

**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 2010/2011**

**October 20, 2011**

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.



**Francis Kessler, Operations Division Manager**

10/21/11

**Date**

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



## Table of Contents

<b>1</b>	<b>INTRODUCTION .....</b>	<b>3</b>
1.1	BACKGROUND .....	3
1.2	PURPOSE AND SCOPE .....	4
1.3	ADAPTIVE MANAGEMENT .....	6
<b>2</b>	<b>STATUS OF THE STORMWATER MANAGEMENT PLAN.....</b>	<b>9</b>
2.1	RC1 – PLANNING.....	10
2.2	RC2 – CAPITAL IMPROVEMENTS .....	22
2.3	RC3 – UPDATE OF STORMWATER MANAGEMENT DESIGN STANDARDS .....	26
2.4	RC4 – OPERATIONS & MAINTENANCE .....	30
2.5	RC5 – PUBLIC EDUCATION & PARTICIPATION.....	45
2.6	RC6 – STORMWATER PROGRAM MANAGEMENT FINANCING.....	53
2.7	RC7 – MAINTAIN & UPDATE GIS SYSTEM .....	56
2.8	RC8 – CITY STORMWATER GRANT PROGRAM.....	58
2.9	RC9 – LEGAL/ORDINANCES .....	59
2.10	ILL1 – SPILL PREVENTION AND RESPONSE PROGRAM.....	62
2.11	ILL2 – ILLICIT DISCHARGE ELIMINATION SYSTEM PROGRAM.....	66
2.12	ILL3 – ILLEGAL DUMPING CONTROL PROGRAM .....	71
2.13	IND1 – INDUSTRIAL STORMWATER DISCHARGE PROGRAM .....	76
2.14	CON1 – CONSTRUCTION SITE CONTROL PROGRAM .....	80
2.15	MON1 – MONITORING .....	85
<b>3</b>	<b>PROGRAM EXPENDITURES AND FUNDING SOURCES .....</b>	<b>88</b>
<b>4</b>	<b>ENFORCEMENT ACTIONS, INSPECTIONS, AND OUTREACH .....</b>	<b>90</b>
<b>5</b>	<b>PLANNING, LAND USE CHANGES, AND DEVELOPMENT.....</b>	<b>91</b>
5.1	LAND USE CHANGES .....	92
5.2	NEW DEVELOPMENT.....	92

## LIST OF FIGURES

FIGURE 1. PERMIT AREA MAP.....	7
FIGURE 2. LAND USE.....	8

## LIST OF TABLES

TABLE 1. ANNUAL REPORTING REQUIREMENTS FOR THE MS4 PERMIT .....	5
TABLE 2. STORMWATER EXPENDITURES .....	89

## LIST OF APPENDICES

APPENDIX A. 2005/2010 SWMP BMP MATRIX	
APPENDIX B. MS4 VIOLATIONS 2010-11	
APPENDIX C. STREET SWEEPING MAP	
APPENDIX D. STORMWATER OUTREACH ACTIVITIES	
APPENDIX E. SUMMARY OF WATER QUALITY DATA FOR FISCAL YEAR 2010/2011	

## LIST OF ACRONYMS

ACWA	Oregon Association of Clean Water Agencies
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
MCIP	Mill Creek Industrial Park (a.k.a. Mill Creek Corporate Center, or MCCC)
MEP	Maximum Extent Practicable
mg/L	Milligrams per liter
MOA	Memorandum of Agreement
MS4	Municipal Separate Storm Sewer System
ODOT	Oregon Department of Transportation
ppm	Parts per million
RC	Residential and commercial area-related BMPs
SDC	System Development Charge
SRC	Salem Revised Code
SSORP	Sanitary Sewer Overflow Response Plan SWMP
SWMP	Stormwater Management Plan
TMDL	Total Maximum Daily Load

# 1 INTRODUCTION

## 1.1 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, EPA has delegated the permitting of NPDES municipal separate storm sewer system (MS4) discharges to the Oregon Department of Environmental Quality (DEQ).

Under 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 (the 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 an 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 MS4 Permit in December 1997, with an expiration date of September 2002.

In April 2002, the City submitted an application for renewal of its NPDES MS4 Permit, along with a revised SWMP that outlined the City's stormwater management efforts for the next five-year permit period. The DEQ issued the renewed MS4 permit in March 2004. In accordance with that permit's conditions, the City evaluated and updated the SWMP in conjunction with the 2<sup>nd</sup> Annual Report submitted to DEQ on November 1, 2005. The 2004 MS4 permit (and updated 2005 SWMP) expired on February 28, 2009, and was administratively extended by the DEQ.

The City submitted its NPDES MS4 permit renewal application to DEQ on September 2, 2008. Along with other required documents for the permit renewal process, the application included a revised SWMP. This SWMP (2008 SWMP) was developed in part using the EPA document *Municipal Separate Storm Sewer System Program Evaluation Guidance* (January 2008), followed by continued evaluation and revision of the 2005 SWMP. Following permit negotiations, this updated SWMP was further revised and submitted to the DEQ on August 13, 2010.

The City of Salem received a renewed MS4 permit on December 30, 2010. Consistent with requirements of Schedule D.6 of the renewed MS4 permit, the City re-submitted the SWMP (revised 2010 SWMP) to the DEQ on March 17, 2011. Between July 1, 2010, and December 29, 2010, the City continued to operate under conditions of the 2004 MS4 permit and 2005 SWMP. For that reason, this Annual Report (FY 2010-2011) describes the status of BMP-related activities in both the 2005 and revised 2010 SWMP. The renewed MS4 permit, 2005 SWMP, and revised 2010 SWMP are all available on the City's website ([www.cityofsalem.net](http://www.cityofsalem.net)).

## **1.2 Purpose and Scope**

The MS4 permit area is defined as being within the current City Limits, as exhibited in Figure 1. Land use within this permit area is exhibited in Figure 2.

Information presented in this Annual Report is based on the revised 2010 SWMP, and also includes discussion of activities that occurred prior to renewal of the MS4 permit on December 30, 2010, as described below. The content of this report is based on requirements listed in Schedule B.5 of the renewed MS4 permit (see Table 1).

This Annual Report summarizes stormwater-related activities that were completed during the period of July 1, 2010, through June 30, 2011, as required by the City's current MS4 permit. The City operated under conditions of the 2004 MS4 permit and 2005 SWMP until the renewed MS4 permit was issued in December 2010. Following receipt of the renewed MS4 permit, the City began to adhere to the conditions of the renewed permit and 2010 SWMP. This Annual Report therefore addresses BMP-related activities described in both SWMPs. However, the 2010 SWMP was used as a template/format for summarizing activities in this Annual Report. Appendix A provides a cross-reference of where the 2005 SWMP is addressed within the format of the 2010 SWMP (and this report).

<b>Table 1. Annual Reporting Requirements for the MS4 Permit</b>		
<b>Permit Section</b>	<b>Reporting Requirement</b>	<b>Location in Annual Report</b>
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 <sup>(1)</sup>
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 - MON 1-3) and Appendix E
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.	Appendix E
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), Section 4, and Appendix B, Appendix D
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)

<sup>(1)</sup> Section 2 contains the status of activities relating to both the 2008 and 2010 SWMP.

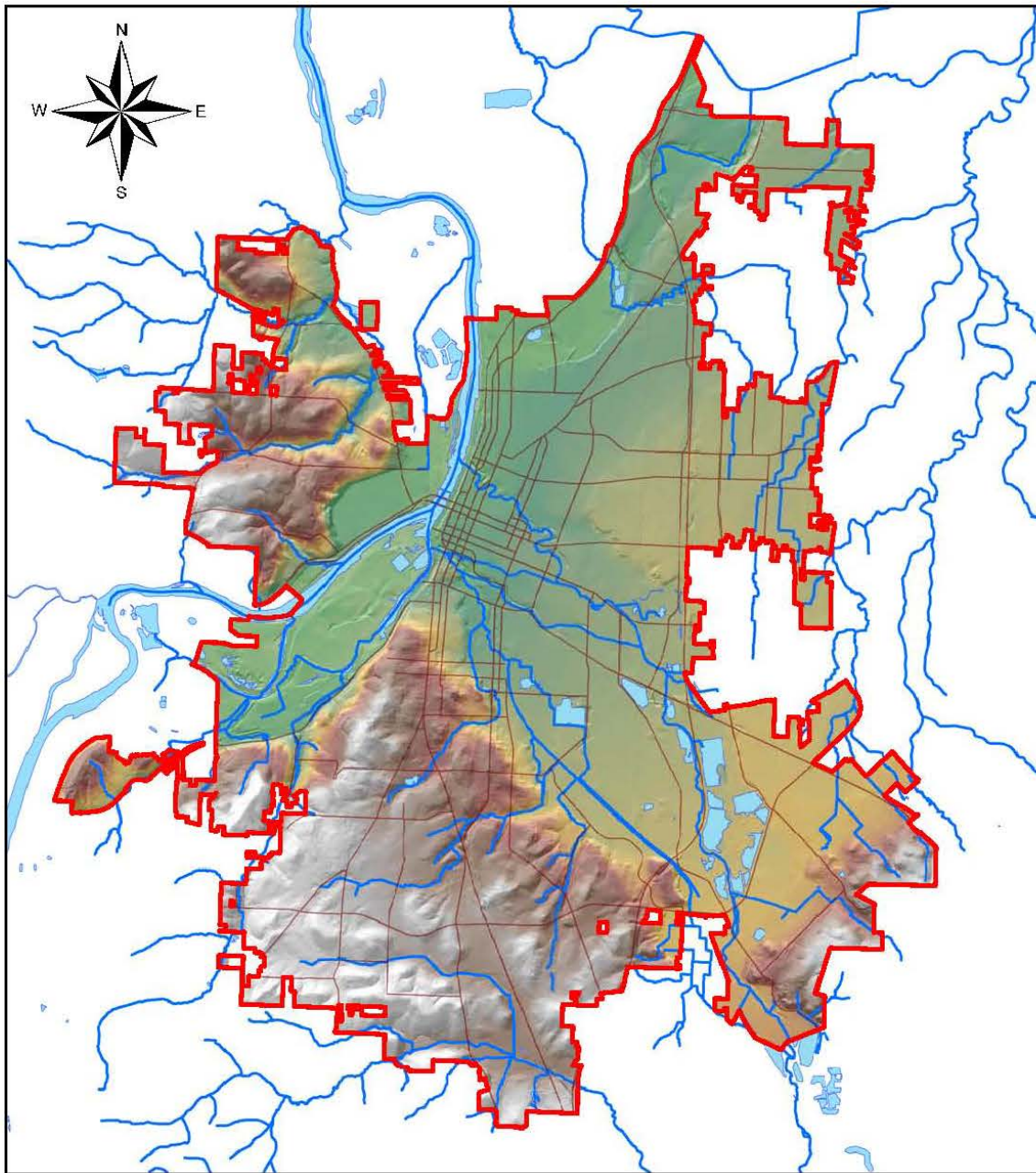
### **1.3 Adaptive Management**

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

The current SWMP became effective with renewal of the MS4 permit on December 30, 2010. The status of Best Management Practices (BMPs) and stormwater program activities discussed in this annual report was limited to the 6 months of implementation that followed, through June 30, 2011. In preparation of this report, City staff were asked to consider if changes in BMP activities were anticipated in next fiscal year (FY 2011/12). Staff reported on activities anticipated to support a number of specific BMP measurable goals or MS4 permit due dates (e.g., preparation for revising the City's stormwater master plan, initiating a hydromodification study, revising the Integrated Pest Management Plan, etc.). However, the City is only 6 months into implementation of the 5-year current SWMP, therefore does not propose specific changes to any of its BMPs at this time.

Consistent with Schedule D.4 of the renewed MS4 permit, City staff will provide the DEQ with a description of the adaptive management approach/process that will be followed through expiration of the MS4 permit on December 29, 2015. Staff will initiate preparation of this document in the upcoming months, and will complete it before the due date of November 1, 2011.

Figure 1. Permit Area Map



0 0.5 1 2  
Miles

**Legend**

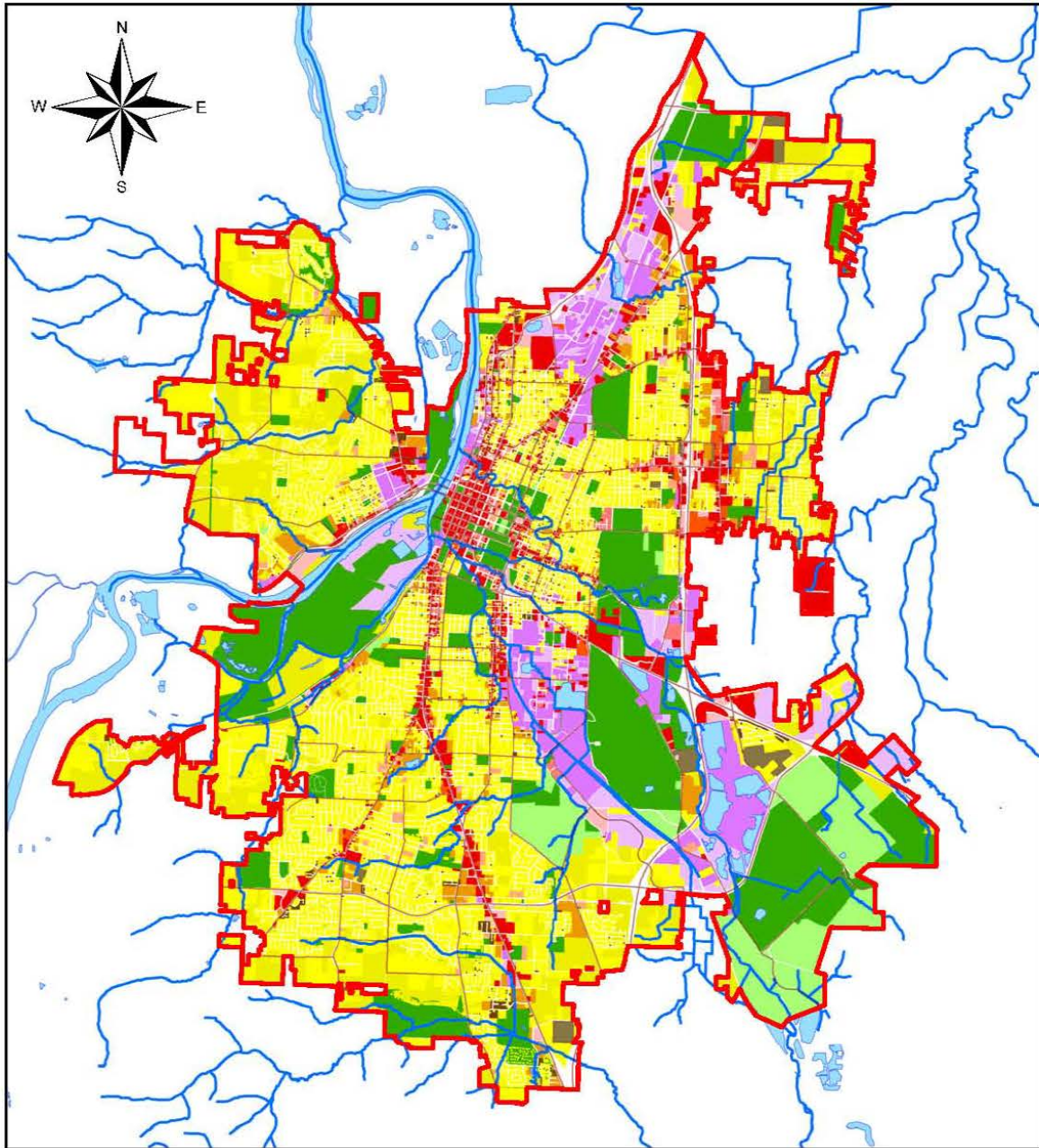
-  City Limit/MS4 Permit Boundary
-  Major Roadways
-  Creeks

**Figure 1:  
MS4 Permit Area Map**





Figure 2. Land Use



0 0.5 1 2  
Miles

**Legend**

- |                                |                             |                    |
|--------------------------------|-----------------------------|--------------------|
| City Limit/MS4 Permit Boundary | Public Land                 | Single Family      |
| Major Roadways                 | Vacant Public               | Multi-Family       |
| Creeks                         | General Commercial          | Duplexes           |
| <b>Land Use</b>                | Mixed Commercial            | Mobile Home Park   |
| Industrial                     | Vacant Commercial           | Vacant Residential |
| Vacant Industrial              | General Office Complex      |                    |
|                                | Religious - Church Property |                    |

Figure 2:  
Land Use Map



## **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 2008 and 2010 SWMP BMPs are discussed in this section of the Annual Report. BMPs within the SWMP have been categorized into five types: structural and source controls for residential and commercial areas (RC); a program for the control of illicit discharges and improper disposal into the storm drainage system (ILL); a program to monitor and control pollutants from industrial facilities, hazardous waste treatment, storage and disposal facilities, and municipal landfills (IND); a program to implement and maintain structural and non-structural BMPs to reduce pollutants from construction sites (CON); and 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:

1. A table describing BMP tasks, associated measurable goals, and tracking measures as stated in the 2010 SWMP.
2. A summary of activities completed during fiscal year 2010-2011 (July 1, 2010 through June 30, 2011) that demonstrate progress made in meeting the measurable goals and tracking measures.

## 2.1 RC1 – Planning

### RC1 – PLANNING, TASK 1

Task Description	Measurable Goals	Tracking Measures
<p>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.</p>	<ul style="list-style-type: none"> <li>• Maintain Master Plan and complete next update within the MS4 permit cycle.</li> </ul>	<ul style="list-style-type: none"> <li>• Track schedule for updating Master Plan.</li> <li>• Report on Master Plan update actions.</li> </ul>

### FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS

*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** for the **Task Description** stated above:*

Updates to the Stormwater Master Plan were previously scheduled to be completed in conjunction with the City’s TMDL Implementation Plan and urban watershed assessments/plans. A TMDL Implementation Plan that encompasses the Willamette Basin TMDL and Molalla-Pudding Basin TMDL was approved by the DEQ on August 5, 2010. Uncertainties surrounding the MS4 permit renewal process put this activity on hold until the requirements associated with the renewed permit were identified. This effort has now been incorporated into the City’s Strategic Planning Work Program and it is scheduled to be completed before the end of the current MS4 permit cycle.

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RC1 – PLANNING, TASK 2

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Task Description	Measurable Goals	Tracking Measures
<p>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.</p>	<ul style="list-style-type: none"> <li>• Complete a hydromodification study and retrofit plan by November 1, 2014.</li> <li>• Incorporate recommendations and early action items of watershed management plans with completion of hydromodification study and retrofit plan.</li> <li>• Develop strategy for completing future watershed management plans by November 1, 2014.</li> </ul>	<ul style="list-style-type: none"> <li>• Report on completion of hydromodification study.</li> <li>• Report on completion of retrofit plan.</li> <li>• Track implementation actions of Pringle Creek Watershed Management Plan.</li> <li>• Report on strategy for completing future watershed management plans.</li> </ul>

**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

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*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** and **MS4 permit requirements** stated above:*

The strategy for completing future Urban Watershed Management Plans is being developed in concert with preparation of the hydromodification study and retrofit plan. It is intended that these documents will help assess and prioritize watershed needs and projects using a GIS-based decision support tool. A strategy will then be developed for implementing and funding actions that will meet multiple objectives, and can be funded either through the CIP process or through potential grant sources.

The City has also completed an urban tree canopy assessment, a potential tree canopy analysis, and a riparian prioritization decision support tool GIS application. New GIS information will include mapping of impervious cover within the UGB. This information will be used in the watershed management planning process.

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RC1 – PLANNING, TASK 3

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<b>Task Description</b>	<b>Measurable Goals</b>	<b>Tracking Measures</b>
<p>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 groundtruthing, that information will be incorporated into the update process.</p>	<ul style="list-style-type: none"> <li>• Compile database of maps and waterways references.</li> <li>• Complete field groundtruthing by end of FY 2011-12.</li> <li>• Update map by end of FY 2012-13.</li> </ul>	<ul style="list-style-type: none"> <li>• Track completion of groundtruthing and map updates.</li> </ul>

**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

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*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** for the **Task Description** stated above:*

The GIS section utilized LiDAR data to determine the location of streams that could not previously be easily identified using aerial imagery and contours. The process of correcting all of the streams inside the City of Salem using the LiDAR as source data was completed. Attributes are maintained in the streams Feature Class that identify the accuracy of the stream lines in the GIS based on how comfortable the Technician was in identifying the location of the stream. In mid-July, near the end of this reporting period, staff initiated field groundtruthing of LiDAR data by use of a hand-held GPS unit. Staff have begun collecting GPS data and creating shapefiles that will later be used to update the official waterways map. This field effort will be completed before the end of FY2011/12, as referenced in the measureable goal.

RC1 – PLANNING, TASK 4

Task Description	Measurable Goals	Tracking Measures
<p>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 employees at the City to inform them about the City’s efforts for pollution prevention. At least annual trainings will be provided to specified City of Salem employees involved in MS4-related activities regarding the permit, including its intentions and their responsibilities in relation to the MS4. 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.</p>	<ul style="list-style-type: none"> <li>• Conduct annual formal coordination meetings for stormwater, more often if necessary.</li> <li>• Conduct annual training of employees involved in MS4-related positions, more often if necessary.</li> </ul>	<ul style="list-style-type: none"> <li>• Prepare an annual meeting summary.</li> <li>• Track changes made to the implementation of the stormwater program based on coordination discussions.</li> <li>• Track major items of coordination.</li> <li>• Track training attendance.</li> <li>• Share and document training suggestions for MS4 implementation changes.</li> </ul>

**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** and **MS4 permit requirements** stated above:*

Following renewal of the City’s MS4 permit in December 2010, multiple permit ‘kickoff’ meetings were conducted with staff that implement stormwater-related activities. Fifteen separate meetings were scheduled with staff from throughout the organization, including multiple workgroups within Public Works (operations, parks and transportation, engineering, information technology), Community Development (planning, code enforcement), Salem Housing Authority, Facilities, Risk, Urban Development, Fire, and Willow Lake Laboratory. Meetings were initiated in FY 2010/11 and continued through early FY 2011/12, with a total of 80 city staff in attendance. The meetings provided staff with an overview of requirements and deliverables associated with the renewed MS4 permit and SWMP.

To initiate the kickoff meetings, a memorandum was distributed to the City Manager's Office, Department Directors, administrators, and more than 30 staff. The memorandum provided an overview of the renewed MS4 permit, identified key permit-related deliverables, and identified strategies for effective coordination between workgroups. One of the strategies discussed was the creation of multiple "project teams," consisting of staff from multiple workgroups tasked with completion of specific MS4 permit deliverables. Project teams were identified for the following topics: 1) Code and Stormwater Management Manual; 2) Erosion Control; 3) Retrofit and Hydromodification; 4) Outreach; 5) Planning; 6) Illicit Discharge Detection and Elimination. Many of these project teams have begun coordination of MS4 permit-required deliverables.

Public Works staff attended multiple trainings and webcasts on stormwater-related topics, including the following presented by the Center for Watershed Protection: Permeable Pavement Design, Installation, and Maintenance; Rooftop Disconnection as a Stormwater Practice; Better Site Design Gets Better. Staff continue to be involved with the Oregon Association of Clean Water Agencies (ACWA) by participating in Phase I and stormwater subcommittees and attending conferences (see RC1 Task 8). Operations staff continue to participate in bi-monthly safety and training programs, of which erosion control is one topic of discussion (see RC4 Task 4). During FY 2011/12, staff are anticipated to assess stormwater-related training and identify options for revising materials in cooperation with efforts to update the Operations Pollution Prevention Plan (see ILL1 Task 4).

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RC1 – PLANNING, TASK 5

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Task Description	Measurable Goals	Tracking Measures
Coordinate with other agencies such as NGOs, private environmental groups, and watershed councils.	<ul style="list-style-type: none"> <li>• Develop a list of contacts and identify issues of coordination.</li> </ul>	<ul style="list-style-type: none"> <li>• Document any MOAs.</li> </ul>

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**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

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*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** and **MS4 permit requirements** stated above:*

**Glenn-Gibson Watershed Council:**

City staff continues to attend monthly Glenn-Gibson Watershed Council meetings to assist with watershed council-related projects and programs, and to provide information on, or for City-related efforts. During this reporting period approximately 3 acres of land at the Van Kleeck property were cleared of Himalayan blackberry and English ivy and replanted with 339 mixed native plants. City staff assisted with the delineation of the 3 acre plot and with coordination of the contracted service provider. City staff also provided flagging to identify planting locations as well as erosion control material.

In addition to the project at the Van Kleeck property, City staff also worked with the Council to remedy an erosion control issue on Archer Brook, reviewed an OWEB grant, supported efforts to restore the Eola Detention Basin in West Salem, and presented two rain garden workshops.

Contacts:

Deborah Topp, Public Works Department  
Aida Airk, Glenn-Gibson Watershed Council Coordinator

**Pringle Creek Watershed Council:**

Staff attends monthly watershed council meetings to facilitate the exchange of information between the Council and the City, provide assistance and/or technical expertise to the council on watershed related issues, and coordinate projects with the council and its partners (e.g., Fairview Wetlands Video and the Mid-Willamette Watershed Alliance's Habitat Restoration Assessment).

Contact:

Ed Emrick, Public Works Department

**Claggett Watershed Council:**

Staff attended regularly scheduled monthly watershed council meetings, providing technical assistance for council projects. During this reporting period the council continued support tree planting activities at Eastgate Basin Park, which encompasses a tributary to Claggett Creek. The council also hosted a presentation by Demeter Design, who conducted stream habitat assessments and identified restoration opportunities in



Claggett Creek. The assessment was part of a larger effort initiated on behalf of the Mid-Willamette Watershed Alliance. Additional Council-supported activities were conducted outside of the limits of the City of Salem, through coordination with the City of Keizer.

Contacts:

Jon Nottage, Public Works Department  
Heather Dimke, Public Works Department

**Straub Environmental Learning Center**

During the fiscal year 2010-2011, the City of Salem Natural Resources Outreach Specialist worked with the education committee for Straub Environmental Learning Center to carry out the programming scheduled for the fiscal year and plan the events for the following year. Examples of programs offered during this reporting year included: Amateur Naturalist Series, Family Nature Night, Nature Kid Series, and Sustainability workshops. The Center saw an increase in participants this year. The 49 presentations/events reached 1,944 adults and children.

Contacts:

Deborah Topp, Public Works Department  
Alex Ninneman, SELC Manager

**Sustainable Cities Initiatives (SCI)**

The Sustainable Cities Initiative is a cross-disciplinary organization at the University of Oregon that seeks to promote education, services, public outreach, and research on the design and development of sustainable cities. Salem was selected as the SCI focus city for the 2010/11 academic year. Projects include:

- North Downtown Waterfront Redevelopment- Planning  
This concept plan aims to restore the ecology along Mill Creek and the Willamette River and transform the North Downtown Riverfront into a mixed-use neighborhood with affordable housing, public transit, community amenities, retail, a neighborhood market, and community gathering places.
- Orchard Village Green Community Integration  
Plan and design environmentally friendly re-use and redevelopment of Orchard Village in a way that integrates Parkway Village affordable housing complex, a sustainable stormwater management system, infill development and the community at-large.
- Traffic Circulation and Transportation Safety  
The City of Salem is developing a sustainable transportation system plan that encourages alternative modes of transportation including, bicycle, pedestrian, and public transportation.
- Sustainable Streetlights  
The purpose for this project is to develop a more energy efficient street light design with a focus on the luminaire and to identify a more sustainable funding mechanism for streetlights.

- **Downtown Parks Connectivity**  
Connect Salem's core area parks with a system of urban trails and bicycle routes that improve pedestrian and bicycle accessibility and enhance the recreational potential and enjoyment of the parks system.

Contact:  
Courtney Knox, Urban Development Department

**Salem Conference Center Solar Installation:**

Urban Development staff participated in the process of getting a solar array on the Salem Conference Center. The array became fully functional on March 18, 2011. As of July 7, 2011, the kilowatt hours generated totaled 48,628.59. According to the website the total energy generated is equivalent to the use of 277 60-watt bulbs for one year while used for 8 hours per day and a total of 34 tons of carbon dioxide (CO<sub>2</sub>) emissions prevented.

Contact:  
Courtney Knox, Urban Development Department

**Electric Vehicle (EV) Charging Stations:**

In conjunction with ECOTality, PGE, and Salem Electric City staff identified City owned sites for publicly available charging stations. In April of 2011 staff obtained approval from Salem City Council to accept a gift agreement from Salem Electric to fund West Salem and downtown sites. During this reporting year staff identified 14 publicly available charging sites, executed agreements with Salem Electric and ECOTality, and began site prep for station installations.

Contact:  
Annie Gorski, Urban Development Department

**Watershed Protection and Preservation Grants:**

During this reporting period grants were awarded to the following groups: Pringle Creek Community, Straub Environmental Learning Center, North Santiam Watershed Council, Salem Audubon Society, and Oregon Watersheds (see RC 8 Task 1).

Contact:  
Pat Dodge, Public Works Department

RC1 – PLANNING, TASK 6

Task Description	Measurable Goals	Tracking Measures
<p>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>	<ul style="list-style-type: none"> <li>• 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.</li> </ul>	<ul style="list-style-type: none"> <li>• Report on significant coordination activities or programs.</li> <li>• Report on completion of SKAPAC Agreement and other IGAs.</li> </ul>

**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals and Tracking Measures** for the Task Description stated above:*

In April and June 2011, meetings were initiated between Marion County, the City of Keizer, and the City of Salem to review the Salem/Keizer Area Planning Advisory Committee (SKAPAC) agreement and consider if it should be updated. Meeting attendees reviewed details of the agreement, discussed the status of each municipalities’ stormwater-related programs, and initiated discussion of SKAPAC’s current applicability. Meetings are scheduled through FY 2011/12 to continue consideration of updating the SKAPAC agreement, as well as possible inclusion of other neighboring municipalities in future discussions (e.g., Polk County and City of Turner).

## RC1 – PLANNING, TASK 7

Task Description	Measurable Goals	Tracking Measures
<p>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>	<ul style="list-style-type: none"> <li>• Complete a retrofit plan before end of year four of the MS4 permit cycle.</li> <li>• Develop a strategy to identify and prioritize potential retrofit projects by November 1, 2013.</li> <li>• Identify a minimum annual budget for stormwater retrofit projects as part of the retrofit strategy by November 1, 2014.</li> </ul>	<ul style="list-style-type: none"> <li>• Report on available budget and completion of retrofit project efforts.</li> </ul>

### FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS

*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals and MS4 permit requirements** stated above:*

As part of the MS4 ‘kickoff’ effort (see RC1 Task 4), a project team of City staff was identified with responsibility for coordinating completion of MS4 permit retrofit requirements. The project team consists of interdisciplinary personnel from the stormwater, wastewater, water resources, engineering, and parks and transportation divisions. During the reporting period, team members initiated research on stormwater retrofits in context of the Urban Subwatershed Restoration Manual Series (Center for Watershed Protection).

In FY 2010/11, the Stormwater Services section budgeted \$15,000 to support retrofit efforts. These funds were used to support two separate efforts:

- Site surveying for continued investigation of potential retrofit at two existing detention facilities for incorporation of vegetated treatment swales. Project feasibility and initial design options were investigated at these facilities in FY 2009/10.
- Incorporation of stormwater treatment at a pedestrian crossing ‘bulb-out’ project. Conceptual planning for the project focused on traffic calming and improving pedestrian crossing safety. Funds were provided for the incorporation of a flow-through planter box, providing stormwater treatment for approximately 5,000 square feet of impervious roadway.

The Kuebler Boulevard widening project necessitated the installation of a large detention basin on the corner of Kuebler and Lone Oak. City staff and contracted consultants

collaborated to add a water quality treatment component to the initial design, which was limited to detention. The design was modified to add a three chamber rain garden to the bottom of the detention basin. With the modified design, small storms will be infiltrated and/or filtered by the rain garden.

RC1 – PLANNING, TASK 8

Task Description	Measurable Goals	Tracking Measures
<p>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>	<ul style="list-style-type: none"> <li>• Attend a minimum of one stormwater-related workshop or conference annually. Attend groundwater-related workshops and conferences as funds allow.</li> <li>• Make information obtained at these events available to other City staff.</li> </ul>	<ul style="list-style-type: none"> <li>• Report on City participation with ORACWA events.</li> </ul>

**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** for the **Task Description** stated above:*

Public Works staff participated in Oregon Association of Clean Water Agencies (ACWA) activities, including the following:

- Staff regularly attend ACWA meetings for the MS4 Phase I and Stormwater subcommittees. Some of the topics discussed at these meetings included Phase I Permit renewal, 2300-A Pesticide General Permit applicability, erosion control field manual, 1200-C construction permits, and stormwater monitoring.
- Multiple staff attended the annual ACWA Stormwater Summit, which included presentations on a diverse range of current issues in stormwater management.
- Multiple staff attended the annual ACWA conference, which included presentations on both stormwater and wastewater management.

## 2.2 RC2 – Capital Improvements

### RC2 – CAPITAL IMPROVEMENTS, TASK 1

<u>Task Description</u>	<u>Measureable Goals</u>	<u>Tracking Measures</u>
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.	<ul style="list-style-type: none"> <li>• Include a funding line item for CIPs in proposed stormwater budget.</li> <li>• Review and prioritize CIPs and budget annually.</li> <li>• Implement CIPs based on prioritization and available funding.</li> </ul>	<ul style="list-style-type: none"> <li>• Track number and description of projects completed.</li> <li>• Report updated CIP list annually.</li> </ul>

### FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS

*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** and **Tracking Measures** for the Task Description stated above:*

The following is a list of stormwater CIP projects that were completed or worked on during the 2010-11 reporting year:

- Battle Creek Stormwater Detention Facility - \$2,000,000  
-Construction now scheduled for FY 2012/13. Reviewed, permit pending.
- West Pringle Creek at McGilchrist - \$100,000  
-Awaiting Urban Renewal Agency funding - not ready to proceed.
- Lower Lefelle St SE at Clark Creek Restoration – \$487,000  
-Construction will be completed by end of October 2011.
- Mill Creek Corporate Center Wetlands – \$5,239,000  
-Construction of earthwork completed this year, landscaping next year. Reviewed and permitted.
- Capitol Street Bridge Storm Drain Improvements - \$23,170  
-Completed. Project administered by ODOT, permitted.
- Court Street, 13<sup>th</sup> to 17<sup>th</sup> Storm Drain Improvements - \$245,000  
- In design, construction scheduled for 2012.

The adopted fiscal year 2011-12 CIP budget totals \$4,549,390. This budget includes carryover funds for projects not completed in fiscal year 2010-11 as well as the following new projects:

- Salem Industrial Park Pipe Replacement - \$534,000
- Battle Creek Golf Course Redevelopment/Stormwater Improvements - \$1,090,000

The Urban Renewal Agency has also initiated 55 acres of wetland improvements within the Mill Creek Corporate Center (MCCC) totaling \$3,012,000. In addition, the City also received a \$476,000 grant for the East side of the Center and Marion Street Bridges Stormwater Retrofit Project. This project will construct infiltration rain gardens to treat runoff from 159,000 sq. ft. of impervious areas from the east half of the two bridges across the Willamette River.



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RC2 – CAPITAL IMPROVEMENTS, TASK 2

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<u>Task Description</u>	<u>Measureable Goals</u>	<u>Tracking Measures</u>
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.	<ul style="list-style-type: none"> <li>Review and integrate multiple resource agency permitting needs, including MS4 permit requirements, into 100% of CIP projects.</li> </ul>	<ul style="list-style-type: none"> <li>Track number of projects reviewed.</li> <li>Track number of projects permitted.</li> </ul>

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**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

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*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** and **Tracking Measures** for the Task Description stated above:*

The CIP projects constructed in the FY 2010-11 had to comply with the conditions laid out in the NPDES MS4 Permit and the 1200CA permit for stormwater. The CIP projects with likely impacts to any jurisdictional waterway also had to comply with other water quality requirements related to Endangered Species Act as required by ODFW, NOAA and the ACOE. Engineering project managers are required to contact Water Resources Staff to involve them early on in the CIP planning, construction plans review and to continue coordinating with them during construction to ensure post construction permit compliance and overall project success related to waterway impacts. See RC 2 Task 1 for a list of projects reviewed and permitted during this reporting year.

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RC2 – CAPITAL IMPROVEMENTS, TASK 3

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<b><u>Task Description</u></b>	<b><u>Measureable Goals</u></b>	<b><u>Tracking Measures</u></b>
<p>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>	<ul style="list-style-type: none"> <li>• Within one year of completion of the hydromodification study and retrofit plan, prioritize easement acquisitions for stormwater facilities.</li> <li>• Following prioritization, identify funding source(s) for inclusion in budget.</li> </ul>	<ul style="list-style-type: none"> <li>• Report on easement acquisition and prioritization process.</li> </ul>

**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

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*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** and **Tracking Measures** for the Task Description stated above:*

As appropriate, access easements are currently acquired when private development occurs. Insufficient funding prevents the acquisition of easements for existing stormwater facilities where easements may be desired. City staff anticipate the criteria for prioritization of easement acquisitions will change as the hydromodification study and retrofit plan are completed; as these efforts will help develop strategies for prioritizing locations for future stormwater facilities.

## 2.3 RC3 – Update of Stormwater Management Design Standards

### RC3 – STORMWATER MANAGEMENT DESIGN STANDARDS, TASK 1

<u>Task Description</u>	<u>Measureable Goals</u>	<u>Tracking Measures</u>
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.	<ul style="list-style-type: none"> <li>• Develop incentives for LID and other stormwater quantity and quality management practices.</li> <li>• Develop updated stormwater design standards to include structural stormwater quality BMPs.</li> <li>• Maintain Stormwater Management Design Standards and update as needed.</li> </ul>	<ul style="list-style-type: none"> <li>• Document revisions made to Stormwater Management Design Standards.</li> <li>• Document the development of any incentives for implementation of LID techniques.</li> </ul>

#### **FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** and **MS4 permit requirements** stated above:*

During the reporting period, revisions to the Stormwater Management Design Standards continued—with particular consideration given to post-construction control requirements identified in the renewed MS4 permit. Public Works Engineering staff are leading this effort, and revisions are anticipated to continue through FY 2011/12.

In 2011, the development of a Stormwater Management Manual was initiated that will accompany revisions to the stormwater design standards. This manual consists of three chapters; 1) Chapter 1 – Policies and Requirements, 2) Chapter 2 – Operations and Maintenance, and Chapter 3 – Source Control. Cumulatively, this manual, the revised design standards, and the revisions to the Salem Revised Code (RC3 Task 2) will address most, if not all, MS4 permit requirements for post-construction site runoff controls.

City of Salem’s new Stormwater Utility, which will be implemented beginning January 2013, includes a rate credit program that provides for reductions in stormwater rates for industrial and commercial properties that have stormwater facilities located on-site. The rate reduction is based on the type of stormwater facility and the amount of impervious surface discharging into the facility. LID stormwater facilities such as rain gardens, permeable paving, and green roofs, are included in the list of stormwater facilities that qualify for a rate reduction.

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RC3 – UPDATE OF STORMWATER MANAGEMENT DESIGN STANDARDS,  
TASK 2

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<u>Task Description</u>	<u>Measureable Goals</u>	<u>Tracking Measures</u>
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.	<ul style="list-style-type: none"> <li>• 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.</li> </ul>	<ul style="list-style-type: none"> <li>• Document the review of design standards and SRC to minimize barriers to implementation of LID techniques.</li> </ul>

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**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

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*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** and **MS4 permit requirements** stated above:*

City staff continued development of a new stand-alone stormwater chapter for the Salem Revised Code (SRC) (see RC9 Task 3). Once completed, this chapter will provide authority to implement revised Stormwater Management Design Standards and the Stormwater Management Manual (see RC3 Task 1). Staff anticipate the SRC stormwater chapter, revised design standards, and management manual will be consolidated as one ‘package’ as outreach efforts, public comment solicitation, and future presentations at City Council are conducted over the upcoming year.

The Planning Division of the Community Development Department is leading a City-wide effort to revise all development-related codes. As part of this effort, City staff are ensuring the new code language removes barriers that inhibit design and implementation techniques intended to reduce stormwater runoff. This initial effort to revise development codes is scheduled to be completed in 2012.

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RC3 – UPDATE OF STORMWATER MANAGEMENT DESIGN STANDARDS,  
TASK 3

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<u>Task Description</u>	<u>Measureable Goals</u>	<u>Tracking Measures</u>
City staff is implementing the Water Quality Development Standards set forth by SRC Chapter 141 for all development requiring a Willamette Greenway Permit.	<ul style="list-style-type: none"> <li>• Implement Water Quality Development Standards in Willamette Greenway.</li> </ul>	<ul style="list-style-type: none"> <li>• Track number of Willamette Greenway Permits issued and description of water quality measures employed.</li> <li>• Track number of new facilities constructed.</li> </ul>

**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

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*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals and Tracking Measures** for the Task Description stated above:*

No development permits were issued for the Willamette Greenway within Salem during the reporting period.

Water Quality Development Standards for the Willamette Greenway are being incorporated into the Public Works Design Standards to create uniform city wide standards. The Stormwater Design Standards are currently being completed and going through an internal review process. It is anticipated that these standards will be presented to the community for their comments in 2012 and adopted in 2013.

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RC3 – UPDATE OF STORMWATER MANAGEMENT DESIGN STANDARDS,  
TASK 4

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<u>Task Description</u>	<u>Measureable Goals</u>	<u>Tracking Measures</u>
<p>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>	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Conduct inspections once construction is completed to ensure work was done in accordance with approved plans.</li> </ul>	<ul style="list-style-type: none"> <li>• Maintain database of plans reviewed and final inspections conducted.</li> </ul>

**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

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*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** and **MS4 permit requirements** stated above:*

New construction plans for all development within City limits are submitted to the Permit Application Center at City Hall room 320. Plans are routed to Public Works Development Services staff, who coordinate the plan review process to ensure that all plans are in compliance with the City’s Stormwater Management Design Standards. Once plans are approved, construction permits are issued and the work is inspected by Public Works staff to ensure compliance with approved plans. All projects are entered and tracked in the AMANDA permit system database.

## 2.4 RC4 – Operations & Maintenance

### RC4 – OPERATIONS AND MAINTENANCE, TASK 1

<u>Task Description</u>	<u>Measurable Goals</u>	<u>Tracking Measures</u>
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.	<ul style="list-style-type: none"> <li>• Review street sweeping program annually for effectiveness and any necessary revisions to sweeping schedule.</li> <li>• Continue sweeping City streets on four zone schedule, sweeping heaviest zone 8 times per year and lightest zone 2-3 times per year.</li> <li>• Continue sweeping City-owned parking lots as needed.</li> </ul>	<ul style="list-style-type: none"> <li>• Record quantity of material collected during sweeping operations.</li> <li>• Record number of curb-miles of streets swept.</li> <li>• Track and report changes made to sweeping schedule, if any.</li> </ul>

### FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS

*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** and **MS4 permit requirements** stated above:*

The City’s street sweeping program continues to operate two street sweepers with a third machine as a back-up. The third machine is operated during peak seasons such as the leaf season or when a sweeper is broken down. Two operators sweep residential and collector streets during the day, and two operators sweep arterial streets during the night time.

