Department of Community Services
MULTNOMAH COUNTY OREGON

Land Use and Transportation Program
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November 1, 2012

Benjamin Benninghoff
Municipal Stormwater Coordinator
Oregon Department of Environmental Quality
811 SW Sixth Ave
Portland, OR 97201-4987

SUBJECT: NPDES MS4 Permit Annual Report 2012

Dear Mr. Benninghoff:

I am pleased to submit the enclosed *NPDES Phase I Permit - Annual Compliance Report 2012 (Permit Year 17)*. This report fulfills reporting requirements for the NPDES Municipal Separate Storm Sewer System (MS4) Discharge Permit #103004.

The report demonstrates the County's progress toward meeting the permit requirements and stormwater program goals for the past year. The report details the activities implemented, program status, and any initiated or proposed program changes.

The monitoring report and data is also enclosed as an appendix of the Annual Report. The County's monitoring data is collected by the City of Gresham under an inter-governmental agreement, and thus represents a coordinated monitoring program. The monitoring report is an excerpt from the Gresham NDPES annual report for FY2012. Additionally, the Total Maximum Daily Load Annual Report 2012 is also included as a separate report in this submission to DEQ.

Please call me at (503) 988-5050, if you have any questions concerning this report.

Sincerely,

Kim Peoples
Road Services Manager

Enclosures: (3)

MULTNOMAH COUNTY

Multnomah County NPDES MS4 Phase I Permit
Stormwater Management Program

Annual Report 2012
Permit year 17

Submitted to:
Oregon Department of Environmental Quality
November 2012

Submitted in Accordance with the Requirements
of the National Pollutant Discharge Elimination System
(NPDES) Permit Number 103004, File Number 120542

Submitted by:
Water Quality Program
Department of Community Services
Multnomah County

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1. Introduction

Multnomah County implements a comprehensive stormwater management program with the goal of reducing pollutants into the municipal stormwater system to the maximum extent practicable. This program is maintained and prioritized in response to the federal Clean Water Act and the County's responsibility to protect the health and welfare of its citizens and natural environment. The Stormwater Management Plan is the main component of the stormwater management program. This plan is submitted to and approved by the Oregon Department of Environmental Quality (DEQ) under the National Pollutant Discharge and Elimination System Municipal Separate Storm Sewer Phase I (NPDES MS4 Phase I) permit. The County's roles and responsibilities for complying with the permit term falls under seven categories of Best Management Practices (BMPs) with a focus on operating and maintaining the County bridges and roads.

This Annual Report summarizes the implementation activities of Multnomah County's Stormwater Management Plan in the County's permit area for the Permit Year 17 (Fiscal year 2012 - July 1, 2011 – June 30, 2012).

2. Program Overview

History

From 1995 to 2010, the Oregon Department of Environmental Quality (DEQ) regulated stormwater from Multnomah County through two separate NPDES MS4 Phase I Discharge permits: Permit #101314 for the areas within the City of Portland permit boundary and Permit #108013 for the areas within the Gresham permit boundary. Multnomah County was a co-permittee on both Portland and Gresham's MS4 Permit.

The County had a limited amount of regulatory area under each permit under the two separate MS4 permits. To reduce the administrative burdens for program management and reporting, Multnomah County requested to DEQ that the permit areas be combined under a single individual permit for the 2010 permit renewal. DEQ granted this request and issued the new individual Phase I permit on December 30, 2010.

Permit area description

Multnomah County is a unique jurisdiction with NPDES permit areas composed of several discrete urban pockets, and approximately twenty-eight miles of road and bridge right-of-ways. The terms "Portland Area" and "Gresham Area" are used in this report to provide clarity in the area descriptions, and to provide continuity from the previous reporting areas.

Within the Portland Area, Multnomah County is responsible for five Willamette River bridges (see Figure 2-1). A few small unincorporated pocket areas within the Portland Urban Services boundary are under Portland's stormwater management through an Intergovernmental Agreement with the City of Portland. These areas are also under the City of Portland's land use authority.

Within the Gresham Area, Multnomah County is responsible for approximately twenty-eight miles of arterial roadways in the Cities of Fairview, Troutdale, and Wood Village, and the unincorporated residential area known as "Interlachen" that is located between Fairview Lake and Blue Lake (see Figure 2-2). In 2007, Troutdale and Wood Village came under NPDES Phase II coverage, and the County roads in those communities also came into permit coverage. Some road segments shown in the following maps are served by Underground Injection Controls or lack curb/gutter systems and do not discharge to surface waters.

More specific details regarding the County's jurisdiction are provided in the Stormwater Management Plan (updated April 2011).

