	17.84	16.33
Oct 2019	Temperature (°C)	11.36	9.57	13.14	13.94	11.54	10.34	11.45	11.21	12.33	11.36
Nov 2019	Temperature (°C)	7.80	6.17	10.30	12.28	8.21	7.45	7.68	7.77	8.69	8.48
Dec 2019	Temperature (°C)	8.31	7.39	9.80	11.14	8.69	7.47	7.28	7.39	8.59	8.30
Jan 2020	Temperature (°C)	9.07	8.57	10.40	11.25	9.43	8.54	8.32	8.35	9.13	8.92
Feb 2020	Temperature (°C)	8.14	7.63	9.27	10.51	8.34	7.77	7.71	7.28	8.52	7.99
Mar 2020	Temperature (°C)	8.89	8.03	9.63	10.42	8.94	7.85	9.25	8.27	9.60	8.61
Apr 2020	Temperature (°C)	11.19	10.75	11.87	11.64	11.78	10.05	12.73	12.33	13.08	11.54
May 2020	Temperature (°C)	13.31	13.02	13.77	13.08	13.54	11.65	14.77	14.33	15.34	13.88
Jun 2020	Temperature (°C)	15.43	15.25	15.31	14.31	15.19	13.30	17.31	16.89	17.18	16.09
Jul 2019	Turbidity (NTU)	9.25	5.12	2.22	2.79	11.22	5.56	3.73	4.78	2.47	5.78
Aug 2019	Turbidity (NTU)	9.09	4.15	3.57	5.08	5.94	32.78	3.49	4.05	2.68	5.28
Sep 2019	Turbidity (NTU)	9.15	4.22	3.39	6.02	6.20	3.64	3.64	4.31	3.18	4.25
Oct 2019	Turbidity (NTU)	9.21	4.46	2.75	3.43	5.66	1.71	2.75	2.56	2.65	4.64
Nov 2019	Turbidity (NTU)	6.93	3.43	1.26	1.91	3.59	1.63	1.50	2.24	2.55	4.29
Dec 2019	Turbidity (NTU)	9.33	5.45	2.19	3.13	7.00	10.56	4.69	6.14	5.96	8.72
Jan 2020	Turbidity (NTU)	9.51	6.99	5.21	3.56	11.23	16.83	17.18	19.08	8.47	11.68
Feb 2020	Turbidity (NTU)	7.70	3.80	3.54	2.01	7.31	16.23	4.70	4.90	4.81	4.76
Mar 2020	Turbidity (NTU)	6.31	3.10	2.64	2.40	5.02	8.86	4.12	4.58	3.37	4.19
Apr 2020	Turbidity (NTU)	5.60	4.45	2.37	3.34	5.12	10.56	4.00	5.49	3.36	5.16
May 2020	Turbidity (NTU)	7.24	5.89	3.91	4.02	5.52	8.39	4.23	5.72	3.85	5.88
Jun 2020	Turbidity (NTU)	7.24	5.36	2.97	NA	6.44	7.73	3.92	5.83	3.92	6.12

Presented pH data consist of A and B grade data with greater than or equal to 80% of data points collected per day.