The frequency of sweeping residential and collector streets is determined by debris accumulation rates identified in three categories or zones (see Appendix A for map of updated sweeping routes). These categories are designated as *Light*, *Medium*, and *Heavy*. 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. The Central Business District (CBD) and Capitol Mall areas are swept at night on a weekly basis. Heavy debris areas within the CBD are swept three times per week during summer months, twice per week in fall through Spring. Arterial Streets are also swept at night, approximately every four weeks.

The regenerative air sweepers utilize a fine water spray for dust control. The City does not sweep any commercial parking lots and contracts out sweeping (on an “as needed” basis) of the City-owned parking lots.

Current record keeping includes tracking volumes of debris. During FY 2010-11 the City swept a total of 16,822 miles. The City collected approximately 2,000 tons of street sweeping debris and removed 4,465 cubic yards of leaves.

Program expenditures for this BMP for FY 2010-11 were as follows: Street Sweeping = \$838,000; Leaf Removal = \$98,010

Beginning in the fall of 2007, new DEQ regulations required all street sweeping debris to be disposed of at sanitary landfill sites. Currently, all City street sweeping debris is being stockpiled at the McNary Field airport, and once a year hauled to the Coffin Butte Sanitary Landfill near Corvallis for disposal.



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RC4 – OPERATIONS AND MAINTENANCE, TASK 2

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<u>Task Description</u>	<u>Measureable Goals</u>	<u>Tracking Measures</u>
<p>The City will continue to perform de-icing operations in a way that minimizes stormwater pollution through: conducting annual inspections and training to ensure proper operation of the de-icing chemical storage facility; training and verification that application equipment is applying deicer at 1/2 to 1/3 the industry standard; construction of an expanded covered storage area for de-icing aggregate materials combined with FEMA floodgates to mitigate migration of aggregates (2011) ; maintaining proper function of adjacent sediment traps and catch basins in the storage yard; sweeping removal of operational de-icing aggregate spillage; and coordinating de-icing activities with Airport Operations and their 1200-Z permit.</p>	<ul style="list-style-type: none"> <li>• Continue current de-icing operations to prevent stormwater pollution.</li> </ul>	<ul style="list-style-type: none"> <li>• Document dates of activities for annual inspections and training.</li> <li>• Document de-icing quantities applied annually.</li> </ul>

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**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

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*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** and **MS4 permit requirements** stated above:*

The City conducts annual training in November each year for all potential operators of de-icing chemical storage facility. Overall responsibility for operation and training is assigned to a Concrete Project Leader. The City continues to apply chemical de-icer at a rate of 8 gallons per lane mile whereas industry standard practice is 15 to 30 gallons per lane mile. The aggregate de-icing material storage facility has been dismantled and a new storage facility is due to be constructed July through mid-November 2011. This new facility will provide weather protection for all stored aggregates and, combined with FEMA required floodgates across the open side of the structure, will mitigate past issues with weather aided migration of these aggregates into nearby stormwater facilities from a previously unprotected area. Nearby storm facilities were cleaned and new protection measures installed during demolition of previous aggregate storage facility. Annual training and inspection of de-icer storage facilities along with quantities applied are documented and tracked each fiscal year.

Sweeping of sanding rock commences immediately at the end of snow & ice mitigation. Sweeping continues until all streets are clear of sanding material. The recovered sanding material is transported to a local gravel company (CEMEX) to be recycled for other uses at no cost to the City (no dumping/disposal fees). Recovered sanding material is not used for re-application during snow & ice events.

The Salem Airport does not utilize the City's de-icing services due to the chemical's potential to damage aluminum aircraft components. The City does make its snow removal services available Airport facilities during snow emergencies if requested.

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RC4 – OPERATIONS AND MAINTENANCE, TASK 3

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<b>Task Description</b>	<b>Measureable Goals</b>	<b>Tracking Measures</b>
<p>Continue to review and update the O&amp;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&amp;M program and specific activities.</p>	<ul style="list-style-type: none"> <li>• Update DPEN and IMS database activities and schedules.</li> <li>• Create line items in budget for specific O&amp;M activities.</li> <li>• Review and update O&amp;M practices and activity schedules every 3 years.</li> </ul>	<ul style="list-style-type: none"> <li>• Track revisions made to O&amp;M practices and activity schedules.</li> </ul>

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**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

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*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** for the **Task Description** stated above:*

Updates to the Drainage Program Evaluation Notebook (DPEN) were completed during FY 2007-08. Updates to the DPEN were recorded in electronic format as an MS Access database. Current program accomplishments are planned through the use of Maintenance Management. Work accomplishments are tracked through work orders entered during routine inspection and maintenance of infrastructure in the Hansen IMS. Any errors found during routine inspection (i.e., T.V inspections, cleaning) are updated in Hansen, GIS, and on City utility 'grid' maps.

Public Works Stormwater Services Operations and Maintenance activities (TV inspection, catch basin cleaning, etc.) are budgeted for annually through a series of line items/accounts (e.g., Maintenance and Repairs, Other Professional Services, Controlled Equipment).

RC4 – OPERATIONS AND MAINTENANCE, TASK 4

Task Description	Measureable Goals	Tracking Measures
Continue to improve the O&M training program and activities especially with regards to safety and protection of water quality.	<ul style="list-style-type: none"> <li>• Conduct O&amp;M safety meetings twice per month.</li> <li>• Attend ACWA committee meetings and workshops as scheduled.</li> <li>• Conduct weekly tailgate meetings with Operations crews.</li> </ul>	<ul style="list-style-type: none"> <li>• Document reviews and modifications to the O&amp;M training program.</li> <li>• Record O&amp;M training activities completed.</li> <li>• Document ACWA meetings and workshops attended.</li> </ul>

**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** and **MS4 permit requirements** stated above:*

Operations and Maintenance safety meetings were conducted bi-monthly and included the following topics: Confined Space; Chemical/Gas Safety; Natural Gas; Hand Tool Safety; Environmental Hazards; Power Tools; Gas Detectors; Blood Borne Pathogens; Alcohol/Drug Awareness; Erosion Control; Haz-Mat Refresher; Excavations; Lifting/Back Safety; Heat Stress; Housekeeping (slips, trips, falls); Heavy Equipment; Self Defense; Personal Protection Equipment; Chainsaw Safety; Fire/Electrical Safety; Bypass Pumping; Lockout/Tagout; Asbestos; Vehicle Operation. These trainings were in addition to regularly scheduled weekly tailgate meetings with Operations and Maintenance staff.

As reported in RC1 Task 8, Public Works staff participated in multiple Oregon Association of Clean Water Agencies (ACWA) activities. Stormwater Services Operations and Maintenance staff were among those that attended the ACWA Stormwater Summit and annual conference.

During FY 2011/12, staff are planning to evaluate stormwater-related training and identify options for revising materials. This is anticipated to be done in cooperation with efforts to update the Operations Pollution Prevention Plan (see ILL1 Task 4).

RC4 – OPERATIONS AND MAINTENANCE, TASK 5

<b>Task Description</b>	<b>Measureable Goals</b>	<b>Tracking Measures</b>
Integrated Pest Management (IPM) Program: Salem Parks Operations Division will continue their program for careful 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.	<ul style="list-style-type: none"> <li>• Review and refine IPM Program during the MS4 permit cycle.</li> <li>• Routine inspections of storage facilities for proper storage of materials and chemicals.</li> </ul>	<ul style="list-style-type: none"> <li>• Document revisions made to IPM Program.</li> <li>• Document inspections of storage facilities.</li> </ul>

**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals and MS4 permit requirements** stated above:*

During the reporting period, Operations staff conducted the following:

- Initiated GPS mapping of invasive weeds in mitigated wetlands sites, to track population trends and herbicide efficacy with a goal of reducing herbicide use and maintaining effective weed control.
- Incorporation of beneficial mycorrhizae to stormwater facility plantings to eliminate the need for fertilizer during plant establishment.
- Conducted annual pesticide safety training for licensed public applicators.

<i>How many Stormwater storage facility inspections were performed this fiscal year?</i>	3 inspections
<i>How many Parks storage facility inspections were performed this fiscal year?</i>	4 inspections

RC4 – OPERATIONS AND MAINTENANCE, TASK 6

<b>Task Description</b>	<b>Measureable Goals</b>	<b>Tracking Measures</b>
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.	<ul style="list-style-type: none"> <li>• Concentrate storm sewer cleaning and TV inspection on areas with historical problems and high potential for illicit discharges.</li> <li>• Inspect 120,000 LF of conveyance system annually.</li> </ul>	<ul style="list-style-type: none"> <li>• Track number of inspections; identify areas with persistent O&amp;M problems.</li> <li>• Track number of cross-connections found.</li> <li>• Track length of conveyance system cleaned and inspected.</li> </ul>

**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** and **MS4 permit requirements** stated above:*

During FY 2010-11, 150,977 linear feet of storm pipe was inspected by Closed Circuit Television (CCTV) equipment. Stormwater sub-basins are inspected routinely and identified problem areas are also inspected. These inspection reports are field entered, imported and exported via Hansen IMS software. Video inspections are recorded on DVD's, and are logged, and retained in storage for later viewing as necessary.

<i>How many inspections were completed this year?</i>	1,127
<i>How many linear feet of conveyance system were inspected?</i>	150,997
<i>How many linear feet of conveyance system were cleaned?</i>	752,272
<i>How many cross-connections were found?</i>	0

RC4 – OPERATIONS AND MAINTENANCE, TASK 7

Task Description	Measureable Goals	Tracking Measures
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.	<ul style="list-style-type: none"> <li>• Walk 50% of the waterways within the City each year for stream cleanup and enhancement.</li> <li>• Complete one stream restoration project each year.</li> </ul>	<ul style="list-style-type: none"> <li>• Track length of waterways walked each year.</li> <li>• Document stream restoration projects completed each year.</li> <li>• Document the amount of litter and garbage removed each year.</li> </ul>

**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** and **MS4 permit requirements** stated above:*

The 2010 Stream Cleaning Program (beginning of reporting period) consisted of 8 crewmembers and an environmental aide. The cleaning crew walked 47 miles of waterways within the City, removing over 16,850 pounds of trash. Of the garbage removed, 3,800 pounds were able to be sorted and recycled. Most of the stream reaches prone to illicit activities such as dumping and transient camps held significantly less material to remove than in past years. Approximately 13 cubic yards of natural debris (primarily Himalayan blackberry) were also removed.

The 2010 stream cleaning crew completed a riparian restoration project along a reach of Waln Creek. This project was conducted on private property, immediately upstream of Valleywood Drive. The project involved the removal of invasive vegetation, installing erosion control matting, seeding with native grasses, and planting 130 native trees and shrubs. The crew also conducted maintenance and invasive vegetation removal for previous restoration sites around the City.

The 2011 Stream Cleaning Program (end of reporting period) consisted of 6 crewmembers and an environmental aide. The crew walked a total of 49 miles of the 90 total stream miles within the City, removing over 11,825 pounds of trash. They also removed approximately 83 cubic yards of natural debris (primarily Himalayan blackberry) from the creeks. In continuing recycling efforts, the crew sorted out 3,075 pounds of recyclable materials. An inmate crew was used to clean 4 miles of the East and West Fork Little Pudding River, which is included in the total 49 miles of waterways cleaned for this reporting period. The inmate crew removed over 500 cubic yards of invasive vegetation.

The 2011 stream cleaning crew completed a riparian restoration project along West Middle Fork of Pringle Creek, in the vicinity of Reed Lane and Baxter Road. The project

incorporated the removal of invasive vegetation (primarily poison hemlock, Himalayan blackberry, and tansy ragwort), installation of erosion control matting, seeding of native grasses and wildflowers, and the planting of 162 native trees, shrubs, rushes, and sedges.

At the end of each stream cleaning season, the environmental aide conducts a presentation to provide an overview of the stream cleaning crew's activities and findings. The presentation is given to City Council members during a regularly scheduled meeting and the public is encouraged to attend.



RC4 – OPERATIONS AND MAINTENANCE, TASK 8

<b>Task Description</b>	<b>Measureable Goals</b>	<b>Tracking Measures</b>
Continue to regularly inspect and maintain public structural stormwater control facilities. Coordinate with RC4 Task 9.	<ul style="list-style-type: none"> <li>Regularly inspect all public detention and water quality facilities.</li> </ul>	<ul style="list-style-type: none"> <li>Track number of public facilities inspected and maintained.</li> <li>Track amount of sediment and debris removed from all facilities.</li> </ul>

**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** and **MS4 permit requirements** stated above:*

Stormwater field staff inspected 135 public and 654 private detention basins, as well as 48 public and 5 private water quality facilities during this reporting year. Of those facilities inspected there were 151 detention basins and 36 water quality facilities cleaned. Approximately 11.15 cubic yards of debris were removed by use of hydro-vac truck and by hand from these detention and water quality facilities. Inspections, repairs, cleanings, and debris totals associated with public facilities are all recorded in the Hansen IMS.

<i>How many public water quality facilities were inspected this year?</i>	48
<i>How many public detention facilities were inspected this year?</i>	135

RC4 – OPERATIONS AND MAINTENANCE, TASK 9

<b>Task Description</b>	<b>Measureable Goals</b>	<b>Tracking Measures</b>
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.	<ul style="list-style-type: none"> <li>Document and implement a long-term maintenance strategy for public and private stormwater control facilities during the MS4 permit cycle.</li> </ul>	<ul style="list-style-type: none"> <li>Track number of private facilities located, mapped, and inspected.</li> <li>Track progress toward developing a facility long-term maintenance strategy.</li> </ul>

**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals and MS4 permit requirements** stated above:*

Stormwater field staff inspected 5 private water quality facilities and 654 private detention basins during this reporting year. In addition, 28 private stormwater control facilities (27 detention and 1 water quality) were located and mapped. Staff continued refinement of the procedures for mapping of new stormwater control facilities in GIS and recording of associated asset information in the Hansen database. These procedures have been followed historically for the inventory/tracking of stormwater assets, but revisions are needed to more accurately track stormwater treatment facilities and privately-owned facilities. Staff will continue revising these procedures through FY 2011/12, helping to assure accurate asset data for all stormwater control facilities as part of a long-term inspection and maintenance program.

Staff have also initiated development of a Stormwater Management Manual, which will accompany the revised Stormwater Management Design Standards. The manual is being prepared with a chapter dedicated to long-term operation and maintenance of stormwater control facilities. This chapter will contain operation and maintenance plans for each stormwater control facility type. Development of the manual will continue through FY 2011/12.

<i>How many private stormwater control facilities were mapped this year?</i>	28
<i>How many private stormwater control facilities were inspected this year?</i>	5

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RC4 – OPERATIONS AND MAINTENANCE, TASK 10

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<b>Task Description</b>	<b>Measureable Goals</b>	<b>Tracking Measures</b>
<p>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. (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.</p>	<ul style="list-style-type: none"> <li>• Regularly inspect and maintain 100% of City ditches using appropriate water quality BMPs.</li> </ul>	<ul style="list-style-type: none"> <li>• Track length of ditch maintenance performed (cleaning and mowing).</li> <li>• Track amount of sediment and debris removed.</li> </ul>

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**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

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*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals and Tracking Measures** for the Task Description stated above:*

During this reporting period 100% (190,454 feet) of City ditches were maintained and approximately 3000 yards of sediment were removed through the cleaning process. Ditch maintenance activities are tracked in the Hansen IMS as Work Orders. All ditch cleaning utilizes erosion prevention measures.

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RC4 – OPERATIONS AND MAINTENANCE, TASK 11

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<b>Task Description</b>	<b>Measureable Goals</b>	<b>Tracking Measures</b>
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.	<ul style="list-style-type: none"> <li>• Clean and inspect 75% of catch basins annually.</li> <li>• Periodically analyze the material removed from the catch basins.</li> </ul>	<ul style="list-style-type: none"> <li>• Track the number and percent of catch basins cleaned annually.</li> <li>• Report on any analysis of removed material.</li> </ul>

**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

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*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals and MS4 Permit Requirements** stated above:*

During the reporting period, 9,407 catch basins were inspected and cleaned. Approximately 64% of all catch basins were cleaned during the six-month period since issuance of the renewed MS4 permit in December, and this increased level of effort is anticipated to continue. Work orders are created for catch basins requiring repairs. During the next reporting period, Operations crews will commit 2 hydro-vac crews to clean and inspect 100% of the public catch basins within Salem city limits.

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RC4 – OPERATIONS AND MAINTENANCE, TASK 12

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<b>Task Description</b>	<b>Measureable Goals</b>	<b>Tracking Measures</b>
<p>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.</p>	<ul style="list-style-type: none"> <li>• Maintain informational package for ownership maintenance responsibilities for detention and water quality facilities.</li> <li>• Implement maintenance activities and requirements identified in long-term maintenance strategy (RC4 Task 9).</li> </ul>	<ul style="list-style-type: none"> <li>• Track number of information packets distributed regarding private stormwater control facilities.</li> <li>• Track maintenance requirements of long-term maintenance strategy.</li> </ul>

**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

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*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** and **MS4 Permit Requirements** stated above:*

Refer to RC4 Task 9. City staff will continue to develop the Stormwater Management Manual, which will discuss long-term operation and maintenance activities for stormwater control facilities.

Stormwater Services continues to maintain an informational webpage dedicated to stormwater detention facilities. Informational packets about detention facilities are periodically sent to appropriate property/facility owners, with the last distribution in late 2007. As resources allow, packets are anticipated to be distributed to targeted audiences (e.g., realtors, plumbers, or property owners) in FY 2011/12. Informational packets for stormwater treatment facilities may be developed following completion of the Stormwater Management Manual and development of a long-term maintenance program for stormwater control facilities.

## 2.5 RC5 – Public Education & Participation

### RC5 – PUBLIC EDUCATION AND PARTICIPATION, TASK 1

Task Description	Measureable Goals	Tracking Measures
<p>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).</p>	<ul style="list-style-type: none"> <li>• Create two (2) public education campaigns* from the Public Outreach Program Matrix.</li> <li>• Support outreach and educational activities for other divisions**.</li> <li>• Conduct an effectiveness evaluation of the outreach program before the end of year four of the MS4 permit cycle.</li> </ul>	<ul style="list-style-type: none"> <li>• Document public outreach and involvement activities for two (2) education campaigns.</li> <li>• Document outreach activities for other divisions.</li> <li>• Document the results of the effectiveness evaluation and subsequent changes to the outreach procedures/efforts.</li> </ul>
<p>*A public education campaign focuses outreach efforts on a target contaminant. The Public Outreach Matrix (Table A.1) contains the outline for educational campaigns by target contaminant. The matrix is a complete list of prioritized outreach activities, tools, partners, key audiences, and measurable goals for Salem’s stormwater management program. The City will develop robust educational campaigns for the top priority contaminants – focusing limited resources on the most critical contaminants first. Top priority contaminants were selected based on the review of monitoring data.</p> <p>**Many of the City’s BMPs, in addition to RC5, contain outreach tasks. To ensure that all required outreach is being completed, outreach tasks from BMPs other than RC5 are included in the Public Outreach Matrix. RC4 – Inventory Private Stormwater Facilities is an example of a BMP that has an outreach task: Annual letters will be mailed to detention basin/water quality facility owners. That task is shown on the matrix and will be completed and documented each year.</p>		

### FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS

*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals and MS4 permit requirements** stated above:*

#### 5-year Stormwater Outreach Plan

In March 2011, staff developed a scope of work for the development of a 5-year outreach plan that correlates with the permit cycle. Staff chose *E. coli* bacteria and turbidity to be the target contaminants for the two public education campaigns that will be addressed through the 5-year Outreach Plan. The plan will contain an outreach and education strategy with goals, objectives, identified target audiences, partners, the identified target contaminants, and messaging. This information will guide the work plan of outreach staff. Three of the City’s consultants of record provided proposals. In April, staff met to select a consultant based on predetermined criteria. The consultant will begin developing the plan in FY 2011/12. Campaigns are also scheduled for implementation in FY

2011/12, including baseline information to assist the City up in completion of an outreach/education effectiveness evaluation (currently scheduled for FY 2013/14).

(See Appendix D for summary table of the City's Outreach Matrix and activities completed during this fiscal year, a table highlighting additional activities completed to meet permit requirements, and a complete list of outreach meetings convened during this reporting period).

#### Riparian Outreach Plan:

During FY 2009-10 staff budgeted for the development of a riparian outreach plan to help prioritize sites for enhancement. In fiscal year 2010-11 the Water and Environmental Resources Section hired a consultant to develop the outreach plan. A postcard was mailed to all streamside residents in Salem inviting them to take an online survey to help the City learn about their behaviors, barriers, and incentives for riparian protection and enhancement. Responses will help inform further development of the Riparian Outreach Plan. Implementation of this effort is expected to begin this year and will dovetail with the 5-year Stormwater Outreach Plan.

#### Urban Tree Canopy:

Development and Planning staff lead a Citywide, interdepartmental effort during this reporting year to review tree and vegetation preservation-related codes. The tree team continues to meeting regularly to review codes, plan submittals, review processes, and to make suggestions for short-term and long-term changes for tree protection. Work continues to be incorporated into the new stormwater code, erosion control code, and the City's Unified Development Code process.

An updated tree canopy study was conducted based on 2009 LIDAR imaging, and results indicate a 42 acre increase in canopy between 2001 and 2009 studies. Current studies are determining the potential canopy, and will be used to help form an outreach program to help the City establish a canopy goal. Current efforts to create a strategic framework to set the goal are underway.

#### Court Street Bioswale:

The public involvement/participation piece of this CIP (See RC 2 Task 1) project was developed to gather community support for creating a bioswale instead of traditional stormwater pipes in a historic residential area to reduce local flooding along Court Street. A series of informational presentations were provided to the homeowners in the area (8/13/2010, 9/20/2010, and 3/9/2011), the neighborhood association (12/6/2010), and the Historic Lands Commission (11/18/2010). These presentations informed the audience of the impact of stormwater discharges on waterbodies and how support of this project would lead to a reduction of standing water in the streets and pollutants in stormwater.

#### Rain Garden at the Straub Environmental Learning Center (SELC):

The local environmental learning center is proposing to use a rain garden to treat roof runoff and to provide an educational opportunity for participants who attend the center's events to learn about stormwater and reduce its impacts. Meetings were held to discuss

the process (10/10/2010 and 4/11/2011). A presentation was conducted for the local biology class about rain gardens and rain garden design (3/3/2011). The students worked in groups to create a design that was judged by City, Learning Center staff and the biology teacher (5/17/2011). The SELC is seeking grant funding to build the rain garden in fiscal year 2011/12.

Glenn-Gibson Creeks Watershed Council and West Salem Neighborhood Association:  
City staff met with these groups to promote rain gardens and conduct workshops for West Salem residents. An article was published in West Side News promoting the planning meeting and the two workshops (2/26/2011 and 4/16/2011). An additional presentation was provided to residents in McMinnville (1/17/2011).

Backyard Habitat:

City staff recently began pursuing a partnership with the Marion Soil and Water Conservation District to determine the feasibility of developing a backyard habitat program that, in part, addresses water quality issues.

City staff continue to promote natural gardening techniques. Many good alternative gardening information products exist; therefore, it is not necessary to develop the materials in-house. This helps save time and resources. When staff finds a good product, they secure and promote that product.

Funding for bill inserts was cut for the FY 2009/10. However, the information provided in the monthly water bills was advertised in the consolidated monthly citywide newsletter.

Radio Spots/Interviews:

The Department of Public Works airs 30-second radio spots on local radio stations Monday – Friday every week of the year. We air 40 30-second spots per month on JC media and KBZY during the morning and evening drive times. The City also airs radio spots on the local Hispanic station La Pantera. The FY 2010-11 radio spots are divided into seven categories/themes: water conservation, stormwater messages and events, parks events, safety and preparedness, Marion County program support, wastewater protection, and PW notices.

The Youth Environmental Education Program Specialist performed 569 presentations and 5 discovery hikes to 13,464 students. Presentations were conducted for the following:

Woody Woodpecker	Pikas	Slugs! Ugh!
Flying Squirrels	Raccoons	Black Bears
Oregon Oaks	All About Owls	Neighborhood Birds
Bird Nests	Awesome Ospreys	Red-tailed Hawks
Sea Stars	Gray Whales	Beavers
Frogs	Great Blue Heron	Turtles



### “Take the Pledge”

This presentation highlights proper waste disposal more than any other presentation, though proper disposal of waste is often a presentation topic. Staff presented the “Take the Pledge” presentation to 9 classes, equaling approximately 187 students. WET materials providing proper disposal techniques and good stewardship behaviors were provided.

### Water Festival

Salem held its fifth annual water festival this year at Willamette University. Staff from the City of Salem, Marion Soil and Water Conservation District, and Marion County conducted 56 presentations to 206 students from Title 1 schools in the Salem-Keizer school district.

### Door Hangers/Storm Drain Markers

Door hangers are being updated and translated into Spanish so that each door hanger will have an English and Spanish side with the “Dump No Waste” message. Approximately 825 door hangers were passed out to residents during the storm drain marking events. This year’s program had 4 groups mark 456 drains.

### Outreach/educational activities for other divisions

Outreach and educational opportunities were coordinated for City staff in other Divisions during this reporting year. These opportunities included the webcasts, training events, and presentations listed below:

- Center for Watershed Protection (CWP) Rooftop Disconnection webcast
- American Society of Civil Engineers Erosion Control webcast
- DEQ and ODOT Sediment Prevention and Erosion Control Training
- Environmental Protection Agency (EPA) Making LID work webcast
- CWP Better Site Design webcast
- Stormwater and Sustainability presentations to the Salem Leadership Academy

City staff continues to be a resource for members of the public interested in low impact landscaping and rainwater harvesting. The following list includes additional presentations performed during this reporting year:

- Woodhaven Estates Detention Basin information (9/8/2010)
- Green and Solar Tour (10/2/2010)
- Salem Home and Remodeling Show (10/22/2010)
- Climate Masters (11/8/2010)
- Native Plant Tour (4/30/2011)
- Take Your Child to Work Day (4/28/2011)

The 2000 Stormwater master plan indicates public participation for the master plan process, one of which is a perceptionnaire. The City surveys its citizens using the perceptionnaire on average every five years. The last survey was conducted in

conjunction with the Pringle Creek Basin Study in 2006-2007 fiscal year. Refer to Appendix D for a complete list of advertisements organized by City staff for the radio, Salem Weekly Newspaper, and Community Connections City newsletter.

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RC5 – PUBLIC EDUCATION AND PARTICIPATION, TASK 2

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<b>Task Description</b>	<b>Measureable Goals</b>	<b>Tracking Measures</b>
Coordinate activities of various groups within the Public Works Department and other City departments assigned responsibility for public outreach and citizen contacts on stormwater matters.	<ul style="list-style-type: none"> <li>• Quarterly meetings of various groups assigned responsibility for public outreach and citizen contacts on stormwater matters.</li> </ul>	<ul style="list-style-type: none"> <li>• Document quarterly meetings and outcomes.</li> </ul>

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**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

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*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals and Tracking Measures** for the Task Description stated above:*

Website redesign:

Water and Environmental Resources staff are currently working with other City staff to review and consolidate water-related material into a user-friendly landing web page that will have an outline based on subject matter and not City organization. Part of the 5-year Stormwater Outreach Plan mentioned in RC 5 Task 1 is to develop the website as a better outreach tool. City staff have received the approval to develop social media in conjunction with the website reorganization, stressing the need for more immediate outreach tools. (See Appendix X for a complete list of related activities completed during this reporting year).

The City’s speakers bureau lists staff available for presentations on stormwater related subject matter. A complete list of speakers available during this reporting year can be found in Appendix D.

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RC5 – PUBLIC EDUCATION AND PARTICIPATION, TASK 3

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<b>Task Description</b>	<b>Measureable Goals</b>	<b>Tracking Measures</b>
Increase the use of community partnerships to carry out outreach goals.	<ul style="list-style-type: none"> <li>• Develop one new partnership per year to carry out outreach goals.</li> </ul>	<ul style="list-style-type: none"> <li>• Document partnerships and outcomes of partnership activities.</li> </ul>

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**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

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*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** and **Tracking Measures** for the Task Description stated above:*

In 2010, staff began participating in the newly developed Mid-Willamette Outreach Group (M-WOG) to address coordination of outreach efforts by local entities. M-WOG participants include: City of Salem, Marion County, Marion Soil and Water Conservation District, Oregon State University Extension Services, and the City of Keizer. The group is currently developing an Erosion and Sediment Control training event, planned for early 2012.

During this reporting year the Public Works Natural Area Specialist facilitated a number of new partnerships and activities related to wetlands and stream health. These partnerships and activities include the following:

- Coordinated with the local Audubon chapter to perform bird surveys of Salem’s urban wetlands to identify species utilizing site-specific habitat.
- Worked with a local Eagle Scout troop on a project to install bird houses and bat boxes at local urban mitigation wetlands.
- Coordinated with a local university student to allow access for Pacific Newt studies in local urban wetlands.
- Organized volunteer groups to do invasive weed removal and habitat restoration along a City-owned riparian restoration section of Gibson Creek.
- Organized volunteer groups to do additional plantings of native sedge and rush species in the 12<sup>th</sup> Street bioswale, working to educate them on the importance of vegetation in filtering stormwater and pollutant removal.

The Watershed Enhancement Team disbanded prior to this reporting period; therefore, no WET meetings were conducted and no visits to businesses referred by WET occurred.

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RC5 – PUBLIC EDUCATION AND PARTICIPATION, TASK 4

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<b>Task Description</b>	<b>Measureable Goals</b>	<b>Tracking Measures</b>
Investigate the use of a stormwater utility to provide an adequate funding base to support expanded public outreach (see RC6-2).	<ul style="list-style-type: none"> <li>• Develop a yearly public education budget.</li> <li>• Document public education and outreach needs in the Stormwater Utility Implementation Plan.</li> </ul>	<ul style="list-style-type: none"> <li>• Document public education budget and expenditures.</li> <li>• Document Utility implementation plan showing public education and outreach needs.</li> </ul>

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**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

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*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** and **Tracking Measures** for the Task Description stated above:*

The City’s outreach budget is contained within the Water and Environmental Resources division budget (See Table 2. Stormwater Expenditures). Additional funding for advertisements pertaining to stormwater outreach is provided by the Director’s Office.

The stormwater utility will not take effect until January 2013 or when Salem’s unemployment rate drops to 7 percent. Efforts to coordinate outreach and education with the utility will occur in future years.

Each year an outreach and education budget is proposed during the budget cycle process. Appendix D contains a table that lists the expenses proposed in 2010 for the FY 2011/12 budget and the actual budgeted amounts for FY 2011/12. Staff will work within the current operating budget for the Water Resources group. Moving forward, budget requests for amount and expenses will change based on the plan implementation and the effectiveness evaluation. Those items will be provided in subsequent years’ budget requests

## 2.6 RC6 – Stormwater Program Management Financing

### RC6 – STORMWATER MANAGEMENT PROGRAM FINANCING, TASK 1

Task Description	Measureable Goals	Tracking Measures
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.	<ul style="list-style-type: none"> <li>• Adopt updated Stormwater SDC methodology by the end of the MS4 permit cycle.</li> </ul>	<ul style="list-style-type: none"> <li>• Report on update to Stormwater SDC methodology.</li> </ul>

#### FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS

*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** and **Tracking Measures** for the Task Description stated above:*

Updating the Stormwater System Development Charge (SDC) methodology will be done as part of the Stormwater Master Plan update. See RC1 Task 1.

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## RC6 – STORMWATER MANAGEMENT PROGRAM FINANCING, TASK 2

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<b>Task Description</b>	<b>Measureable Goals</b>	<b>Tracking Measures</b>
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.	<ul style="list-style-type: none"><li>• Adopt new stormwater utility by the end of the MS4 permit cycle.</li></ul>	<ul style="list-style-type: none"><li>• Report on adoption of new stormwater utility.</li></ul>

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### **FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

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*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** and **Tracking Measures** for the Task Description stated above:*

On December 6, 2010, the Salem City Council approved development of a Stormwater Utility. The Council established an initial implementation date of January 2013, and a phase-in period of three years, with final implementation to be completed in January 2016. Over the next year staff will resume outreach efforts associated with the utility.

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RC6 – STORMWATER MANAGEMENT PROGRAM FINANCING, TASK 3

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Task Description	Measureable Goals	Tracking Measures
Identify and pursue grant opportunities for stormwater quality projects, including potential retrofit and LID project opportunities.	<ul style="list-style-type: none"> <li>Pursue grant opportunities as staff resources allow.</li> </ul>	<ul style="list-style-type: none"> <li>Track number of grants applied for each year.</li> <li>Track number of grants received each year.</li> </ul>

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**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

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*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals and Tracking Measures** for the Task Description stated above:*

During the reporting period, the City was awarded two grants from the Oregon Department of Transportation (ODOT) for Stormwater Retrofit projects. These retrofit projects include:

\$476,000 for the East Side Center and Marion Street Bridges Stormwater Retrofit Project. This project will construct infiltration rain gardens to treat runoff from 159,000 sq. ft. of impervious area, which includes the east half of the two bridges across the Willamette River. This project is in the design phase and is scheduled to be constructed in the spring of 2012.

\$693,800 for the West Side Center and Marion Street Bridges Stormwater Retrofit Project. This project will construct infiltration rain gardens to treat runoff from 211,000 sq. ft. of impervious area from the west half of the two bridges across the Willamette River. This project is scheduled for funding in 2012.

Total grant award to date is \$1,169,800. These projects are 100% ODOT funded, no City of Salem funding is being used, and ODOT will own and maintain the facilities when they are completed.



## 2.7 RC7 – Maintain & Update GIS System

### RC7 – MAINTAIN AND UPDATE GIS SYSTEM, TASK 1

<u>Task Description</u>	<u>Measurable Goals</u>	<u>Tracking Measures</u>
Continue maintenance of the GIS database and Hansen IMS database. These on-going 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.	<ul style="list-style-type: none"> <li>• Continue performing database updates annually.</li> <li>• Create record of GIS maintenance activities.</li> </ul>	<ul style="list-style-type: none"> <li>• Record maintenance/updates made to database.</li> </ul>

### FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS

*Briefly summarize GIS updates and maintenance activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals for the Task Description** stated above:*

One of the primary functions of the GIS Section of the Public Works Department is the management and maintenance of the City’s Stormwater assets in the GIS. These edits are on-going and come from a number of sources including Permitted Development, CIP Projects, and in-house construction and maintenance. In addition, Public Works Operations staff regularly provide data updates and maintenance of information located in the field while performing routine maintenance and inspection of the existing system. GIS added approximately 3,450 feet of newly installed stormwater structures in the 2010/2011 fiscal year. In addition, the GIS Section has also begun entering privately owned stormwater structures that impact the City’s systems including pipes, manholes, catch basins, detention basins, and other stormwater facilities.

<i>How many linear feet of storm line were added to the GIS system this year?</i>	3450
<i>How many linear feet of storm line were abandoned this year?</i>	0

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RC7 – MAINTAIN AND UPDATE GIS SYSTEM, TASK 2

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<b>Task Description</b>	<b>Measurable Goals</b>	<b>Tracking Measures</b>
Integrate the information in the 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.	<ul style="list-style-type: none"> <li>• Create an action plan for how the GIS and IMS system will be integrated and updated.</li> <li>• Implement action plan to integrate GIS and IMS.</li> </ul>	<ul style="list-style-type: none"> <li>• Track completion of action plan items.</li> <li>• Track implementation status of database integration.</li> </ul>
<p><b><u>MS4 Permit Requirements Addressed by this BMP</u></b></p> <p>Not applicable for this task.</p> <p>(refer to 2010 MS4 permit for details and deadlines)</p>		

**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

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*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** for the **Task Description** stated above:*

Due to Stormwater Utility efforts, activities related to the integration of GIS and IMS (Hansen), also known as the GeoAdministrator Project, have been put on hold. The Public Works Department has utilized consultant services in the past to develop the required database structures for the GIS asset management, and we fully intend to use these databases to insure a clean connection between the two systems. The first GeoAdministrator asset to be converted will be sanitary sewer data, followed by stormwater data. The implementation plan already exists at this time and will be followed in the implementation of the integration of the GIS system and Hansen system.

## 2.8 RC8 – City Stormwater Grant Program

### RC8 – CITY STORMWATER GRANT PROGRAM, TASK 1

Task Description	Measureable Goals	Tracking Measures
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.	<ul style="list-style-type: none"> <li>• Continue to fund \$50,000 grant program.</li> <li>• Expand matching grant program for watershed protection.</li> <li>• Promote the grant program in conjunction with RC5 outreach activities.</li> </ul>	<ul style="list-style-type: none"> <li>• Maintain a list of grant awards tracking funding and projects.</li> </ul>

#### FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS

*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** for the **Task Description** stated above:*

Continue to fund \$50,000 grant program.

During the FY 2010/11, five watershed protection and preservation grants were awarded for a total of \$23,062. Two grants were for invasive species removal (\$8,730), one for sponsorship of the mid-Willamette valley green awards (\$1,000), one for sub-basin planning and project implementation in the North Santiam Watershed (\$7,500), and one for boulder placement in Pringle Creek (\$5,832). City staff have identified a need to further advertise this grant so that a larger proportion of the funding available is provided to beneficial projects in the community.

The City continues to develop incentives as tools to encourage the protection of riparian areas in Salem. The Riparian Outreach Plan development and the Riparian Prioritization Process were priority items during FY 2010-11. City staff budgeted for the development of a riparian outreach plan to help prioritize sites for enhancement. The Water and Environmental Resources Section hired a consultant to develop this outreach plan. A postcard was mailed to all streamside residents in Salem inviting them to take an online survey to help the City learn about behaviors, barriers, and incentives for riparian protection and enhancement. The data assessment is scheduled to be provided to the City in July 2011, with the final outreach plan provided to the City in September 2011.

The City's Free Tree Program was put on hold during FY 2010-11 due to staffing constraints. This program will be re-initiated during the FY 2011-12 reporting period to once again provide free native trees and shrubs to streamside property owners in Salem.

## 2.9 RC9 – Legal/Ordinances

### RC9 – LEGAL/ORDINANCES, TASK 1

Task Description	Measureable Goals	Tracking Measures
<p>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.</p>	<ul style="list-style-type: none"> <li>• Adopt the UDC and integrate stormwater-related revisions to the SRC by the end of the MS4 permit cycle.</li> </ul>	<ul style="list-style-type: none"> <li>• Report on progress for adoption of UDC and integration of stormwater-related SRC.</li> </ul>

### FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS

*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** for the **Task Description** stated above:*

The City of Salem continues the project to incorporate selected chapters of the Salem Revised Code (SRC) into a single, Unified Development Code (UDC). Led by the Community Development Department, the effort involves grouping various and related sections and subsections of existing chapters of the SRC into the more cohesive UDC format. During the past year, 13 chapters, primarily involving land use, have been completed. Aspects of the SRC involving public works-related regulations are expected to be addressed later in 2011. In the future (particularly as related to development and adoption of a new stormwater-dedicated chapter to the SRC).

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RC9 – LEGAL/ORDINANCES, TASK 2

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<b>Task Description</b>	<b>Measureable Goals</b>	<b>Tracking Measures</b>
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).	<ul style="list-style-type: none"> <li>• Revise SRC (as needed).</li> </ul>	<ul style="list-style-type: none"> <li>• Track any MS4 stormwater pertinent revisions made to the SRC.</li> </ul>

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**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

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*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** and **MS4 Permit Requirements** stated above:*

The proposed new Stormwater Code (see RC 9 Task 3) includes a new section on enforcement that will include a matrix-based penalty assessment, as well as clarified regulations related to Stop Work Orders and Notices of Violation.

The implementation phase of the new Stormwater Code will include training for development review staff in order to ensure that the new provision of the code and associated Stormwater Design Standards, including on-site water quality and water quantity requirements, are incorporated in proposed development plans.

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RC9 – LEGAL/ORDINANCES, TASK 3

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<b>Task Description</b>	<b>Measureable Goals</b>	<b>Tracking Measures</b>
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).	<ul style="list-style-type: none"> <li>• Adopt the new SRC chapter for stormwater by the end of the MS4 permit cycle.</li> </ul>	<ul style="list-style-type: none"> <li>• Report on adoption of the new SRC chapter for stormwater, and processes/milestones enroute to formal adoption of the SRC revisions.</li> </ul>

**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

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*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** and **MS4 Permit Requirements** stated above:*

Work continues on drafting a new and separate chapter of the Salem Revised Code (SRC) that is specific to stormwater (see RC3 Task 2). The current draft, which is undergoing internal review, includes sections on prohibited and non-prohibited discharges, and minimum requirements for stormwater flow control and treatment. A new section regarding enforcement has also been prepared.

## 2.10 ILL1 – Spill Prevention and Response Program

### ILL1 – SPILL PREVENTION & RESPONSE PROGRAM, TASK 1

Task Description	Measurable Goals	Tracking Measures
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 de-icing activities of the Airport Operations and their 1200-Z permit, and possibly the Oregon Air National Guard.	<ul style="list-style-type: none"> <li>• Continue to implement the spill prevention and emergency response program and review and revise as needed.</li> </ul>	<ul style="list-style-type: none"> <li>• Document refinements to cleanup procedures for vehicular accidents and structural fires.</li> </ul>

### FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS

*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goal** that has been identified for the **MS4 permit requirements** stated above:*

Salem Fire will continue to respond to any spill or leak of any de-icing materials at the airport. Salem Fire will continue to contain and stop any leak that may be occurring, and work with Environmental Services to properly clean up the spill or leak. Incidents responded to during FY 2010/11 are provided in ILL 1 Task 2.

Salem Fire only uses water during firefighting drills. Foam or dry chemicals are used once per year for training exercises at the Salem Airport. Airport training operations only proceed with consultation from Environmental Services staff to ensure all materials are handled appropriately.

*Describe any current measures in place to prevent or control the release of materials related to fire-fighting training activities. Are any new efforts anticipated in the next fiscal year?*

Salem Fire only uses water during firefighting drills. If foam or dry chemicals are used, a consultation with Environmental Services is done so that the affected area can be cleaned.

**ILL1 – SPILL PREVENTION & RESPONSE PROGRAM, TASK 2**

<b>Task Description</b>	<b>Measurable Goals</b>	<b>Tracking Measures</b>
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.	<ul style="list-style-type: none"> <li>• Develop a review schedule with a checklist for the spill response plan.</li> </ul>	<ul style="list-style-type: none"> <li>• 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.</li> </ul>

**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goal** and **MS4 permit requirements** stated above:*

Salem Fire adheres to a series of Standard Operating Guidelines (SOGs). These SOGs are reviewed internally every 2 years. Salem Fire will continue to respond to any spill when requested by the fire dispatch center, and a summary of FY 2010/11 is provided in the table above. If the spill or leak is beyond the capability or the amount of equipment carried on Salem Fire vehicles, Environmental Services would be contacted and their response requested.

Environmental Services procedures are reviewed and updated periodically, as required. Environmental Services will continue spill response as requested by the Dispatching agencies, focusing on sanitary sewer, storm sewer, and environmental protection (see table above for FY 2010/11 activities).