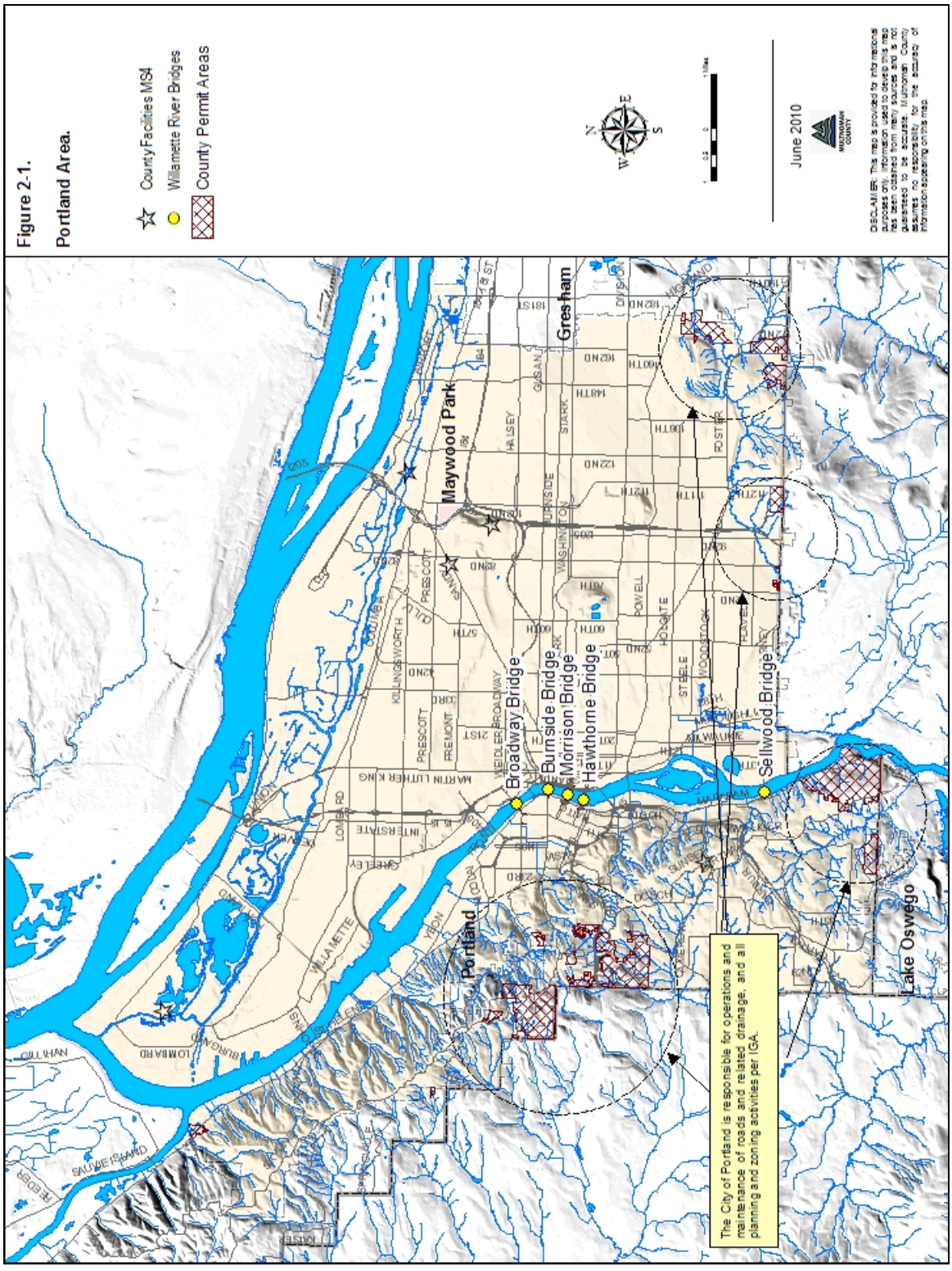
Figure 2-1.
Portland Area.
County Facilities MS4
Willamette River Bridges
County Permit Areas
June 2010
DISCLAIMER: This map is provided for informational purposes only. Information used to create this map has been obtained from many sources and is believed to be accurate. Multnomah County assumes no responsibility for the accuracy of information appearing on this map.
Portland
Gresham
Maywood Park
Lake Oswego
Broadway Bridge
Burnside Bridge
Morrison Bridge
Hawthorne Bridge
Sellwood Bridge
The City of Portland is responsible for operations and maintenance of roads and related drainage, and all planning and zoning activities per IGA.

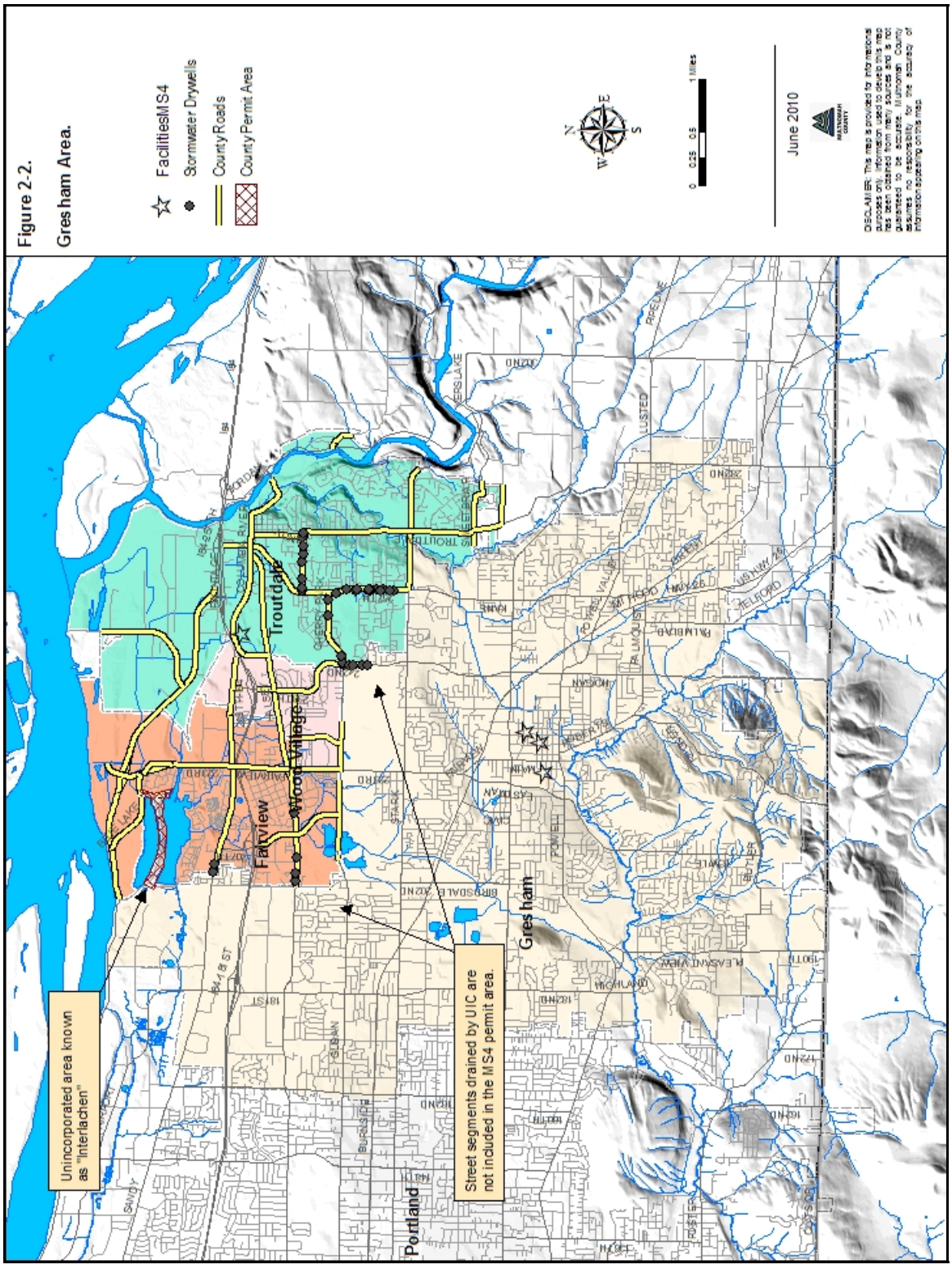
Figure 2-2.
Gresham Area.
FacilitiesMS4
Stormwater Drywells
CountyRoads
CountyPermit Area
June 2010
Troutdale
Fairview
Wood Village
Gresham
Portland
Unincorporated area known as "Interlachen"
Street segments drained by UIC are not included in the MS4 permit area.