<i>How many spill events did Fire Department staff respond to from the following categories?</i>	
<i>Chemical leaks or spills</i>	24
<i>Vehicle accidents</i>	920
<i>Fuel or oil spills</i>	153
<i>How many spill responses did Environmental Services staff respond to?</i>	567
<i>How many water quality issues did Environmental Services staff respond to?</i>	163



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### ILL1 – SPILL PREVENTION & RESPONSE PROGRAM, TASK 3

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<b>Task Description</b>	<b>Measurable Goals</b>	<b>Tracking Measures</b>
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.	<ul style="list-style-type: none"><li>• Continue to implement the daily equipment inspection program.</li></ul>	<ul style="list-style-type: none"><li>• Report revisions to the daily inspection program</li></ul>

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### FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS

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*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goal** and **MS4 permit requirements** stated above:*

Each vehicle has a daily checklist that is in compliance with OSHA. The City of Salem requires that vehicle operators conduct inspections at the beginning and the end of their shift.

Risk Section staff conducted weekly spot checks on vehicles to insure that daily inspection checks were being completed as required by City policy.

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ILL1 – SPILL PREVENTION & RESPONSE PROGRAM, TASK 4

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<b>Task Description</b>	<b>Measurable Goals</b>	<b>Tracking Measures</b>
Develop an updated Operations Pollution Prevention Plan; incorporating new/expanded/relocated Operations-oriented facilities.	<ul style="list-style-type: none"> <li>• Update the Operations Pollution Prevention Plan by the end of the MS4 permit cycle.</li> <li>• Implement the updated Operations Prevention Plan upon completion.</li> </ul>	<ul style="list-style-type: none"> <li>• Track progress toward updating the Operations Pollution Prevention Plan.</li> <li>• Track implementation of the Operations Pollution Prevention Plan.</li> </ul>

**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

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*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** and **MS4 permit requirements** stated above:*

Efforts to update the Operations Pollution Prevention Plan are scheduled to begin in August 2011. Revisions to the plan will be coordinated through the Yardmaster Committee, which has staff representatives from each of the workgroups/users of the operations property. The development of this plan is anticipated to continue throughout FY 2011/12.

A new aggregate de-icing material storage facility is scheduled to be constructed within the next reporting year. This facility will all stored aggregates from weather and will incorporate FEMA required flood gates to ensure aggregates do not migrate into nearby stormwater facilities.

## 2.11 ILL2 – Illicit Discharge Elimination System Program

### ILL2 – ILLICIT DISCHARGE ELIMINATION PROGRAM, TASK 1

Task Description	Measurable Goals	Tracking Measures
<p>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.</p>	<ul style="list-style-type: none"> <li>• Respond to reports of illicit discharges and suspicious water quality conditions.</li> <li>• Maintain database to document unusual/suspicious discharges, sources found, and corrective actions taken.</li> </ul>	<ul style="list-style-type: none"> <li>• Track calls and mitigation actions taken in database.</li> </ul>

### FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS

*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** and **MS4 permit requirements** stated above:*

Environmental Services staff responded to 163 water quality responses during this last fiscal year, and continues to provide 24/7 coverage to respond to calls reporting discharges affecting storm or sanitary sewers and the environment. Calls are tracked by use of the Hansen IMS. When a responsible party is identified, they are tasked with correcting their discharge. If they are unable or unwilling to do so, staff help implement corrective action and bill the responsible party to recoup City incurred costs. A summary of enforcement actions and inspections is provided in Section 4 of this report. A complete list of MS4 Violations for the reporting year is provided in Appendix C.

ILL2 – ILLICIT DISCHARGE ELIMINATION PROGRAM, TASK 2

<u>Task Description</u>	<u>Measurable Goals</u>	<u>Tracking Measures</u>
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.	<ul style="list-style-type: none"> <li>Inspect City’s wastewater users for proper management of wastewater and stormwater.</li> </ul>	<ul style="list-style-type: none"> <li>Track number of inspections and associated findings.</li> </ul>

**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

*Briefly summarize specific activities and findings in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** and **MS4 permit requirements** stated above:*

Environmental Services staff will continue to inspect users subject to wastewater treatment requirements to insure all requirements are met. A summary of activities during this reporting period is provided in the table above.

<i>Total number of wastewater discharge inspections/business contacts?</i>	1,157
<i>Total number of industrial and commercial facilities evaluated this year?</i>	463

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ILL2 – ILLICIT DISCHARGE ELIMINATION PROGRAM, TASK 3

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<b>Task Description</b>	<b>Measurable Goals</b>	<b>Tracking Measures</b>
Work with Wastewater Collection Services to identify and correct cross-connections between the sanitary sewer and stormwater systems.	<ul style="list-style-type: none"> <li>• Review stormwater and ambient stream monitoring data to identify possible cross-connection discharges into the stormwater system.</li> <li>• Maintain communications with Wastewater Collections and other City staff to identify any system cross connection problems.</li> </ul>	<ul style="list-style-type: none"> <li>• Document number of cross-connections identified and corrective actions taken.</li> </ul>

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**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

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*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** and **MS4 permit requirements** stated above:*

Follow-up activities for potential cross-connections occur when stormwater and ambient stream monitoring data are collected at levels that fall outside established ranges of variability for the time of year and location. Environmental Services records indicate no cross-connections were identified during this reporting period.

**ILL2 – ILLICIT DISCHARGE ELIMINATION PROGRAM, TASK 4**

<b>Task Description</b>	<b>Measurable Goals</b>	<b>Tracking Measures</b>
Develop and update a storm sewer outfall dry weather inspection and monitoring prioritization plan.	<ul style="list-style-type: none"> <li>• Prioritize outfalls for storm sewer outfall inspection and monitoring, and inspect annually.</li> <li>• Coordinate prioritization process with ILL 2 Task 5.</li> </ul>	<ul style="list-style-type: none"> <li>• Document review of outfall monitoring plan.</li> <li>• Document priorities established for monitoring and inspection.</li> <li>• Track dry weather inspections conducted and results of inspection.</li> </ul>

**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** and **MS4 permit requirements** stated above:*

In the summer of 2010, outfalls were prioritized based on catchment size and land zoned for industrial uses. As a result, staff attempted to inspect all outfalls 30” in diameter or greater that drain industrially zoned areas. Of the 28 priority outfalls identified, five could not be inspected due to safety concerns, and two could not be located in the field due to dense vegetation (see table above). Seventeen outfalls had no flow or suspicious conditions, and one outfall had flow due to groundwater. Three outfalls were investigated by Environmental Services staff—one of which was determined to be an illicit discharge. The source of the illicit discharge was determined and the responsible company fixed the cause and cleaned up the problem area.

<i>How many outfalls were inspected during the reporting period?</i>	21
<i>How many inspected outfalls displayed dry-weather flow?</i>	4
<i>Total number of outfalls with illicit discharges?</i>	1

**ILL2 – ILLICIT DISCHARGE ELIMINATION PROGRAM, TASK 5**

<b><u>Task Description</u></b>	<b><u>Measurable Goals</u></b>	<b><u>Tracking Measures</u></b>
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.	<ul style="list-style-type: none"> <li>• Continue to identify and map contaminated sites in the GIS system.</li> </ul>	<ul style="list-style-type: none"> <li>• Track number of contaminated sites added to the GIS system.</li> </ul>

**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

*Please describe the nature of the spills that are documented?*

Spills may be from a variety of sources including leaks at fixed site tanks and process lines, releases during loading or off-loading activities, or discharges during accidents or other unanticipated emergencies or malfunctions. Underground fuel storage tanks that were not previously identified, or from old sites closed prior to the adoption of current cleanup requirements are the source of many of the releases entered onto the contaminated site map.

<i>How many contaminated sites were added to the GIS system during the FY 2010/2011 reporting period?</i>	5
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## 2.12 ILL3 – Illegal Dumping Control Program

### ILL3 – ILLEGAL DUMPING CONTROL PROGRAM, TASK 1

Task Description	Measurable Goals	Tracking Measures
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.	<ul style="list-style-type: none"> <li>• Continue to support the Adopt-a-Street Program.</li> </ul>	<ul style="list-style-type: none"> <li>• Record the miles of adopted streets, number of participating groups, and volume of litter collected through the Adopt-a-Street Program.</li> </ul>

### FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS

*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** and **MS4 permit requirements** stated above:*

The Adopt-A-Street program had 90 active groups that maintained 180 miles of street right-of-way. In FY 2010-11, 1,700 volunteers picked up 11,000 pounds of litter.



**ILL3 – ILLEGAL DUMPING CONTROL PROGRAM, TASK 2**

<b>Task Description</b>	<b>Measurable Goals</b>	<b>Tracking Measures</b>
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.	<ul style="list-style-type: none"> <li>• Continue to operate the 24-hour Public Works Dispatch Reporting Center.</li> <li>• Assign reports to appropriate City staff for action, including actions taken under ILL2-1.</li> </ul>	<ul style="list-style-type: none"> <li>• Record number and types of reported illegal dumping incidents.</li> <li>• Track media outreach when a discharge warrants.</li> </ul>

**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals, Tracking Measures and MS4 permit requirements** stated above:*

Environmental Services continues to respond to, investigate, and take appropriate enforcement action relating to reports of discharge violations affecting the sanitary and storm sewers, or the environment. Environmental Services provide information pertaining to illegal dumping at Open House events for the City of Salem and Keizer, and takes part annually in the City of Salem Public Works Day. Sanitary sewer spills are coordinated through an established SSORP (Sanitary Sewer Overflow Response Plan). This plan incorporates an element of public notification for defined sanitary sewer overflow events. Refer to Section 4 and Appendix B for a list of enforcement actions related to illicit discharges during the reporting period.

<i>How many prohibited discharge violations did Environmental Services staff issue during the reporting period?</i>	20
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ILL3 – ILLEGAL DUMPING CONTROL PROGRAM, TASK 3

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<b>Task Description</b>	<b>Measurable Goals</b>	<b>Tracking Measures</b>
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.	<ul style="list-style-type: none"> <li>• Continue to support the Adopt-A-Stream Program.</li> </ul>	<ul style="list-style-type: none"> <li>• Maintain a descriptive list of adopt a stream program projects, objectives, outcomes upon completion, and number of participants.</li> </ul>

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**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

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*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals, Tracking Measures and MS4 permit requirements** stated above:*

The City continued to support the Adopt-A-Stream Program again this year. However, in part due to budget and resource constraints (both the City and School District), meetings and training sessions were limited.

Teachers in the Adopt-A-Stream program have different levels of involvement. Some teachers do the minimum requirement of the program, which is to collect water quality data, with or without assistance provide by staff, and return it to the City. Teachers are provided water quality testing kits in return for the collected data. Other participants attend monthly scheduled training meetings, when available, coordinated by Water Resources staff in addition to performing the studies.

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ILL3 – ILLEGAL DUMPING CONTROL PROGRAM, TASK 4

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Task Description	Measurable Goals	Tracking Measures
Continue to support Marion County in their efforts to provide convenient alternatives for legal disposal of household hazardous wastes and other recyclable materials.	<ul style="list-style-type: none"> <li>• Continue to support Marion County in providing alternatives for household hazardous waste disposal.</li> </ul>	<ul style="list-style-type: none"> <li>• Document frequency and type of support activities</li> </ul>

**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

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*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** and **MS4 permit requirements** stated above:*

The City helped advertise Marion County’s programs through radio spots, through an interview (spring cleaning and household hazardous waste), and through print advertisement (Call for Leaf Haul volunteers and Fall Leaf Haul event). In addition, two drug take back programs were sponsored in part by the City, which provided an alternative to throwing the items out in the trash. The City is working on creating an established site for Salem residents to safely and legally dispose of prescription and over the counter drugs.

Marion County support elements were 9.4 percent of the weekly radio spots, 8 percent of radio interviews, and 25 percent of the monthly print ads in Salem Weekly.

In addition, the City continues to distribute door hangers describing harmful effects of illicit dumping. Approximately 825 door hangers were passed out to residents during the storm drain marking events. Door hangers are currently being updated and translated into Spanish so that each will have an English and Spanish side with the “Dump No Waste” message.

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ILL3 – ILLEGAL DUMPING CONTROL PROGRAM, TASK 5

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<b>Task Description</b>	<b>Measurable Goals</b>	<b>Tracking Measures</b>
Continue to support the annual yard debris cleanup effort.	<ul style="list-style-type: none"><li>• Support the annual yard debris cleanup effort.</li></ul>	<ul style="list-style-type: none"><li>• Record amount of debris cleaned up and level of participation.</li></ul>

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**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

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*Lists the collection site, volume of debris collected, and level of participation:*

The annual yard debris cleanup effort took place on December 4, 2010, and collected 480 total yards of debris (Oregon State Fairgrounds = 180 yards, Sprague High School = 210 yards, Wallace Marine Park = 90 yards). There were 100 volunteers for this event. The number of participants in this event has not previously been tracked. Efforts to track this will commence during the 2011-12 reporting year.

## 2.13 IND1 – Industrial Stormwater Discharge Program

### IND1 – INDUSTRIAL STORMWATER DISCHARGE PROGRAM, TASK 1

Task Description	Measurable Goals	Tracking Measures
<p>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>	<ul style="list-style-type: none"> <li>• Inspect stormwater systems while conducting inspections of City-permitted wastewater users.</li> <li>• Develop process to coordinate with DEQ on industrial permits within the City.</li> </ul>	<ul style="list-style-type: none"> <li>• Track coordination efforts with DEQ.</li> <li>• Include stormwater observations as appropriate on inspection reports and follow-up actions.</li> </ul>

### FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS

*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting deadlines identified in the **BMP and MS4 permit requirements** stated above:*

Environmental Services continues to inspect storm drains at permitted industrial facilities during routine full facility inspections. This is done to insure facilities comply with permit requirements preventing any process wastewater, or other pollutants, from being discharged from their facility to the storm system. These inspections are included in the total number of industrial and commercial facilities screened during this reporting year (See ILL2 Task 2).

There were no coordinated Land Use Compatibility Statements (LUCS) or Underground Storage Tank (UST) activities completed during this reporting period.

IND1 – INDUSTRIAL STORMWATER DISCHARGE PROGRAM, TASK 2

<b>Task Description</b>	<b>Measurable Goals</b>	<b>Tracking Measures</b>
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.	<ul style="list-style-type: none"> <li>• Review industrial plans as necessary for additional stormwater treatment.</li> <li>• Conduct inspections once construction is completed to ensure work was done in accordance with approved plans.</li> </ul>	<ul style="list-style-type: none"> <li>• Maintain database of plans reviewed and final inspections conducted.</li> </ul>

**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting deadlines identified in the **Measurable Goals** and **MS4 permit requirements** stated above:*

Environmental Services will continue participating in the plan review and inspection processes to help insure appropriate treatment is included during construction, or remodel, of industrial sites. After the stormwater-dedicated chapter to Salem Revised Code is updated and design standards adopted, new requirements will be included for the plan review process. The number of plans reviewed and post-construction inspections completed during the reporting year is provided in the table above.

<i>How many industrial plans were reviewed by City staff during the reporting period?</i>	250
<i>How many post-construction inspections were completed by City staff during the reporting period?</i>	194

IND1 – INDUSTRIAL STORMWATER DISCHARGE PROGRAM, TASK 3

<b>Task Description</b>	<b>Measurable Goals</b>	<b>Tracking Measures</b>
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.	<ul style="list-style-type: none"> <li>• Send surveys to new customers as accounts are opened.</li> <li>• Enter survey results into database – on-going as surveys are returned.</li> </ul>	<ul style="list-style-type: none"> <li>• Track number of surveys sent out.</li> <li>• Track number of surveys returned and entered into database.</li> <li>• Track targeted public education activities for specific industries.</li> </ul>

**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting deadlines identified in the **Measurable Goals and MS4 permit requirements** stated above:*

Environmental Services will continue sending out surveys to target new businesses opening in Salem which may require pre-treatment measures or have the potential to contribute significant pollutant loads to the MS4. All surveys are followed up with either a phone call or site visit to ensure that the surveys are completed and the required information is collected.

<i>How many surveys were distributed as part of the pretreatment business survey database?</i>	39
<i>Of the surveys distributed, how many were returned and entered into the database?</i>	73*

\* Surveys from past years that had not been returned to the City when originally sent.

**IND1 – INDUSTRIAL STORMWATER DISCHARGE PROGRAM, TASK 4**

<b>Task Description</b>	<b>Measurable Goals</b>	<b>Tracking Measures</b>
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.	<ul style="list-style-type: none"> <li>• Produce two technical bulletins for industrial users each year.</li> </ul>	<ul style="list-style-type: none"> <li>• Track published technical materials prepared for industrial users each year.</li> </ul>

**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

<i>How many technical bulletins did the City produce for industrial users during the reporting period?</i>	2
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## 2.14 CON1 – Construction Site Control Program

### CON1 – CONSTRUCTION SITE CONTROL PROGRAM, TASK 1

<b>Task Description</b>	<b>Measureable Goals</b>	<b>Tracking Measures</b>
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.	<ul style="list-style-type: none"> <li>• Implement SRC 75.</li> <li>• Conduct annual program reviews.</li> <li>• Implement appropriate improvements and/or Code amendments.</li> <li>• Perform plan reviews for erosion control requirements.</li> </ul>	<ul style="list-style-type: none"> <li>• Track number of erosion control plans reviewed for compliance with SRC 75.</li> </ul>

### **FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals and MS4 permit requirements** stated above:*

The Public Works Inspections Section continues to improve inspection document retention procedures by uploading erosion inspection reports into the AMANDA system. This procedure insures instant access to reports by any staff member. Staff continue to maintain an erosion control report folder with a current copy of 1200-C permits, along with inspection reports associated with each 1200-C permit. Staff continues inspections of single family construction permit work. Inspectors are instructed to report any activity noted which could result in sediment discharges, regardless of permit status.

<i>How many Erosion Control Inspections were completed during the reporting period?</i>	228
<i>How many Erosion Control permits were issued during the reporting period?</i>	214
<i>Erosion Control Permits Issued by Category:</i>	
<i>Commercial</i>	47
<i>Grading</i>	0
<i>Single Family</i>	167
<i>Storm</i>	0

CON1 – CONSTRUCTION SITE CONTROL PROGRAM, TASK 2

Task Description	Measureable Goals	Tracking Measures
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.	<ul style="list-style-type: none"> <li>• Provide annual erosion control training to City staff and private contractors.</li> </ul>	<ul style="list-style-type: none"> <li>• Track education and training programs conducted and number of staff/public trained.</li> </ul>

**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** and **MS4 permit requirements** stated above:*

Inspection staff continues to attend training sessions and webinars related to erosion, sediment control, and MS4 permit implementation. During the reporting period, three Inspectors received Oregon Department of Transportation certification as Environmental Construction Inspectors. One Inspector was certified as an NPDES Storm Water Inspector and two inspectors were certified as NPDES Erosion Inspectors by the National Storm Water Center. City staff from a variety of workgroups attended a free erosion control training featuring speakers from the DEQ and ODOT on October 29, 2010 at Louks Auditorium on October 29, 2010. Staff continues discussion of erosion control reporting and enforcement at weekly staff meetings. Additional training and certification will be provided to staff during the winter season as classes are scheduled.

During field inspections, every effort is made to educate contractors in the proper implementation of the erosion control BMPs. Staff is instructed to stress the importance of additional measures, not always shown on the approved plans, required to prevent sediment from leaving the site.

As reported in RC 5 Task 3, a collaborative effort was initiated during this reporting period to conduct an erosion and sediment control training event in early 2012.

<i>Total number of training opportunities this year for City Staff and private contractors?</i>	5
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CON1 – CONSTRUCTION SITE CONTROL PROGRAM, TASK 3

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<b>Task Description</b>	<b>Measureable Goals</b>	<b>Tracking Measures</b>
Document and streamline site plan review, inspection, and enforcement procedures for the construction site runoff control program.	<ul style="list-style-type: none"> <li>• Complete documentation of site plan review, inspection, and enforcement procedures before the end of year four of the MS4 permit cycle.</li> </ul>	<ul style="list-style-type: none"> <li>• Track completion of documented procedures.</li> </ul>

**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

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*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** and **MS4 permit requirements** stated above:*

Engineering Division continues to provide plan review of erosion control plans for larger complex projects. Projects are evaluated for dry weather and wet weather seasons. Inspection of projects is documented in the AMANDA system including the ability to attach associated pictures of the site.

During this reporting year efforts were initiated to update the Erosion/Pollution Prevention Manual and to review erosion control inspection procedures (See CON 1 Task 4).

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CON1 – CONSTRUCTION SITE CONTROL PROGRAM, TASK 4

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<b>Task Description</b>	<b>Measureable Goals</b>	<b>Tracking Measures</b>
Continue to review and update the Erosion Prevention and Sediment Control Technical Guidance Handbook.	<ul style="list-style-type: none"> <li>• Update Technical Guidance Handbook before the end of year four of the MS4 permit cycle.</li> </ul>	<ul style="list-style-type: none"> <li>• Track updates made to the Technical Guidance Handbook.</li> </ul>

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**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

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*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** and **MS4 permit requirements** stated above:*

During this fiscal year, staff formed an internal review team, held initial meetings, and began collecting information from other jurisdictions to compile the best available information, in effort to eventually revise Salem’s Erosion Prevention and Sediment Control Plan Technical Guidance Handbook. There have also been discussions within the Association of Clean Water Agencies (ACWA) to develop a similar document. Salem staff will participate in this effort as appropriate.

CON1 – CONSTRUCTION SITE CONTROL PROGRAM, TASK 5

Task Description	Measureable Goals	Tracking Measures
Continue to coordinate with the City’s 1200-CA Permit for City construction projects subject to its program.	<ul style="list-style-type: none"> <li>• Requirements for 1200-CA compliance incorporated into City construction plans, specifications, and contract documents.</li> <li>• Make erosion prevention and sediment control a key agenda item at all pre-construction conferences.</li> <li>• Include inspection of all site erosion prevention and sediment control measures as part of City projects.</li> </ul>	<ul style="list-style-type: none"> <li>• Track renewal of 1200-CA permit.</li> </ul>

**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** and **MS4 permit requirements** stated above:*

During project pre-construction conferences, copies of the City’s Erosion Prevention and Sediment Control (EPSC) Technical Guidance Handbook is discussed and distributed to contractors. The contractors reporting process and the City’s inspection procedures are also discussed.

The Public Works Inspections section is required to submit erosion control reports on a weekly basis for all capital improvement program projects. These reports are reviewed and signed by the Project Managers. Reports are then filed in the project master file. Additionally, daily erosion control inspections are reported through a check box on the City’s Daily Report form.

<i>How many EPSC inspection reports were completed for City construction projects during the reporting period?</i>	186
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## 2.15 MON1 – Monitoring

### MON1 – MONITORING, TASK 1

Task Description	Measurable Goals	Tracking Measures
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.	<ul style="list-style-type: none"> <li>• Install additional monitoring stations.</li> <li>• Monitor the station alarms in conjunction with the illicit discharge control program (ILL2, Task 1).</li> <li>• Follow up on potential hotspots or problem areas as may be identified through data analyses.</li> </ul>	<ul style="list-style-type: none"> <li>• Track number of additional monitoring stations implemented.</li> </ul>

### FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS

*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** for the Task Description stated above:*

In June 2011, a consultant was used to do a field reconnaissance and identify preferred locations for additional stream flow and water quality monitoring stations. The consultant evaluated four different creeks and found locations that would be the most suitable for both stream flow and water quality monitoring. Over the next year, the consultant will further explore location and design feasibility for up to four stations. It is anticipated that one new station will be constructed during FY 2011/12.

Environmental Services staff responded to 124 alarms from in-stream continuous water quality monitoring stations during FY 2010/11. Of the 124 alarms responded to, 25 were deemed erroneous due to instrument error. Of the remaining 99 alarms, 59 occurred during storm conditions and 40 occurred during dry conditions. The alarms resulted from a wide range of circumstances, including: in-water work, water line/trench flushing, wildlife activity, and children playing in the creek. All alarms that occurred during dry conditions were considered hot spot/problem areas that prompted field investigation. Dry condition alarms that showed a recurring pattern often resulted in additional follow-up activities such as TV inspection, smoke testing, or other forms of source tracking.

<i>How many stations alarms did City staff respond to as part of the illicit discharge control program during the reporting period?</i>	124
<i>How many hotspots or problem areas did City staff follow up on that were identified through data analyses during the reporting period?</i>	40

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MON1 – MONITORING, TASK 2

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<b>Task Description</b>	<b>Measurable Goals</b>	<b>Tracking Measures</b>
<p>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>	<ul style="list-style-type: none"> <li>• Update database for collected data.</li> <li>• Review collected data for purposes of trending and benchmarking by the end of the permit term.</li> <li>• Follow-up on potential hotspots or problem areas as may be identified by the data review.</li> </ul>	<ul style="list-style-type: none"> <li>• Document findings regarding trends.</li> </ul>

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**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

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*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals** for the **Task Description** stated above:*

The City’s “Surface Water and Stormwater Monitoring Plan”, conditionally approved by the DEQ on June 29, 2011, refers to the urban stream sampling program as the Monthly Instream monitoring component. With the renewal of the MS4 permit in December 2010, Monthly Instream monitoring added sampling parameters of zinc, copper, and lead (total and dissolved for each) for sites located in Pringle and Clark Creeks. Additionally, total suspended solids was added for the West Fork Little Pudding River site. These additional parameters were collected following MS4 permit renewal. The data will aid in trends and benchmarking analyses to be completed near the end of the MS4 permit term.

All data collected under this task has been entered into appropriate databases and verified for accuracy. Data collected during FY 2010/11 did not prompt follow up investigation (such as if an illicit discharge were suspected).

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MON1 – MONITORING, TASK 3

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Task Description	Measurable Goals	Tracking Measures
Continue to implement all components (MS4 outfall, instream, pesticide, and macro-invertebrate) of the City’s “Surface Water and Stormwater Monitoring Plan.”	<ul style="list-style-type: none"> <li>• Implement the City’s Stormwater Monitoring Plan, including MS4 outfall, instream, pesticide, and macro-invertebrate monitoring components.</li> </ul>	<ul style="list-style-type: none"> <li>• Provide summary statistics for sampling results from each wet-weather season.</li> <li>• Track any modifications to the monitoring plan.</li> </ul>

**FY 2010-11 ACTIVITIES & ACCOMPLISHMENTS**

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*Briefly summarize specific activities completed in FY 2010/2011 which demonstrate progress in meeting the **Measurable Goals and MS4 permit requirements** stated above:*

The City’s “Surface Water and Stormwater Monitoring Plan” clarifies the urban stream sampling program to include the monitoring components of Monthly Instream, Instream Storm, and Stormwater (MS4 outfall). Because the plan was approved at the end of the reporting period (conditionally approved by the DEQ on June 29, 2011), the City was unable to conduct monitoring associated with Instream Storm, Stormwater, Mercury, Pesticides, and Macroinvertebrate monitoring components. Summaries of data collected during the reporting period for Monthly Instream, Continuous Instream, and Willamette River monitoring components is provided in Appendix E.

Of particular note in the collection of data this reporting period, a sampling site monitored under the City’s previous MS4 permit (2004-10), located in West Salem, exhibited an unusually high concentration of zinc during a fall 2009 storm sampling event. An additional grab sample was collected at that site during the fall of 2010, of which sampling results exhibited a more typical concentration of zinc. These data are included Appendix E.



### **3 PROGRAM EXPENDITURES AND FUNDING SOURCES**

As discussed in previous annual reports, historically, stormwater-related program costs in Salem have been funded through the wastewater rates, which are comprised of a water consumption (flow) component and a fixed user charge. In 2009, the Water/Wastewater Task Force began researching options for the development of a stormwater utility that would be funded by a separate stormwater service charge. On December 6, 2010, Salem City Council approved the adoption of a stormwater utility with an effective date of January 1, 2013. During the next two years, the City will continue working with the community in order to implement the new utility and associated fees.

The intent of the stormwater utility is to more accurately and fairly link the stormwater impacts of the ratepayer's property to the rate paid by each ratepayer. The stormwater service charge will be based on each property's impervious surface and an assessment of stormwater programmatic costs that are shared equally among all ratepayers. The purpose of developing a stormwater utility is to implement an equitable way of paying for Salem's stormwater programs. In creating the stormwater utility, the City will integrate the stormwater program needs with a cost of service approach that more fairly and accurately distributes stormwater costs among customers. Additionally, properties that take steps to reduce their impervious surface areas or that have onsite facilities that reduce stormwater impacts will have an opportunity to reduce their stormwater service charge.

Table 2 provides a summary of the total stormwater program expenditures for the current reporting year as well as those anticipated through the next (FY 2011/12) as identified in the adopted budget for each fiscal year.

**Table 2. Stormwater Expenditures**

<b><u>Stormwater Operating Costs</u></b>	<b><u>FY 2010-11 Budget</u></b>	<b><u>FY 2011-12 Budget</u></b>
Stormwater Operations & Maintenance	\$1,675,250	\$1,840,780
Stormwater Quality	\$1,374,034	\$1,480,740
Cleaning	\$502,397	\$504,590
T.V. Inspection	\$173,808	\$188,273
Water and Environmental Resources	\$278,146	\$322,292
Environmental Services	\$227,374	\$246,138
Planning & Development	\$422,307	\$483,964
Laboratory	\$35,035	\$36,023
Operations Administration	\$121,226	\$124,480
Utility Billing	\$259,851	\$287,969
Dispatch	\$56,619	\$50,923
Debt for Capital	\$763,427	\$766,642
Department Administration (Nondivisional)	\$389,423	\$428,574
Nondivisional (Street Sweeping, Watershed Grants, HazMat/Emergency Mgmt.)	\$1,079,450	\$1,164,491
Budgeted Capital Improvements	\$2,767,380	\$4,549,390
<b>TOTAL:</b>	<b>\$10,125,727</b>	<b>\$11,310,778</b>

## 4 ENFORCEMENT ACTIONS, INSPECTIONS, AND OUTREACH

During the FY 2010-11 reporting period, 228 erosion control-related inspections were conducted by Public Works Development Services Inspectors.

A total of 214 erosion control permits were issued, including the following (refer to CON 1 Task 1 through CON 1 Task 5):

<u>Erosion Control Permits Issued</u>	<u>Number of Permits</u>
Commercial	47
Grading	0
Single Family	167
Storm	0

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 to assure that 1200-C permitted sites comply with City and State erosion prevention and sediment control requirements (refer to CON 1 Tasks 1 through 5).

During the 2010-11 reporting period, Environmental Services staff responded to 163 water quality responses and reported 26 violations of the Municipal Separate Storm Sewer System (MS4). Of the 26 violations, 20 were prohibited discharges. Enforcement actions related to these violations included warnings, citations, notice of violations (refer to Appendix C).

A complete description of outreach activities that occurred during this reporting year can be found in Section 2 of this report.

## **5 PLANNING, LAND USE CHANGES, AND DEVELOPMENT**

The City of Salem Public Works Department Stormwater Management Design Standards (Design Standards) were significantly revised in July 2004. The purpose of these Design Standards is to implement the Stormwater Master Plan and Stormwater Management Plan (SWMP) by providing uniformity under which the City's stormwater infrastructure is designed, constructed, operated, and maintained.

The July 2004 Design Standards update was intended to reflect several state-of-the-art practices. Specific updates included strengthening of the on-site detention standards, clarification of design standards for open channel versus piped conveyance systems, and initiation of standards for water quality facilities.

In February 2007, the Design Standards [and some associated Salem Revised Code (SRC) sections] were again revised to incorporate the stormwater management program and design criteria/standards specifically associated with the new Mill Creek Industrial Park (MCIP; a.k.a. Mill Creek Corporate Center, or MCCC). Those revisions focused not only on the need for adequate detention, but mandatory provisions for stormwater quality facilities based principally on the extensive use of bioswales throughout the developable area. The SRC revisions were set forth in Ordinance No. 73-07, and principally focused on amendments to Chapter 73 to establish the MCIP standards, with relatively minor housekeeping amendments to Chapters 70 and 77. The approach taken with the adopted MCIP-related SRC and Design Standards revisions was consistent with that anticipated for future City-wide stormwater quality standards.

Revisions to the Design Standards to reflect the post-construction requirements presented in the renewed MS4 permit have continued through FY 2010-11. These updates will be adopted via the City's relatively new administrative rule process. This requires Salem Revised Code changes in the form of a new stand-alone stormwater chapter (SRC 71) before the Design Standards can be formally adopted. It is anticipated that the new SRC Chapter 71 will be completed in during FY 2011-12. Adoption of the revised Design Standards will follow shortly thereafter, with an anticipated effective date during FY 2012-13.

The City's Community Development Department is developing a Uniform Development Code (UDC) for City Council adoption that principally focuses on revisions to the City's Zoning Ordinance as set forth by Salem Revised Code (SRC) Title X, Chapters 110 through 166. It is currently envisioned that three separate work products will be adopted and incorporated (as appropriate) into SRC revisions, as follows:

- Site Plan Review process [principally for multi-family, commercial, and industrial land uses] adopted in FY 2009-10.
- Procedures Ordinance adopted in FY 2009-10.
- UDC targeted for adoption in FY 2011-12.

## **5.1 Land Use Changes**

All 12 annexations on the November 2010 ballot (encompassing 326.11 acres) were approved by the voters. Owner-initiated annexations, as well as those enclaved vacant properties, became effective in early 2011. The remaining City-initiated annexations which had existing single family residences on them will not be officially annexed until 2012.

## **5.2 New Development**

The City of Salem has seen a number of developments in the past year, and continues to see a steady stream of new projects at all phases of development. During the reporting period, there was the addition of 1,020,433.26 square feet of new/replaced impervious surface area related to development projects in Salem. Below are several noteworthy projects that are moving forward in the development process:

### **Under Construction:**

- Oregon State Hospital renovation on Center Street NE, including a new street connection from Center Street NE to State Street.
- West Salem Schools (two facilities), scheduled completion date late 2011.
- South Salem (Battle Creek) School, scheduled completion date Fall 2012.
- East Salem School (Walker/Sunnyview), scheduled completion date Fall 2012.
- Blackberry Slope subdivision, 3025 River Road S, moving through the plan review process.
- Bonaventure Development, 3400 Boone Road S, scheduled to start construction Fall 2011.
- Cherry City Electric, 3750 Fairview Industrial Drive SE, moving through the plan review process.
- Capitol Auto, Salem Industrial Drive NE, scheduled completion date Fall 2011.
- West Salem Medical Office, 1049 Edgewater Street NW, Scheduled to begin construction Fall 2011.
- Vista Place, 2990 Commercial Street SE, completion date Fall 2011.
- Baxter Ridge Apartments, 1668 Baxter Road SE, Phase I near completion, Phase II to begin the plan review process in Fall 2011.

**Estimate of Potential Future Development:**

- Pringle Square mixed-use development at the Boise Cascade property on Commercial Street SE.
- Salem Renewable Energy and Technology Center, an 80-acre technology center on Gaffin Road SE.
- Mill Creek Corporate Center (MCCC), a 500- acre industrial development between Highway 22, Kuebler Boulevard SE,
- Turner Road SE, and Deer Park Road SE.

APPENDIX A. 2005/2010 SWMP BMP MATRIX





APPENDIX B. MS4 VIOLATIONS 2010-11

ALL MS4 VIOLATIONS FOR FY 2010-11				
Record	Business Name	Date	Violation	Enforcement
8422	Salem-Keizer Community Development Apartments	7/8/2010	Prohibited Discharge To The Storm Sewer	7/8/2010
8404	Willamette Valley Fruit Company	7/9/2010	Failure To Install Pretreatment Equipment	7/9/2010
5067	North Santiam Paving Inc	7/16/2010	Prohibited Discharge To The Storm Sewer	7/19/2010
8428	Western Construction Systems LLC	8/2/2010	Prohibited Discharge To The Storm Sewer	8/2/2010
3765	Ashland Brothers Concrete Sawing	8/5/2010	Prohibited Discharge To The Storm Sewer	8/5/2010
731	Norpac 7	8/6/2010	Prohibited Discharge To The Environment	8/10/2010
8070	Popeye's Chicken & Biscuits	8/10/2010	Prohibited Discharge To The Environment	8/10/2010
2005	Oregon State Fair and Exposition Center	8/25/2010	Prohibited Discharge To The Environment	8/25/2010
8484	Private Residence-Marsaglia-Sinkhole	8/26/2010	Sinkhole Problem Needing Repairs	8/26/2010
4114	Marble Center, The	8/27/2010	Prohibited Discharge To The Environment	8/27/2010
2005	Oregon State Fair and Exposition Center	9/1/2010	Prohibited Discharge To The Environment	9/1/2010
2005	Oregon State Fair and Exposition Center	9/1/2010	Prohibited Discharge To The Environment	9/1/2010
731	Norpac 7	9/9/2010	Prohibited Discharge To The Storm Sewer	9/14/2010
727	Truitt Brothers	9/29/2010	Prohibited Discharge To The Environment	9/29/2010
8458	Sunset Stucco and Exteriors LLC	10/1/2010	Prohibited Discharge To The Storm Sewer	10/15/2010
8457	MV Mobile Detailing	10/4/2010	Prohibited Discharge To The Environment	10/4/2010
8455	Private Residence-Simpson-Sinkhole	10/7/2010	Sinkhole Problem Needing Repairs	10/12/2010
174	McDonald's Restaurant	10/22/2010	Failure To Install Grease Pretreatment	1/7/2011
475	Maaco Auto Painting and Bodywork	11/5/2010	Prohibited Discharge To The Storm Sewer	11/5/2010
7481	Taco Bell	1/4/2011	Prohibited Discharge To The Environment	1/4/2011
8495	Private Residence-Wright-Gravel in Street	1/6/2011	Placing Pollutants Where Prohibited	1/6/2011
8475	Willamette Urology	3/7/2011	Failure To Install Pretreatment Equipment	3/7/2011
8533	Private Residence-Tennant-Dumping Paint	3/14/2011	Prohibited Discharge To The Storm Sewer	3/14/2011
6811	Ennis Traffic Safety Solutions	3/21/2011	Prohibited Discharge To The Storm Sewer	4/1/2011
5498	Mill Creek Station And Catering	5/25/2011	Prohibited Discharge To The Storm Sewer	5/25/2011
8570	Donald Shelton Private Contractor	5/25/2011	Prohibited Discharge To The Storm Sewer	5/25/2011

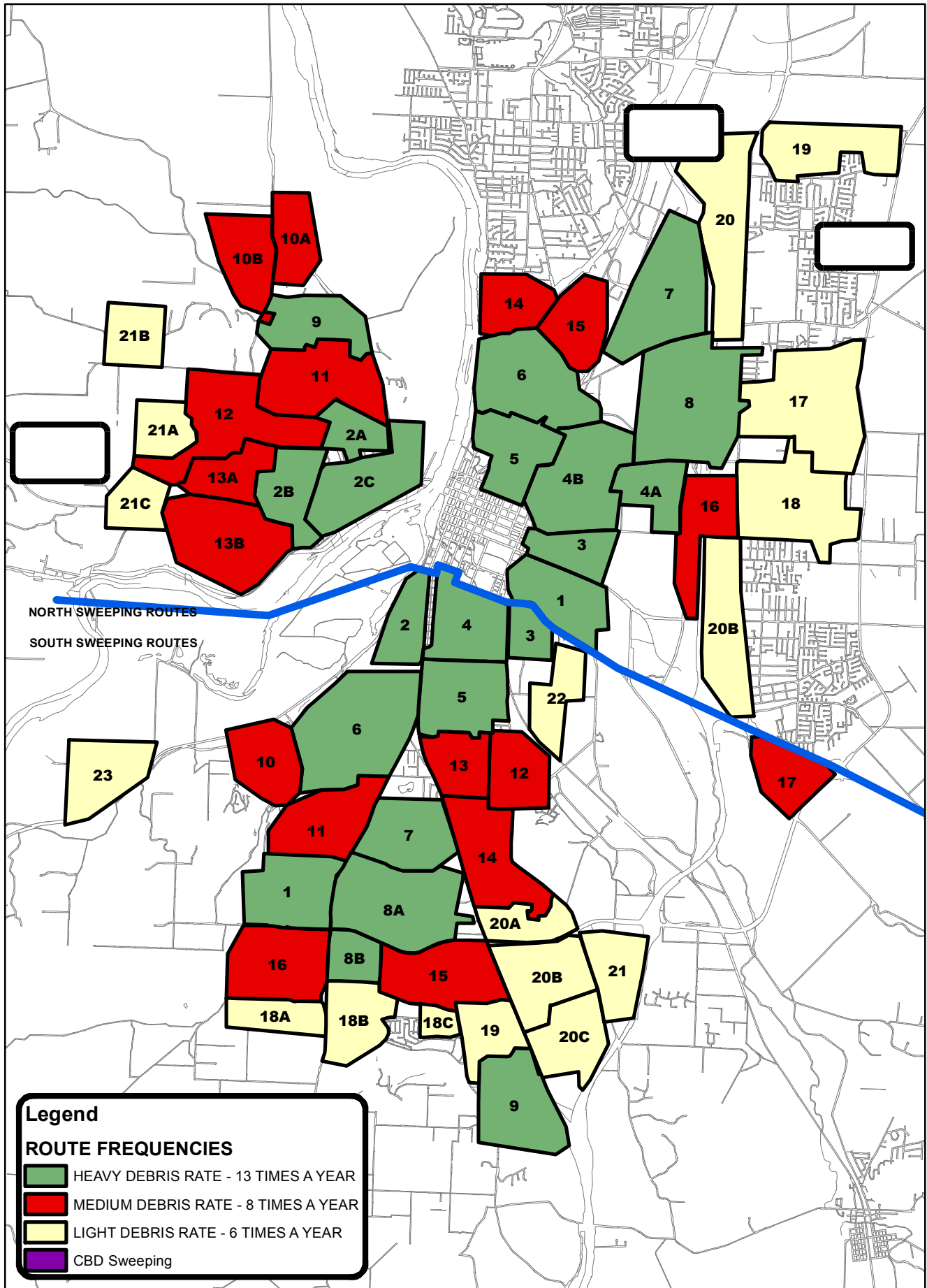
Action Taken	Response	Received	Citation	Amount	Court Date	Paid Date	Compliance	Discharge	Outfall
Warning							7/8/2010	Paint	Storm
Warning							8/10/2010	Failure to Install Pretreatment	Both
Citation			138581	\$300	8/8/2010	8/16/2010	8/16/2010	Mud	Storm
Warning							8/2/2010	Concrete Wash Water	Storm
Warning							8/5/2010	Concrete Slurry	Storm
Notice of Violation	Yes	8/18/2010					8/18/2010	Process Waste Water	Environment
Warning							8/10/2010	Mop Wash Water	Environment
Warning							8/25/2010	Grey Water	Environment
Warning							12/16/2010	Sinkhole	Both
Citation			138639	\$300	9/10/2010	9/28/2010	9/28/2010	Marble Slurry	Environment
Warning							9/1/2010	Grey Water	Environment
Warning							9/1/2010	Grey Water	Environment
Notice of Violation	Yes	9/23/2010					9/9/2010	Wastewater	Both
Warning							9/29/2010	Mud	Environment
Warning							10/15/2010	Cement Wash Water	Storm
Warning							10/11/2010	Wash Water	Storm
Notice of Violation							10/19/2010	Sinkhole	Both
Notice of Violation	Yes	1/11/2011					2/4/2011	Failure to Install Pretreatment	Both
Warning							11/5/2010	Vehicle Wash Water	Storm
Warning							1/4/2011	Chemical Wash Water	Storm
Warning							1/10/2011	Gravel	Environment
Warning							Waived	Failure to Install Pretreatment	Storm
Warning							3/14/2011	Paint Wash Water	Storm
Notice of Violation	Yes						3/21/2011	Process Chemical Spill	Storm
Citation			138583	\$300	6/8/2011	6/2/2011	6/2/2011	Food Grease	Storm
Citation			138582	\$300	6/8/2011	6/2/2011	6/2/2011	Concrete Slurry	Storm