Reporting requirements

The following table summarizes the requirements for the annual report as described in Schedule B.5 of the permit:

Permit reporting requirement	*Annual report section*
a. Status of each SWMP program element and progress in meeting measurable goals	BMP summary - status
b. Status or results of any public education program effectiveness evaluation conducted during the reporting year and summary of how the results were or will be used for adaptive management	BMP summary PI-1
c. Summary of the adaptive management process implementation during reporting year, including proposed changes or additions to BMPs	BMP summary – adaptive management
d. Proposed changes to SWMP elements designed to reduce TMDL pollutants	BMP summary
e. Summary of total stormwater program expenditures and funding sources over the reporting year and those anticipated in the next reporting year	Stormwater program budget
f. Summary of monitoring program results, including monitoring data and analyses	Environmental monitoring; also see Gresham and Portland permit annual reports
g. Proposed modifications to the monitoring plan	Environmental monitoring
h. Summary of the enforcement actions, inspections, public education programs, and illicit discharge screening and investigations	BMP summary
i. Overview of land use changes, concept planning and new development activities in the reporting year, including number of new post-construction permits issued and an estimate of the total new or replaced impervious surface area related to new development and redevelopment projects	Permit area description; BMP summary (ND, STR)
j. Results of ongoing field screening and follow up related to illicit discharges.	BMP summary (ILL-5)

Environmental monitoring

The City of Gresham and City of Portland have historically collected, managed, and analyzed stormwater and instream data on behalf of the County as the lead Permittee for the respective NPDES permits when the County was a co-permittee on both permits. Because the County's jurisdiction is part of the fabric of both permit areas, the data for each permit represented the overall quality of stormwater and instream health. This environmental monitoring was a component of the Intergovernmental Agreements (IGA) with both the City of Portland and City of Gresham.

Beginning December 2010, the County managed its stormwater program under a single individual permit. The monitoring requirements are met through a new IGA with the City of Gresham, and the monitoring plan is available online through the City of Gresham website.

The environmental data and analysis presented in the Annual Reports for City of Gresham independent of this report fulfill the monitoring requirement for the County's Annual Report, per the respective IGA. The monitoring results are attached as an appendix to this report.

The data includes monitoring requirements from the County permit: two instream monitoring sites, two macroinvertebrate monitoring sites, and one mercury monitoring site. These are fulfilled by data from Fairview and Beaver Creeks, and the Columbia Slough Water Quality Facility.

Adaptive management process

The assessment of BMPs occurs annually during preparation of the County NDPES annual report, to be submitted to DEQ by November 1 of each permit year. Among other reporting requirements, the MS4 annual report must contain (Schedule B.5) the following:

> *The status of implementing the stormwater management program and each SWMP program element, including progress in meeting the measurable goals identified in the SWMP.*

By providing a summary in the NPDES annual report of progress toward attaining BMP measurable goals (through data collection and tracking measures), the County both: 1) meets the aforementioned reporting requirement, and 2) facilitates a critical step in adaptively managing its stormwater program by assessing each BMP.

While preparing this MS4 annual report, the County collected data and feedback from staff responsible for implementing/reporting on each BMP to facilitate the BMP assessment process. Key factors considered in the annual evaluation include but are not limited to:

- *Was the BMP measurable goal attained? If not, describe circumstances why, and how progress will be made toward future attainment.*

- *For multi-year BMPs, were milestones or timelines met?*

- *Can we feasibly refine or improve the BMP to gain efficiency or effectiveness in removing stormwater pollutants?*

- *Are staffing/financial resources available to support such a BMP improvement or refinement?*

3. BMP Summary

The Multnomah County Stormwater Management Plan is a set of Best Management Practices (BMPs) designed to reduce stormwater pollutants to the maximum extent practicable. The County's stormwater management plan is made up of thirty-two BMPs grouped into seven categories as shown below. The following table summarizes the task, measurable goals, status, and changes for each BMP.