SRC1	SRC2	Address	Zipcode	Contact	Inspector	Photos	Certified	Received	SR Number
73.160	73.165	2595 Lee St SE	97301	Scott	James K Gengler				2131300
74.150	73.165	1448 Salem Industrial Dr NE	97303	Not Indicated	James K Gengler				
73.160		710 Howard St SE	97302	Randy Iott	Bill Fear	Yes			
73.160		5105 Commercial St SE	97306	David Arana	Ron Bernt				2137406
73.160	73.165	2700 Commercial St SE	97302	Kim Ashland	James K Gengler				
73.165		2325 Madrona Ave SE	97302	Joe Janota	Jim VanHouten		Yes	8/11/2010	
73.160		1238 23rd St SE	97302	Jessie	Ron Bernt	Yes			2139362
73.160	73.165	2330 17th St NE	97301	Stratus Trailer	James K Gengler				
73.095		2180 Lowen St NW	97304	John Marsaglia	Bill Fear				
73.160		2080 Front St NE	97301	Andres Labate	Chris Collins				
73.160	73.165	2330 17th St NE	97301	HR Imperial Trailer	James K Gengler				
73.160	73.165	2330 17th St NE	97301	Wanderer Wagon	James K Gengler				
74.130		2325 Madrona Ave SE	97302	Joe Janota	Jim VanHouten		Yes	9/16/2010	
76.015	73.160	3600 Kuebler Rd S	97302	Dustin Shelton	James K Gengler	Yes			
73.160		4339 Cedar Ave NE	97303	Servando Garcia	Jim VanHouten	Yes			2152365
73.160		Mobile	MOB	Ryan Valentine	Bill Fear				
73.095		1180 Alpine Dr NW	97304	David Simpson	Ron Bernt	Yes	Yes	10/15/2010	2153822
73.255	74.210	4020 Commercial St SE	97302	RHC Associates	James K Gengler		Yes	1/10/2011	
73.160	73.165	2815 Silverton Rd NE	97301	Not Indicated	James K Gengler				
73.160	73.165	5795 Commercial St SE	97306	Not Indicated	James K Gengler				
75.090	76.010	806 Thompson Ave NE	97301	M. Menden	Bill Fear				4240519
73.255		2973 12th St SE	97302	CD Redding	James K Gengler				
73.160	73.165	605 Spruce St NE	97301	Tennant	James K Gengler	Yes			4256197
73.160		1675 Commercial St NE	97303	Sean Murphy	Bill Fear		Yes	4/4/2011	4257937
73.160		200 Hawthorne Ave SE	97301	Lisa Viegas	Bill Fear				4273536
73.160		2900 Foxhaven Dr SE	97306	Donald Shelton	Bill Fear	Yes			

APPENDIX C. STREET SWEEPING MAP



# CITY OF SALEM RESIDENTIAL SWEEPING ROUTES DAY SHIFT



## APPENDIX D. STORMWATER OUTREACH ACTIVITIES

<b>MS4 Outreach Matrix Summary Table</b>			
<b><u>Target Contaminants</u></b>	<b><u>Progress Report</u></b>	<b><u>Outreach Tools Used</u></b>	<b><u>SWMP and Permit Elements</u></b>
<b>E.Coli</b> <i>Source: pet waste &amp; streamside wildlife</i>	<ul style="list-style-type: none"> <li>Developing Riparian Outreach Plan*</li> <li>Developing a 5-year MS4 Outreach Plan aimed at E. coli and turbidity**</li> <li>Continued implementing outreach regarding pet waste.</li> </ul>	<ul style="list-style-type: none"> <li>Community Connections Citywide Newsletters: <b>July, December, January</b> and <b>April</b> issues</li> <li>40 radio spots per week on two stations for a total of 80 weekly spots: Aired one week in <b>August, October, January, and May/June</b></li> <li>Take the Pledge presentations to <b>9 classes</b></li> <li>Conducted survey of <b>1294 riparian landowners</b> regarding their behaviors and motivators</li> </ul>	RC 5 – 1 4di 4dii 4dvi (progress)
<b>Turbidity</b> <i>Source: erosion of soils</i>	<ul style="list-style-type: none"> <li>Developing a 5-year MS4 Outreach Plan aimed at E. coli and turbidity**</li> <li>Developing Riparian Outreach Plan*</li> <li>Developing a contractor training</li> </ul>	<ul style="list-style-type: none"> <li>Contractor <b>training scheduled</b> for 2012</li> </ul>	RC 5 – 1 4dv 4dvi (progress)
<b>Household Waste</b> <i>Source: residential neighborhoods</i>	<ul style="list-style-type: none"> <li>Continued implementing outreach regarding household waste</li> </ul>	<ul style="list-style-type: none"> <li>Community Connections Citywide Newsletters: <b>September</b> issue regarding drug take back</li> <li>Salem Weekly ad: <b>September</b></li> <li>Take the Pledge presentations to <b>9 classes</b></li> <li>Radio spots: <b>September, March, October (2 weeks), November, December, January, March (2 weeks), April.</b></li> <li>Radio interview: <b>March</b></li> <li>Storm drain marking: <b>456 drains</b> marked, <b>852 door hangers</b> distributed</li> </ul>	RC 5 – 1 4di 4dii 4diii 4dviii
<b>Garbage</b> <i>Source: residential neighborhood, including single and multi-house residents Business and industry</i>	<ul style="list-style-type: none"> <li>Continued implementing outreach regarding trash and garbage</li> </ul>	<ul style="list-style-type: none"> <li>Community Connections Citywide Newsletters: July, <b>August, September, November,</b></li> <li>Storm drain marking: <b>456 drains</b> marked, <b>852 door hangers</b> distributed</li> <li>Take the Pledge presentations to <b>9 classes</b></li> <li>Radio spots: <b>July, August, February, May, and June</b></li> <li>Salem Weekly print ad: <b>February and June</b></li> </ul>	RC 5 – 1 4di 4dii 4diii 4dviii
<b>Toxins: Copper / Lead / Zinc / Chromium</b> <i>Source: street runoff, Roof tops and gutters(see attached), Electronic waste</i>	<ul style="list-style-type: none"> <li>Continue Green Disk program</li> </ul>	<ul style="list-style-type: none"> <li>Staff can recycle unwanted electronic equipment through the Green Disk program.</li> </ul>	



<b>MS4 Outreach Matrix Summary Table</b>			
<b><u>Target Contaminants</u></b>	<b><u>Progress Report</u></b>	<b><u>Outreach Tools Used</u></b>	<b><u>SWMP and Permit Elements</u></b>
<b>Pesticides</b> <i>Source: residential and agricultural settings</i>	<ul style="list-style-type: none"> <li>Continued implementing outreach regarding pesticides and proper disposal of household waste</li> </ul>	<ul style="list-style-type: none"> <li>Take the Pledge presentations to <b>9 classes</b></li> <li>Radio spots: <b>October and March</b></li> <li>Radio interview: <b>March</b></li> <li>Storm drain marking: <b>456 drains</b> marked and <b>852 door hangers</b> distributed</li> <li>Low impact landscape presentations<sup>#</sup>: <b>September, October 2, October 22, November 8, April 30, and April 28</b></li> </ul>	RC 5 – 1 4di 4dii 4diii 4dviii
<b>Mercury</b> <i>Source: Soil Erosion and many household products.</i>	<ul style="list-style-type: none"> <li>Continued implementing outreach regarding mercury and proper disposal of household waste</li> </ul>	<ul style="list-style-type: none"> <li>Radio spots: <b>October, November, December, and April.</b></li> <li>Radio interview: <b>March</b></li> </ul>	RC 5 – 1 4di 4dii 4diii
<b>Temperature / Dissolved Oxygen</b> <i>Source: lack of shade; decomposing organic material, temperature and turbidity</i> <i>Agriculture and residential nutrient runoff</i>	<ul style="list-style-type: none"> <li>Developing Riparian Outreach Plan*</li> </ul>	<ul style="list-style-type: none"> <li>Conducted survey of <b>1294 riparian landowners</b> regarding their behaviors and motivators</li> </ul>	4dvi (progress)
<b>Nutrients</b>	Continued implementing outreach regarding nutrients	<ul style="list-style-type: none"> <li>Radio spots: <b>July, August, and August/September</b></li> <li>Low – impact landscape presentations: <b>September, October 2, October 22, November 8, April 30, and April 28</b></li> </ul>	RC 5 – 1 4di
<b>General Water Quality</b>	Continued implementing outreach regarding general water quality issues	<ul style="list-style-type: none"> <li>Radio spots: July, August, <b>October, December (2), January, February, March, April (3) and May</b></li> <li>Radio interview: <b>April</b></li> <li>SW Print ad: <b>April</b></li> <li>Court Street Bioswale presentations: <b>August 13, September 20 , November 18, December 6, and March 9</b></li> <li>Rain Garden presentations: <b>January 17, February 26 , and April 16</b></li> <li>Low – impact landscape presentations: <b>September, October 2, October 22, November 8, April 30, and April 28</b></li> <li>Environmental Learning Center Rain Garden Student Design presentations and meetings: <b>October 10, March 3, April 11, and May 17</b></li> <li>Presentations: <b>88 presentations to 944 students</b></li> </ul>	RC 5 – 1 4di 4dii

<b>Additional Permit Elements</b>		
<b><u>Permit Element</u></b>	<b><u>Description</u></b>	<b><u>Actions</u></b>
<b>4e</b>	Public Involvement and Participation for the following: <ul style="list-style-type: none"> <li>Monitoring Plan Involvement and Participation</li> </ul>	<p style="text-align: center;"><b><u>Notice</u></b></p> <ul style="list-style-type: none"> <li>Plan posted on the City's website highlights section for a 30-day public comment period: <b>March 25 to April 25, 2011.</b></li> <li>Emailed notice to watershed councils and neighborhood associations and sent e-blast to neighborhood associations</li> <li>Sent a press release to the major media outlets</li> <li>Presentations requested by, and presented to, the South Gateway Neighborhood Association and the Glenn-Gibson Creeks Watershed Council</li> </ul> <p style="text-align: center;"><b><u>Public Response</u></b></p> <ul style="list-style-type: none"> <li>Provided e-mail addresses, phone numbers, and a mailing address as means of accepting comments and feedback.</li> <li>No comments received.</li> </ul>
Addresses permit element 4e		

<b>Radio Spot Calendar</b>					
July 2010	One inch/week	Storm Drain Marking Call for Volunteers	Car Wash	Movies at the Park	One inch/ week
August 2010	Pet Waste	Car Wash	Movies at the Park	Storm Drain Marking Call for Volunteers	Food Waste Composting Program
September 2010	Food Waste Composting Program cont'd	Back to School Safety	Sharrows	Drug Take Back Event / Pollution Prevention Week	Salem Green and Solar Tour
October 2010	Pet Waste	Children's health month --No idling in school zones-- Ashtsma and obesity	CFL Recycling	Poison Prevention HHW	
November 2010	Leaf Ranger	CFL Recycling	Leaf Ranger	Leaf Haul	Leaf Haul Event
December 2010	CFL and thermometer take back	No idling	Emergency Preparedness	River at your door	
January 2011	Poison Prevention HHW	Water Facts	Pet Waste	Downtown Open House	
February 2011	Plastic not Fantastic	FOG	Dump No Waste	Personal Preparedness	Poison Prevention
March 2011	Poison Prevention (cont'd)	Nixle	Clean and Green	Personal Preparedness	River at your Door
April 2011	Oregon Arbor Week	Rain Garden Workshop	No Ivy League	CFL Disposal	
May 2011	Water Facts	Salem Parks Foundation	Public Works Day	Personal Preparedness	Pet Waste
June 2011	Park Rentals	PW Day	Public Works Day	Fireworks Safety	
Grey highlight indicate outreach that supports the City's Stormwater Management Plan and MS4 permit					

<b>Salem Weekly Print Advertisements</b>					
<b>July 2010</b>	<b>August 2010</b>	<b>September 2010</b>	<b>October 2010</b>	<b>November 2010</b>	<b>December 2010</b>
One inch per week	Environmental Action Plan Annual Report	Drug Take Back	Leaf Haul Volunteers	Fall Leaf Haul	Drain Grease
January 2011	February 2011	March 2011	April 2011	May 2011	June 2011
Downtown Projects	Dump No Waste	Nixle	Rain Garden workshop / Ivy pull	Recreation Guide	Storm Drain Volunteer Request
Grey highlight indicate outreach that supports the City's Stormwater Management Plan and MS4 permit					

<b>Community Connections City Newsletter</b>					
<b>July 2010</b>	<b>August 2010</b>	<b>September 2010</b>	<b>October 2010</b>	<b>November 2010</b>	<b>December 2010</b>
Pet Waste/ E. Coli	Wallace Park Clean Up / Garbage	Wallace Park Clean Up / Garbage		Wallace Park Clean Up Report / Garbage	Pet Waste / E. Coli
Storm Drain Marking Call for Volunteers / various		Drug Turn in Event			
January 2011	February 2011	March 2011	April 2011	May 2011	June 2011
Mutt Mitt Volunteer Thank You			What is stormwater? Pet waste problem and solution / E. coli		
Grey highlight indicates outreach that supports the City's Stormwater Management Plan and MS4 permit					

<b>Outreach Meetings</b>		
<b>Meeting Date</b>	<b>Topic(s)</b>	<b>Outcome</b>
September 30, 2010	Introduction to stormwater outreach to PW staff	Identified how individual projects may tie into the public outreach matrix. Staff from this meeting that could play a substantial role in the upcoming outreach under the new permit were identified and placed on the newly formed outreach team.
October 29, 2010	Introduction to stormwater outreach to non-PW staff	Determined if and how individual programs may relate or how stormwater elements can be promoted by them. The library has available advertising space. Community Development has neighborhood liaisons that can help coordinate presentations schedules and stormwater information dissemination.
January 13, 2011	PW MS4 kickoff meeting format and identification of staff for project teams	Identified staff for various project teams
February 1, 2011	Riparian Outreach Plan Proposal Review	Water Resources staff met to review the plan proposals and select a consultant. EnviroIssues was the chosen consultant to develop the plan.
February 1, 2011	5-year stormwater outreach	Staff met to discuss and brainstorm ideas received for a 5-year stormwater outreach plan review. Scope of work was created and a formal proposal was sent to consultants of record.
February 14, 2011	MS4 kickoff	Staff reviewed kickoff meeting information
February 23, 2011	Downspout disconnections	Public Works and Community Development staff met to discuss information regarding downspout disconnections/ alternative plumbing code and stormwater design standards. Downspouts can be disconnected and may require a plumbing code. For rain gardens, a business will require a plumbing permit. For a resident, they may not require a permit if their property is not intended for sale or lease. New design standards are not yet in effect. It was agreed that Gresham's brochure was a good example.
April 4, 2011	Riparian Outreach Plan	Plan kickoff meeting discussing the process to create the riparian outreach plan. Based on comments, the consultant refined the schedule and process.
May 2, 2011	MS4 kickoff	The outreach team met during the kickoff meeting and received an overview of MS4 Permit and Stormwater Management Plan requirements relating to outreach, grant efforts, and the annual reporting template.

<b>Website Re-design</b>		
<b>Meeting Date</b>	<b>Topic(s)</b>	<b>Outcome</b>
January 14, 2011	How to use the web as a better outreach tool (goals)	<ul style="list-style-type: none"> <li>A. Be user friendly to staff and the public</li> <li>B. Unite water items into one landing site</li> <li>C. Increase site visibility and ease of access</li> <li>D. Eliminate old/ redundant material</li> <li>E. Allow a short address: www. cityofsalem/water</li> <li>F. Set up Google data capture so we can determine site use</li> </ul>
February 10, 2011	Review of other sites for pros and cons in developing a water landing page	<p>Cautions:</p> <ul style="list-style-type: none"> <li>• navigation bar should not be longer than the page</li> <li>• do not make text heavy</li> <li>• no pictures of staff</li> <li>• pdfs must be OCR</li> <li>• Title VI will be done by the City</li> </ul> <p>Will have choice of templates.</p>
May 27, 2011	Page Layout	Discussion of the tab layout and creating a subject/topic-based site: drinking water, stormwater, wastewater, wetlands, waterways

**Speakers Bureau**

<b>Stormwater Program or Issue</b>	Streambank Restoration	Erosion Prevention and Sediment Control	Wetland Mitigation Design and Maintenance	School Presentations and Education Outreach	Stormwater System Overview	Annual Stream Cleanup	Public Education and Participation	O&M of Stormwater System	Water Quality Monitoring Data	Permit review and renewal	Stormwater Treatment Techniques (LID, Green Infrastructure, rain gardens, etc.)	Stormwater Utility Fee	Naturescaping
Mark Akimoff			X								X		X
Justin Boyington					X				X	X			
Robert Chandler												X	
Zach Diehl				X	X	X	X				X		
Heather Dimke				X	X		X		X	X			
Ed Emrick	X		X										
Patricia Farrell	X		X										
Angel Garcia					X			X					
Mike Gotterba					X								
Nitin Joshi	X	X								X	X		
Sam Kidd		X			X	X	X	X				X	
Jon Nottage					X	X				X	X		
Anita Panko				X					X				
Deborah Topp				X			X			X		X	X

<b>FY 2011/12 Budget for Outreach Activities</b>		
<b>Expense Type</b>	<b>Amount requested</b>	<b>Amount budgeted FY 2011/12</b>
Supplies*	\$1920	\$1920
YEEP supplies	\$720	\$720
Printing*	\$1000	\$1000
Advertising	\$4000	\$4000
Training	\$750	\$0
Outreach and Education events	\$ 4500	\$0
Other professional services	\$50,500	\$35,000
Small tools*	\$2500	\$2500
<b>Total</b>	<b>\$65,890</b>	<b>\$45,140</b>
Difference		-\$20,750

\*The asterisks indicate that the budget is not dedicated to outreach, but is the amount available to the Water Resources group of the Water and Environmental Resources Section.

APPENDIX E. SUMMARY OF WATER QUALITY DATA FOR FISCAL YEAR  
2010/11

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

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**Summary of Water Quality Data  
For Fiscal Year 2010/2011**

**Prepared by: City Salem Public Works Department  
Stormwater Services**

**October 2011**



## Table of Contents

1.0	Introduction.....	3
1.1	Status of Monitoring Plan .....	3
1.2	Monitoring Activities Summary.....	3
2.0	Background to Monitoring Elements.....	3
2.1	Monthly Instream .....	3
2.2	Continuous Instream .....	4
3.0	Data Summary .....	5
3.1	Comparisons to Water Quality Criteria.....	5
3.2	Continuous Instream Water Quality Alarms .....	8
4.0	Conclusion .....	8

## List of Tables

(All Tables follow text of this document)

Table 1.	Monthly and Continuous Instream Site Names
Table 2.	Site Locations for Each Monitoring Element
Table 3.	Parameters for Each Monitoring Element
Table 4.	Water Quality Criteria for Monitored Streams
Table 5.	Median Values for Monthly Instream Sites
Table 6.	Number of Water Quality Criteria Exceedances for Monthly Instream Sites
Table 7.	Monthly Instream Data
Table 8.	Continuous Instream Grade A and Grade B Data Qualifications
Table 9.	Monthly Medians Values for Continuous Instream Data
Table 10.	Willamette River Water Quality Data
Table 11.	Storm Samples Collected 11/30/10

## List of Figures

(All Figures follow Tables at end of this document)

Figure 1.	Monitoring Site Map Fiscal Year 2010 / 2011
Figure 2.	Monthly Instream Mean Value Comparison for Dry and Rain Conditions
Figure 3.	Monthly Instream E. Coli Upstream / Downstream Site Comparison
Figure 4.	Continuous Instream Temperature 7-Day Moving Average Maximum
Figure 5.	Continuous Instream Dissolved Oxygen Daily Mean
Figure 6.	Continuous Instream pH Daily Mean
Figure 7.	Continuous Instream pH Data Record for Mill Creek (MIC3) April and May 2011
Figure 8.	Continuous Instream Water Quality Alarms
Figure 9.	Monthly Total Rainfall Across Salem

## **1.0 Introduction**

### **1.1 Status of Monitoring Plan**

On December 30, 2010, the City of Salem received its renewed National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System (NPDES MS4) Permit. As a requirement of this NPDES MS4 Permit, the City of Salem (City) must prepare a monitoring plan consistent with conditions stated in Schedule B.2 of the Permit. City staff developed the “Surface Water and Stormwater Monitoring Plan”, and submitted it to the Oregon Department of Environmental Quality (DEQ) on April 29, 2011. On June 29, 2011, the City received notice from the DEQ that the monitoring plan had been approved, with the condition that DEQ comments be addressed. City staff are currently addressing the comments and making appropriate edits, with intent to submit a final monitoring plan to the DEQ before its due date of November 1, 2011.

### **1.2 Monitoring Activities Summary**

This document provides a summary of monitoring data collected during the previous NPDES MS4 reporting period, from July 1, 2010 to June 30, 2011. Because the conditionally approved monitoring plan was not received by City staff until June 29, 2011, some monitoring elements were not initiated or conducted during the reporting period, including: 1) Instream Storm, 2) Stormwater, 3) Mercury, 4) Pesticide, and 5) Macroinvertebrate monitoring. However, monitoring was completed for the Monthly Instream and Continuous Instream monitoring elements. Consequently, the narrative and data summary provided in this document only addresses these two monitoring elements.

With the NPDES MS4 Permit renewal in December, monitoring conducted during this fiscal year was split between two different permits (the 2004-2010 Permit and the renewed 2010-2015 Permit). The parameters monitored in the Monthly Instream<sup>1</sup> element were modified with the renewed Permit, and as a result, City staff began monitoring for these parameters in January 2011(see section 2.1 for more specific details). The Continuous Instream monitoring element was not a requirement of the 2004-2010 Permit, but is a requirement of the renewed Permit. However, the Continuous Instream monitoring element was implemented for the duration of this fiscal year, and data for the entire reporting period was included in this summary.

## **2.0 Background to Monitoring Elements**

### **2.1 Monthly Instream**

As discussed in the City’s monitoring plan, Monthly Instream monitoring of urban streams is conducted on a predetermined schedule. This monitoring element includes the collection of grab samples and field measurements on 11 of Salem’s MS4 stormwater runoff receiving streams. Ten of the monitored streams are paired with upstream (at or near where the stream enters the City’s jurisdiction) and downstream (at or near where the stream exists the City’s jurisdiction or enters a receiving stream) site locations. Additionally, there is a downstream monitoring site on the West Fork Little Pudding. Since the Little Pudding starts in the greater Salem area and runs

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<sup>1</sup> Identified as Urban Streams monitoring in the City’s 2004-2010 Stormwater Management Plan.

dry during the summer months, an upstream site was not selected. Figure 1 details the locations of each site. Water quality parameters collected at all sites include:

- Temperature
- Turbidity
- Specific Conductivity
- pH
- Dissolved Oxygen (DO)
- Nitrate + Nitrite as Nitrogen (NO<sub>3</sub>+NO<sub>2</sub>-N)
- Escherichia coli (E.coli)
- Biochemical Oxygen Demand (BOD)

Additional water quality parameters for sites within the Pringle Creek Watershed (PRI1, PRI5, CLA1, and CLA10) [refer to Table 1 for list of site names] were added to meet compliance with the renewed NPDES MS4 Permit. These additional parameters include:

- Zinc (total recoverable and dissolved)
- Copper (total recoverable and dissolved)
- Lead (total recoverable and dissolved)
- Hardness

In addition, total suspended solid (TSS) was added to the list of parameters for the West Fork Little Pudding site.

## **2.2 Continuous Instream**

As discussed in the monitoring plan, the City maintains a network of Continuous Instream monitoring sites located on urban streams within the city. At this time there are 11 sites located on 5 different streams. However, one of the sites, MIC1, will be decommissioned during fiscal year 2011/2012, and was therefore not identified in the renewed NPDES MS4 Permit. For these reasons, the data collected at the MIC1 site was not included in this data summary. The remaining site locations for this monitoring element are positioned in an upstream/downstream configuration. The upstream sites are adjacent to where the stream enters the City and the downstream sites are either above the confluence with another stream or where the stream exits the City's jurisdictional boundary.

Continuous data collected includes:

- Temperature
- DO
- Specific Conductivity
- pH
- Turbidity
- 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. Table 8<sup>2</sup> shows what the City has qualified as grade A and grade B data collected by way of the Continuous Instream monitoring element.

The Continuous Instream monitoring element has an alarm programming logic that is used to recognize abnormalities in the data and trigger an alarm at the City's Public Works Dispatch Center. This alarm system supports the City's Illicit Discharge Detection and Elimination (IDDE) program. A summary of information related to the continuous water quality alarms is included in section 3.3.

## **3.0 Data Summary**

### **3.1 Comparisons to Water Quality Criteria**

Water quality criteria for temperature, pH, dissolved oxygen, E.coli, copper, lead, and zinc, as discussed in the following subsections, are summarized in Table 4.

#### **Temperature**

Mill Creek and Pringle Creek are identified as Water Quality Limited [303(d) listed] for temperature in Oregon's 2004/2006 Integrated Report. These two streams are monitored through the Monthly and Continuous Instream monitoring elements.

The 7-day moving average maximum temperature has been computed using data from the Continuous Instream monitoring element (Fig. 4). Periodic exceedances of the temperature water quality criteria occurred at 7 of the 10 monitoring sites. These sites included BAT3, BAT12, MIC12, MIC3, PRI3, PRI12 and GLE3.

Although Monthly Instream temperature data is a single field measurement collected on one day per month, data suggest additional sites may occasionally exceed the year-round temperature water quality criteria of 18°C, including CGT1, CLA1, GIB15, and PRI5. There were no single field measurement exceedances of the 13°C salmon and steelhead spawning criteria for applicable sites.

#### **Dissolved Oxygen**

Nine streams within Salem city limits are identified as Water Quality Limited in Oregon's 2004/2006 Integrated Report for DO. Eight out of the nine are monitored for DO through the Monthly Instream monitoring element. Four out of the nine are monitored for DO through the Continuous Instream monitoring element.

Continuous Instream data indicate that all sites had occasional exceedances of the DO water quality criteria (Fig. 5). The two Clark Creek sites, CLK1 and CLK12, had the lowest number of exceedances with three and eight daily mean exceedances, respectively.

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<sup>2</sup> All tables and figures are at the end of this document and are not necessarily discussed in the order that they appear.

Monthly Instream data showed that the DO water quality criteria was exceeded at 16 monitoring sites (refer to Table 6). The two sites on Clark Creek, CLA1 and CLA10, and the downstream site on Glenn Creek, GLE1, did not have any exceedances. The GIB1 and GIB15 sites, located on Gibson Creek (referred as Gibson Gulch in Oregon's 2004/2006 Integrated Report), exhibited the greatest number of DO exceedances—with 5 out of 12 and 6 out of 12 samples, respectively, at each site exceeding the criteria. Of note, these sites have the most stringent DO water quality criteria, with the 11 mg/L criteria lasting from October 1-May 31.

### **pH**

None of the streams in Salem city limits are identified as Water Quality Limited for pH in Oregon's 2004-2006 Integrated Report; however, Clark, Croisan, Gibson, Glenn, Mill, and Pringle Creeks are listed as Category 2 (attaining) or Category 3 (insufficient data).

Data from the Continuous Instream monitoring element illustrates a daily mean low-end exceedance of the 6.5 pH standard occurred at six of the ten sites, including BAT12, BAT3, CLK12, CLK1, MIC12, and PRI12 (Fig. 6). There were no exceedances of the 8.5 high-end pH standard at these sites. However, MIC3 data exhibited a number of readings above the high-end exceedance during the months of April and May. Figure 7 provides a detailed illustration of the continuous pH record for MIC3 during this time period. In addition to these exceedances, a number of other continuous monitoring sites exhibited periodic pH water quality standard exceedances, both on the low-end and the high-end. These exceedances could result from a number of factors, such as instrumentation errors, sensor interference from aquatic organisms or other debris, or an illicit discharge.

Low-end exceedances of the Monthly Instream pH occurred at 5 of the 21 sites (BAT1, BAT12, CLA10, CRO1 and CRO10). The BAT1 site had the highest number of low-end exceedances with 5 out of the 12 samples falling below the criteria. There were no high-end exceedances for any of the Monthly Instream monitoring sites. Refer to Table 6 for the number of pH water quality exceedances at each of the monthly instream sites.

### **E. Coli**

E. coli is identified as Water Quality Limited in Oregon's 2004/2006 Integrated Report for 10 streams within Salem city limits. All of these streams are monitored for E. coli through the Monthly Instream monitoring element.

E. coli has two different water quality criteria, including:

- 30 day log mean of 126 organisms per 100 mls based on a minimum of 5 samples
- No single sample greater than 406 organisms per 100 mls

E. coli is not sampled on a frequency that allows for computation of the 30 day log mean. For that reason, the greater than 406 single sample criteria was used to determine the number of exceedances at each site.

Monthly Instream data indicates that the E. coli single sample criteria was periodically exceeded at 20 of the 21 sites (refer to Table 6) in both dry and rain conditions<sup>3</sup>. The CGT5, CLA10, and LPW1 sites had the greatest number of exceedances with 5 out of 12 samples exceeding the

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<sup>3</sup> 'Dry' is defined as less than 0.05 inches in the 24 hours prior to sample collection, and 'rain' is defined as greater than or equal to 0.05 inches of rainfall in the previous 24 hours.

criteria. Only the upstream Croisan Creek site, CRO10, did not exceed the E. coli single sample criteria.

Figure 2 illustrates the geometric mean for E. coli concentrations during dry and rain conditions for each Monthly Instream site. When comparing dry and rain conditions, the geometric mean was higher at nine sites during dry conditions and higher at twelve sites during rain conditions. When comparing sites on the same stream during rain conditions, seven streams exhibited an increase in geometric mean from upstream to downstream sites, one stream (Mill Race) exhibited an upstream to downstream increase of less than one, and two streams exhibited an upstream to downstream decrease (Claggett Creek and Pringle Creek). During dry conditions, seven streams exhibited an increase in geometric mean from upstream to downstream sites, while three showed an upstream to downstream decrease (Claggett Creek, Gibson Creek, and Mill Race).

### **Metals**

Pringle Creek is identified as Water Quality Limited in Oregon's 2004/2006 Integrated Report for copper, lead, and zinc. As previously indicated, monitoring for these metals through the Monthly Instream monitoring element was initiated in January at four sites in the Pringle Creek watershed, following renewal of the NPDES MS4 Permit. Water quality criteria for each of these metals is hardness dependant. For this reason, monitoring for hardness was also initiated at these sites in January.

An exceedance of total recoverable copper occurred at two of the four sites, CLA1 and PRI5 (refer to Table 6). The CLA1 copper exceedance occurred during a sampling event when 1.03 inches of rainfall fell in the previous 24 hours. The PRI5 copper exceedance occurred during a sampling event when 0.4 inches of rainfall fell in the previous 24 hours. There were no instances of dissolved copper criteria being exceeded for any of the monitored sites. Furthermore, there were no instances of dissolved copper concentration being above the .0025 mg/L laboratory reporting limit.

Exceedances of total recoverable zinc occurred at two of the four sites, with CLA1 exhibiting two exceedances and PRI5 having one (refer to Table 6). All total recoverable zinc exceedances occurred during rain conditions. The CLA1 exceedances occurred during sampling events when 1.03 inches and 0.39 inches of rainfall fell in the previous 24 hours. The PRI5 exceedance occurred during a sampling event when 0.4 inches of rainfall fell in the previous 24 hours. There were no exceedances of dissolved zinc at any of the monitoring sites.

Additional zinc (total recoverable and dissolved) grab sample data was collected during a storm event this reporting period at three different sites identified in the City's 2004-2010 Stormwater Management Plan. These sites included a MS4 site and two instream sites. The results of these data showed an exceedance of total recoverable zinc at the MS4 site (refer to Table 11). These sites have had zinc water quality exceedances of varying magnitudes in the past. As a result, sampling for zinc at these sites may continue during the current permit cycle.

There were no water quality criteria exceedances for total recoverable lead and dissolved lead this fiscal year.

## **Other Parameters**

There are a number of other parameters that have been monitored this fiscal year that have not been included in the narrative section of this data summary. These parameters either did not exceed the water quality criteria or do not have a set water quality criteria. However, all parameters monitored this fiscal year are represented in the tables and figures included in this data summary.

### **3.2 Continuous Instream Water Quality Alarms**

An alarm system was developed for incorporation with the City's Continuous Instream monitoring element that was described in Section 2.2 of this document. The alarm system supports the City's Illicit Discharge Detection and Elimination (IDDE) program by recording, notifying, and prompting the investigation of water quality abnormalities that may be indicative of an illicit discharge. Parameters that are evaluated through the alarm system include pH, temperature, specific conductivity, DO, turbidity, and flow. The Continuous Instream alarm system is an important tool in the continued improvement and success of the City's IDDE program. Examples include aiding in the elimination of periodic illicit discharges, helping to prioritize outfalls for dry weather outfall screening activities, and outreach opportunities to inform/educate residents and contractors.

Over the last 3 years of implementing and refining the alarm system, there has been an observed decrease in the total number of alarms recorded at most stations (Fig. 8). This is especially apparent with the CLK1 and CLK12 sites, with a 57% and 58% reduction, respectively. These stations have extremely low summer flows, allowing for easy identification of water quality abnormalities.

The alarm counts in Figure 8 have been filtered to remove alarms resulting from rain events and also those known to have resulted from non-prohibited activities identified in Schedule A.4.a.xii in the City's NPDES MS4 Permit. In addition, alarms associated with permitted activities during the in-water work period and alarms believed to be a result of wildlife activity within the stream were removed. Removal of the above stated alarms was based on best professional judgment to isolate alarms believed to have resulted from illicit discharges.

Four Continuous Instream monitoring sites (BAT12, GLE12, MIC12, and PRI12) are located at or near the City's jurisdictional boundary (where the creek flows into city limits); for that reason, alarms at these sites were not included in Figure 8. However, alarms at these four sites are treated the same as any other site and provide early warning of stream conditions entering the City, as well as provide opportunities to work cooperatively with neighboring jurisdictions to help improve stream health.

## **4.0 Conclusion**

Results from water quality monitoring conducted during this fiscal year exhibit periodic exceedances of water quality criteria/standards for temperature, pH, DO, E. coli, copper and zinc. With the exception of copper and zinc, all other parameters listed above had water quality exceedances during both dry and rain conditions. Exceedances of total recoverable copper and zinc occurred during rain conditions only.

It is anticipated that in future summaries of water quality data, additional information will be obtained in regard to the seasonality of water quality standard exceedances. This will be a result of implementing additional efforts in storm-based sampling identified in the stormwater monitoring plan, including Instream Storm, Stormwater (MS4), Pesticide, and Mercury monitoring.

Cumulatively, data collected throughout this NPDES MS4 Permit cycle will be utilized to meet monitoring objectives identified in the City's monitoring plan, while also supporting data analyses that will be conducted in preparation of a NPDES MS4 Permit renewal package (due to DEQ July 1,2015).



Table 1.  
Monthly and Continuous Instream Site Names

Stream	Monthly Instream Site		Continuous Instream Site	
	upper	lower	upper	lower
Battle Creek	BAT 12	BAT 1	BAT12	BAT3
Claggett Creek	CGT 5	CGT 1	na	na
Clark Creek	CLA 10	CLA 1	CLK12	CLK1
Croisan Creek	CRO 10	CRO 1	na	na
Gibson Creek	GIB 15	GIB 1	na	na
Glenn Creek	GLE 10	GLE 1	GLE12	GLE3
Mill Creek	MIC 10	MIC 1	MIC12	MIC3
Mill Race	MRA 10	MRA 1	na	na
Pringle Creek	PRI 5	PRI 1	PRI12	PRI3
Shelton Ditch	SHE 10	SHE 1	na	na
West Fork Little Pudding River	na	LPW 1	na	na

na = Site does not exist on this stream section for the applicable monitoring element

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

Continuous Instream	
Site ID	Site Location
BAT12	Lone Oak Rd SE
BAT3	Commercial St SE
CLK1	Bush Park
CLK12	Ewald St SE
GLE12	Hidden Valley Dr NW
GLE3	Wallace Rd NW
MIC12	Turner Rd SE
MIC3	North Salem High School
PRI12	Trelstad Ave SE
PRI3	Pringle Park

Willamette River	
Site ID	Site Location (Approximate River Mile)
Wheatland Ferry	71
Spongs Landing	77
WLTP*	78
Sunset Park	81
Mill Creek	82.9
Railroad Bridge	83

\*Willow Lake Pollution Control Facility- 150 feet downstream from effluent diffuser

Table 3.  
Parameters for Each Monitoring Element

Parameter	Monitoring Element		
	Monthly Instream	Continuous Instream	Willamette River
Alkalinity			x
Biological Oxygen Demand (BOD <sub>stream</sub> )	x		x
Specific Conductivity	x	x	x
Copper (Total Recoverable and Dissolved)	x <sup>1</sup>		
Dissolved Oxygen (DO)	x	x	x
E. coli	x		x
Hardness	x <sup>1</sup>		
Lead (Total Recoverable and Dissolved)	x <sup>1</sup>		
Ammonia Nitrogen (NH <sub>3</sub> -N)			x
Nitrate and Nitrite as Nitrogen (NO <sub>3</sub> +NO <sub>2</sub> -N)	x		x
pH	x	x	x
Total Dissolved Solids (TDS)			x
Temperature	x	x	x
Total Phosphorus (TP)			x
Total Solids (TS)			x
Total Suspended Solids (TSS)	x <sup>2</sup>		x
Turbidity	x	x	x
Zinc (Total Recoverable and Dissolved)	x <sup>1</sup>		

<sup>1</sup> Pringle Creek Watershed sites only (PRI1, PRI5, CLA1, and CLA10)

<sup>2</sup> West Fork of Little Pudding River site only (LPW 1)

**Table 4.**  
**Water Quality Criteria for Monitored Streams**

<b>Parameter</b>	<b>Season</b>	<b>Criteria</b>	<b>Applicable Waterbody</b>
<b>Dissolved Oxygen</b>	January 1-May 15	Spawning: Not less than 11.0 mg/L or 95% saturation	Battle Creek*, Claggett Creek*, 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 <sup>□</sup>
	October 15 - May 15	Spawning: Not less than 11.0 mg/L or 95% saturation	Mill Creek, Pringle Creek <sup>*1</sup> , Shelton Ditch*
	Year Around (Non-spawning)	Cold water: Not less than 8.0 mg/L or 90% saturation	Battle Creek*, Croisan Creek*, Clark Creek, Pringle Creek <sup>2</sup>
Cool water: Not less than 6.5 mg/L		Claggett Creek*, Glenn Creek*, Mill Creek, Pringle Creek <sup>1</sup> , Shelton Ditch, West Fork Little Pudding River	
<b>pH</b>	Year Around	Must be within the range of 6.5 to 8.5 pH units	All creeks
<b>Temperature</b>	October 15 - May 15	Salmon and steelhead spawning: 13°C 7-day average maximum	Mill Creek*, Pringle Creek <sup>1</sup> , Shelton Ditch
	October 1- May 31	Salmon and steelhead spawning: 13°C 7-day average maximum	Gibson Creek <sup>□</sup>
	Year Around (Non-spawning)	Salmon and trout rearing and migration: 18°C 7-day average maximum	Battle Creek, Claggett Creek, Clark Creek, Croisan Creek, Gibson Creek <sup>□</sup> , Glenn Creek, Mill Creek*, Pringle Creek*, Shelton Ditch, West Fork Little Pudding River
<b>E. coli</b>	Fall-Winter-Spring	30 day log mean of 126 E. coli organisms per 100 ml (or) no single sample > 406 organisms per 100 ml	Battle Creek*, Claggett Creek*, Clark Creek*, Croisan Creek, Glenn Creek*, Mill Creek*, Pringle Creek*, Shelton Ditch*, West Fork Little Pudding River*
	Summer	30 day log mean of 126 E. coli organisms per 100 ml (or) no single sample > 406 organisms per 100 ml	Battle Creek*, Claggett Creek*, Clark Creek*, Croisan Creek*, Glenn Creek*, Mill Creek*, Pringle Creek*, Shelton Ditch
<b>Copper</b>	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*
<b>Lead</b>	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*
<b>Zinc</b>	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 TMDL for Temperature and E. coli

\* Oregon's 2004/2006 Integrated Report Section 303(d) listed

□ Gibson Creek is referred as Gibson Gulch in Oregon's 2004/2006 Integrated Report

<sup>1</sup> Applies to Pringle Creek from river mile 0 to 2.6

<sup>2</sup> Applies to Pringle Creek from river mile 2.6 to 6.2

Table 5.  
Median Values for Monthly Instream Sites

Station	Number of Samples	Temperature (C)	DO (mg/L)	Specific Conductivity ( $\mu$ S/cm)	Turbidity (NTUs)	pH	E. Coli	NO <sub>3</sub> +NO <sub>2</sub> -N (mg/L)	BOD <sub>stream</sub> (mg/L)
BAT 1	12	10.9	10.0	46.5	11.2	6.9	227.5	0.8	1.1
BAT 12	12	10.4	10.4	42.5	8.8	6.8	164.0	0.9	0.9
CGT 1	12	13.7	7.9	190.6	7.9	7.1	149.0	0.2	1.8
CGT 5	10	12.0	9.3	164.2	15.2	7.1	324.5	0.2	1.8
CLA 1	12	12.1	10.3	92.0	4.1	7.1	276.0	1.0	0.9
CLA 10	12	12.6	9.9	71.0	4.2	6.9	318.0	1.6	1.0
CRO 1	12	10.2	10.2	68.7	7.1	6.9	326.5	0.5	1.1
CRO 10	12	10.6	10.0	48.8	7.8	6.8	28.5	0.6	1.0
GIB 1	12	11.8	9.6	90.7	9.4	7.1	132.0	1.1	1.0
GIB 15	12	11.7	9.7	100.2	10.9	7.1	68.5	1.9	1.0
GLE 1	11	11.7	10.3	97.4	6.9	7.2	272.0	0.9	1.0
GLE 10	12	11.1	10.4	63.9	7.4	7.2	54.5	1.1	0.7
LPW 1	9	11.1	10.2	172.8	24.8	7.0	488.0	0.6	1.4
MIC 1	12	11.9	10.5	81.7	6.8	7.1	317.0	1.1	1.0
MIC 10	12	11.4	10.7	71.0	7.3	7.1	119.5	1.2	1.2
MRA 1	12	12.0	10.9	81.0	6.8	7.3	183.0	1.3	1.5
MRA 10	12	11.5	10.5	82.3	7.4	7.2	191.5	1.2	1.3
PRI 1	11	11.7	10.8	73.7	6.4	7.4	119.0	1.0	1.2
PRI 5	12	12.3	10.3	85.3	4.7	7.2	130.0	0.7	1.3
SHE 1	12	11.7	10.8	69.8	6.8	7.3	120.5	1.2	1.4
SHE 10	12	11.6	10.8	74.8	6.1	7.1	107.0	1.2	1.1