- Public Involvement and Education (PI);
- Operations and Maintenance (OM);
- Illicit Discharges Control (ILL);
- New Development Standards (ND);
- Structural Controls (STR);
- Natural Systems (NS); and
- Program Management (PM).

Managers and staff in the Multnomah County Department of Community Services, Land Use and Transportation Program are organized into "functional groups" to implement the Stormwater Management Program. The functional groups are:

- Public Affairs
- Bridge Engineering
- Bridge Maintenance
- Land Use and Transportation Planning
- Code Compliance
- Facilities
- Emergency Response
- Right-of Way Permits
- Road Maintenance
- Road Engineering
- Asset Management
- Nuisance Code
- Program Management

PI – Public Involvement and Education

Overall goal: *To inform and educate the public about the causes of stormwater pollution, the effects on local streams and rivers, and the need for stormwater management, and to encourage active participation in pollution reduction efforts.*

	Tasks	*Measurable Goal*	*Status*	*Adaptive Management*
PI-1 Participate in Regional Public Education Efforts	Provide County representative to attend the *Regional Coalition for Clean Rivers and Streams* (RCCRS) meetings. Plan and Implement public education campaign promoting behaviors that improve water quality.	Help develop and implement RCCRS annual strategy to promote behavior change through the RCCRS website, television, radio and social media. Evaluate education campaign effectiveness by November 1, 2014.	RCCRS contracted EviroIssues to manage the outreach program. The firm continued the use of "Don't be a Water Hazard" and "Is your lawn chemical free" logos and slogans for web, social media, billboard, bus ads, radio and cable spots based on previous focus group research by Davis, Hibbits & Midgall in 2010. RCCRS also paid to support the KOIN TV "Do the Right Thing – Clean Water Tips" program which promotes on broadcast TV and web. Over 22,350,000 impressions for all media oulets. Additionally, the County's watershed model was used at the Children's Clean Water Festival and an Earth Day event during the permit term.	The RCCRS membership is decreasing as a result of budget cuts and other priorities. Future discussions to stabilize the coalition is needed as well as additional ideas for messaging.
PI-2 Participate in Public Meetings	Attend public meetings related to water quality.	Track participation in watershed council and ad hoc committee meetings.	Water Quality (WQ) staff shared monitoring and project updates at regular monthly meetings of the Johnson Creek Watershed Council and Sandy River Watershed Council. WQ Staff facilitates the Interjurisdictional Committee for Johnson Creek, a technical workgroup that coordinates stream monitoring and analysis for Johnson Creek watershed.	No change
PI-3 Distribute Public Education Information Regarding Stormwater	Make brochures and other educational materials from Soil & Water Conservation Districts and Watershed Councils available at the planning office. Ensure that public education materials are current and cover relevant topics.	Track the number of materials distributed at meetings, front counters and online.	Although the landowners who visit the planning office are largely rural property owners not included in the NPDES permit area, this public education outlet is valuable for the TMDL pollutant reduction. Approximately 96 brochures were taken on various topics from septic maintenance, riparian management and livestock care, during the last permit year. Also, 43 hits on the County website of Beaver Creek fish survey results were recorded.	No change

PI-4 Conduct Training and Education for County Personnel	Send a representative(s) to water quality conferences when feasible. Share information learned in training with other staff. Train volunteers, maintenance and operations crews, as well as inspectors on impacts of activities on water quality and MS4 in addition to new approaches to water quality protection and proper reporting procedures.	Conduct a minimum of one staff training session a year.	Road crew trainings include: Road Maintenance & Operations Manual (RMOM) BMP review (10/11), Johnson Creek fish survey presentation(11/11), vendor training on Vactor (2/12) and CCTV (8/12) equipment, sweeping techniques, confined space training for WQ filter vault inspection (5/12). WQ staff attended the regional Urban Ecology symposium (2/12) and ACWA Stormwater Summit(5/12). Vegetation staff continued to participate in regular meetings of the Cooperative Weed Management Areas group.	No change
PI-5 Implement the Adopt-a-Road Program	Develop a strategy to promote the adopt-a-road program. Track road segments where volunteer roadside litter removal and clean-up is performed through participation in County Adopt-A-Road programs.	Continue to advertise and support the adopt-a-road program as interest exists.	Adopt-a-road program is promoted though a County webpage, complete with instructions. Five groups are active in the NPDES area, with one new group signed on in June, 2011. Clean ups range from once a month to once a year depending on the group. Adopt a Road is a trash pick up, but additional eyes on the road for illegal dumping is a benefit to the Roads program, as well as increasing the stewardship ethic in the community.	No change
PI-6 Maintain Signage to Protect Water Quality	Determine whether any areas need to be marked or re-marked and provide staff and materials to carry this out. Maintain signs in right-of-way promoting watershed awareness, as requested by watershed councils.	Inspect drain markers and signage once per permit term at all catch basins and stream crossings in the permit area.	GIS mapping of catch basins were completed with drain marker inspection. Over 80 new catch basin markers – "Do Not Pollute" – were installed at various locations.	No change
PI-7 Provide Opportunities for Public Involvement During the CIP Process	Involve the public in the process of updating the Capital Improvement Plan and Program (every two years) and in evaluating the stormwater quality impacts and issues associated with the program.	Ensure opportunities for public participation in the CIP update process through public meetings. Ensure that public comment period is established for permit renewal.	CIP update process was completed in FY12 with review of stormwater treatment among criteria for bicycle and pedestrian priorities to develop rankings. County conducted public meetings throughout the County, including several advisory committees meetings with the East Mult Co Trans Comm, local municipalities and other groups. The public involvement program for the Sellwood Bridge project also continues from previous years.	No change
PI-8 Facilitate Public Reporting of Illicit Discharges	Determine where signs need to be posted regarding illegal dumping and place them.	Install and maintain signage in all known areas that are problematic in terms of dumping.	No activity in permit year.	No change

OM – Operations and Maintenance

Overall goal: *To implement operations and maintenance practices for public streets, bridges, storm sewers, and other facilities to reduce pollutants in discharges from the municipal separate storm sewer system.*

BMP	*Tasks*	*Measurable Goal*	*Status*	*Adaptive Management*
OM-1 Review the RMOM for Potential Updates to Address Water Quality	Review the Road Maintenance Operations Manual annually. When manual revisions are made, conduct refresher staff training as provided for under BMP PI-4.	Annually review of the RMOM to ensure current practices are incorporated respect to water quality.	The RMOM was updated in November 2010 and again in June 2011 with small changes in bridge maintenance BMPs. No changes in the RMOM were made during the this permit year.	No change
OM-2 Inspect and Maintain the Storm Drainage System	Inspect the entire stormwater conveyance system on an annual basis. Utilize the record keeping system and database to record findings and follow-up work completed by field crews.	Establish criteria used to determine catch basin (CB) cleaning frequency to maintain effective pollutant removal by July 1, 2011. Clean all roadway catch basins (CB) a minimum of 2 times per year, unless catch basin cleaning records indicates less frequent or more frequent cleaning is appropriate.	Criteria for roadway CB and sweeping frequency were submitted to DEQ on June 22, 2011. The program involves remote data entry from vehicles in the field and GIS to store data. Radio-based Automatic Vehicle Locators with remote data entry were installed and tested. While baseline data has been collected, data from the fall and spring intervals has not been consistent due to technical failures, and difficulty in transitioning to the new system. While we are interested in the amount of sediment accumulation between cleanings, one third of catch basins have outlet pipes at the bottom of the sump, and thus do not regularly trap sediment as expected. Further quality control is needed to develop the dataset needed for effectiveness evaluation. (See PM-3 for additional information). Parking lot CBs maintained by County Facilities were inspected and cleaned on annual basis.	Achieving the consistency and reliability of systems needed for this project is a challenge. Remote data input, data retrieval from the contractor, overall technical support have been impeding factors. While an adequate system was found, new solutions are being researched.
OM-3 Conduct Street Sweeping	Track street sweeping efforts to record the sweeping frequency.	Use catch basin cleaning records or inspections to inform the necessary sweeping frequency. Establish criteria used to determine street sweeping frequencies to maintain effective pollutant removal, and identify high priority street	(See OM-2 and PM-3) Automatic Vehicle Location tracking hardware was installed and tested, which will allow for the GIS tracking of street sweeping frequency. Sweeping routes have been established in GIS. The next step to evaluate catch basin fullness during cleaning intervals will allow us to associate sweeping with catch basin cleaning frequency.	The next step will to develop SAP work orders to link GIS with AVL to maximize efficiency in street sweeping operations.

		sweeping areas by July 1, 2011		
OM-4 Properly Dispose of Road Waste Material	Identify alternatives for a new decant facility to be used for the dewatering of road wastes, or upgrades to the existing facility.	Annually review disposal options that protect water quality.	Vactor waste and sweepings are disposed at a private transfer facility. Vactor liquid is field decanted into public sewer trunk with approval from Fairview. WQ staff researched alternative ditch waste disposal options. Samples collected from ditches with a range of traffic volumes were analyzed and determined that high traffic rural and urban ditch spoils should be treated as solid waste. Ditching spoils from the urban area will continue to be disposed at a waste facility.	No change
OM-5 Minimize Impacts from Anti-icing Operations	Continue to follow the County RMOM procedures for the application, collection, and washing of sanding materials applied to roadways. Continue to research alternative anti-icing methods.	Conduct street sweeping to recover sanding materials within two weeks after the Road Maintenance Manager determines that the roads are free from the threat of an ice or snow event.	Sanding materials were used very sparingly on steep hills and freeway ramps during approximately three freezing events in FY12 and were removed within two weeks after the threat of ice was gone. The effectiveness of MgCl has allowed us to reduce sanding. The County began using MgCl last year after a review of anti-icing chemicals showed that it was likely to be more effective than CMA which had been used previously.	Continue to reduce the use of sanding materials with MgCl to reduce water quality impacts
OM-6 Minimize Impacts from County Truck Hauling Practices	Follow the RMOM procedures for conducting equipment checks when hauling materials.	See OM-1	No activity in permit area.	See OM-1
OM-7 Minimize Impacts From Right-of-Way and Road Shoulder Maintenance	Conduct maintenance according to RMOM	See OM-1	Activity was minimal and followed RMOM BMPs.	See OM-1
OM-8 Minimize Impacts from Ditch Maintenance	Conduct maintenance according to RMOM	See OM-1	Activity was minimal and followed RMOM BMPs.	See OM-1

OM-9 Maintain County-owned stormwater facilities	Inventory facilities by January 1, 2013	Annual inspection of treatment facility	Road Crews received confined space training to take care of inspection and replacement of Contech Stormwater filters in the two filter vaults. Both vaults were inspected in FY12, and cartridges are slated for replacement in FY13. Stormfilters on County bridges were inspected and replaced in FY11. The County Roads owns two vegetated infiltration swales which were inspected annually by Vegetation staff. County Facilities maintains several Vortex units and one swale in facility parking lots. Inspection and cleaning occurred annually.	No change