Table 6.  
Number of Water Quality Criteria Exceedances for Monthly Instream Sites

Station	DO	pH	E. Coli			Copper		Lead		Zinc	
			Total #	Dry <sup>2</sup>	Rain <sup>3</sup>	Total	Dissolved	Total	Dissolved	Total	Dissolved
BAT 1	1	5	4	4	0						
BAT 12	1	2	1	1	0						
CGT 1	4	0	4	1	3						
CGT 5	4	0	5	1	4						
CLA 1	0	0	4	1	3	1	0	0	0	2	0
CLA 10	0	2	5	3	2	0	0	0	0	0	0
CRO 1	3	1	3	2	1						
CRO 10	3	2	0	0	0						
GIB 1	5 <sup>1</sup>	0	3	1	2						
GIB 15	6 <sup>1</sup>	0	2	1	1						
GLE 1	0	0	2	1	1						
GLE 10	2	0	3	3	0						
LPW 1	1	0	5	2	3						
MIC 1	1	0	3	1	2						
MIC 10	3	0	1	0	1						
MRA 1	na	0	2	0	2						
MRA 10	na	0	3	1	2						
PRI 1	1	0	2	1	1	0	0	0	0	0	0
PRI 5	2	0	3	0	3	1	0	0	0	1	0
SHE 1	1	0	2	1	1						
SHE 10	2	0	1	0	1						

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

na = Not available (City staff was unable to find dissolved oxygen water quality criteria associated with this waterbody)

<sup>1</sup> City staff was unable to find year around dissolved oxygen water quality criteria associated with this waterbody

<sup>2</sup> Dry is < 0.05 inches of rainfall in previous 24 hours

<sup>3</sup> Rain is ≥ 0.05 inches of rainfall in previous 24 hours

Table 7.  
Monthly Instream Data

Site ID	Date	Time	Weather	Sampler Initials	Temp (C)	DO (mg/L)	Cond (uS/cm)	Turb (NTUs)	pH	E-Coli	NO2&NO3 (mg/L)	BOD (mg/L)	FLAG?	Rainfall previous 24 hours
BAT 1	7/20/2010	11:15	Cloudy/No Rain	SC	15.8	8.71	51.1	14.6	6.45	548	0.48	0.7		0
BAT 1	8/24/2010	11:10	Sunny	SC	16.3	8.31	54.6	12.5	6.7	1203	0.48	1		0
BAT 1	9/7/2010	11:10	Cloudy/No Rain	JVH	15.1	8.02	56.7	19.6	7.03	1414	0.37	1.1	turbid	0.01
BAT 1	10/12/2010	11:15	Sunny	JVH	11.7	9.41	54	12.8	7.11	687	0.64	1.1		0
BAT 1	11/16/2010	11:15	Cloudy/No Rain	JVH	11.3	9.59	48.6	9.8	7.03	291	0.78	1.3		0.16
BAT 1	12/7/2010	11:10	Light Rain	SC	9.5	10.5	46.5	9.1	6.23	54	1.36	0.8		0.03
BAT 1	1/11/2011	11:25	Cloudy/No Rain	JVH	5.8	11.55	45.8	7.2	7.24	12	1.36	1		0.01
BAT 1	2/15/2011	11:15	Cloudy/No Rain	JVH	6.1	11.3	27.1	34.7	7.25	236	0.66	1.4		1.03
BAT 1	3/15/2011	11:20	Light Rain	JVH	9.1	10.42	45.5	19.4	7.05	41	1.28	1.2		0.56
BAT 1	4/12/2011	12:15	Sunny	SC	9.1	11.08	44.4	6.1	6.34	25	1.2	0.8		0.05
BAT 1	5/17/2011	11:25	Light Rain	SC	10.5	10.36	44.9	5.9	6.43	80	0.95	0.9		0.01
BAT 1	6/14/2011	11:15	Cloudy/No Rain	SC	13.2	9.6	46.4	7.9	6.36	219	0.8	1.1		0
<b>Median</b>					<b>10.9</b>	<b>10.0</b>	<b>46.5</b>	<b>11.2</b>	<b>6.9</b>	<b>227.5</b>	<b>0.8</b>	<b>1.1</b>		

Site ID	Date	Time	Weather	Sampler Initials	Temp (C)	DO (mg/L)	Cond (uS/cm)	Turb (NTUs)	pH	E-Coli	NO2&NO3 (mg/L)	BOD (mg/L)	FLAG?	Rainfall previous 24 hours
BAT 12	7/20/2010	10:50	Cloudy/No Rain	SC	16.2	8.87	43.5	11.2	6.55	276	0.25	0.7	very shallow	0
BAT 12	8/24/2010	10:50	Sunny	SC	15.6	8.71	49.9	12.9	6.78	291	0.15	1	water level very low	0
BAT 12	9/7/2010	10:50	Light Rain	JVH	14.7	8.37	53.7	11.2	7.27	308	0.11	1		0.01
BAT 12	10/12/2010	11:00	Sunny	JVH	11.4	9.36	47.6	10.9	7.19	461	0.2	1.3		0
BAT 12	11/16/2010	11:00	Light Rain	JVH	11	10.08	42.6	5.7	7.22	78	0.86	0.8		0.16
BAT 12	12/7/2010	10:40	Cloudy/No Rain	SC	9.2	10.82	42.9	5.6	6.08	84	1.44	0.7		0.03
BAT 12	1/11/2011	11:05	Cloudy/No Rain	JVH	5.8	11.63	42.4	4.8	7.32	45	1.46	1		0.01
BAT 12	2/15/2011	11:00	Cloudy/No Rain	JVH	6.9	11.06	42	17.3	6.84	156	0.96	0.9		1.03
BAT 12	3/15/2011	11:05	Light Rain	JVH	8.4	10.65	40.7	16	7.6	29	1.4	0.9		0.56
BAT 12	4/12/2011	11:25	Sunny	SC	8.5	11.24	40.3	5.4	6.53	68	1.21	0.6		0.05
BAT 12	5/17/2011	11:00	Light Rain	SC	9.8	10.61	40.4	6.2	6.43	261	0.94	0.7		0.01
BAT 12	6/14/2011	10:50	Cloudy/No Rain	SC	12.5	10.19	40.5	6.6	6.5	172	0.77	0.8		0
<b>Median</b>					<b>10.4</b>	<b>10.4</b>	<b>42.5</b>	<b>8.8</b>	<b>6.8</b>	<b>164.0</b>	<b>0.9</b>	<b>0.9</b>		

Table 7.  
Monthly Instream Data

Site ID	Date	Time	Weather	Sampler Initials	Temp (C)	DO (mg/L)	Cond (uS/cm)	Turb (NTUs)	pH	E-Coli	NO2&NO3 (mg/L)	BOD (mg/L)	FLAG?	Rainfall previous 24 hours
CGT 1	7/20/2010	13:35	Sunny	SC	21.2	6.46	234	6.4	7.25	308	0.05	1.5		0
CGT 1	8/24/2010	13:10	Sunny	SC	20.7	6.56	227	14.6	7.34	727	0.05	1.8		0
CGT 1	9/7/2010	13:40	Cloudy/No Rain	JVH	18.6	6.29	227	12.5	7.04	172	0.05	2		0.14
CGT 1	10/12/2010	14:00	Sunny	JVH	15.2	6.87	176.4	5.1	7.1	75	0.05	1.6		0
CGT 1	11/16/2010	14:05	Cloudy/No Rain	JVH	12	7.39	116.7	8.9	7.07	687	0.21	1.7		0.14
CGT 1	12/7/2010	14:25	Heavy Rain	SC	8	7.65	188	46.8	6.8	111	0.72	1.8		0.08
CGT 1	1/11/2011	14:05	Cloudy/No Rain	JVH	5.1	8.95	193.2	6.2	7.06	23	0.64	1.2		0
CGT 1	2/15/2011	13:45	Cloudy/No Rain	JVH	6.7	11.14	44.2	30.5	7.25	548	0.15	2.2		0.79
CGT 1	3/15/2011	13:50	Cloudy/No Rain	JVH	9.6	10.5	34.4	110	6.83	1300	0.14	2.7		0.68
CGT 1	4/12/2011	14:00	Sunny	SC	12.1	12.52	165.3	6.9	7.78	63	0.55	1.5		0.05
CGT 1	5/17/2011	13:55	Cloudy/No Rain	SC	15.4	9.89	202.8	4.8	7.05	91	0.35	2.2		0
CGT 1	6/14/2011	13:30	Cloudy/No Rain	SC	18.9	8.12	207.8	4.8	7.02	126	0.21	3.3		0.01
<b>Median</b>					<b>13.7</b>	<b>7.9</b>	<b>190.6</b>	<b>7.9</b>	<b>7.1</b>	<b>149.0</b>	<b>0.2</b>	<b>1.8</b>		

Site ID	Date	Time	Weather	Sampler Initials	Temp (C)	DO (mg/L)	Cond (uS/cm)	Turb (NTUs)	pH	E-Coli	NO2&NO3 (mg/L)	BOD (mg/L)	FLAG?	Rainfall previous 24 hours
CGT 5	7/20/2010			SC									Dry, man in the bushes	0
CGT 5	8/24/2010			SC									Dry	0
CGT 5	9/7/2010	13:25	Cloudy/No Rain	JVH	15.5	3.72	217.5	52.5	7.1	1414	0.31	7.1	turbid, first flush	0.14
CGT 5	10/12/2010	13:35	Sunny	JVH	12.4	5.47	61.5	16.4	7	138	0.1	1.7		0
CGT 5	11/16/2010	13:40	Cloudy/No Rain	JVH	12	8.63	87.8	13.9	7.13	980	0.22	1.9		0.14
CGT 5	12/7/2010	14:00	Heavy Rain	SC	8.1	8.89	179.2	12.1	6.76	214	0.93	1.2		0.08
CGT 5	1/11/2011	13:35	Cloudy/No Rain	JVH	4.1	11.07	195.8	18.5	7.13	22	1.08	1.2		0
CGT 5	2/15/2011	13:30	Cloudy/No Rain	JVH	7	11.1	55.1	36.2	7.22	435	0.15	1.7		0.79
CGT 5	3/15/2011	13:25	Cloudy/No Rain	JVH	9.7	10.2	46	111	6.83	1300	0.27	2.4		0.68
CGT 5	4/12/2011	13:40	Sunny	SC	12	13.49	152.2	10.7	7.48	48	0.6	2.2		0.05
CGT 5	5/17/2011	13:30	Cloudy/No Rain	SC	12.9	9.63	176.1	7.3	6.82	140	0.17	1.6		0
CGT 5	6/14/2011	13:15	Cloudy/No Rain	SC	15.5	6.09	192.5	7.5	7.09	816	0.09	1.9		0.01
<b>Median</b>					<b>12.0</b>	<b>9.3</b>	<b>164.2</b>	<b>15.2</b>	<b>7.1</b>	<b>324.5</b>	<b>0.2</b>	<b>1.8</b>		



Table 7.  
Monthly Instream Data

Site ID	Date	Time	Weather	Sampler Initials	Temp (C)	DO (mg/L)	Cond (uS/cm)	Turb (NTUs)	pH	E-Coli	NO2&NO3 (mg/L)	BOD (mg/L)	FLAG?	Rainfall previous 24 hours	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
CLA 1	7/20/2010	11:00	Cloudy/No Rain	JVH	15.3	9.61	92.9	4.3	7.29	1414	0.77	0.8		0							
CLA 1	8/24/2010	13:15	Sunny	CC	18.9	8.89	90.9	5.1	7.47	192	0.78	0.7		0							
CLA 1	9/7/2010	14:45	Light Rain	CC	16.8	8.42	63.1	204	7.04	2420	0.68	9.4		0.07							
CLA 1	10/12/2010	14:15	Sunny	CC	14.5	10.01	92.4	3.8	7.44	276	0.97	0.9		0							
CLA 1	11/16/2010	15:00	Cloudy/No Rain	CC	12.5	10.22	87.7	7.9	7.34	179	0.94	1.1		0.16							
CLA 1	12/7/2010	10:35	Cloudy/No Rain	JVH	10.7	10.8	97.9	2.6	7.15	108	1.41	0.8		0.03							
CLA 1	1/11/2011	14:15	Cloudy/No Rain	co/bf	7	11.91	96.9	2.2	7.39	172	1.52	0.7	*Dissolved Zn sample contaminated	0.01	<0.0025	<0.0025	<0.0005	<0.0005	0.0048	0.00615*	31
CLA 1	2/15/2011	11:45	Cloudy/No Rain	CC	7.5	11.4	53.9	34.7	7.11	921	0.55	2		1.03	0.00415	<0.0025	0.0023	<0.0005	0.0346	0.016	19
CLA 1	3/15/2011	13:45	Light Rain	CC	10.8	10.32	63.8	77	6.93	1553	0.66	2.1		0.39	0.007	<0.0025	0.0061	<0.0005	0.0512	0.0141	25
CLA 1	4/12/2011	10:40	Sunny	JVH	9.2	11.61	95.1	3	6.52	179	1.32	0.7		0.05	<0.0025	<0.0025	<0.0005	<0.0005	0.00840	0.00695	32
CLA 1	5/17/2011	11:05	Cloudy/No Rain	JVH	11.7	10.75	92.6	3	6.89	387	1.11	0.8		0.01	<0.0025	<0.0025	<0.0005	<0.0005	0.006	0.005	27
CLA 1	6/14/2011	10:50	Cloudy/No Rain	JVH	14	9.92	91.6	3.4	6.96	276	0.99	0.9		0	<0.0025	<0.0025	<0.0005	<0.0005	0.0079	0.00625	31

Median 12.1 10.3 92.0 4.1 7.1 276.0 1.0 0.9

\*Dissolved Zn sample contaminated

Site ID	Date	Time	Weather	Sampler Initials	Temp (C)	DO (mg/L)	Cond (uS/cm)	Turb (NTUs)	pH	E-Coli	NO2&NO3 (mg/L)	BOD (mg/L)	FLAG?	Rainfall previous 24 hours	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
CLA 10	7/20/2010	9:30	Cloudy/No Rain	SC	14.9	9.31	69	4.5	6.5	1120	1.26	1		0							
CLA 10	8/24/2010	9:30	Sunny	SC	16.3	9.18	68	8.9	6.95	1046	1.21	1		0							
CLA 10	9/7/2010	9:45	Light Rain	JVH	16.1	8.73	69.5	6.3	6.91	770	1.15	1.2		0.07							
CLA 10	10/12/2010	10:00	Cloudy/No Rain	JVH	14.2	9.4	70.6	3.9	6.93	345	1.33	1.2		0							
CLA 10	11/16/2010	9:55	Cloudy/No Rain	JVH	12.9	9.39	66.7	4.8	6.86	411	1.36	0.8		0.16							
CLA 10	12/7/2010	9:30	Cloudy/No Rain	SC	12.2	10.08	74.9	2.5	6.4	56	1.86	0.7		0.03							
CLA 10	1/11/2011	10:00	Cloudy/No Rain	JVH	9.4	10.68	75.1	2	6.95	517	2.08	0.9	*Dissolved Zn sample contaminated	0.01	<0.0025	<0.0025	<0.0005	<0.0005	0.00665	0.0085*	22
CLA 10	2/15/2011	9:55	Light Rain	JVH	7	11.19	35.2	18.4	7.14	291	0.52	1.5		1.03	<0.0025	<0.0025	<0.0005	<0.0005	0.0258	0.0232	20
CLA 10	3/15/2011	10:05	Light Rain	JVH	10.4	10.22	74.9	8.6	7	60	1.94	0.9		0.39	<0.00250	<0.0025	<0.0005	<0.0005	0.0122	0.0106	22
CLA 10	4/12/2011	9:45	Cloudy/No Rain	SC	10.1	10.96	73.4	2.8	6.31	37	1.93	0.8		0.05							
CLA 10	5/17/2011	9:35	Cloudy/No Rain	SC	11.6	10.11	71.3	3.3	6.6	46	1.81	0.9		0.01	<0.0025	<0.0025	0.0009	<0.0005	0.0083	0.0067	21
CLA 10	6/14/2011	9:25	Cloudy/No Rain	SC	13.4	9.76	74	2.8	6.59	47	1.75	1.2		0	<0.0025	<0.0025	<0.0005	<0.0005	0.00755	0.00685	22

Median 12.6 9.9 71.0 4.2 6.9 318.0 1.6 1.0

\*Dissolved Zn sample contaminated

Table 7.  
Monthly Instream Data

Site ID	Date	Time	Weather	Sampler Initials	Temp (C)	DO (mg/L)	Cond (uS/cm)	Turb (NTUs)	pH	E-Coli	NO2&NO3 (mg/L)	BOD (mg/L)	FLAG?	Rainfall previous 24 hours
CRO 1	7/20/2010	9:50	Cloudy/No Rain	SC	14.7	8.62	84.2	6.7	6.7	122	0.31	1		0
CRO 1	8/24/2010	9:50	Sunny	SC	14.4	7.77	97.1	8.8	6.76	308	0.3	1.4		0
CRO 1	9/7/2010	10:05	Light Rain	JVH	14.6	7.27	100.7	7.4	7.08	345	0.31	1.1		0.01
CRO 1	10/12/2010	10:20	Cloudy/No Rain	JVH	10	9.89	90.2	8.6	7.16	365	0.47	1.2		0
CRO 1	11/16/2010	10:15	Cloudy/No Rain	JVH	10.9	9.79	70.1	7.1	7.15	130	0.62	1.1		0.16
CRO 1	12/7/2010	9:50	Cloudy/No Rain	SC	8.6	10.96	63.3	6.4	6.38	73	1.22	1		0.03
CRO 1	1/11/2011	10:20	Cloudy/No Rain	JVH	4.6	12.29	62.9	5.6	7.21	26	1.12	1.4		0.01
CRO 1	2/15/2011	10:10	Light Rain	JVH	6.3	11.61	50.1	68	7.1	345	0.46	1.6		1.03
CRO 1	3/15/2011	10:25	Heavy Rain	JVH	9	10.82	56.9	23.7	7.23	579	1.03	1.4		0.22
CRO 1	4/12/2011	10:30	Sunny	SC	7.7	11.89	64.9	6.4	6.78	50	0.73	0.7		0.05
CRO 1	5/17/2011	10:00	Cloudy/No Rain	SC	10.3	10.57	68	5.5	6.7	2420	0.51	1		0.01
CRO 1	6/14/2011	10:00	Cloudy/No Rain	SC	13.3	9.84	69.4	7	6.73	435	0.4	0.9		0
<b>Median</b>					<b>10.2</b>	<b>10.2</b>	<b>68.7</b>	<b>7.1</b>	<b>6.9</b>	<b>326.5</b>	<b>0.5</b>	<b>1.1</b>		

Site ID	Date	Time	Weather	Sampler Initials	Temp (C)	DO (mg/L)	Cond (uS/cm)	Turb (NTUs)	pH	E-Coli	NO2&NO3 (mg/L)	BOD (mg/L)	FLAG?	Rainfall previous 24 hours
CRO 10	7/20/2010	10:25	Cloudy/No Rain	SC	15.3	8.26	59.7	7.8	6.57	40	0.22	0.6		0
CRO 10	8/24/2010	10:25	Sunny	SC	15.2	7.88	70.3	10.8	6.61	34	0.08	1.1	water looks bad, stagnant	0
CRO 10	9/7/2010	10:25	Light Rain	JVH	14.3	7.55	73.3	11.1	6.89	326	0.2	1	stagnant, iron bacteria	0.01
CRO 10	10/12/2010	10:40	Sunny	JVH	10.4	9.21	66.7	12.2	7.08	71	0.2	1.2		0
CRO 10	11/16/2010	10:40	Cloudy/No Rain	JVH	10.8	9.63	50.3	6.3	7.16	23	0.69	1		0.16
CRO 10	12/7/2010	10:15	Cloudy/No Rain	SC	8.5	10.74	48.8	5.9	6.22	6	1.3	0.8		0.03
CRO 10	1/11/2011	10:45	Cloudy/No Rain	JVH	4.9	11.85	46.1	5.8	7.25	6	1.16	0.8		0.01
CRO 10	2/15/2011	10:30	Cloudy/No Rain	JVH	6.6	11.3	46.7	31.7	7.23	45	0.74	1.1		1.03
CRO 10	3/15/2011	10:50	Heavy Rain	JVH	8.6	10.81	45	22.7	7.13	10	1.28	1.3		0.22
CRO 10	4/12/2011	11:00	Sunny	SC	8.7	11.22	45.4	5.8	6.53	2	0.82	0.9		0.05
CRO 10	5/17/2011	10:40	Light Rain	SC	10.8	10.3	46.8	5.2	6.41	19	0.45	0.9		0.01
CRO 10	6/14/2011	10:30	Cloudy/No Rain	SC	13.4	9.58	48.8	7.8	6.56	53	0.32	1.1		0
<b>Median</b>					<b>10.6</b>	<b>10.0</b>	<b>48.8</b>	<b>7.8</b>	<b>6.8</b>	<b>28.5</b>	<b>0.6</b>	<b>1.0</b>		

Table 7.  
Monthly Instream Data

Site ID	Date	Time	Weather	Sampler Initials	Temp (C)	DO (mg/L)	Cond (uS/cm)	Turb (NTUs)	pH	E-Coli	NO2&NO3 (mg/L)	BOD (mg/L)	FLAG?	Rainfall previous 24 hours
GIB 1	7/20/2010	13:25	Sunny	JVH	16.7	7.33	106	12	7.14	461	0.51	0.8	beaver dam	0
GIB 1	8/24/2010	10:45	Sunny	CC	16.9	7.34	115.3	10.3	7.21	118	0.4	1.2		0
GIB 1	9/7/2010	11:15	Heavy Rain	CC	15.4	6.92	116.5	9.8	7.19	190	0.39	1.2		0.04
GIB 1	10/12/2010	11:15	Sunny	CC	12	8.42	117	9.8	7.22	102	0.54	1.3		0
GIB 1	11/16/2010	11:30	Cloudy/No Rain	CC	11.5	9.3	94	8.3	7.07	1203	0.78	1.1		0.21
GIB 1	12/7/2010	13:10	Light Rain	JVH	8.2	10.85	82.7	9	7.11	30	1.74	0.5		0.05
GIB 1	1/11/2011	11:00	Cloudy/No Rain	cc/bf	4.3	11.97	83.2	8.1	7.17	28	2.07	0.8		0
GIB 1	2/15/2011	10:45	Cloudy/No Rain	CC	7.1	11.1	74.6	62	7.05	1553	0.97	1.4		0.73
GIB 1	3/15/2011	11:00	Heavy Rain	CC	10.5	10.22	72.6	26.4	7.11	146	1.59	1.2		0.38
GIB 1	4/12/2011	13:05	Sunny	JVH	9.6	11.05	81.8	8.3	7.01	10	1.73	0.6		0.06
GIB 1	5/17/2011	13:05	Cloudy/No Rain	JVH	12.5	9.97	87.5	6.2	6.67	36	1.46	0.9		0
GIB 1	6/14/2011	13:20	Cloudy/No Rain	JVH	14.7	9	93.8	6.6	6.99	387	1.15	0.8		0.16
<b>Median</b>					<b>11.8</b>	<b>9.6</b>	<b>90.7</b>	<b>9.4</b>	<b>7.1</b>	<b>132.0</b>	<b>1.1</b>	<b>1.0</b>		

Site ID	Date	Time	Weather	Sampler Initials	Temp (C)	DO (mg/L)	Cond (uS/cm)	Turb (NTUs)	pH	E-Coli	NO2&NO3 (mg/L)	BOD (mg/L)	FLAG?	Rainfall previous 24 hours
GIB 15	7/20/2010	13:50	Sunny	JVH	18.3	8.07	109.1	13	7.14	1986	1.1	0.7		0
GIB 15	8/24/2010	11:00	Sunny	CC	16.6	8.24	115.7	21.8	7.25	387	0.48	1.1		0
GIB 15	9/7/2010	11:30	Heavy Rain	CC	16.1	8.26	120.6	6.3	7.33	140	0.66	0.9		0.04
GIB 15	10/12/2010	11:30	Sunny	CC	12	9.31	118.8	6.4	7.27	69	0.54	0.9		0
GIB 15	11/16/2010	11:45	Cloudy/No Rain	CC	11.2	9.56	110.7	14.9	7.08	105	1.4	1.3		0.21
GIB 15	12/7/2010	13:30	Light Rain	JVH	8.4	10.55	89.6	7	7.04	32	2.34	0.8		0.05
GIB 15	1/11/2011	11:15	Cloudy/No Rain	cc/bf	5.5	11.75	90.6	6.7	7.29	23	2.85	0.7		0
GIB 15	2/15/2011	11:00	Cloudy/No Rain	CC	7.3	11.07	84.9	92.2	6.98	488	1.55	1.6		0.73
GIB 15	3/15/2011	11:15	Heavy Rain	CC	10.7	10.28	81.7	28.5	7.26	31	2.37	1		0.38
GIB 15	4/12/2011	13:25	Sunny	JVH	11.4	10.97	87.8	8.8	6.95	10	2.49	0.8		0.06
GIB 15	5/17/2011	13:25	Cloudy/No Rain	JVH	13.5	9.77	96.5	8.1	6.8	61	2.59	1.4		0
GIB 15	6/14/2011	13:50	Cloudy/No Rain	JVH	16	9.22	103.8	22.9	6.98	68	2.93	1		0.16
<b>Median</b>					<b>11.7</b>	<b>9.7</b>	<b>100.2</b>	<b>10.9</b>	<b>7.1</b>	<b>68.5</b>	<b>1.9</b>	<b>1.0</b>		

Table 7.  
Monthly Instream Data

Site ID	Date	Time	Weather	Sampler Initials	Temp (C)	DO (mg/L)	Cond (uS/cm)	Turb (NTUs)	pH	E-Coli	NO2&NO3 (mg/L)	BOD (mg/L)	FLAG?	Rainfall previous 24 hours
GLE 1	7/20/2010	13:05	Sunny	JVH	16.3	8.17	123.1	10.5	7.23	272	0.81	0.6	stagnant	0
GLE 1	8/24/2010			CC									No Sample	0
GLE 1	9/7/2010	11:00	Cloudy/No Rain	CC	15.2	8.02	123.4	8.4	7.29	326	0.55	1.2		0.04
GLE 1	10/12/2010	11:00	Sunny	CC	12	9.71	119.6	6.9	7.38	649	0.86	1.2		0
GLE 1	11/16/2010	11:15	Cloudy/No Rain	CC	11.7	10.09	97.4	8	7.26	517	0.77	1.4		0.21
GLE 1	12/7/2010	12:50	Light Rain	JVH	9.2	10.89	97.7	4.7	7.17	29	1.7	0.9		0.05
GLE 1	1/11/2011	10:45	Cloudy/No Rain	cc/bf	5.1	12.22	89.8	5.4	7.29	66	1.69	0.9		0
GLE 1	2/15/2011	10:30	Cloudy/No Rain	CC	7.2	11.5	63.2	47.9	7.1	387	0.63	1.3		0.73
GLE 1	3/15/2011	10:45	Heavy Rain	CC	9.8	16.67	83.5	23.4	7.25	60	1.75	1.2		0.38
GLE 1	4/12/2011	11:30	Sunny	JVH	8.4	11.54	90.4	5.5	7.15	35	1.61	0.9		0.06
GLE 1	5/17/2011	12:40	Cloudy/No Rain	JVH	11.8	10.33	96.4	5.6	6.68	140	1.22	0.8		0
GLE 1	6/14/2011	13:05	Cloudy/No Rain	JVH	14.8	9.29	104.4	4.5	6.73	345	0.94	1	llamas upstream	0.16
<b>Median</b>					<b>11.7</b>	<b>10.3</b>	<b>97.4</b>	<b>6.9</b>	<b>7.2</b>	<b>272.0</b>	<b>0.9</b>	<b>1.0</b>		

Site ID	Date	Time	Weather	Sampler Initials	Temp (C)	DO (mg/L)	Cond (uS/cm)	Turb (NTUs)	pH	E-Coli	NO2&NO3 (mg/L)	BOD (mg/L)	FLAG?	Rainfall previous 24 hours
GLE 10	7/20/2010	14:10	Sunny	JVH	14.8	9.23	67.5	7.8	7.17	461	0.43	0.5		0
GLE 10	8/24/2010	11:15	Sunny	CC	14.7	8.73	98.3	6.4	7.1	980	0.05	0.9		0
GLE 10	9/7/2010	11:45	Heavy Rain	CC	16.3	8.28	105	9.6	7.11	2420	0.13	0.9		0.04
GLE 10	10/12/2010	11:45	Sunny	CC	11.8	10.09	92.2	2.9	7.33	196	0.16	0.8		0
GLE 10	11/16/2010	12:00	Cloudy/No Rain	CC	11.3	10.21	78.6	4.7	7.22	30	0.77	0.6		0.21
GLE 10	12/7/2010	13:50	Light Rain	JVH	8.6	11.07	63.6	7.7	6.99	56	1.54	0.6		0.05
GLE 10	1/11/2011	11:30	Cloudy/No Rain	cc/bf	5.6	11.93	56.8	7	7.24	20	1.61	0.8		0
GLE 10	2/15/2011	11:15	Cloudy/No Rain	CC	7.1	11.4	58.1	37.6	7.27	53	1.3	0.8		0.73
GLE 10	3/15/2011	11:30	Heavy Rain	CC	9.2	10.78	57.3	28.8	7.33	59	1.89	1		0.38
GLE 10	4/12/2011	13:40	Sunny	JVH	10.2	10.91	57.2	9.2	6.96	23	1.6	0.6		0.06
GLE 10	5/17/2011	13:40	Cloudy/No Rain	JVH	10.8	10.49	60.2	6.2	7.24	17	1.3	0.6		0
GLE 10	6/14/2011	14:05	Cloudy/No Rain	JVH	12.6	10.25	64.1	5.1	7.05	24	0.91	0.5		0.16
<b>Median</b>					<b>11.1</b>	<b>10.4</b>	<b>63.9</b>	<b>7.4</b>	<b>7.2</b>	<b>54.5</b>	<b>1.1</b>	<b>0.7</b>		

Table 7.  
Monthly Instream Data

Site ID	Date	Time	Weather	Sampler Initials	Temp (C)	DO (mg/L)	Cond (uS/cm)	Turb (NTUs)	pH	E-Coli	NO2&NO3 (mg/L)	BOD (mg/L)	FLAG?	Rainfall previous 24 hours	TSS
LPW 1	7/20/2010			SC									dry	0	
LPW 1	8/24/2010			SC									dry	0	
LPW 1	9/7/2010			JVH									dry	0.14	
LPW 1	10/12/2010	13:10	Sunny	JVH	13.3	8.78	88.2	24.8	7.07	770	0.11	1.5		0	
LPW 1	11/16/2010	13:15	Cloudy/No Rain	JVH	12	9.83	158.1	9.7	7.07	488	1.18	1.2		0.14	
LPW 1	12/7/2010	13:40	Heavy Rain	SC	8.6	10.16	218.5	10.7	6.64	44	2.05	1	several ducks upstream	0.08	
LPW 1	1/11/2011	13:15	Cloudy/No Rain	JVH	4.9	12.71	230	58.5	7.07	46	2.04	0.9		0	72
LPW 1	2/15/2011	13:15	Cloudy/No Rain	JVH	7	11.41	71.3	31.5	6.96	687	0.48	1.5		0.79	21
LPW 1	3/15/2011	13:05	Cloudy/No Rain	JVH	9.6	9.95	86	127	6.8	649	0.75	2		0.68	62
LPW 1	4/12/2011	13:10	Sunny	SC	11.1	17.38	172.8	4	6.81	69	0.64	1.2		0.05	2
LPW 1	5/17/2011	13:10	Cloudy/No Rain	SC	14	11.45	207.9	4.6	7.21	326	0.22	1.4	ducks (ducklings) upstream	0	2
LPW 1	6/14/2011	12:45	Cloudy/No Rain	SC	16.4	6.93	238	25.1	6.94	579	0.27	1.4		0.01	25
<b>Median</b>					<b>11.1</b>	<b>10.2</b>	<b>172.8</b>	<b>24.8</b>	<b>7.0</b>	<b>488.0</b>	<b>0.6</b>	<b>1.4</b>			

Site ID	Date	Time	Weather	Sampler Initials	Temp (C)	DO (mg/L)	Cond (uS/cm)	Turb (NTUs)	pH	E-Coli	NO2&NO3 (mg/L)	BOD (mg/L)	FLAG?	Rainfall previous 24 hours
MIC 1	7/20/2010	8:55	Cloudy/No Rain	SC	17.5	9.18	69.2	5	6.84	308	0.3	0.9		0
MIC 1	8/24/2010	8:45	Sunny	SC	16.7	9.3	54.1	6.6	6.83	291	0.16	1.1		0
MIC 1	9/7/2010	9:20	Cloudy/No Rain	JVH	16	9.39	54.6	5.9	7.16	921	0.13	0.9		0.01
MIC 1	10/12/2010	9:35	Cloudy/No Rain	JVH	12.2	10.08	95	2.8	7.09	326	0.52	1.2	low flow	0
MIC 1	11/16/2010	9:30	Cloudy/No Rain	JVH	11.5	10.61	99.6	7.4	7.13	866	2.78	0.9		0.16
MIC 1	12/7/2010	8:45	Cloudy/No Rain	SC	8.5	11.44	92.2	6.9	6.78	51	2.86	0.9	Gate open. No padlock.	0.03
MIC 1	1/11/2011	9:35	Cloudy/No Rain	JVH	4	12.86	88	4.6	7.27	84	2.26	0.7		0.01
MIC 1	2/15/2011	9:30	Heavy Rain	JVH	7	11.56	84.2	105	7.16	613	1.29	2.2		1.03
MIC 1	3/15/2011	9:30	Light Rain	JVH	9	11.07	80.1	20.2	7.1	75	1.94	0.9		0.38
MIC 1	4/12/2011	9:15	Cloudy/No Rain	SC	9	11.7	83.3	11.1	7.09	184	1.59	1.4		0.05
MIC 1	5/17/2011	9:10	Cloudy/No Rain	SC	12.2	10.44	71.1	6.6	7.04	365	0.92	1.2		0.01
MIC 1	6/14/2011	8:50	Cloudy/No Rain	SC	15.3	9.81	63.3	8.8	6.84	326	0.52	1.1		0
<b>Median</b>					<b>11.9</b>	<b>10.5</b>	<b>81.7</b>	<b>6.8</b>	<b>7.1</b>	<b>317.0</b>	<b>1.1</b>	<b>1.0</b>		

Table 7.  
Monthly Instream Data

Site ID	Date	Time	Weather	Sampler Initials	Temp (C)	DO (mg/L)	Cond (uS/cm)	Turb (NTUs)	pH	E-Coli	NO2&NO3 (mg/L)	BOD (mg/L)	FLAG?	Rainfall previous 24 hours
MIC 10	7/20/2010	11:50	Sunny	SC	17.3	9.63	60.4	7.4	6.99	236	0.38	1.4		0
MIC 10	8/24/2010	11:40	Sunny	SC	17.1	9.77	49.7	6.3	7.36	147	0.14	1.3		0
MIC 10	9/7/2010	11:35	Light Rain	JVH	15.1	9.55	49.1	7.2	7.14	276	0.14	1.1		0.01
MIC 10	10/12/2010	11:40	Sunny	JVH	11.4	10.82	67.1	6.6	7.21	142	0.95	1.1		0
MIC 10	11/16/2010	11:40	Cloudy/No Rain	JVH	11.4	10.34	93.7	7.7	7.1	101	2.81	1		0.16
MIC 10	12/7/2010	11:52	Light Rain	SC	8.6	11.09	87.6	8	6.61	38	2.92	0.8		0.03
MIC 10	1/11/2011	11:40	Cloudy/No Rain	JVH	4	12.45	80.3	5.8	7.19	38	2.3	1.2		0.01
MIC 10	2/15/2011	11:30	Light Rain	JVH	6.4	10.97	93.7	115	7.12	921	1.37	2.2		1.03
MIC 10	3/15/2011	11:50	Cloudy/No Rain	JVH	8.8	10.57	76.5	24.2	7.14	78	1.82	1.2		0.38
MIC 10	4/12/2011	12:40	Sunny	SC	9.4	12.43	74.9	7.7	6.9	33	1.6	1		0.05
MIC 10	5/17/2011	12:00	Cloudy/No Rain	SC	11.6	11.72	64.4	5.7	7.1	93	0.95	1.4		0.01
MIC 10	6/14/2011	11:35	Cloudy/No Rain	SC	14.7	10.35	57.3	6.8	7.08	138	0.55	1.2		0
<b>Median</b>					<b>11.4</b>	<b>10.7</b>	<b>71.0</b>	<b>7.3</b>	<b>7.1</b>	<b>119.5</b>	<b>1.2</b>	<b>1.2</b>		

Site ID	Date	Time	Weather	Sampler Initials	Temp (C)	DO (mg/L)	Cond (uS/cm)	Turb (NTUs)	pH	E-Coli	NO2&NO3 (mg/L)	BOD (mg/L)	FLAG?	Rainfall previous 24 hours
MRA 1	7/20/2010	10:15	Cloudy/No Rain	JVH	18	9.22	66	5.9	7.19	172	0.27	1.3		0
MRA 1	8/24/2010	11:30	Sunny	CC	17.2	9.52	52.1	5.9	7.5	206	0.14	1.2		0
MRA 1	9/7/2010	14:00	Cloudy/No Rain	CC	16.3	9.77	53.7	5.9	7.6	517	0.16	2		0.07
MRA 1	10/12/2010	13:30	Sunny	CC	13.1	10.54	87.6	6.8	7.65	291	1.15	1.7		0
MRA 1	11/16/2010	14:30	Cloudy/No Rain	CC	11.9	10.8	98.8	8.6	7.44	98	2.81	1		0.16
MRA 1	12/7/2010	10:00	Cloudy/No Rain	JVH	8.3	11.63	93.3	6.7	7.26	50	2.9	1		0.03
MRA 1	1/11/2011	13:30	Cloudy/No Rain	cc/bf	4.1	13.04	87.9	5.3	7.4	33	2.24	1.6		0.01
MRA 1	2/15/2011	13:30	Light Rain	CC	7.2	11.64	96.2	92.2	7.32	649	1.4	2.2		1.06
MRA 1	3/15/2011	13:00	Light Rain	CC	9.7	11.17	78.7	30	7.35	105	1.77	1.4		0.4
MRA 1	4/12/2011	10:10	Cloudy/No Rain	JVH	8.6	12.1	83.2	9.6	6.64	194	1.56	1.4		0.05
MRA 1	5/17/2011	10:50	Light Rain	JVH	12	10.92	69.8	6	6.73	108	0.89	1.5		0.01
MRA 1	6/14/2011	10:15	Cloudy/No Rain	JVH	15.2	10.14	62.7	7.9	7.21	238	0.53	1.6		0
<b>Median</b>					<b>12.0</b>	<b>10.9</b>	<b>81.0</b>	<b>6.8</b>	<b>7.3</b>	<b>183.0</b>	<b>1.3</b>	<b>1.5</b>		

Table 7.  
Monthly Instream Data

Site ID	Date	Time	Weather	Sampler Initials	Temp (C)	DO (mg/L)	Cond (uS/cm)	Turb (NTUs)	pH	E-Coli	NO2&NO3 (mg/L)	BOD (mg/L)	FLAG?	Rainfall previous 24 hours
MRA 10	7/20/2010	9:30	Cloudy/No Rain	JVH	17.8	8.34	66.2	5.9	7.2	236	0.28	1.2		0
MRA 10	8/24/2010	9:45	Sunny	CC	16.4	9.04	52.1	5.3	7.39	291	0.14	1		0
MRA 10	9/7/2010	10:00	Cloudy/No Rain	CC	15.7	9.05	54.1	4.7	7.39	488	0.14	1.2		0.07
MRA 10	10/12/2010	10:15	Sunny	CC	11.5	9.1	88.5	11.8	7.29	687	1.1	1.6		0
MRA 10	11/16/2010	10:15	Cloudy/No Rain	CC	11.5	10.4	100.1	8.5	7.55	127	2.8	0.8		0.16
MRA 10	12/7/2010	9:10	Cloudy/No Rain	JVH	8.3	11.09	93.1	7.3	7.16	28	2.84	0.8		0.03
MRA 10	1/11/2011	9:45	Cloudy/No Rain	cc/bf	3.7	12.63	88.2	5.2	7.04	66	2.21	1.5		0.01
MRA 10	2/15/2011	9:45	Light Rain	CC	6.9	11.08	94.7	107	7.18	770	1.33	2.1		1.06
MRA 10	3/15/2011	10:15	Heavy Rain	CC	9.1	10.65	81.5	18.8	7.24	86	1.91	1.4		0.4
MRA 10	4/12/2011	9:35	Cloudy/No Rain	JVH	8.4	11.48	83	9.3	7.13	161	1.54	1.2		0.05
MRA 10	5/17/2011	9:40	Cloudy/No Rain	JVH	11.8	10.93	70	5.9	6.63	115	0.9	1.4		0.01
MRA 10	6/14/2011	9:35	Cloudy/No Rain	JVH	14.9	9.73	62.9	7.5	7.08	222	0.52	1.3		0
<b>Median</b>					<b>11.5</b>	<b>10.5</b>	<b>82.3</b>	<b>7.4</b>	<b>7.2</b>	<b>191.5</b>	<b>1.2</b>	<b>1.3</b>		