ILL – Illicit Discharge

Overall goal: *To prevent, identify, investigate, and if appropriate, control/eliminate any non-stormwater discharges into the municipal separate storm sewer system.*

BMP	*Tasks*	*Measurable Goal*	*Status*	*Adaptive Management*
ILL-1 Implement the Spill Response Program	Continue to follow and implement the Multnomah County Spill Response Plan. Track and record spills and information regarding spills as they occur.	Conduct spill response procedures when spills are reported.	County crews responded to one minor spill of fuel on NE 238th Dr in Wood Village. Absorbent material was applied to the spill, then cleaned up and disposed at a private facility. Fuel was contained on the road surface.	No change
ILL-2 Address Spills from Private Truck Haulers	Report to the appropriate agency of the private truck hauling practices impacting the County right-of-way and the stormwater conveyance system.	Contact all private haulers when spills are observed to ensure proper clean up	No activity in permit area.	No change
ILL-3 Require Erosion and Pollution Controls for Public Projects (formerly ILL-4 and ILL-5)	Execute formal contracting practices including pre-construction meetings, bonding, construction permit review, and erosion control inspections.	Inspect 100% of County project sites	DEQ responded to the County's request to inspect and enforce against the Morrision Bridge contractor, Conway Construction, for poor pollution control practices (7/11). As termination proceedings began, the contractor proposed new pollution control measures and work ultimately resumed. DEQ issued a citation to the contractor, but the citation was appealed and ultimately pulled.	No change
ILL-4 Investigate Illegal Dumping	Continue to implement the existing field inspection program during routine maintenance activities. Record and report any noticeable illegal discharge and dumping in the right-of-way.	Clean up all reported discharge or debris dumped in the right-of-way	Nuisance Code Enforcement responded to two incidents of human feces deposited in the right of way in the urban areas of Gresham and Troutdale.	No change
ILL-5 Detect and Eliminate Illicit Discharges to the Storm Sewer	Continue to inspect and maintain the bridge restroom facility holding tanks on a quarterly basis. Document enforcement response plan for illicit discharges by November 1, 2011 Develop pollutant parameter actions levels and identify priority outfall locations by July 1,	Conduct quarterly maintenance of bridge facilities. Conduct tasks by date above, and annual inspection of dry weather flows at major outfalls.	Bridge facilities maintained quarterly without incident. Dry weather outfall inspection of eight outfalls occurred in September 2011. No flows were observed.	The County Illicit Discharge Detection and Elimination Program was submitted to DEQ in July 2012.

	2012.			

ND – New Development

Overall goal: *New Development Standards (ND) BMPs are designed to mitigate pollutant discharges and other water quality impacts associated with new development and redevelopment during and after construction.*

BMP Description	*Tasks*	*Measurable Goal*	*Status*	*Adaptive Management*
ND-1 Require Erosion Control for Private Development	Review and provide comments on applications for grading permits and hillside development permits. Perform Erosion and Sediment Control Inspections for all approved construction projects.	Inspect 100% of sites once during the permit review, and a second time during active construction.	One erosion control permit was opened. The initial inspection was completed, and the follow up will occur during construction next year.	No change
ND-2 Regulate Stormwater Discharge	Continue to review new development permit applications to ensure proper connection to the storm sewer system and application of design standards. Inspect stormwater facilities during and after construction to ensure that the site is compliant with design standards.	Conduct plan reviews and inspections for 100% of permitted projects.	No activity in permit area.	No change

STR – Structural Controls

Overall goal: *To implement structural modifications (constructed facilities) to existing systems/development to reduce pollutants in discharges from the municipal separate storm sewer system.*

BMP	*Tasks*	*Measurable Goal*	*Status*	*Adaptive Management*
STR-1 Address Water Quality with New Capital or Roadway Improvement Projects	Develop criteria and strategy for when stormwater treatment will be incorporated into public projects. Conduct plan checks of stormwater quality treatment facilities that are included in capital improvement or roadway improvement projects to assure they follow standard design criteria that include stormwater quality considerations, and that the appropriate facility is selected for the intended purpose.	Identify strategy or criteria used to determine when stormwater quality treatment will be incorporated into Capital Improvement Projects by November 1, 2013.	See below – Morrison Bridge improvements.	No change
STR-2 Retrofit Existing Facilities for Water Quality Benefit	Include consideration of stormwater treatment for water quality purposes in capital projects to reduce pollutants to the maximum extent practicable. Conduct a hydromodification assessement and develop a strategy to identify and prioritize potential retrofit projects by November 1, 2014.	Identify one retrofit project by November 1, 2013. Develop hydromodification and retrofit strategy by November 1, 2014.	Morrison Bridge replacement of steel deck with concrete deck includes new storm filter catch basins and improved traction for reduced accidents/spills. The movable solid deck now also collects debris which is collected in traps when decks are raised. Bio-bags are used at the outlets of these traps to catch sediment.	No change
STR-3 Inventory and Map the County Storm Sewer System	Continue to update the County GIS storm sewer system map.	Complete GIS drainage system maps of the NPDES permit area by 2014, including catch basins, culverts, manholes, ditches and pipes systems.	Catch basin GIS layer was completed and verified using field checks and aerial imagery. Pipe and culvert maps are in development at 50%. Given the nature of the County system – arterial roadways within the Cities of Troutdale, Wood Village, and Fairview, - interjurisdictional coordination is a major factor in developing and finalizing GIS work.	With limited funds, GIS work has been largely done with engineering interns. Given the complexity of the project and lack of continuity with interns, funding for a limited duration (2 yr) position was leveraged to ensure consistency and timeliness of project completion.

NS – Natural Systems

Overall goal: *to help preserve and restore the natural environment/functions to reduce pollutants in discharges from the municipal separate storm sewer system.*

BMP	*Tasks*	*Measurable Goal*	*Status*	*Adaptive Management*
NS-1 Conduct Vegetation Management Activities	Follow RMOM and IVM procedures. Maintain current Oregon Department of Agriculture (ODA) certifications for chemical applicators. Review and update integrated vegetation management practices (IVM) annually.	Review RMOM vegetation activities and the Integrated Vegetation Management Program (IVM) annually.	Facilities Management developed a new Pesticide, Herbicide, and Fertilizer management policy for use on County properties with input from the Water Quality Program. No changes on the existing Road Services IVM wee proposed.	No change
NS-2 Specify Native Vegetation in ROW and Permitted Projects	Review the current contract specifications for landscaping in the right-of-way, and update as needed. Promote the use of native vegetation and develop contract specifications for landscaping. Condition plan approvals with invasive plants removal, if needed. Ensure contract specifications are followed which require certain landscaping materials and placement.	Inspect 100% of project sites for landscaping specifications.	No activity in permit year.	No change

PM – Program Management

Overall goal: *Program Management BMPs ensure effective program management, coordination, and reporting.*

BMP	*Tasks*	*Measurable Goal*	*Status*	*Adaptive Management*
PM-1 Stormwater Program Management	Continue to participate in the NPDES MS4 coordination meetings and any DEQ meetings. Continue to work with other NPDES MS4 permittees and DEQ to implement the stormwater management program. Review each BMP file annually. Prepare an annual report to demonstrate the County's compliance with requirements. Submit to DEQ.	Annually review BMP implementation data and submit annual report by November 1 each year.	Annual report submitted to DEQ.	No change
PM-2 Assess and Evaluate the Stormwater BMP Program	Evaluate progress of BMPs for annual report using adaptive management approach.	Develop an adaptive management approach by November 1, 2011.	The adaptive management approach was discussed with other ACWA phase I jurisdiction staff to develop a consistent and meaningful strategy for program evaluation. The approach was included in the 2011 annual report. Current adaptive management considerations are included in this table.	No change
PM-3 Maintain Environmental Management Database	Pilot new GPS and onboard computer technology by July 2011. Develop GIS or other mapping technology to sync with GPS system by July 2012. Develop SAP work orders and tracking to integrate with GIS by July 2013.	Ensure tasks are completed by dates shown.	Automatic Vehicle Location devices (AVL with radio-based transmitters) were installed and beta testing commenced. The final verification for catch basin GIS data was completed and GIS mapping is linked to the AVL. During FY13, final move from existing Access database system to GIS-based system will occur. Also in FY13, Road segments will be translated from GIS to SAP to begin developing GIS-SAP integrated work orders and data storage.	(See OM-2)

4. Stormwater Management Program Budget

Program activity within the County's NPDES permit area is divided between areas that were previously managed under the Portland area and Gresham area NDPES permits. The Water Quality program, consisting of one staff manages the County stormwater program, and portions of two Asset Management staff provide mapping and database services across the entire permit area. Services specific to the two areas are described below.

Gresham area stormwater related services:

- Road Maintenance expenditures and anticipated budget allocations within the Fairview and Interlachen incorporate items including drainage maintenance, right-of-way, surface management, vegetation management, general administration, emergency road hazard response and training.

- Road Engineering expenditures and anticipated budget allocations within Fairview and Interlachen incorporate drainage studies and reviews, environmental compliance review, as-built plan drafting and inventory, GIS database entry, and training.

- Land Use and Transportation Planning expenditures and anticipated budget for design review of capital improvements and right-of-way impacts to the County roads in Fairview, Troutdale, and Wood Village, and for design review and permits for development within the Interlachen Area.

Portland area stormwater related services:

- Bridge Maintenance expenditures and anticipated budget allocations within the Portland Permit area incorporate items including, drainage maintenance, right-of-way, surface management, vegetation management, general administration, emergency road hazard response and training.

- Bridge Engineering expenditures and anticipated budget allocations within the Portland Permit area incorporate drainage studies and reviews, environmental compliance review, as-built plan drafting and inventory, GIS database entry, and training.

- Multnomah County Road Maintenance, contracts the City of Portland and Clean Water Services to maintain and operate County owned roads to their respective standards in the urban unincorporated pocket areas through Intergovernmental Agreements.

- Road Engineering continues to retain authority to review access and impacts to the right-of-way including stormwater discharge when such discharges cannot be retained on site.

- Transportation Planning within the Portland Permit area includes development review in the unincorporated pockets where such development has the potential to access or impact the county right-of-way.

Funding sources for stormwater program expenditures are derived from two sources. The Land Use Planning receives funding from County's General Fund. The Transportation Division (Road and Bridge

Services and Transportation Planning) receive funding from the State Highway Trust Fund. This fund consists of revenue from this source include the State gasoline tax, weight/mile tax on trucks, and vehicle registration fees, which are constitutionally dedicated to road related issues. The County has no revenue from dedicated stormwater fees. This is a result of the County roads and unincorporated pockets being nested within other city jurisdiction's service areas.

The table below outlines program expenditures for Fiscal Year 2012 and provides the anticipated budget for Fiscal Year 2013.