Site ID	Date	Time	Weather	Sampler Initials	Temp (C)	DO (mg/L)	Cond (uS/cm)	Turb (NTUs)	pH	E-Coli	NO2&NO3 (mg/L)	BOD (mg/L)	FLAG?	Rainfall previous 24 hours	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	
PRI 1	7/20/2010	10:00	Cloudy/No Rain	JVH	17.8	9.34	66.6	6.4	7.26	111	0.33	1.2		0								
PRI 1	8/24/2010	10:15	Sunny	CC	16.7	9.64	54.8	4.7	7.54	114	0.14	1		0								
PRI 1	9/7/2010	10:30	Light Rain	CC	15.7	9.71	55.2	4.8	7.41	387	0.15	1		0.07								
PRI 1	10/12/2010	10:30	Sunny	CC	11.7	10.78	73.7	6.7	7.47	156	0.96	1.3		0								
PRI 1	11/16/2010	10:45	Cloudy/No Rain	CC	11.6	10.79	98.1	7	7.62	147	2.81	1.2		0.16								
PRI 1	12/7/2010	9:35	Cloudy/No Rain	JVH	8.3	11.28	92.8	5.7	7.17	51	3.04	0.9	Willamette River influence	0.03								
PRI 1	1/11/2011	10:15	Cloudy/No Rain	cc/bf	4	12.85	87.4	5.3	7.27	68	2.13	1.1	*Dissolved Zn sample contaminated	0.01	<0.0025	<0.0025	<0.0005	<0.0005	0.006	0.0069*	31	
PRI 1	2/15/2011	10:15	Light Rain	CC	6.8	11.66	74.6	82.3	7.5	548	1.06	2.1		1.03	0.00485	<0.0025	0.0017	<0.0005	0.0314	0.0081	31	
PRI 1	3/15/2011												No sample	0.4								
PRI 1	4/12/2011	10:00	Cloudy/No Rain	JVH	8.3	12.06	82.8	7.8	7.77	119	1.5	1.1		0.05	<0.0025	<0.0025	<0.0005	<0.0005	<0.00250	<0.00250	28	
PRI 1	5/17/2011	10:00	Cloudy/No Rain	JVH	11.7	10.73	71.1	4.7	6.96	73	0.9	1.3		0.01	<0.0025	<0.0025	<0.0005	<0.0005	<0.0025	<0.0025	25	
PRI 1	6/14/2011	10:00	Cloudy/No Rain	JVH	14.9	10.15	64	6.8	7.22	461	0.54	1.2		0	<0.0025	<0.0025	<0.0005	<0.0005	<0.0025	<0.0025	25	
<b>Median</b>					<b>11.7</b>	<b>10.8</b>	<b>73.7</b>	<b>6.4</b>	<b>7.4</b>	<b>119.0</b>	<b>1.0</b>	<b>1.2</b>										

\*Dissolved Zn sample contaminated

Table 7.  
Monthly Instream Data

Site ID	Date	Time	Weather	Sampler Initials	Temp (C)	DO (mg/L)	Cond (uS/cm)	Turb (NTUs)	pH	E-Coli	NO2&NO3 (mg/L)	BOD (mg/L)	FLAG?	Rainfall previous 24 hours	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	
PRI 5	7/20/2010	11:05	Cloudy/No Rain	JVH	18.3	8.95	84.2	3.4	7.22	79	0.41	0.7		0								
PRI 5	8/24/2010	13:15	Sunny	CC	20.7	8.47	92.2	2.9	7.63	117	0.2	1.3		0								
PRI 5	9/7/2010	14:45	Light Rain	CC	17.3	8.2	79.2	17.3	7.28	2420	0.46	8.8		0.07								
PRI 5	10/12/2010	14:15	Sunny	CC	14.3	9.83	77.9	4	7.47	143	0.53	1.6		0								
PRI 5	11/16/2010	15:00	Cloudy/No Rain	CC	12	10.09	92.7	5.3	7.37	152	1.19	1		0.16								
PRI 5	12/7/2010	10:40	Cloudy/No Rain	JVH	8.9	11.01	90.7	5.5	7.22	12	1.68	1		0.03								
PRI 5	1/11/2011	14:15	Cloudy/No Rain	co/bf	5.6	12.08	86.3	5.8	7.36	30	1.61	0.6	*Dissolved Zn sample contaminated	0.01	0.0044	<0.0025	<0.0005	<0.0005	0.0042	0.0055*	30	
PRI 5	2/15/2011	11:45	Cloudy/No Rain	CC	7	11.38	55.2	39.9	7.1	435	0.47	1.7		1.03	0.00365	<0.0025	0.0015	<0.0005	0.0212	0.0056	21	
PRI 5	3/15/2011	13:45	Light Rain	CC	10	10.5	60	82.4	7.06	411	0.62	1.8		0.4	0.00625	<0.0025	0.0036	<0.0005	0.0372	0.006	22	
PRI 5	4/12/2011	10:55	Sunny	JVH	9.8	11.73	90.2	3.1	6.73	20	1.09	1.2		0.05	<0.0025	<0.0025	<0.0005	<0.0005	0.00455	0.00280	32	
PRI 5	5/17/2011	11:10	Cloudy/No Rain	JVH	12.6	10.9	87.6	4	6.78	52	0.94	1.3		0.01	<0.0025	<0.0025	<0.0005	<0.0005	0.00395	0.00285	30	
PRI 5	6/14/2011	10:55	Cloudy/No Rain	JVH	15.9	9.86	80.8	3.5	7.14	178	0.79	1.1		0	<0.0025	<0.0025	<0.0005	<0.0005	0.0044	0.0026	29	
<b>Median</b>					<b>12.3</b>	<b>10.3</b>	<b>85.3</b>	<b>4.7</b>	<b>7.2</b>	<b>130.0</b>	<b>0.7</b>	<b>1.3</b>										

\*Dissolved Zn sample contaminated

Site ID	Date	Time	Weather	Sampler Initials	Temp (C)	DO (mg/L)	Cond (uS/cm)	Turb (NTUs)	pH	E-Coli	NO2&NO3 (mg/L)	BOD (mg/L)	FLAG?	Rainfall previous 24 hours
SHE 1	7/20/2010	10:35	Cloudy/No Rain	JVH	17.7	9.28	64.5	5.9	7.27	153	0.32	1		0
SHE 1	8/24/2010	11:45	Sunny	CC	17.6	9.25	53.1	6.7	7.6	86	0.15	1.1		0
SHE 1	9/7/2010	14:30	Cloudy/No Rain	CC	16.2	9.5	52.3	7	7.52	326	0.18	2		0.07
SHE 1	10/12/2010	14:00	Sunny	CC	12.5	10.6	71	5.8	7.57	111	0.9	1.6		0
SHE 1	11/16/2010	14:45	Cloudy/No Rain	CC	11.7	10.68	97.7	7.9	7.4	69	2.82	1		0.16
SHE 1	12/7/2010	10:15	Cloudy/No Rain	JVH	8.3	11.47	91.8	5.6	7.15	34	2.88	0.9		0.03
SHE 1	1/11/2011	14:00	Cloudy/No Rain	co/bf	4.2	12.76	86.7	5.3	7.26	54	2.25	1.6		0.01
SHE 1	2/15/2011	13:45	Light Rain	CC	6.9	11.48	88.4	107	7.37	1414	1.48	2.7		1.05
SHE 1	3/15/2011	13:15	Light Rain	CC	9.2	11.01	30.3	21.4	7.23	84	1.91	1.4		0.4
SHE 1	4/12/2011	10:25	Sunny	JVH	8.2	12.08	79.5	7.7	7.16	130	1.53	1.1		0.05
SHE 1	5/17/2011	10:35	Light Rain	JVH	11.7	10.96	68.5	5.4	6.78	727	0.92	1.4		0.01
SHE 1	6/14/2011	10:30	Cloudy/No Rain	JVH	14.8	10.06	62	6.8	6.83	178	0.53	1.3		0
<b>Median</b>					<b>11.7</b>	<b>10.8</b>	<b>69.8</b>	<b>6.8</b>	<b>7.3</b>	<b>120.5</b>	<b>1.2</b>	<b>1.4</b>		



Table 7.  
Monthly Instream Data

Site ID	Date	Time	Weather	Sampler Initials	Temp (C)	DO (mg/L)	Cond (uS/cm)	Turb (NTUs)	pH	E-Coli	NO2&NO3 (mg/L)	BOD (mg/L)	FLAG?	Rainfall previous 24 hours
SHE 10	7/20/2010	9:10	Cloudy/No Rain	JVH	17.7	9.26	63.9	5.9	7.22	107	0.36	1.1		0
SHE 10	8/24/2010	9:30	Sunny	CC	16.9	9.36	52	5.4	7.32	147	0.15	1		0
SHE 10	9/7/2010	9:45	Cloudy/No Rain	CC	15.5	9.63	52.2	5.3	7.43	186	0.15	1.1		0.07
SHE 10	10/12/2010	10:00	Sunny	CC	11.6	10.84	70.9	5.9	7.39	133	0.97	1.3		0
SHE 10	11/16/2010	10:00	Cloudy/No Rain	CC	11.9	10.61	98.1	8.3	7.24	51	2.87	0.8		0.16
SHE 10	12/7/2010	8:55	Cloudy/No Rain	JVH	8.4	11.4	91.3	6.1	7.14	22	2.92	1		0.03
SHE 10	1/11/2011	9:30	Cloudy/No Rain	cc/bf	4.5	12.51	85.3	4.9	6.68	46	2.19	1.1		0.01
SHE 10	2/15/2011	9:30	Light Rain	CC	7.2	11.41	93.9	98	6.94	548	1.45	1.9		1.05
SHE 10	3/15/2011	10:00	Light Rain	CC	9.6	10.71	78.6	18.7	7.03	53	2.06	1.1		0.4
SHE 10	4/12/2011	9:20	Cloudy/No Rain	JVH	8.4	11.71	78.6	8.9	7.01	152	1.54	1.2		0.05
SHE 10	5/17/2011	9:20	Cloudy/No Rain	JVH	11.5	10.92	67.8	6	6.63	93	0.92	1.6		0.01
SHE 10	6/14/2011	9:20	Cloudy/No Rain	JVH	14.7	10.11	61.4	7	7.04	107	0.53	1.4		0
<b>Median</b>					<b>11.6</b>	<b>10.8</b>	<b>74.8</b>	<b>6.1</b>	<b>7.1</b>	<b>107.0</b>	<b>1.2</b>	<b>1.1</b>		

Table 7.  
Monthly Instream Data

Duplicates

Site ID	Date	Time	Weather	Sampler Initials	Temp (C)	DO (mg/L)	Cond (uS/cm)	Turb (NTUs)	pH	E-Coli	NO2&NO3 (mg/L)	BOD (mg/L)	FLAG?	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
CRO 10Dup	7/20/2010	10:25	Cloudy/No Rain	SC	15.3	8.26	59.7	8	6.57	69	0.19	0.7	Winkler DO = 8.1 mg/L							
GLE 1Dup	7/20/2010	13:05	Sunny	JVH	16.2	8.16	123.1	10.3	7.23	435	0.8	0.8	stagnant, Winkler DO = 8.4 mg/L							
CLA 1Dup	8/24/2010	13:15	Sunny	CC	18.9	8.89	90.9	5.1	7.47	214	0.76	0.6	Winkler DO = 9.1 mg/L							
MIC 1Dup	8/24/2010	8:45	Sunny	SC	16.6	9.41	54.2	6.6	6.91	387	0.16	1.2	Winkler DO = 9.4 mg/L							
CGT 1Dup	9/7/2010	13:40	Cloudy/No Rain	JVH	18.6	6.29	227	11.4	7.16	152	0.05	2	beaver dam upstream, Winkler DO = 6.2 mg/L							
MRA 1Dup	9/7/2010	14:00	Cloudy/No Rain	CC	16.3	9.77	53.7	5.9	7.6	461	0.15	1.8	Winkler DO = 9.8 mg/L							
MRA 1Dup	10/12/2010	13:30	Sunny	CC	13.1	10.54	87.6	6.8	7.65	326	1.21	1.2	Winkler DO = 10.6 mg/L							
CGT 5Dup	10/12/2010	13:35	Sunny	JVH	12.4	5.47	61.5	16.6	7.02	131	0.09	1.5	Winkler DO = 5.8 mg/L							
LPW 1Dup	11/16/2010	13:15	Cloudy/No Rain	JVH	12	9.82	158.1	9.8	7.09	548	1.12	1.2	Winkler DO = 9.6 mg/L							
MRA 1Dup	11/16/2010	14:30	Cloudy/No Rain	CC	11.9	10.8	98.8	8.6	7.44	82	2.78	0.7	Winkler DO = 10.8 mg/L							
GLE 10Dup	12/7/2010	13:50	Light Rain	JVH	8.6	11.07	63.6	7.4	6.97	40	1.51	0.9	Winkler DO = 11.3 mg/L							
MIC 1Dup	12/7/2010	8:45	Cloudy/No Rain	SC	8.5	11.44	92.2	6.5	6.54	57	2.8	0.7	Winkler DO = 11.6 mg/L							
MRA 1Dup	1/11/2011	13:30	Cloudy/No Rain	cc/bf	4.1	13.04	87.9	5.4	7.32	27	2.11	0.9	Winkler DO = 13.3 mg/L							
CGT 5 Dup	1/11/2011	13:35	Cloudy/No Rain	JVH	4.1	11.05	195.8	18.5	7.14	24	1.06	1.1	Winkler DO = 11.3 mg/L							
SHE 1 Dup	2/15/2011	13:45	Light Rain	CC	6.9	11.52	81.7	99.1	7.28	866	1.42	2.3	Winkler DO = 11.4 mg/L							
CGT 1 Dup	2/15/2011	13:45	Cloudy/No Rain	JVH	6.7	11.14	44.2	30.5	7.25	613	0.98	2.2	Winkler DO = 10.9 mg/L							
CLA 1 Dup	3/15/2011	13:45	Light Rain	CC	10.8	10.32	63.8	77	6.93	1300	0.33	2	Winkler DO = 10.6 mg/L							
MIC 1 Dup	3/15/2011	9:30	Light Rain	JVH	9	11.07	80.1	19.8	7.04	78	1.81	1.2	Winkler DO = 11.1 mg/L							
PRI 5 Dup	4/12/2011	10:55	Sunny	JVH	9.8	11.72	90.3	3.3	6.71	19	1.11	0.9	Winkler DO = 1.6 mg/L	<0.0025	<0.0025	<0.0005	<0.0005	0.00385	0.00280	32
CLA 10 Dup	4/12/2011	9:45	Cloudy/No Rain	SC	10.2	10.89	73.2	3.2	6.35	99	1.94	0.5	Winkler DO = 10.2 mg/L	<0.0025	<0.0025	<0.0005	<0.0005	0.00705	0.00650	21
CRO 1 Dup	5/17/2011	10:00	Cloudy/No Rain	SC	10.3	10.57	68	5.2	6.93	2420	0.51	1.2	Winkler DO = 10.6 mg/L							
GLE 1 Dup	5/17/2011	12:40	Cloudy/No Rain	JVH	11.7	10.34	96.6	5.5	6.9	127	1.23	0.7	Winkler DO = 10.6 mg/L							
CLA 10 Dup	6/14/2011	9:25	Cloudy/No Rain	SC	13.4	9.76	74	2.8	6.5	23	1.75	0.9	Winkler DO = 9.8 mg/L							
GIB 1 Dup	6/14/2011	13:20	Cloudy/No Rain	JVH	14.7	9	93.7	6.6	6.91	345	1.15	0.9	Winkler DO = 9.0 mg/L							

Table 8.  
Continuous Instream Grade A and Grade B Data Qualifications

Grade Values	Temperature (°C)	pH	Specific Conductivity (µS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)
<b>A</b>	± <0.5	± ≤ 0.30	≤ 10%	± ≤ 3 or 5% (whichever is greater)	± ≤ 0.3
<b>B</b>	± 0.51 to 2.00	± > 0.3to 0.50	> 10% to ≤ 15%	± ≤5 or 30% (whichever is greater)	± > 0.3 to ± ≤ 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 9.**  
**Monthly Medians Values for Continuous Instream Data**

Monthly Medians for Turbidity at Continuous Instream Sites

	<b>Jul-10</b>	<b>Aug-10</b>	<b>Sep-10</b>	<b>Oct-10</b>	<b>Nov-10</b>	<b>Dec-10</b>	<b>Jan-11</b>	<b>Feb-11</b>	<b>Mar-11</b>	<b>Apr-11</b>	<b>May-11</b>	<b>Jun-11</b>
<b>Station Name</b>	<b>Turbidity (NTU)</b>	<b>Turbidity (NTU)</b>	<b>Turbidity (NTU)</b>	<b>Turbidity (NTU)</b>	<b>Turbidity (NTU)</b>	<b>Turbidity (NTU)</b>	<b>Turbidity (NTU)</b>	<b>Turbidity (NTU)</b>	<b>Turbidity (NTU)</b>	<b>Turbidity (NTU)</b>	<b>Turbidity (NTU)</b>	<b>Turbidity (NTU)</b>
BAT3	13.88	13.75	13.52	13.96	11.05	21.10	13.89	13.14	18.10	13.42	12.48	13.83
BAT12	10.18	9.48	10.07	11.18	10.92	13.82	10.03	6.90	11.60	9.11	10.06	10.71
CLK1	6.05	6.65	6.03	3.54	4.06	NA	4.03	3.64	9.93	5.27	4.12	4.57
CLK12	5.34	6.24	7.10	NA	4.09	8.85	2.59	4.32	9.86	5.58	8.77	NA
GLE3	7.70	9.60	5.80	6.00	9.50	14.70	8.80	7.80	14.10	8.90	6.80	6.60
GLE12	13.27	7.89	3.26	2.88	NA	22.26	NA	21.47	23.94	14.03	9.10	6.00
MIC3	6.09	6.74	6.33	4.72	20.86	18.27	11.19	14.58	25.40	12.77	9.63	10.00
MIC12	10.03	8.47	7.36	6.86	12.56	27.19	NA	NA	36.65	13.78	9.87	10.53
PRI3	6.55	4.40	5.86	4.21	8.47	26.61	8.59	5.16	14.96	7.08	4.47	8.43
PRI12	NA	11.31	11.88	15.11	NA	17.30	10.70	11.04	14.47	8.89	8.41	6.40

Monthly Medians for Specific Conductivity at Continuous Instream Sites

	<b>Jul-10</b>	<b>Aug-10</b>	<b>Sep-10</b>	<b>Oct-10</b>	<b>Nov-10</b>	<b>Dec-10</b>	<b>Jan-11</b>	<b>Feb-11</b>	<b>Mar-11</b>	<b>Apr-11</b>	<b>May-11</b>	<b>Jun-11</b>
<b>Station Name</b>	<b>Specific Conductivity (µS/cm)</b>	<b>Specific Conductivity (µS/cm)</b>	<b>Specific Conductivity (µS/cm)</b>	<b>Specific Conductivity (µS/cm)</b>	<b>Specific Conductivity (µS/cm)</b>	<b>Specific Conductivity (µS/cm)</b>	<b>Specific Conductivity (µS/cm)</b>	<b>Specific Conductivity (µS/cm)</b>	<b>Specific Conductivity (µS/cm)</b>	<b>Specific Conductivity (µS/cm)</b>	<b>Specific Conductivity (µS/cm)</b>	<b>Specific Conductivity (µS/cm)</b>
BAT3	52.24	57.72	59.54	56.36	50.40	47.90	47.40	47.05	44.59	45.37	47.20	48.90
BAT12	45.02	53.39	55.26	49.58	45.30	44.79	44.00	43.81	42.00	43.34	43.02	43.10
CLK1	98.59	97.15	94.22	97.82	101.23	102.66	95.97	89.27	92.19	93.63	94.75	100.38
CLK12	70.79	71.37	71.06	74.81	75.36	78.78	77.25	73.84	76.39	75.09	73.80	72.90
GLE3	120.00	131.00	124.00	130.00	NA	91.00	88.00	94.00	86.00	91.00	98.00	110.00
GLE12	74.18	96.61	96.45	98.82	80.34	59.63	58.87	60.10	57.94	59.00	62.00	70.00
MIC3	66.93	57.15	54.76	72.03	103.35	90.15	88.22	91.72	82.70	85.48	76.10	63.60
MIC12	56.13	55.85	52.97	73.49	100.47	85.12	78.64	83.17	76.07	79.44	72.09	54.87
PRI3	95.33	103.32	97.58	95.34	96.12	90.58	90.20	93.09	84.64	88.84	94.00	85.00
PRI12	69.12	62.43	64.43	94.58	92.80	80.60	81.40	84.30	77.30	80.10	80.70	69.90

Presented median values consist of A and B grade data

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

Table 9.  
Monthly Medians Values for Continuous Instream Data

Monthly Medians for Temperature at Continuous Instream Sites

	Jul-10	Aug-10	Sep-10	Oct-10	Nov-10	Dec-10	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11
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	17.13	16.97	15.83	12.25	10.65	9.29	8.34	7.24	8.64	9.56	11.39	13.63
BAT12	16.64	16.37	14.96	10.99	9.83	8.87	7.88	6.64	8.13	9.01	10.80	13.21
CLK1	16.66	16.70	16.40	13.81	12.19	10.76	9.83	8.71	10.01	10.75	12.44	14.34
CLK12	15.29	16.12	16.16	14.52	13.33	11.92	10.92	10.10	10.38	10.77	11.84	13.24
GLE3	16.68	16.45	15.62	12.67	10.93	9.32	8.52	7.13	9.10	10.08	12.04	14.43
GLE12	14.54	14.90	14.22	11.20	9.64	8.51	7.73	6.48	8.20	8.98	10.25	12.25
MIC3	NA	20.20	19.05	16.28	12.43	10.01	8.01	7.65	6.29	8.53	10.46	12.65
MIC12	19.42	18.34	15.37	12.02	10.29	8.33	7.80	6.49	8.60	10.17	12.25	14.66
PRI3	18.94	18.54	17.32	13.24	11.16	9.22	8.7	7.49	9.42	10.86	13.31	16.05
PRI12	18.22	17.68	15.63	13.63	NA	NA	NA	NA	NA	NA	12.31	14.82

Monthly Medians for pH at Continuous Instream Sites

	Jul-10	Aug-10	Sep-10	Oct-10	Nov-10	Dec-10	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11
Station Name	pH	pH	pH	pH	pH	pH	pH	pH	pH	pH	pH	pH
BAT3	6.63	6.49	6.68	6.54	6.35	6.19	6.26	6.48	5.91	6.07	6.22	6.56
BAT12	7.09	7.15	7.17	7.17	6.87	6.81	7.01	7.05	6.84	6.97	6.82	6.84
CLK1	7.30	7.16	7.03	6.88	7.09	6.65	6.88	7.01	6.80	6.98	7.09	6.95
CLK12	6.93	6.85	6.63	6.51	6.42	6.41	6.41	6.52	6.33	6.45	6.57	6.71
GLE3	7.45	7.59	7.55	7.57	7.14	7.03	7.12	7.29	7.07	7.19	7.20	7.26
GLE12	7.20	7.05	6.97	7.08	7.03	6.86	6.87	6.85	6.67	6.74	7.23	7.22
MIC3	7.20	7.48	7.27	7.05	7.26	7.09	7.20	7.34	7.05	7.40	7.37	7.20
MIC12	7.13	7.28	7.23	7.28	6.79	6.62	6.76	7.03	6.63	6.80	7.07	7.17
PRI3	7.17	7.15	7.16	7.20	7.22	7.02	6.97	6.95	7.07	7.12	7.06	7.30
PRI12	7.03	7.08	6.80	6.59	6.64	6.53	6.59	6.72	6.56	6.54	6.59	6.57

Presented median values consist of A and B grade data

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

Table 9.  
Monthly Medians Values for Continuous Instream Data

Monthly Medians for Dissolved Oxygen at Continuous Instream Sites

	Jul-10	Aug-10	Sep-10	Oct-10	Nov-10	Dec-10	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11
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	7.99	7.73	7.49	8.99	9.24	10.01	10.63	11.00	10.69	10.67	10.23	9.69
BAT12	8.38	8.81	9.47	10.29	10.68	11.06	11.66	11.86	11.43	11.23	10.66	10.10
CLK1	8.90	8.90	8.93	10.31	10.15	10.46	10.53	11.17	10.98	10.56	10.14	9.74
CLK12	8.79	8.33	8.31	9.45	9.47	10.11	10.36	10.63	10.29	10.25	9.88	9.61
GLE3	8.92	8.90	9.09	9.38	10.03	NA	NA	12.22	11.11	11.14	10.51	9.71
GLE12	9.18	8.28	8.49	9.78	10.36	10.93	11.36	11.73	11.19	11.60	10.72	10.18
MIC3	8.24	8.68	9.55	9.52	10.62	11.05	11.67	12.06	11.40	10.91	10.46	9.94
MIC12	8.58	8.85	9.77	10.51	10.02	10.63	11.20	11.59	10.77	10.46	10.04	9.57
PRI3	8.30	8.28	8.67	9.31	10.05	10.54	11.07	11.45	10.74	10.14	9.54	9.21
PRI12	8.27	8.30	9.05	9.06	9.37	10.13	10.84	11.15	10.46	10.21	9.67	9.25

Monthly Medians for Stage at Continuous Instream Sites

	Jul-10	Aug-10	Sep-10	Oct-10	Nov-10	Dec-10	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11
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	4.20	4.07	4.09	4.19	4.84	5.95	5.11	4.73	5.53	4.90	4.46	4.35
BAT12	4.20	4.14	NA	4.38	4.67	4.98	4.62	4.50	4.69	4.51	4.35	4.26
CLK1	4.07	4.04	4.09	4.25	4.47	4.72	4.41	4.31	4.55	4.36	4.25	3.69
CLK12	4.13	4.11	4.09	4.09	4.25	4.47	4.20	4.11	4.30	4.16	4.00	4.01
GLE3	3.88	3.84	3.94	4.08	4.57	5.17	4.74	4.57	5.10	4.74	4.51	4.28
GLE12	0.65	0.61	0.61	0.71	0.96	1.25	1.23	1.13	1.33	1.10	0.92	0.79
MIC3	5.06	5.09	5.14	4.69	6.35	7.00	6.31	5.57	6.44	6.05	5.68	5.61
MIC12	7.24	7.28	7.38	7.40	8.13	8.76	8.07	7.64	8.34	7.95	7.69	7.45
PRI3	4.15	4.12	4.15	4.20	4.61	4.82	4.53	4.46	4.84	4.53	4.41	4.34
PRI12	4.40	4.32	4.40	4.44	4.72	5.10	4.71	4.55	4.92	4.68	4.50	4.58

Presented median values consist of A and B grade data

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

Table 10.  
Willamette River Water Quality Data

Willamette River at River Mile 71																
	Date	Flow	Temp, field	pH, field	Cond, field	Alk	Turb, field	TS	TSS	TDS	NO3+ NO2	NH3-ISE, lo-level	T-Phos	DO	BODs	Ecoli_QT
Site Name	MM/DD/YYYY	cfs	*C	S.U.	uS/cm	mg/l	NTU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/L	mg/l	#/100 mL
Wheatland Ferry	7/13/2010		19.4	7.46	65.8	27	2.22	65	4	61	0.16	0.05	0.042	9.2	1	10.9
Wheatland Ferry	7/27/2010		20.4	7.45	64.9	25	1.79	60	2.8	57	0.17	0.05	0.047	8.9	0.6	2
Wheatland Ferry	8/10/2010		19.5	7.31	66.6	27	2.07	66	4	62	0.22	0.07	0.051	8.8	0.7	6.3
Wheatland Ferry	8/17/2010		21.9	7.4	71	28	1.83	70	4.2	66	0.23	0.08	0.049	8.5	0.6	5.2
Wheatland Ferry	9/14/2010		17.4	7.32	67	27	1.9	66	5.6	60	0.18	0.06	0.047	9.4	<0.5	4.1
Wheatland Ferry	9/28/2010		17.3	7.24	66	28	1.9	66	3.6	62	0.18	0.06	0.052	9.4	0.6	9.7
Wheatland Ferry	10/19/2010		12.3	7.3	65.2	26	4.2	65	4.8	60	0.14	0.08	0.048	10.5	0.7	4.1
Wheatland Ferry	11/9/2010		10.8	7.2	63.7	24	12.6	79	12.4	67	0.49	0.05	0.074	10.5	1.4	365.4
Wheatland Ferry	2/22/2011		6.8	7.37	41.1	28	11	79	5.2	74	0.58	0.06	0.058	11.6	<1.0	34.1
Wheatland Ferry	3/29/2011		8.5	7.45	63.7	26	15.9	78	12.4	66	0.45	0.08	0.069	11.3	1.1	35
Wheatland Ferry	5/10/2011		10.6	7.43	53.4	24	4.02	65	5	60	0.18	0.07	0.044	11.1	1	15.8
Wheatland Ferry	5/24/2011		12.2	7.5	54.2	24	3.16	55	4.2	51	0.13	<0.05	0.037	11	1.2	2
Wheatland Ferry	5/10/2011		10.6	7.43	53.4	24	4.02	65	5	60	0.18	0.07	0.044	11.1	1	15.8
Wheatland Ferry	5/24/2011		12.2	7.5	54.2	24	3.16	55	4.2	51	0.13	<0.05	0.037	11	1.2	2
Wheatland Ferry	6/7/2011		12.7	7.47	54.9	24	4.83	68	6.4	62	0.11	<0.05	0.044	10.4	1	9.8
Wheatland Ferry	6/21/2011		15.1	7.57	59.4	24	3.11	66	4	62	0.12	0.05	0.043	10.3	0.7	4.1
<b>Median</b>			<b>12.5</b>	<b>7.43</b>	<b>63.7</b>	<b>25.5</b>	<b>3.16</b>	<b>66</b>	<b>4.5</b>	<b>61.5</b>	<b>0.18</b>	<b>0.06</b>	<b>0.047</b>	<b>10.45</b>	<b>1</b>	<b>8</b>

Willamette River at River Mile 77																
	Date	Flow	Temp, field	pH, field	Cond, field	Alk	Turb, field	TS	TSS	TDS	NO3+ NO2	NH3-ISE, lo-level	T-Phos	DO	BODs	Ecoli_QT
Site Name	MM/DD/YYYY	cfs	*C	S.U.	uS/cm	mg/l	NTU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/L	mg/l	#/100 mL
Spongs Landing	7/13/2010		19.2	7.48	64.5	26	2.46	64	4	60	0.11	0.05	0.037	9.2	0.9	11
Spongs Landing	7/27/2010		20.3	7.52	63.9	26	1.83	59	3	56	0.11	0.05	0.049	9	0.6	3.1
Spongs Landing	8/10/2010		19.1	7.34	65.2	27	2.15	64	6	58	0.14	<0.05	0.043	9.1	0.7	9.7
Spongs Landing	8/17/2010		21.7	7.52	69.8	28	1.84	72	6.4	66	0.18	0.07	0.046	8.6	0.6	4.1
Spongs Landing	9/14/2010		17.4	7.41	65.8	27	2.17	66	5.6	60	0.13	0.05	0.041	9.6	<0.5	5.2
Spongs Landing	9/28/2010		17.3	7.31	66.4	28	2.8	65	3.6	61	0.15	0.1	0.05	9.5	0.7	9.8
Spongs Landing	10/19/2010		12.2	7.33	65.3	26	4	65	4.4	61	0.09	0.09	0.046	10.5	0.8	8.6
Spongs Landing	11/9/2010		10.8	7.26	63.1	24	12.5	80	13.6	66	0.37	<0.05	0.072	10.5	1.3	325.5
Spongs Landing	2/22/2011		6.8	7.4	40.6	28	11.1	81	5.2	76	0.55	<0.05	0.054	11.7	<1.0	16.1
Spongs Landing	3/29/2011		8.4	7.43	63.4	25	15.1	76	12	64	0.42	0.07	0.066	11.3	1	30.5
Spongs Landing	5/10/2011		10.5	7.43	52.4	23	4.89	66	4.4	62	0.18	0.06	0.042	11	0.9	10.8
Spongs Landing	5/24/2011		12.2	7.53	52.9	23	3.17	59	4.8	54	0.13	<0.05	0.033	10.9	1.1	1
Spongs Landing	5/10/2011		10.5	7.43	52.4	23	4.89	66	4.4	62	0.18	0.06	0.042	11	0.9	10.8
Spongs Landing	5/24/2011		12.2	7.53	52.9	23	3.17	59	4.8	54	0.13	<0.05	0.033	10.9	1.1	1
Spongs Landing	6/7/2011		12.5	7.46	52.8	24	5.26	72	6.8	65	0.09	<0.05	0.041	10.4	1	13.4
Spongs Landing	6/21/2011		15.2	7.54	57.7	24	2.84	61	4.8	56	0.11	0.05	0.039	10.1	0.8	1
<b>Median</b>			<b>12.35</b>	<b>7.43</b>	<b>63.25</b>	<b>25.5</b>	<b>3.17</b>	<b>65.5</b>	<b>4.8</b>	<b>61</b>	<b>0.135</b>	<b>0.06</b>	<b>0.0425</b>	<b>10.45</b>	<b>0.9</b>	<b>9.75</b>

Table 10.  
Willamette River Water Quality Data

Willamette River at River Mile 78																
Site Name	Date	Flow	Temp, field	pH, field	Cond, field	Alk	Turb, field	TS	TSS	TDS	NO3+ NO2	NH3-ISE, lo-level	T-Phos	DO	BODs	Ecoli,QT
	MM/DD/YYYY	cfs	*C	S.U.	uS/cm	mg/l	NTU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/L	mg/l	#/100 mL
WLTP 150 feet downstream	7/13/2010		19.3	7.46	65.4	26	2.34	64	4	60	0.12	0.1	0.047	9.1	0.9	6.3
WLTP 150 feet downstream	7/27/2010		20.3	7.45	65.1	25	2.09	57	4.4	53	0.14	0.06	0.037	8.8	0.5	4.1
WLTP 150 feet downstream	8/10/2010		19.2	7.29	67.4	27	2.37	68	4	64	0.17	0.08	0.045	9	0.6	7.5
WLTP 150 feet downstream	8/17/2010		21.6	7.4	71.9	28	2.03	72	6.4	66	0.2	0.12	0.054	8.5	0.7	3
WLTP 150 feet downstream	9/14/2010		17.4	7.33	68	27	1.78	67	6	61	0.13	0.14	0.057	9.4	<0.5	5.2
WLTP 150 feet downstream	9/28/2010		17.2	7.24	68.1	28	2.4	66	3.6	62	0.15	0.17	0.06	9.4	0.7	7.5
WLTP 150 feet downstream	10/19/2010		12.3	7.29	67.7	27	3.8	67	4.4	63	0.1	0.2	0.068	10.5	0.8	12.1
WLTP 150 feet downstream	11/9/2010		10.8	7.19	62.5	24	13	80	13.2	67	0.44	<0.05	0.072	10.5	1.2	325.5
WLTP 150 feet downstream	2/22/2011		6.8	7.34	40.6	27	10.8	78	5.2	73	0.58	<0.05	0.053	11.6	<1.0	9.6
WLTP 150 feet downstream	3/29/2011		8.4	7.42	63.8	25	15.2	76	13.2	63	0.4	0.07	0.066	11.3	1.2	25.9
WLTP 150 feet downstream	5/10/2011		10.4	7.34	54	23	4.15	63	4.4	59	0.17	<0.05	0.039	11	0.8	17.5
WLTP 150 feet downstream	5/24/2011		12.1	7.5	52.5	24	3.23	56	3.6	52	0.11	0.06	0.035	10.8	1.1	3.1
WLTP 150 feet downstream	5/10/2011		10.4	7.34	54	23	4.15	63	4.4	59	0.17	<0.05	0.039	11	0.8	17.5
WLTP 150 feet downstream	5/24/2011		12.1	7.5	52.5	24	3.23	56	3.6	52	0.11	0.06	0.035	10.8	1.1	3.1
WLTP 150 feet downstream	6/7/2011		12.5	7.38	53.4	23	5.6	70	6.8	63	0.1	<0.05	0.04	10.5	0.9	13.5
WLTP 150 feet downstream	6/21/2011		15	7.53	57.8	24	2.66	60	4	56	0.1	<0.05	0.039	10.1	0.6	3.1
<b>Median</b>			<b>12.4</b>	<b>7.36</b>	<b>63.15</b>	<b>25</b>	<b>3.23</b>	<b>66.5</b>	<b>4.4</b>	<b>61.5</b>	<b>0.145</b>	<b>0.09</b>	<b>0.046</b>	<b>10.5</b>	<b>0.8</b>	<b>7.5</b>

Willamette River at River Mile 81																
Site Name	Date	Flow	Temp, field	pH, field	Cond, field	Alk	Turb, field	TS	TSS	TDS	NO3+ NO2	NH3-ISE, lo-level	T-Phos	DO	BODs	Ecoli,QT
	MM/DD/YYYY	cfs	*C	S.U.	uS/cm	mg/l	NTU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/L	mg/l	#/100 mL
Sunset Park	7/13/2010		19.1	7.47	64.2	26	2.64	62	3.6	58	0.11	<0.05	0.029	9.3	0.9	22.8
Sunset Park	7/27/2010		20.2	7.38	64.1	25	2.62	66	4.8	61	0.13	<0.05	0.033	8.8	1.6	7.4
Sunset Park	8/10/2010		19.1	7.28	64.5	26	3.79	65	5.6	59	0.15	<0.05	0.041	8.8	0.7	13.4
Sunset Park	8/17/2010		21.5	7.41	69.2	27	2.62	74	5.6	68	0.19	<0.05	0.042	8.4	0.6	19.7
Sunset Park	9/14/2010		17.2	7.33	64.1	26	2.23	67	5.2	62	0.14	<0.05	0.032	9.5	<0.5	12.2
Sunset Park	9/28/2010		17.2	7.26	64.2	28	2.2	66	3.6	62	0.15	<0.05	0.042	9.4	0.6	21.8
Sunset Park	10/19/2010		12.2	7.28	63.4	26	4	64	4.4	60	0.1	<0.05	0.034	10.5	0.7	18.1
Sunset Park	11/9/2010		10.7	7.24	64.2	24	13.1	81	13.6	67	0.58	<0.05	0.069	10.4	1.3	290.9
Sunset Park	2/22/2011		6.8	7.35	40.6	27	11.4	81	6	75	0.64	<0.05	0.051	11.6	<1.0	12
Sunset Park	3/29/2011		8.5	7.34	63.8	25	15.1	75	12.8	62	0.48	0.06	0.064	11.3	1.1	49.5
Sunset Park	5/10/2011		10.5	7.4	53.1	23	4.3	64	5.6	58	0.2	<0.05	0.037	11.3	0.7	12
Sunset Park	5/24/2011		12	7.41	51.9	23	3.64	60	3.6	56	0.13	<0.05	0.028	10.8	1	10.9
Sunset Park	5/10/2011		10.5	7.4	53.1	23	4.3	64	5.6	58	0.2	<0.05	0.037	11.3	0.7	12
Sunset Park	5/24/2011		12	7.41	51.9	23	3.64	60	3.6	56	0.13	<0.05	0.028	10.8	1	10.9
Sunset Park	6/7/2011		12.7	7.38	53	23	6.59	71	6	65	0.12	<0.05	0.035	10.4	0.8	16
Sunset Park	6/21/2011		15	7.48	53.6	24	2.95	59	4	55	0.11	<0.05	0.033	10.1	0.6	13.2
<b>Median</b>			<b>12.45</b>	<b>7.38</b>	<b>63.6</b>	<b>25</b>	<b>3.715</b>	<b>65.5</b>	<b>5.4</b>	<b>60.5</b>	<b>0.145</b>	<b>N/A</b>	<b>0.036</b>	<b>10.4</b>	<b>0.75</b>	<b>13.3</b>



Table 10.  
Willamette River Water Quality Data

Willamette River at Mill Creek 82.9																
	Date	Flow	Temp, field	pH, field	Cond, field	Alk	Turb, field	TS	TSS	TDS	NO3+ NO2	NH3-ISE, lo-level	T-Phos	DO	BODs	Ecoli,QT
Site Name	MM/DD/YYYY	cfs	*C	S.U.	uS/cm	mg/l	NTU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/L	mg/l	#/100 mL
Mill Creek	7/13/2010		17.8	7.44	78.2	29	4.95	76	4.8	71	0.35	<0.05	0.051	9.2	0.8	151.5
Mill Creek	7/27/2010		19.5	7.44	67.8	28	4.87	67	5.6	61	0.3	<0.05	0.053	8.8	0.8	126.7
Mill Creek	8/10/2010		18.3	7.33	60.5	25	4.58	62	7.6	54	0.21	<0.05	0.046	9.3	0.7	209.8
Mill Creek	8/17/2010		20.9	7.57	65.5	26	3.76	63	6.8	56	0.26	<0.05	0.052	8.6	0.7	204.6
Mill Creek	9/14/2010		16.4	7.33	55.7	24	3.88	62	4.6	57	0.15	<0.05	0.036	9.8	<0.5	290.9
Mill Creek	9/28/2010		17.2	7.27	63.7	27	2.1	65	2.4	63	0.16	<0.05	0.04	9.4	0.6	141.4
Mill Creek	10/19/2010		11.9	7.28	69	28	3.4	64	3.6	60	0.15	0.06	0.035	10.6	0.7	35
Mill Creek	11/9/2010		10.2	7.15	102	24	15.2	114	12.4	102	3.06	<0.05	0.099	10.9	1.9	218.7
Mill Creek	2/22/2011		6.7	7.47	82	24	7.45	83	3.8	79	2.24	<0.05	0.037	12.1	<1.0	65
Mill Creek	3/29/2011		9.1	7.29	85.3	25	12.9	86	9.2	77	1.88	0.11	0.077	11.3	1.6	166.4
Mill Creek	5/10/2011		10.3	7.49	52.3	23	5.02	65	4	61	0.32	<0.05	0.039	11	1.1	41.4
Mill Creek	5/24/2011		12.1	7.5	52	23	3.2	60	4	56	0.16	<0.05	0.028	10.7	1	12.2
Mill Creek	5/10/2011		10.3	7.49	52.3	23	5.02	65	4	61	0.32	<0.05	0.039	11	1.1	41.4
Mill Creek	5/24/2011		12.1	7.5	52	23	3.2	60	4	56	0.16	<0.05	0.028	10.7	1	12.2
Mill Creek	6/7/2011		13.1	7.43	68.1	26	6.95	78	7.2	71	0.7	<0.05	0.045	10.3	1	146.7
Mill Creek	6/21/2011		15.5	7.52	57.8	24	6.9	70	8.4	62	0.74	<0.05	0.049	9.7	0.6	120.1
<b>Median</b>			<b>12.6</b>	<b>7.44</b>	<b>64.6</b>	<b>24.5</b>	<b>4.91</b>	<b>65</b>	<b>4.7</b>	<b>61</b>	<b>0.31</b>	<b>0.085</b>	<b>0.0425</b>	<b>10.45</b>	<b>0.9</b>	<b>134.05</b>

Willamette River at River Mile 83																
	Date	Flow	Temp, field	pH, field	Cond, field	Alk	Turb, field	TS	TSS	TDS	NO3+ NO2	NH3-ISE, lo-level	T-Phos	DO	BODs	Ecoli,QT
Site Name	MM/DD/YYYY	cfs	*C	S.U.	uS/cm	mg/l	NTU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/L	mg/l	#/100 mL
Railroad Bridge	7/13/2010	10900	19.1	7.37	63.1	24	2.8	64	5.2	59	0.11	<0.05	0.027	8.7	0.8	13.2
Railroad Bridge	7/27/2010	9740	20.1	7.27	63	24	2.28	62	3.6	58	0.14	<0.05	0.032	8.4	<0.5	8.4
Railroad Bridge	8/10/2010	8420	18.9	7.24	64	25	2.26	63	4.8	58	0.16	<0.05	0.036	8.9	0.5	7.5
Railroad Bridge	8/17/2010	7430	21.2	7.37	67.8	27	2.34	69	4.8	64	0.18	<0.05	0.038	8.5	0.6	2
Railroad Bridge	9/14/2010	7550	17.1	7.16	64.2	26	1.9	66	4	62	0.13	<0.05	0.032	9.3	<0.5	4.1
Railroad Bridge	9/28/2010	8560	17.1	7.31	64.1	27	2	65	3.6	61	0.14	<0.05	0.039	9.38	0.6	5.2
Railroad Bridge	10/19/2010	10500	12.3	7.2	63.5	25	3.8	63	6	57	0.09	<0.05	0.034	10.5	0.8	6.3
Railroad Bridge	11/9/2010	25000	10.8	7.17	60.9	22	13.8	79	13.2	66	0.38	<0.05	0.068	10.4	1.2	224.7
Railroad Bridge	2/22/2011	18500	6.7	7.37	40	27	11.2	81	5.2	76	0.52	<0.05	0.052	11.6	<1.0	12.2
Railroad Bridge	3/29/2011	32800	8.4	7.21	62.5	25	15.5	74	11.6	62	0.38	0.06	0.063	11.3	1.1	31.8
Railroad Bridge	5/10/2011	25700	10.2	7.38	51.6	22	4.45	62	6	56	0.15	<0.05	0.034	10.9	0.9	12.2
Railroad Bridge	5/24/2011	21500	11.8	7.43	51.4	23	3.48	58	4.4	54	0.11	<0.05	0.028	10.8	1	8.6
Railroad Bridge	5/10/2011	25700	10.2	7.38	51.6	22	4.45	62	6	56	0.15	<0.05	0.034	10.9	0.9	12.2
Railroad Bridge	5/24/2011	21500	11.8	7.43	51.4	23	3.48	58	4.4	54	0.11	<0.05	0.028	10.8	1	8.6
Railroad Bridge	6/7/2011	29600	12.3	7.35	51.3	23	5.88	64	6	58	0.1	<0.05	0.035	10.5	1	12.1
Railroad Bridge	6/21/2011	17400	14.8	7.38	53.5	23	2.6	63	4.8	58	0.11	<0.05	0.033	10.1	0.8	2
<b>Median</b>		<b>17950</b>	<b>12.3</b>	<b>7.36</b>	<b>61.7</b>	<b>24</b>	<b>3.48</b>	<b>63.5</b>	<b>5</b>	<b>58</b>	<b>0.14</b>	<b>N/A</b>	<b>0.034</b>	<b>10.45</b>	<b>0.9</b>	<b>8.6</b>

Table 11.  
Storm Samples Collected 11/30/10

Site Number	Sample Name	Type	pH, field	Temp, field (°C)	Hardness (mg/L)	Diss. Zn (mg/L)	Total Zn (mg/L)
D33478-226	Glenn Storm	Grab	6.57	9.6	23.2	0.0304	0.0447*
D33478-UP	Glenn Upstream	Grab	6.6	8.6	24	0.0165	0.0213
D33478-DOWN	Glenn Downstream	Grab	6.74	8.6	24	0.0163	0.0234

\*Value exceeds water quality criteria

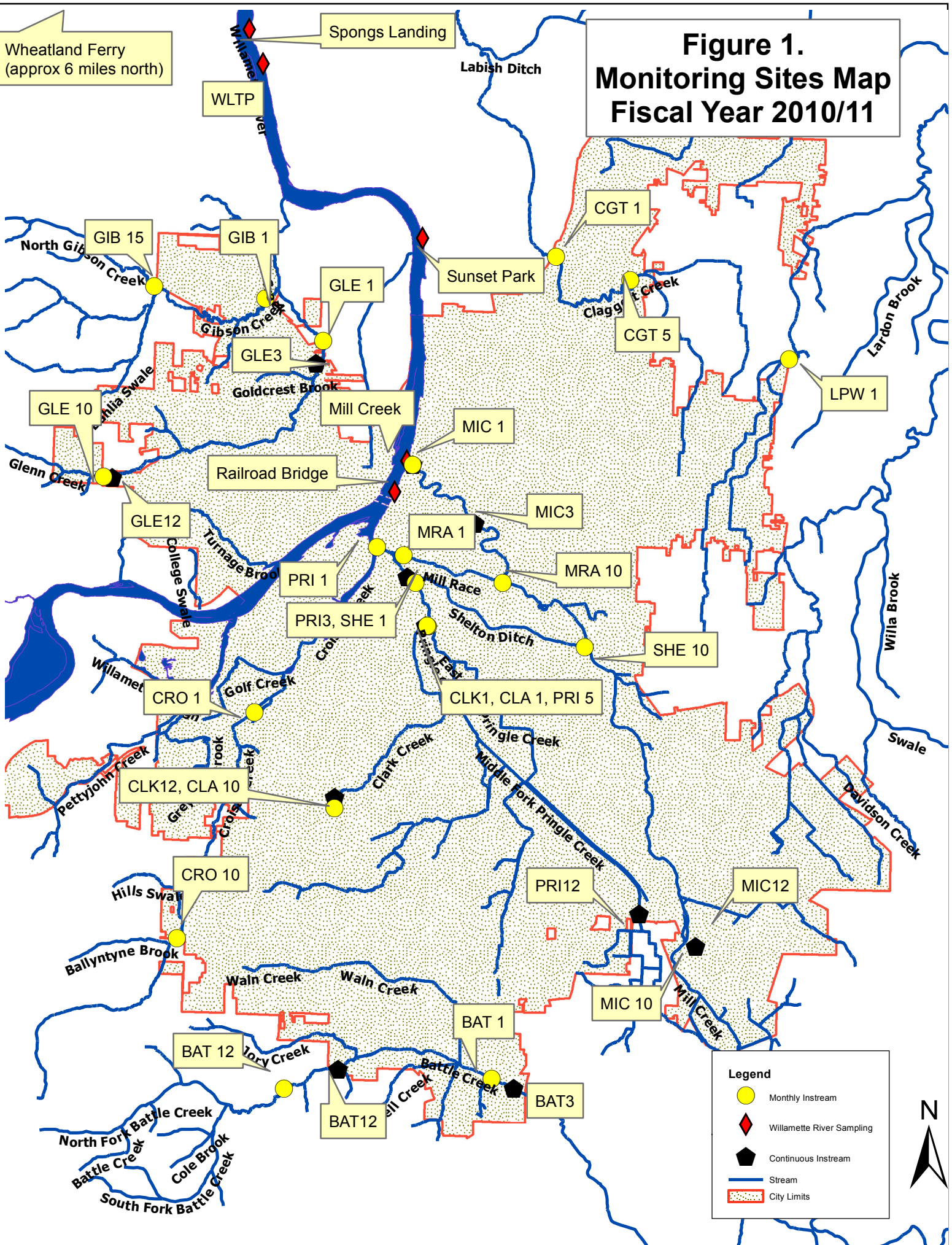
Site ID D33478-226 is a MS4 monitoring location identified under NDPES MS4 permit (2004-2010)

Site ID D33478-UP is an instream monitoring location identified under NDPES MS4 permit (2004-2010)

Site ID D33478-DOWN is an instream monitoring location identified under NDPES MS4 permit (2004-2010)

Wheatland Ferry  
(approx 6 miles north)

# Figure 1. Monitoring Sites Map Fiscal Year 2010/11



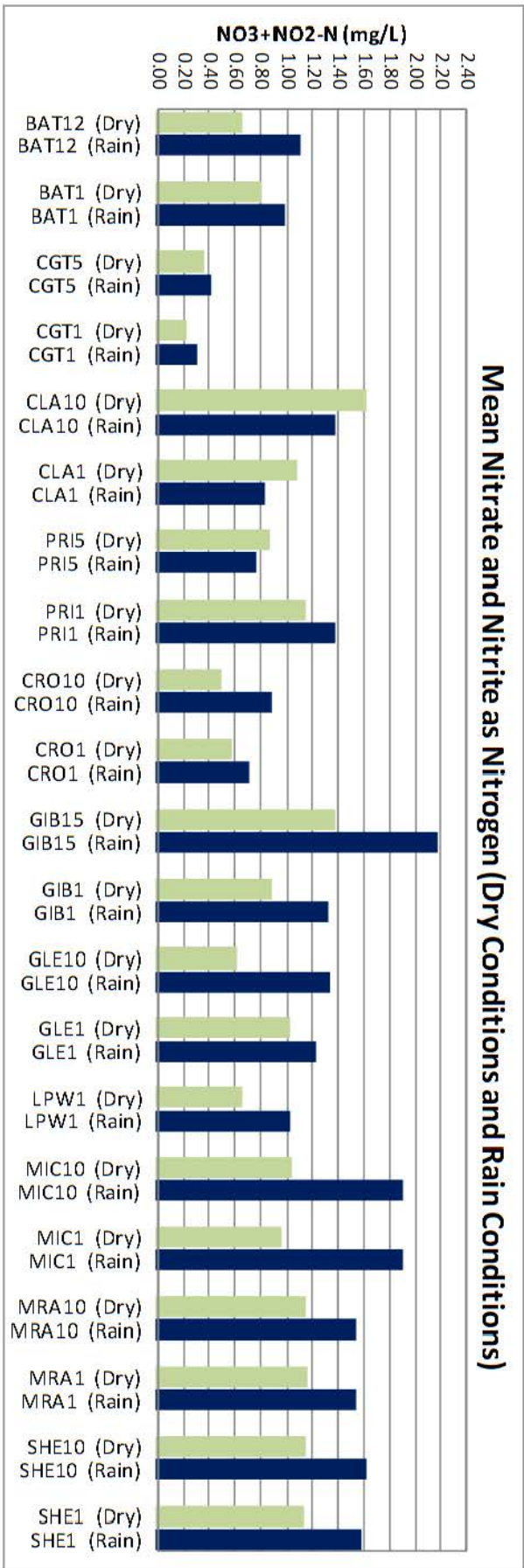
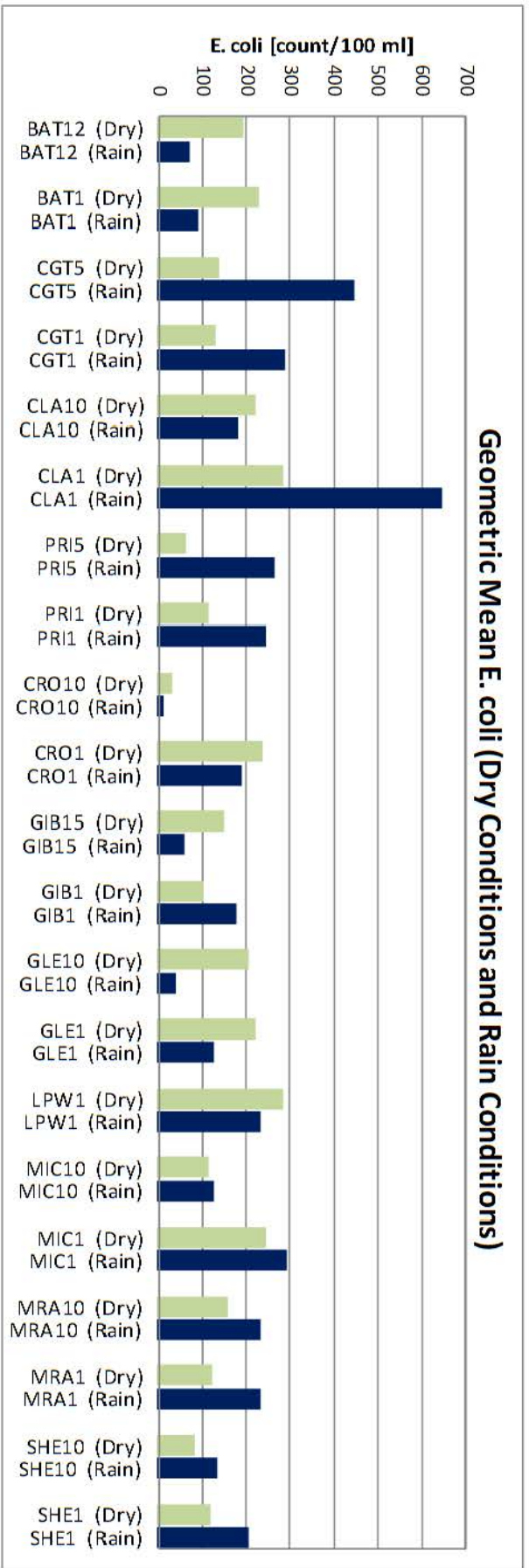
**Legend**

- Monthly Instream
- ◆ Willamette River Sampling
- ⬠ Continuous Instream
- Stream
- ⋯ City Limits



Figure 2

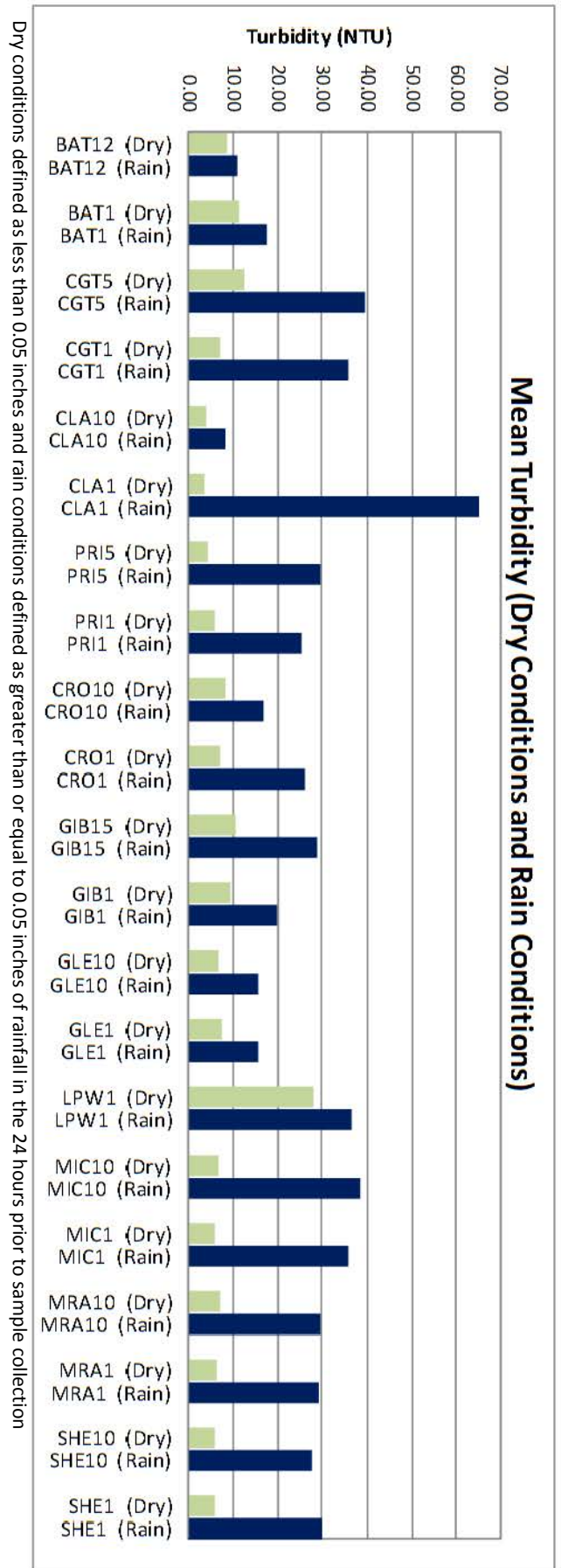
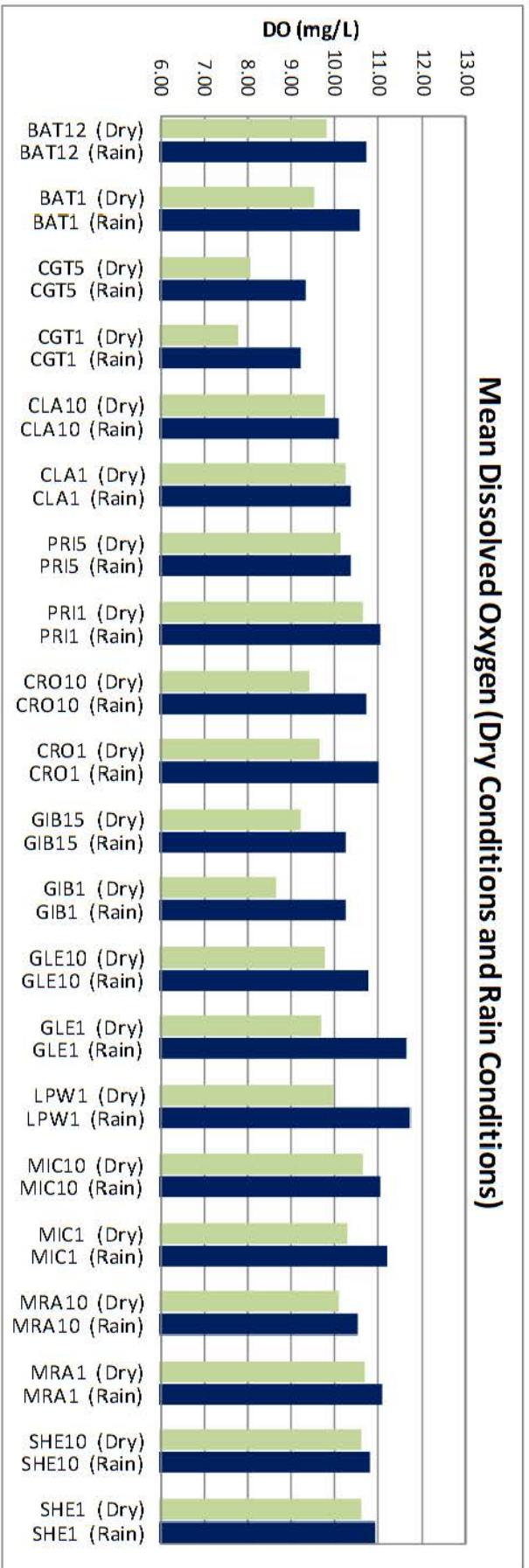
Monthly Instream Mean Value Comparison for Dry and Rain Conditions



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

Figure 2

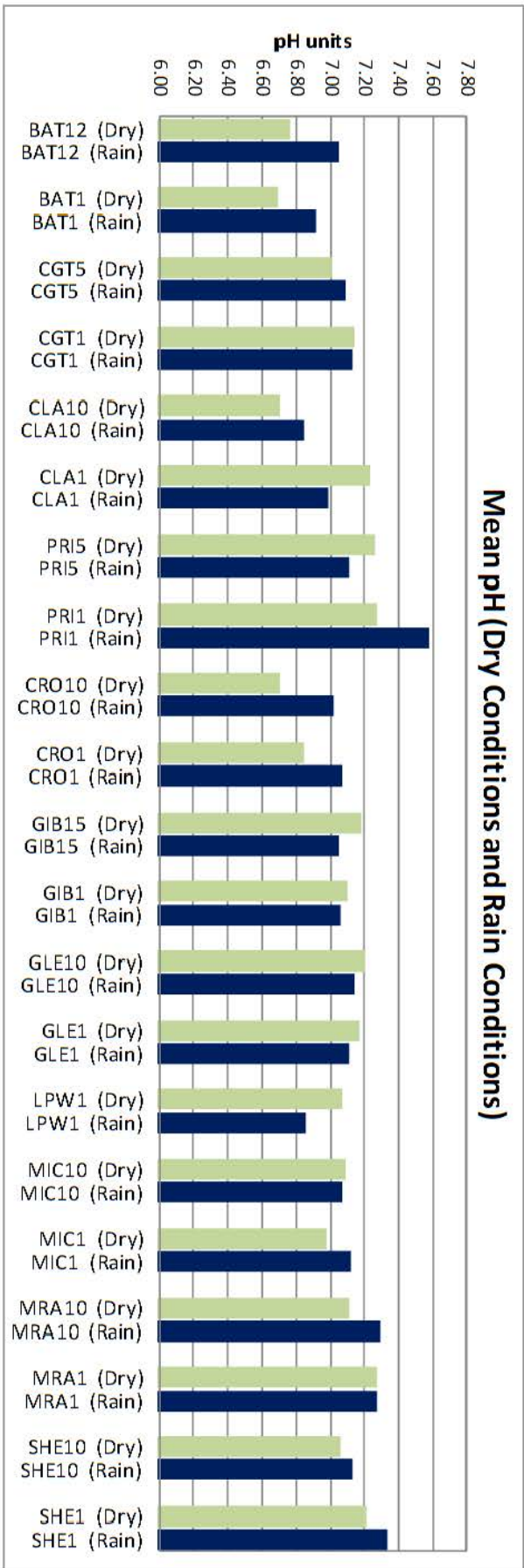
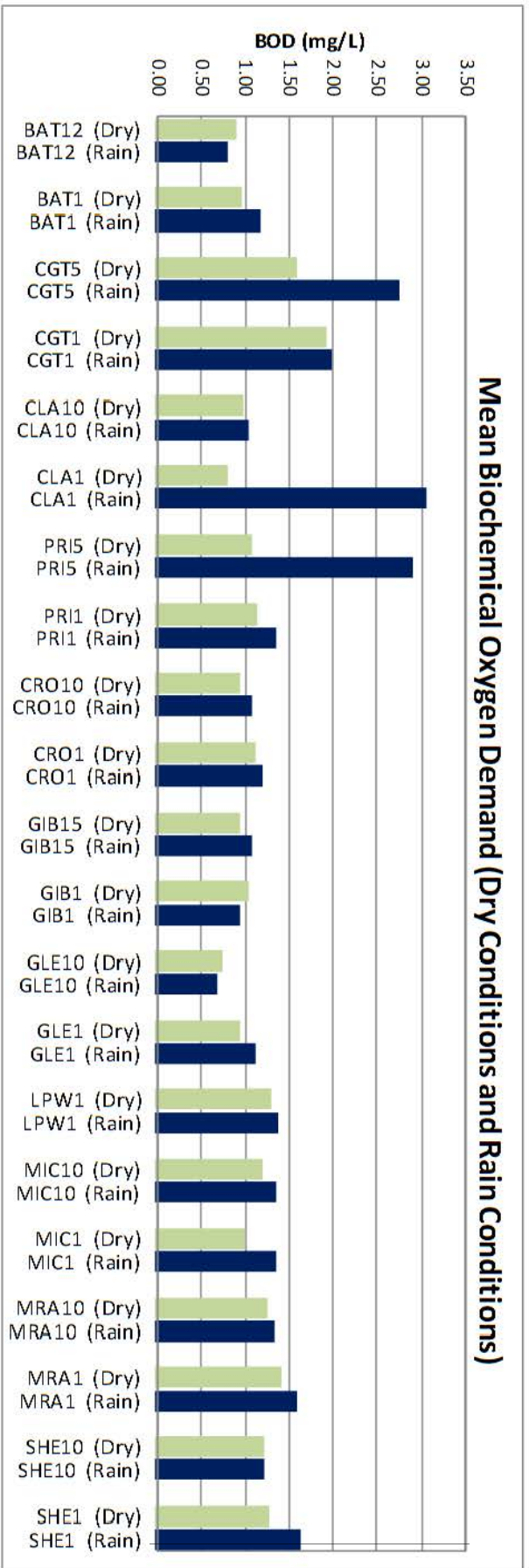
Monthly Instream Mean Value Comparison for Dry and Rain Conditions



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

Figure 2

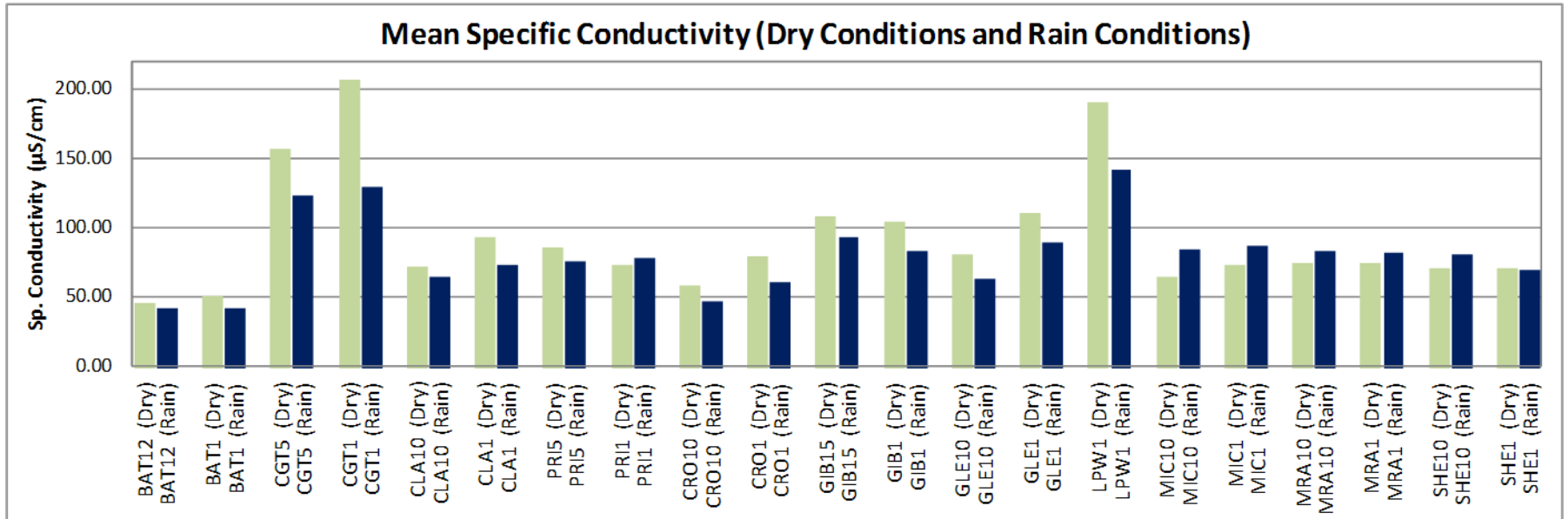
Monthly Instream Mean Value Comparison for Dry and Rain Conditions



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

Figure 2

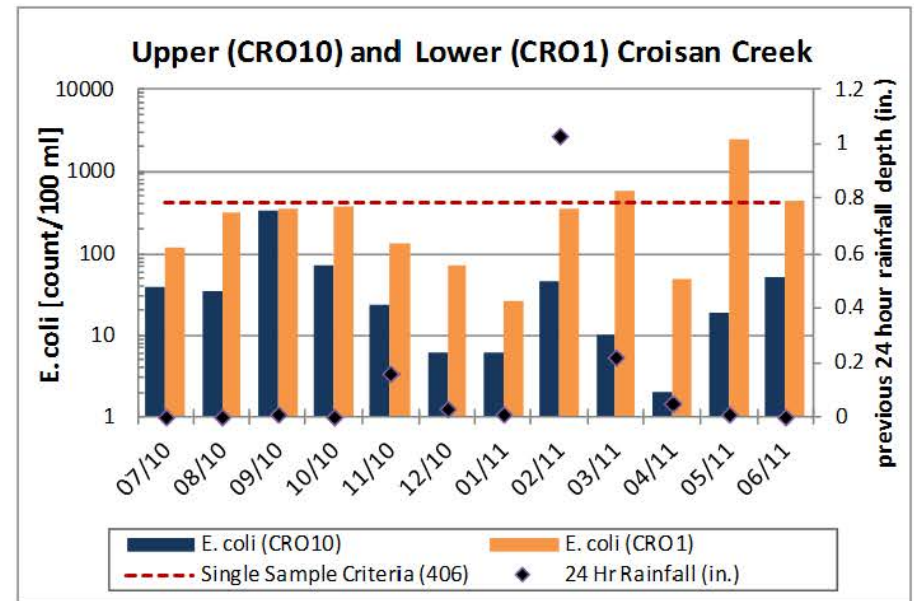
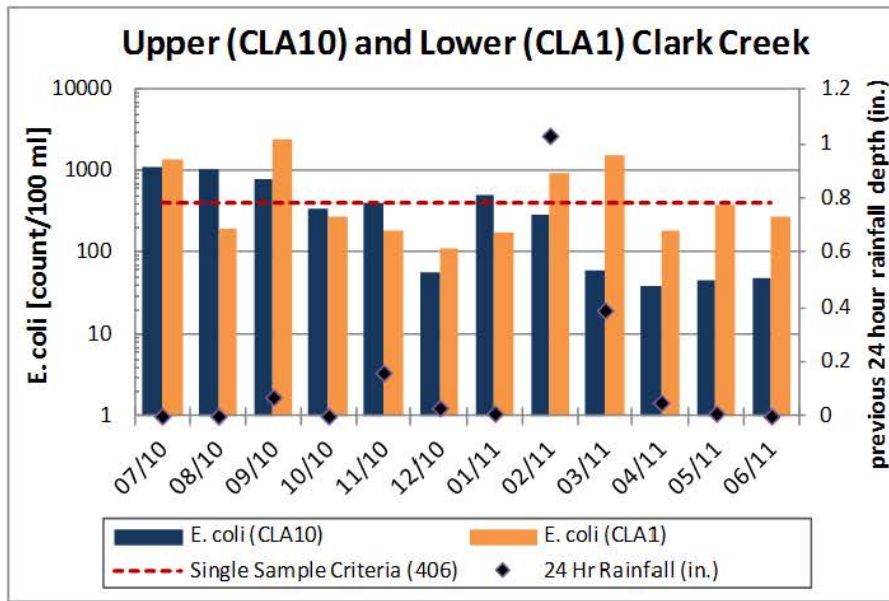
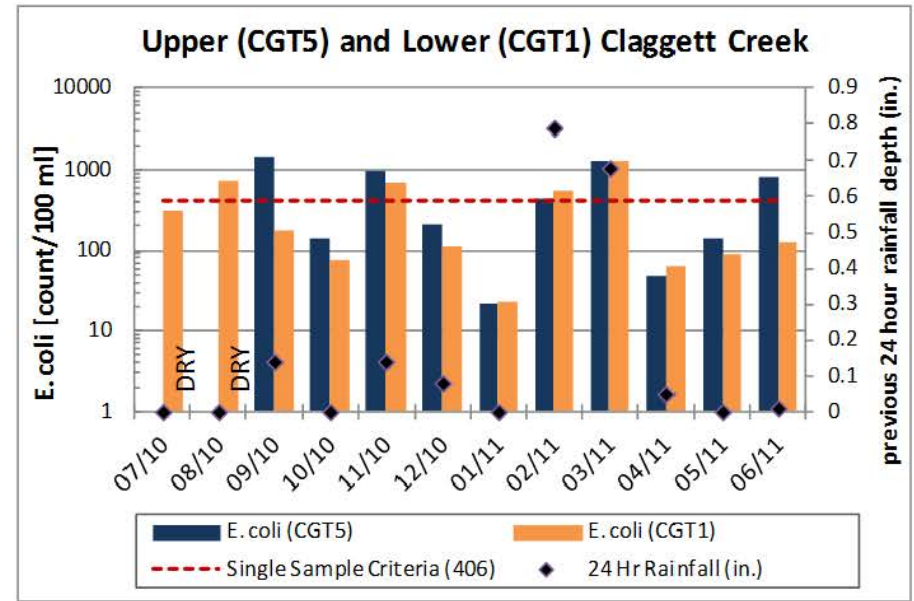
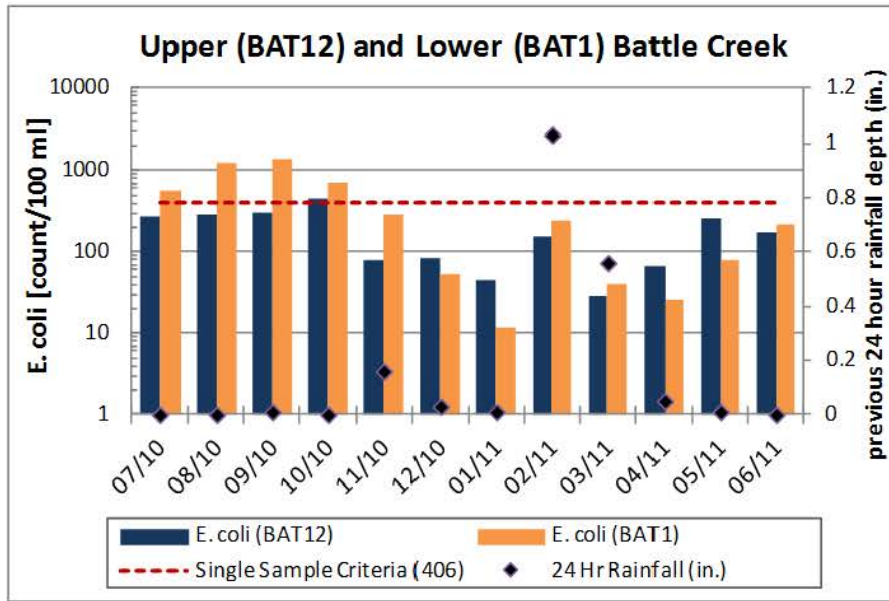
Monthly Instream Mean Value Comparison for Dry and Rain Conditions



Dry conditions defined as less than 0.05 inches and 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

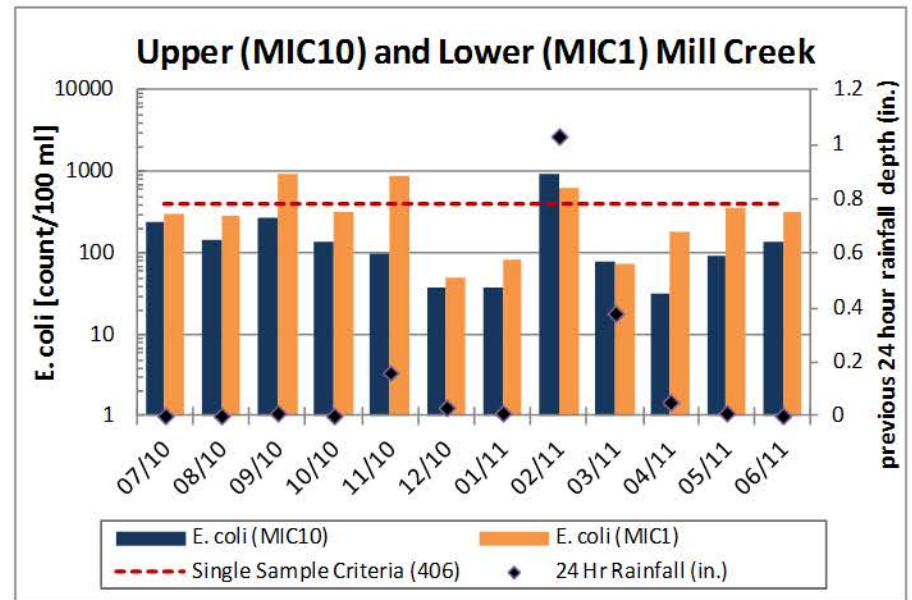
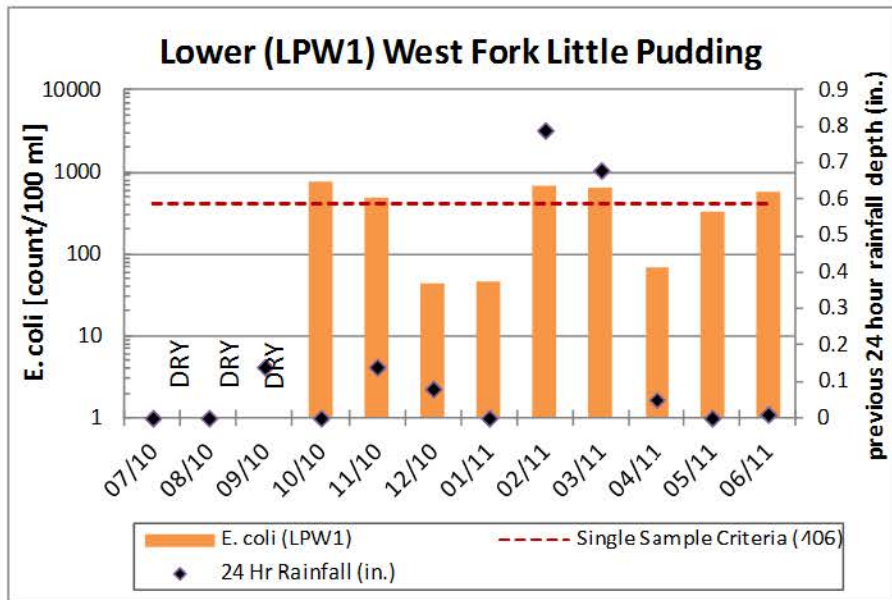
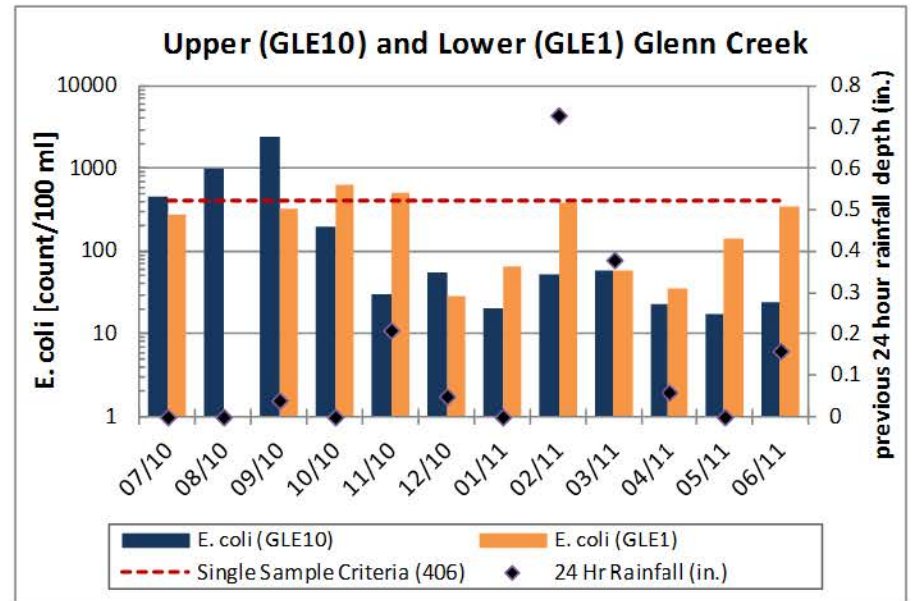
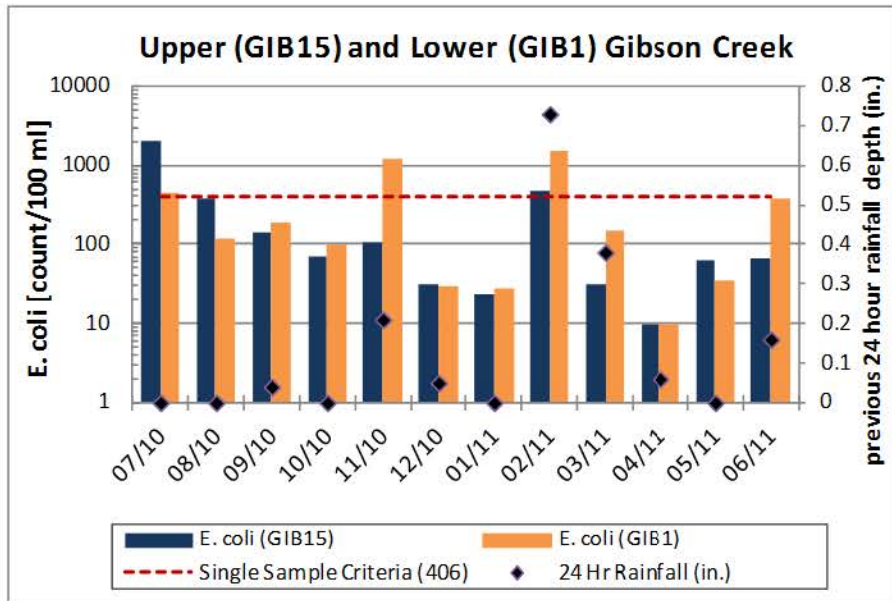


If 24 hour rainfall depth prior to sample collection differed between upstream and downstream sites, the average rainfall was used



Figure 3

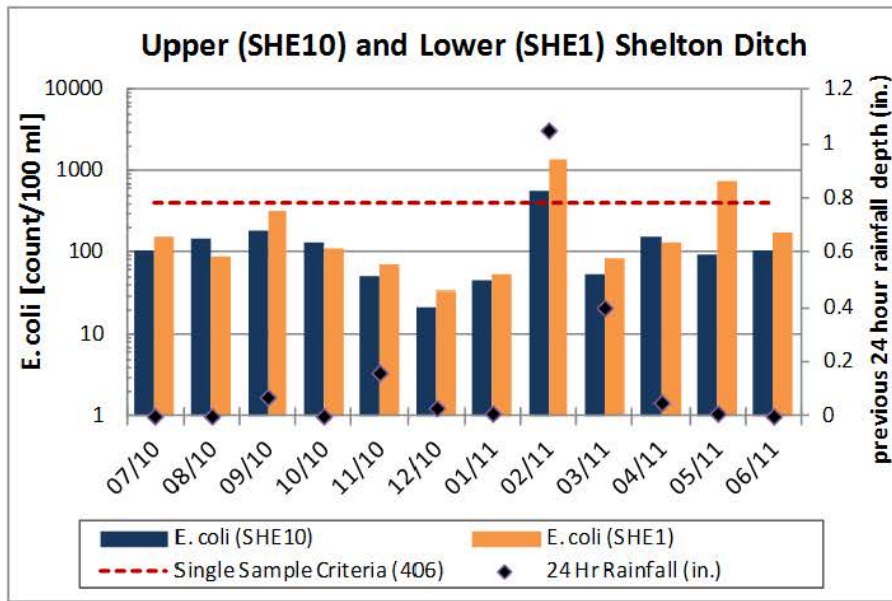
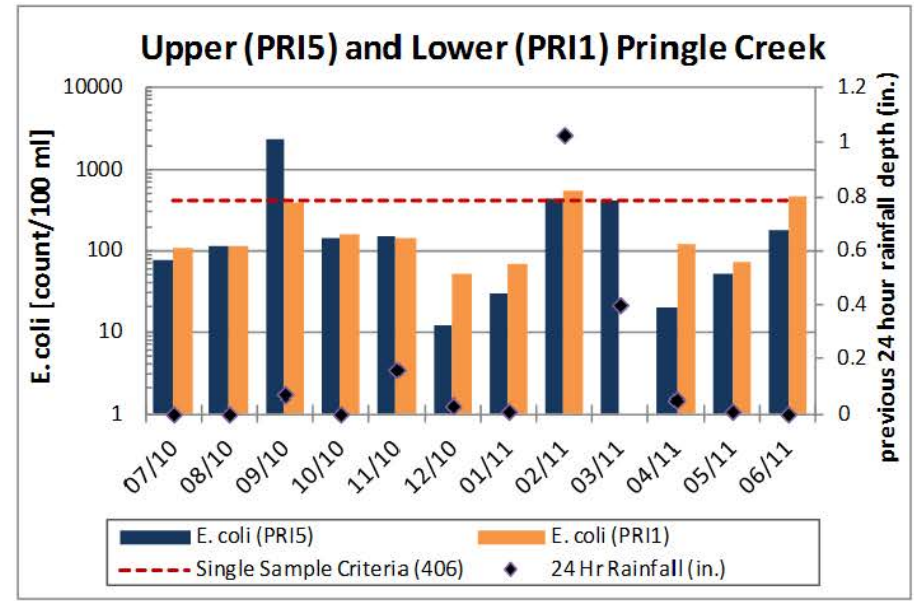
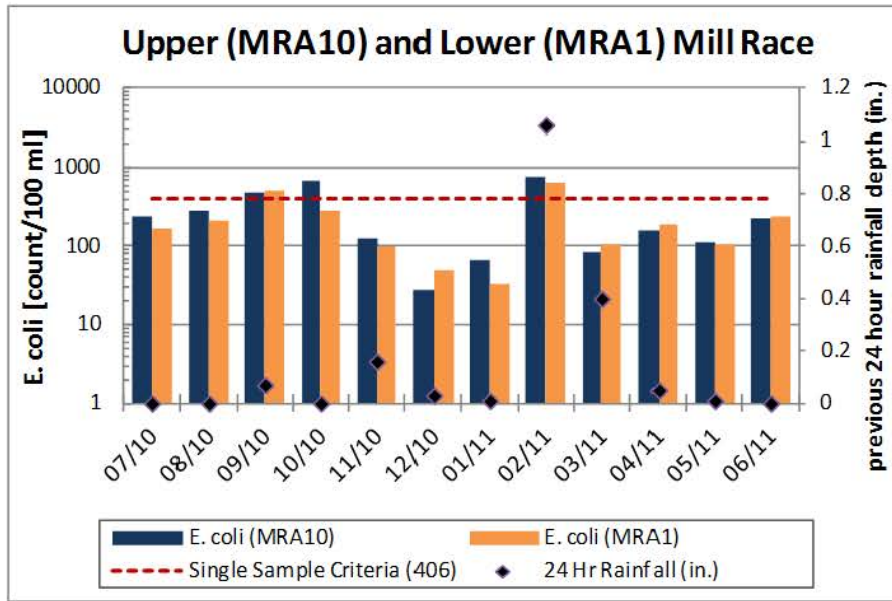
Monthly Instream E. Coli Upstream / Downstream Site Comparison



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

Figure 3

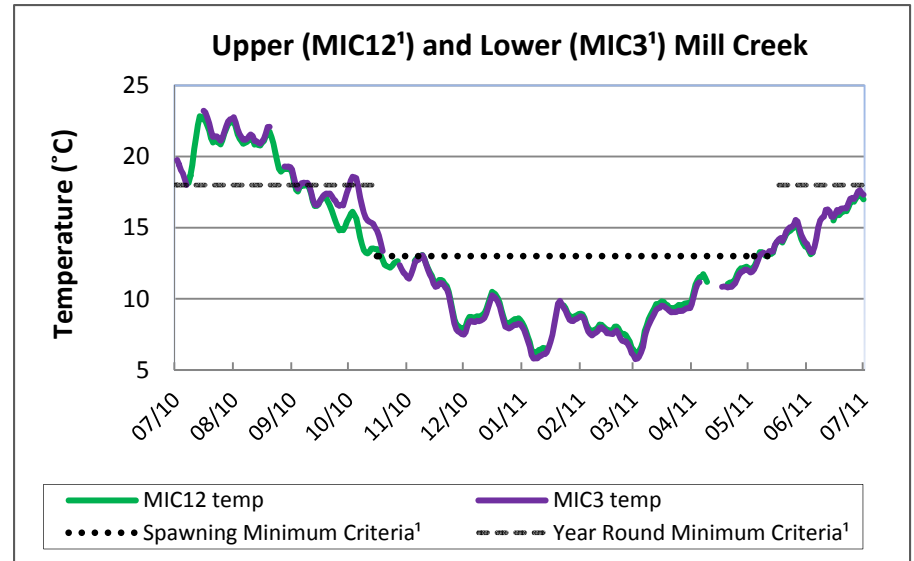
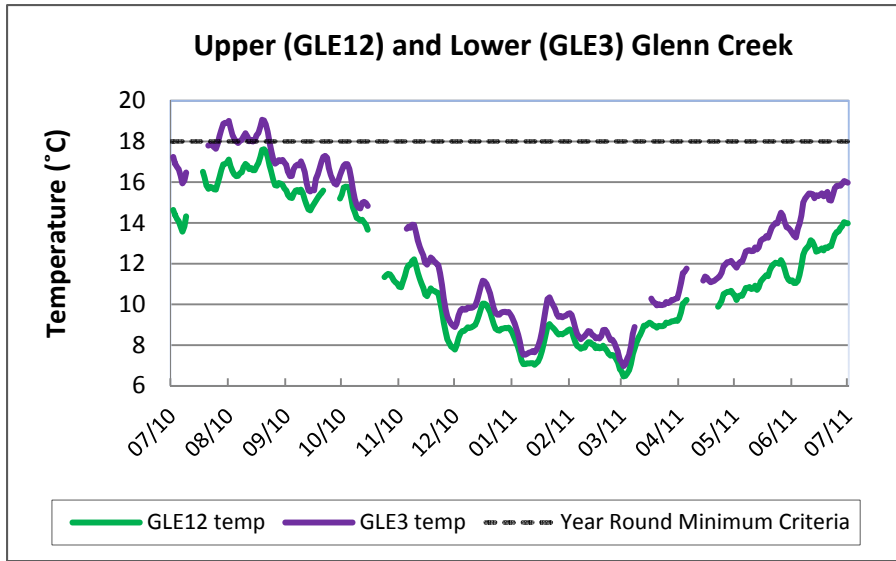
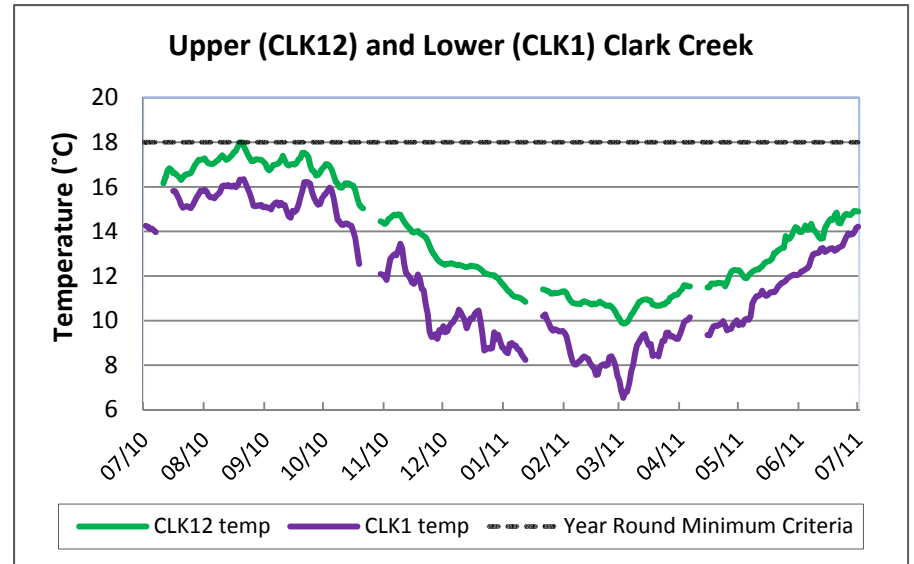
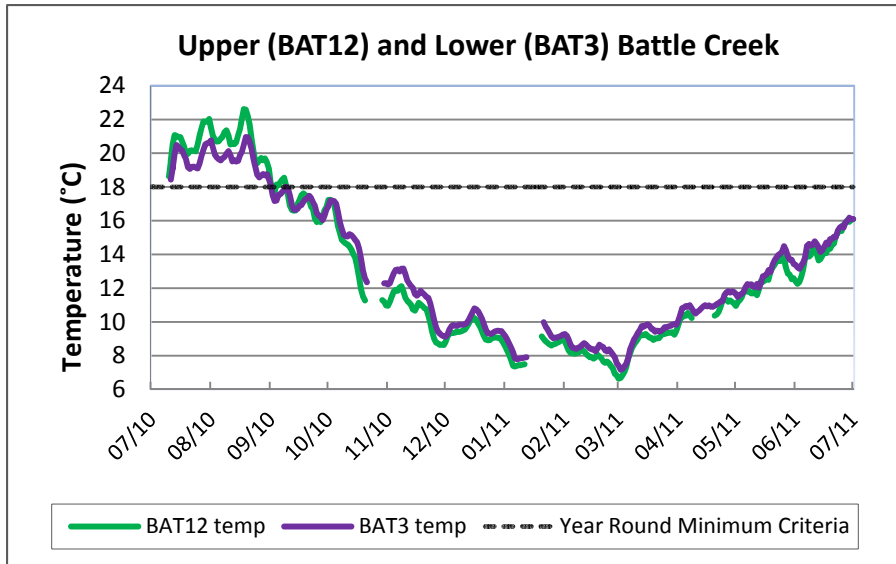
Monthly Instream E. Coli Upstream / Downstream Site Comparison



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

Figure 4

Continuous Instream Temperature 7-Day Moving Average Maximum



Presented temperature data consists of A grade data with greater than 80% of data points collected per day

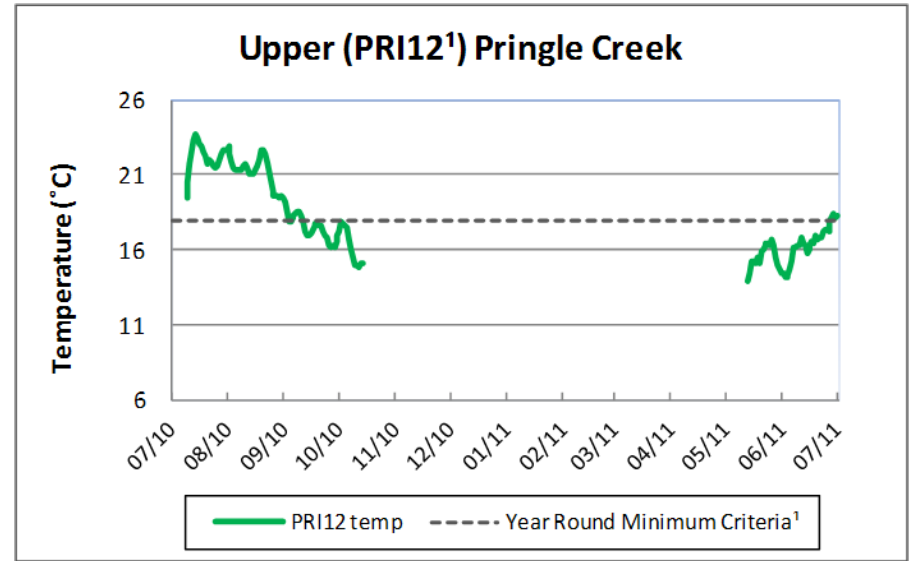
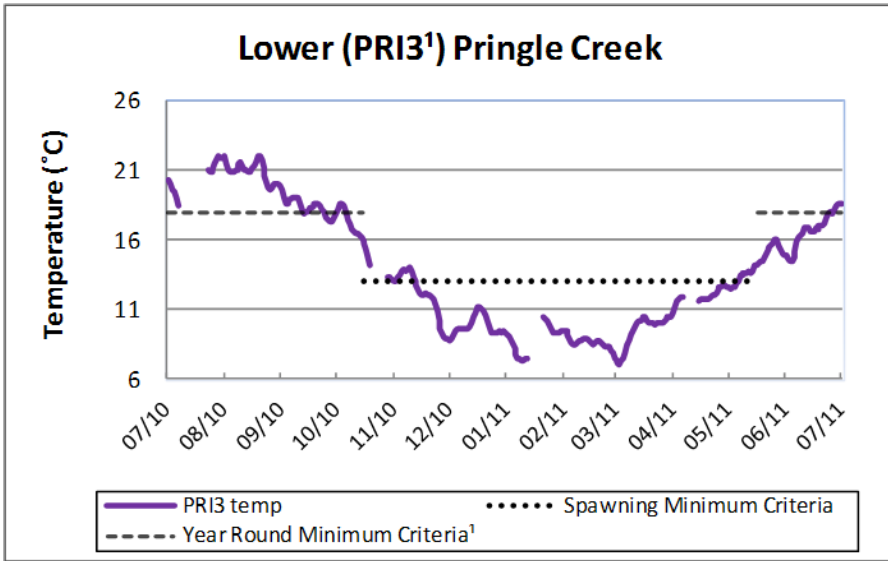
Temperature Criteria as defined in OAR 340-041-0028 and OAR-340-0340, Tables 340A and 340B

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

<sup>1</sup> Oregon's 2004/2006 Integrated Report Section 303(d) listed

Figure 4

Continuous Instream Temperature 7-Day Moving Average Maximum



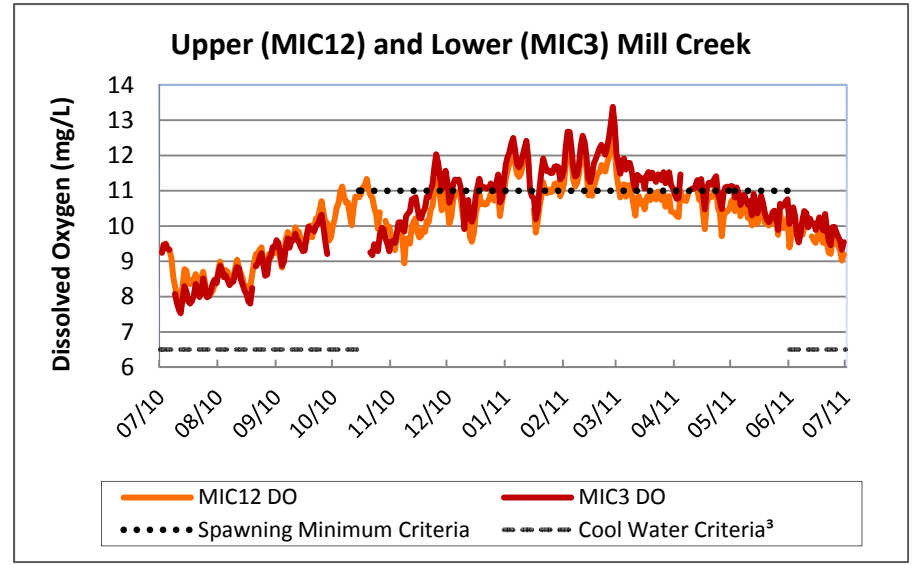
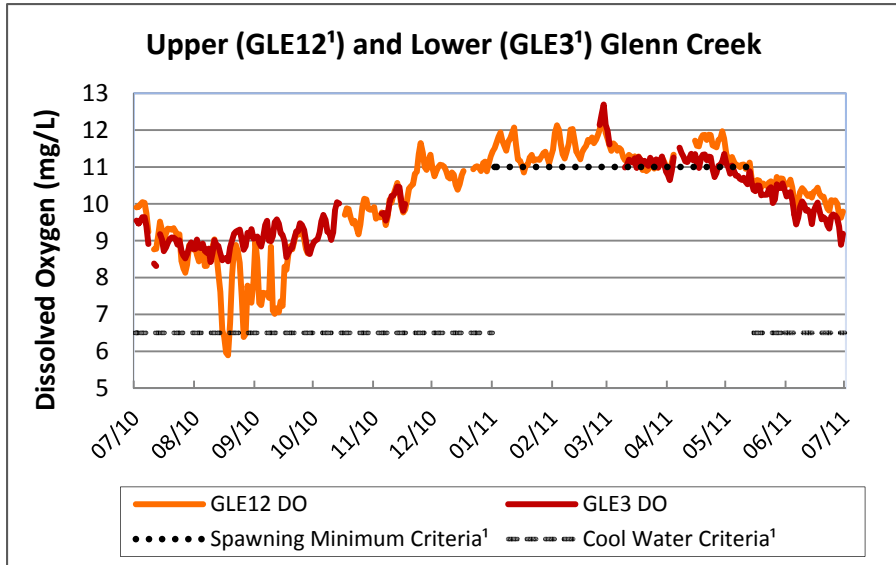
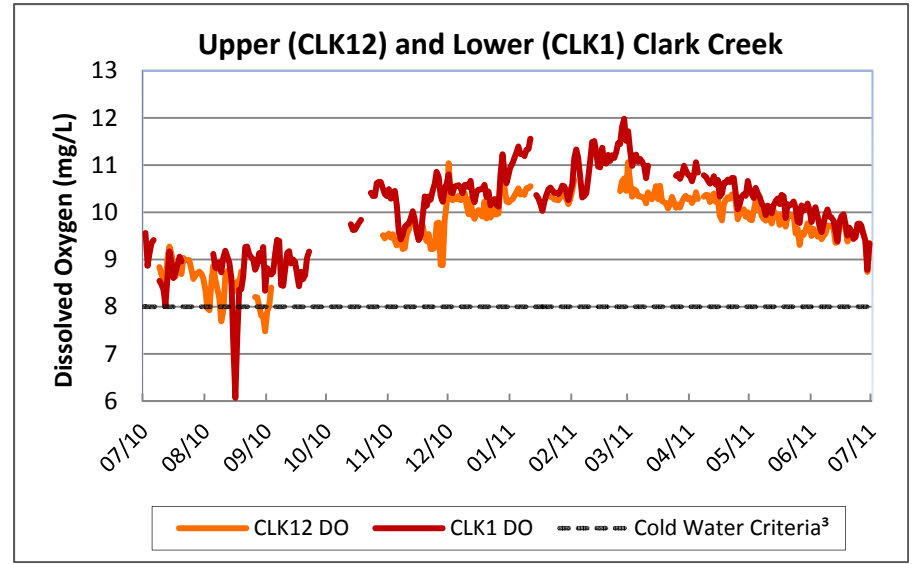
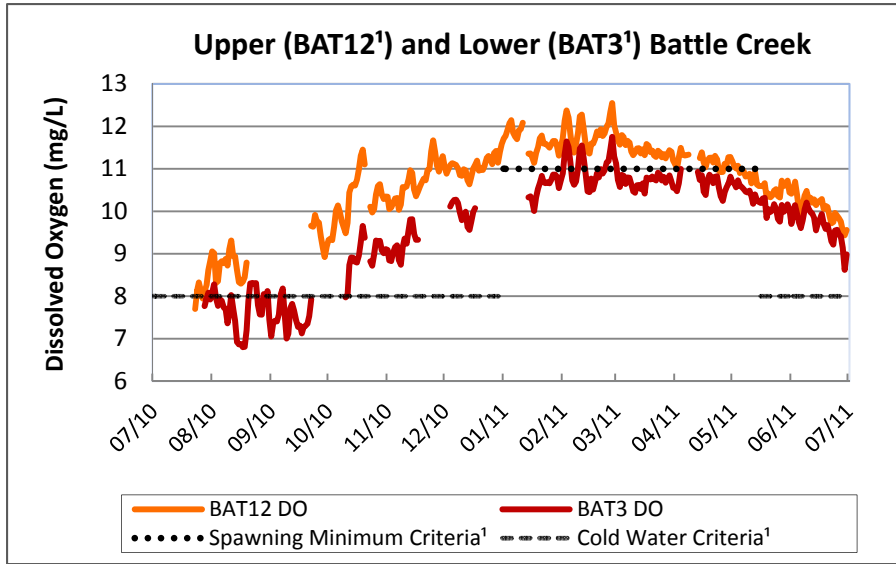
Presented temperature data consists of A grade data with greater than or equal to 80% of data points collected per day  
 Note: PRI12 temperature data from 10/14/10 to 5/11/11 did not meet A or B grade criteria due to issues with instrumentation  
 Temperature Criteria as defined in OAR 340-041-0028 and OAR-340-0340, Tables 340A and 340B

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

<sup>1</sup> Oregon's 2004/2006 Integrated Report Section 303(d) listed

Figure 5

Continuous Instream Dissolved Oxygen Daily Mean



Presented DO data consists of A and B grade data with greater than or equal to 80% of data points collected per day

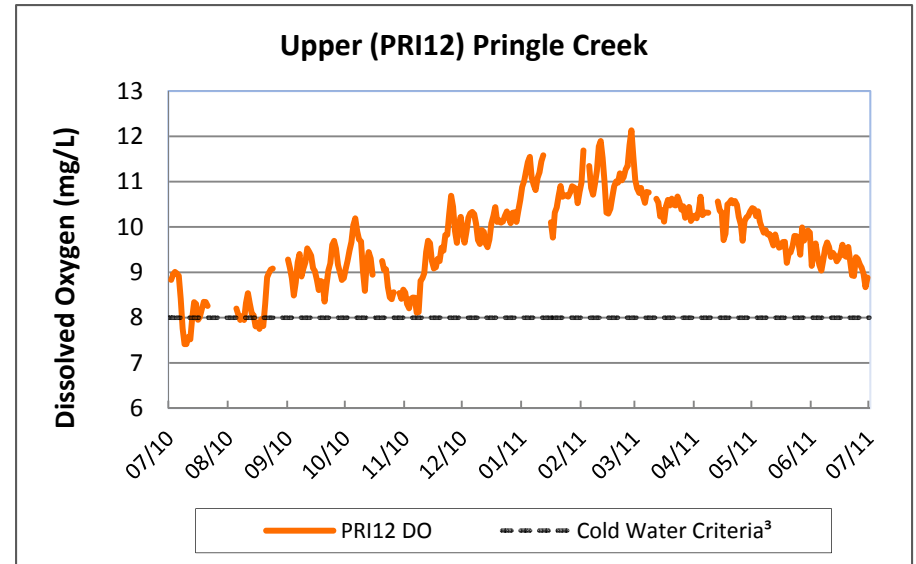
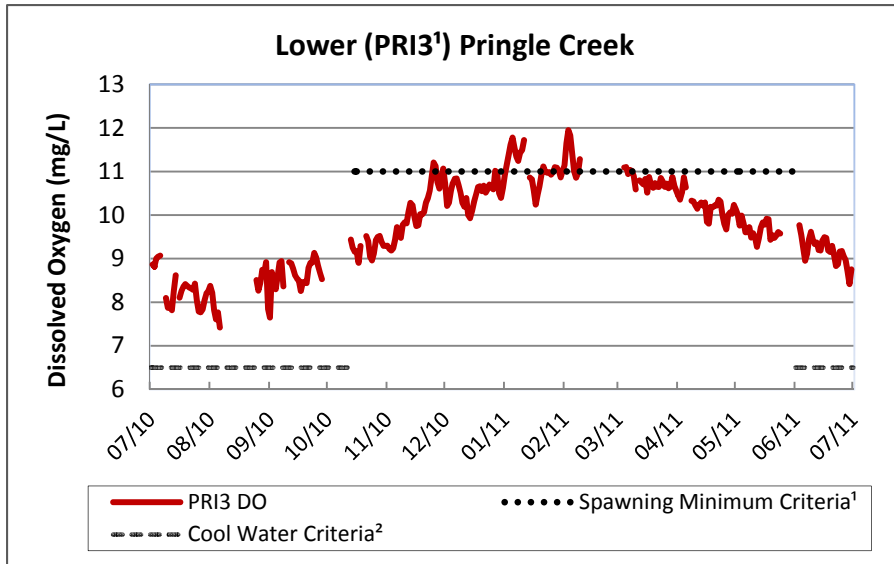
DO Criteria as defined in OAR 340-041-0016 and OAR-340-0340, Tables 340A and 340B

- Spawning Minimum Criteria for applicable streams may not be less than 11 mg/L
- Cold Water Criteria for applicable streams may not be less than 8 mg/L
- Cool Water Criteria for applicable streams may not be less than 6.5 mg/L

<sup>1</sup> Oregon's 2004/2006 Integrated Report Section 303(d) listed

<sup>3</sup> Oregon's 2004/2006 Integrated Report, Category 3

Figure 5  
 Continuous Instream Dissolved Oxygen Daily Mean



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 340A and 340B

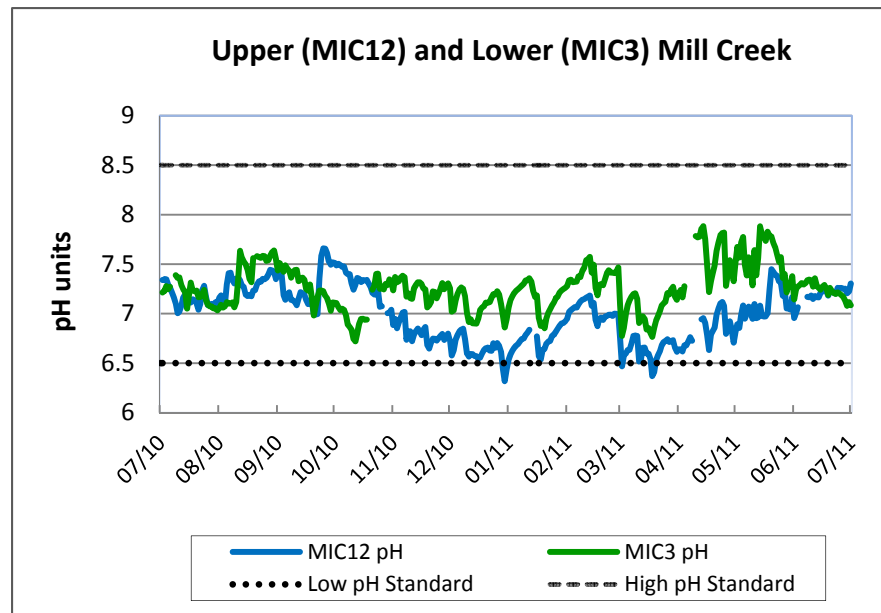
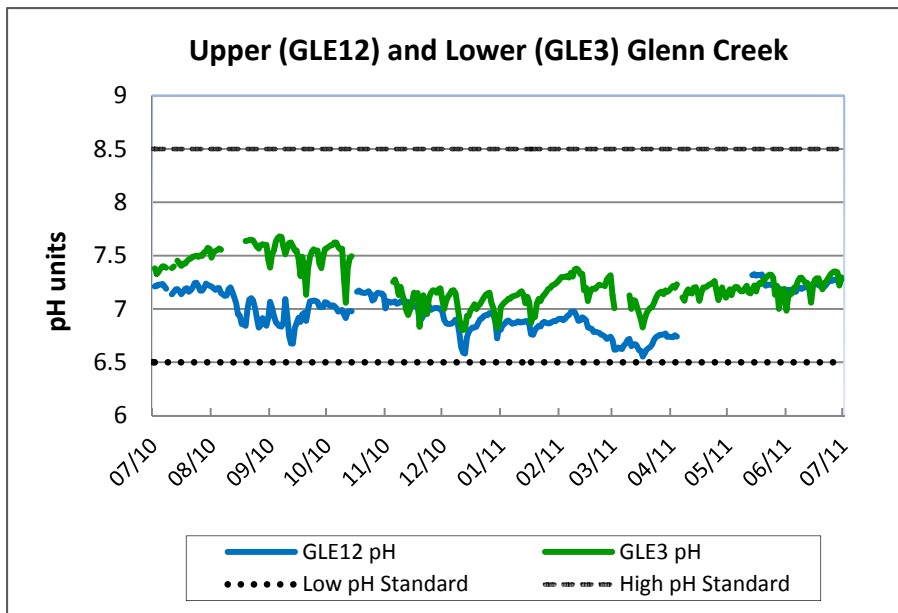
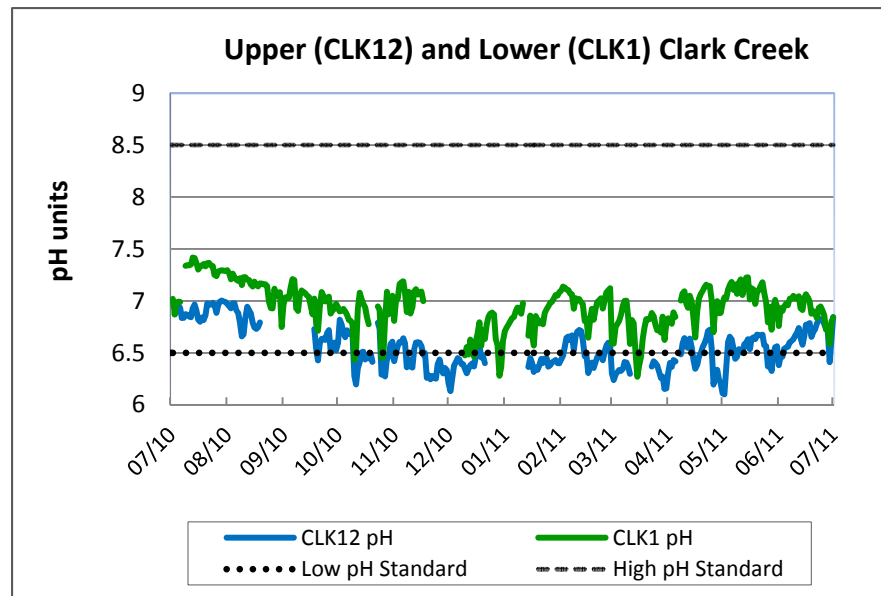
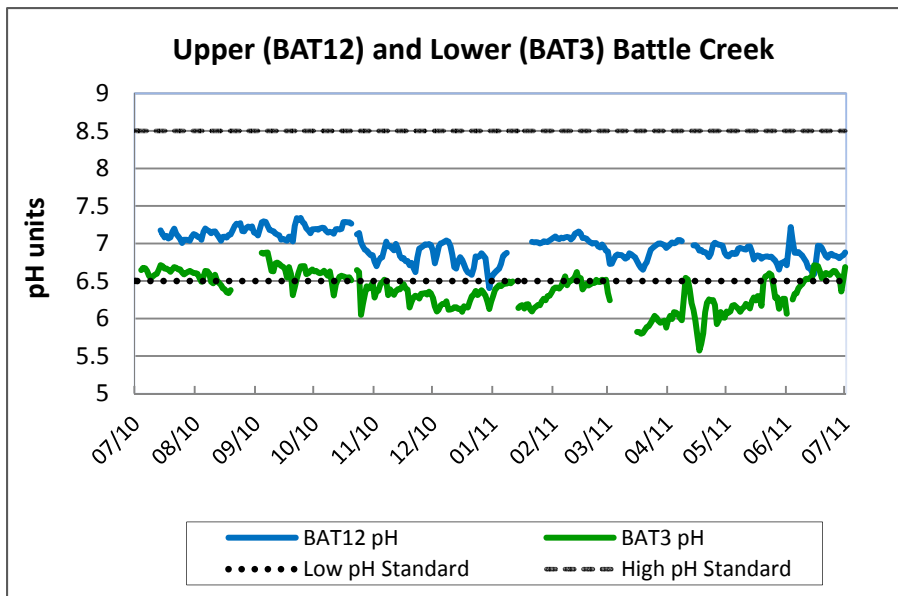
- Spawning Minimum Criteria for applicable streams may not be less than 11 mg/L
- Cold Water Criteria for applicable streams may not be less than 8 mg/L
- Cool Water Criteria for applicable streams may not be less than 6.5 mg/L

<sup>1</sup> Oregon's 2004/2006 Integrated Report Section 303(d) listed

<sup>2</sup> Oregon's 2004/2006 Integrated Report, Category 2

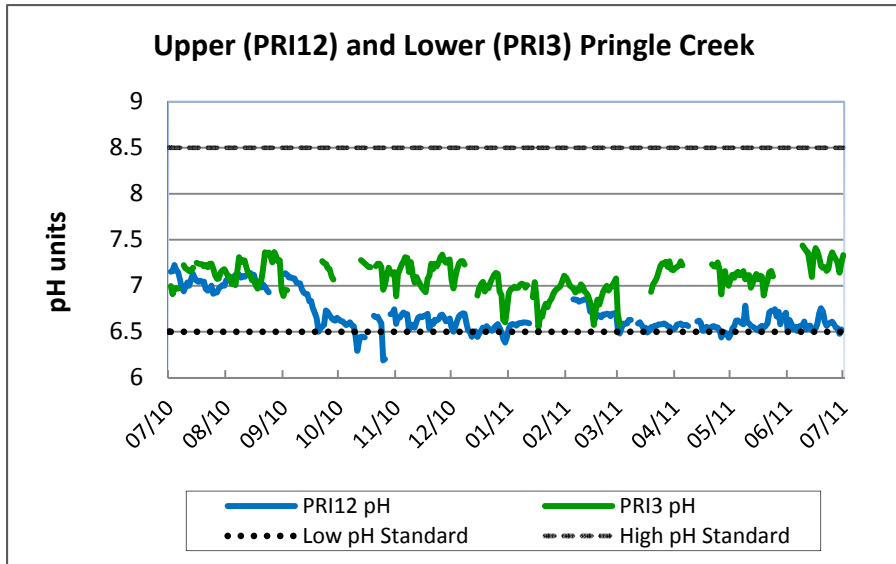
<sup>3</sup> Oregon's 2004/2006 Integrated Report, Category 3

Figure 6  
Continuous Instream pH Daily Mean



Presented pH data consists 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 may not fall outside the ranges of 6.5 to 8.5

Figure 6  
Continuous Instream pH Daily Mean



Presented pH data consists 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 may not fall outside the ranges of 6.5 to 8.5



Figure 7

Continuous Instream pH Data Record for Mill Creek (MIC3) April and May 2011

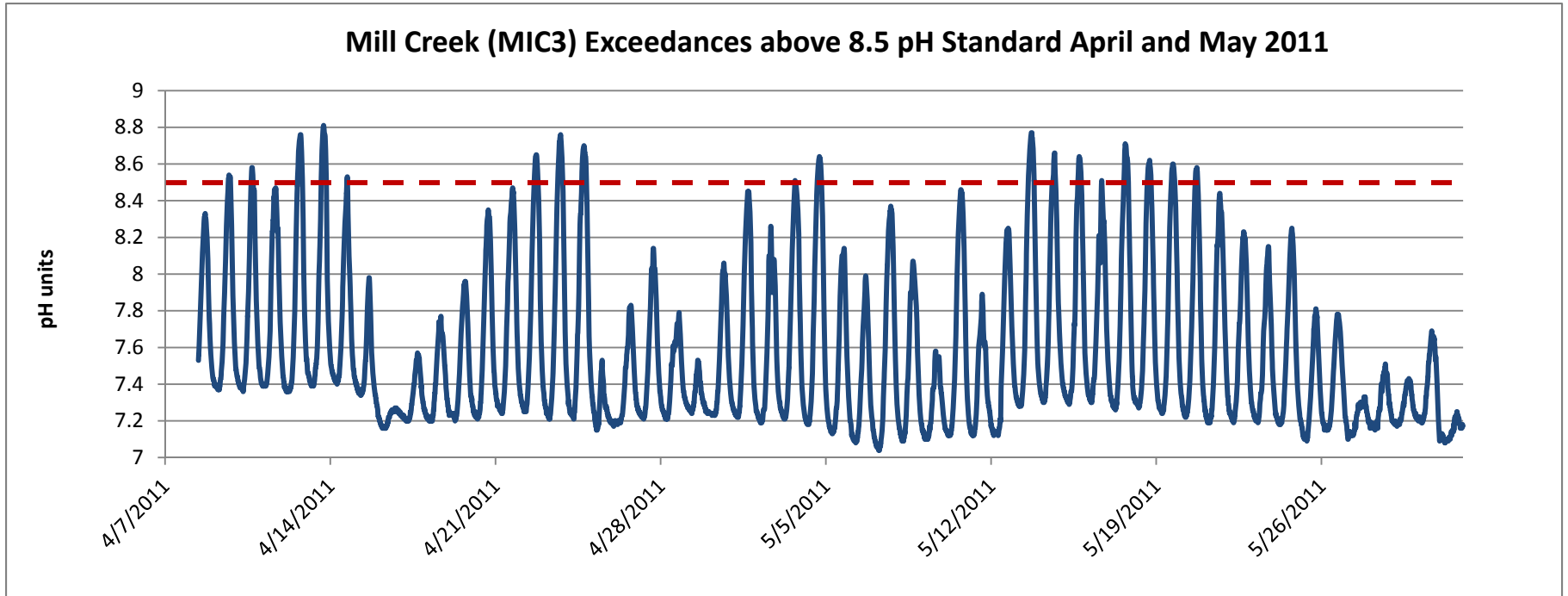
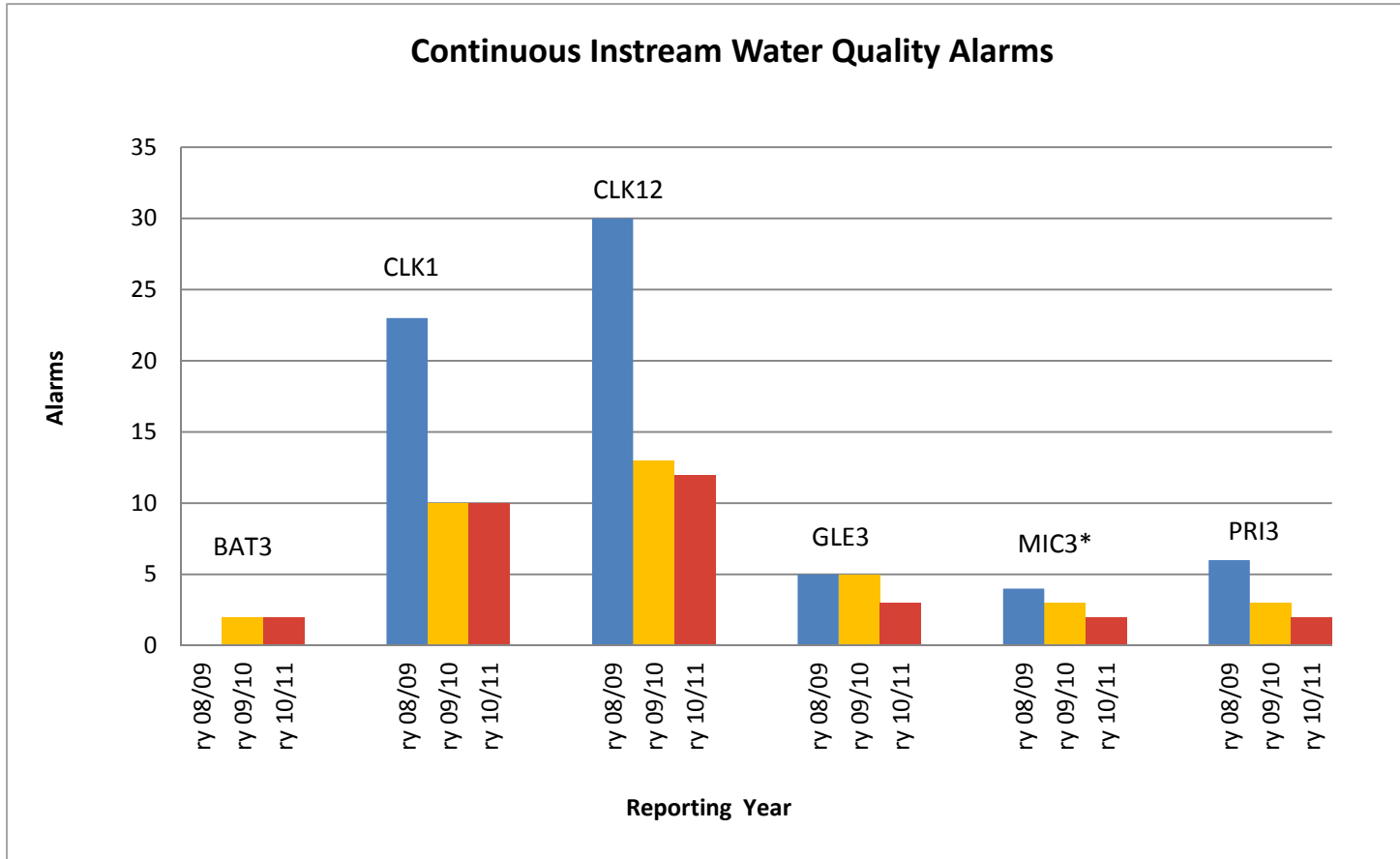
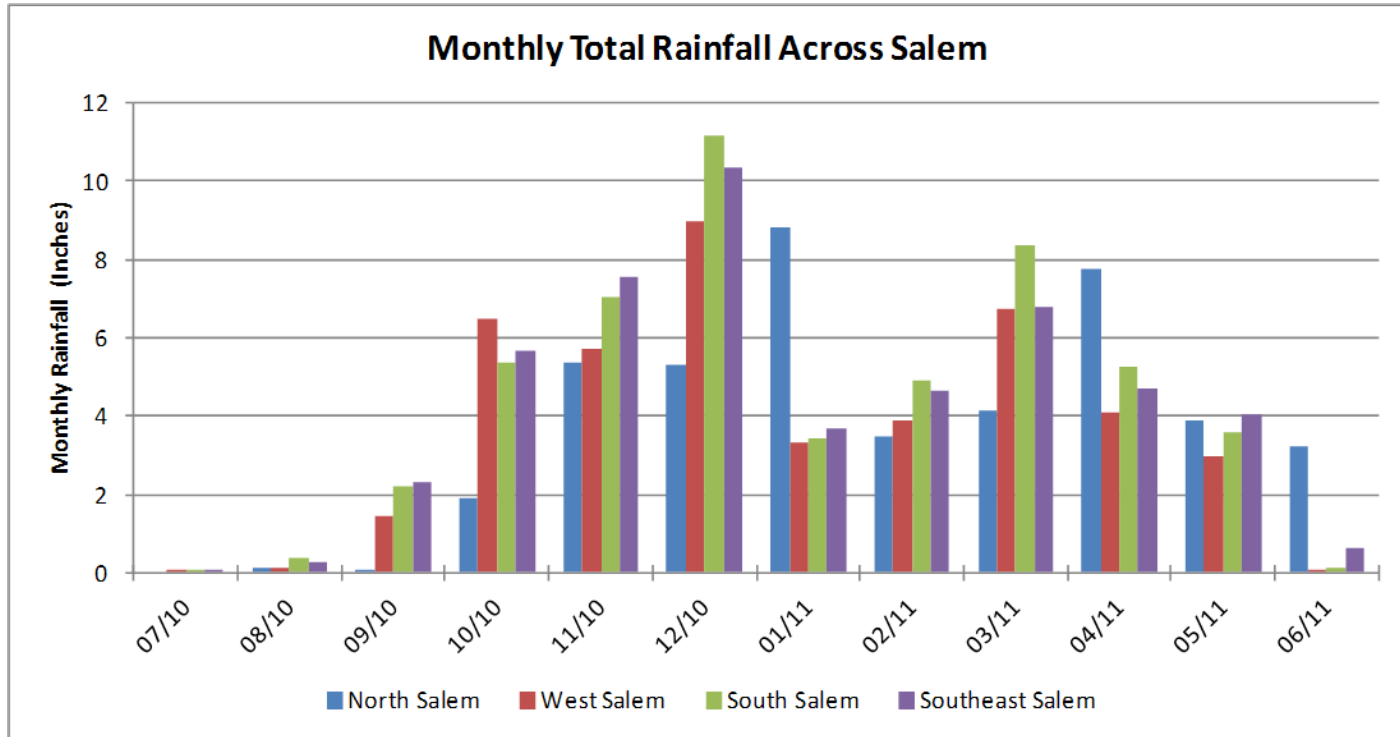


Figure 8  
 Continuous Instream Water Quality Alarms



\*MIC3 and MIC1 have been combined and labeled MIC3. Both stations are downstream of outfalls within the City's jurisdiction on Mill Creek.  
 Note: The alarm counts have been filtered, based on best professional judgment, to remove alarms resulting from: rain events, non-prohibited activities identified in Schedule A.4.a.xii in the City's NPDES MS4 permit, permitted activities during the in-water work period, and wildlife activity.

Figure 9  
Monthly Total Rainfall Across Salem



Rainfall data is from rain gauges maintained by City of Salem