Program Area	*FY 2012 actual*	*FY 2013 budget*
Water Quality Program[1]	$142,000	$177,000
Asset Management[2]	$15,300	$20,000
Gresham area		
• Road Maintenance[3]	$245,900	$250,000
• Road Engineering[3]	$143,000	$146,000
• Land Use & Transportation Planning	$590	$500
Portland Area		
• Bridge Maintenance/Operations	$13,600	$43,000
• Bridge Engineering[4]	$73,397,000	$196,948,800
• Road Maintenance IGA	$20,900	$100,000
• Road Engineering[5]	$10,700	$10,000
• Transportation Planning	$2,030	$2,000

[1]*Figure includes entire Water Quality program includes one staff, monitoring budget for UIC, TMDL and NPDES programs, and additional program costs. Increase from previous year is the result of some additional allocation of other program areas that previously funded water quality activities.*
[2]*Estimate is based on a portion of time from two Asset Management staff.*
[3]*Estimate is based on actual spending from the previous year for time spent on water quality work plus a budget for training.*
[4] *The amount shown represents the entire Bridge Engineering program. The entire program is included because Bridge Services do not budget or collect charges for water quality tasks. Water quality best practices are integral in all aspects of design and construction and hence we are not able to be segregated from the other work. Increase in budget reflects Sellwood Bridge funding.*
[5]*Estimate of the amount of time spent on spends on water quality issues in Portland area right-of-way.*

Cities of Gresham & Fairview

Environmental Monitoring Program Annual Report Public Comment Period October 5-25, 2012

Prepared by:
City of Gresham, Department of Environmental Services,
Watershed Division

Cities of Gresham & Fairview Environmental Monitoring Program Annual Report

A. History

Background

The data reported in this PY 17 Annual Report reflects the Cities of Gresham and Fairview's implementation of the Environmental Monitoring Plan that was approved by DEQ and became effective July 1, 2011. The City of Gresham collects data for Multnomah County under an Interjurisdictional Agreement and that data is included in this report.

B. Required Elements

This section of the Annual Compliance Report represents the permit requirements for Gresham & Fairview related to the Environmental Monitoring Plan. However, each jurisdiction's Stormwater Management Plan (SWMP) is represented in Section Three, Four and Five, respectively. As described in the City of Gresham and Fairview's NPDES Permit, Schedule B) 5., the annual report must include:

f. A summary of monitoring program results, including monitoring data that are accumulated throughout the reporting year and/or assessments or evaluations.

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.

The environmental monitoring requirements specified in Table B-1 of the NPDES permit are summarize below in Table 2. Elements required by the permit are *italicized* text.

Table 2. Environmental Monitoring Requirements from NPDES permit

Monitoring Type	Monitoring Location(s)	Monitoring Frequency	Pollutant Parameter Analyte(s)	Notes
Instream Monitoring	*Three (3) sites in the Columbia Slough basin:* 1. Fairview Lake @ Lake Shore Park (FVL1) 2. Fairview Creek @ mobile estates (FCI0) 3. Fairview Creek @ Stark (FCI1) *Two (2) sites in the Sandy River basin:* 1. Kelly Creek @ Mt. Hood Community College Pond (KCI1) 2. Kelly Creek @ Detention Pond (KCI4) *Four (4) sites in the Johnson Creek subbasin:* 1. Johnson Creek @ Jenne Rd (JCI1) 2. Johnson Creek @ Palmblad (JCI2) 3. Kelley Creek @ Pleasant Valley Grange (KI1) 4. Kelley Creek @ Rodlun Rd (KI2)	*Four (4) events/year*	*DO, pH, temperature, conductivity, turbidity, E. coli, hardness, BOD, TSS, Chlorophyll-a (May-Oct); nutrients (nitrate, ammonia, Total P, o-Phos); Total recoverable and dissolved metals (copper, lead and zinc); legacy pesticides (JC only)*	The City of Portland collects data on the entire Columbia Slough, but based on their probabilistic sampling design, locations monitored any permit year will be reported to DEQ by Portland.
Continuous Instream Monitoring	*Two (2) continuous monitoring stations:* 1. Johnson Creek @ Regner 2. Fairview Creek @ Glisan*	*Ongoing* 15-minute interval	*Temperature and flow*	Flow data collected by USGS through Joint Funding Agreement #3225. *Fairview gage does not collect temperature. City of Gresham periodically collects summer temperature at Glisan location, as well as other locations throughout city.

Stormwater Monitoring - Storm Event	*Three (3) sites.* Monitored 30 random and spatially balanced stormwater locations.	*Three (3) events/year* Monitored 1 event at each locations during 3 different events	*DO, pH, temperature, conductivity, turbidity, E. coli, hardness, BOD, TSS; nutrients (nitrate, ammonia, Total P, o-Phos); Total recoverable and dissolved copper, lead and zinc; pesticides*	The co-permittees proposed collection of 30 stormwater samples/year in their DEQ-approved Monitoring Plan, which meets the permit intents per section B)2)e)ii) of the NPDES permit, which would require the total number of data collected in a year to be greater than the product of the monitoring locations and frequency, which would be 9.
Stormwater Monitoring - Mercury	*Two (2) sites:* 1. Inlet to Fairview Creek Water Quality Facility (FCWQF-1) 2. West inlet to Columbia Slough Water Quality Facility (CSWQF-1) 3. East inlet to Columbia Slough Water Quality Facility (CSWQF-2)	Two (2) events/year; one summer event and one winter event	*Mercury (Total Recoverable and Dissolved); Methyl Mercury (Total Recoverable and Dissolved)*	Collected low level mercury and methyl mercury samples in conjunction with Structural BMP monitoring.
Macro-Invertebrate Monitoring	*One (1) site in the Columbia Slough basin:* 1. Fairview Creek @ mobile estates (FCI0) 2. Fairview Creek @ Stark (FCI1) *One (1) site in the Sandy River basin:* 1. Kelly Creek @ Mt. Hood Community College Pond (KCI1) 2. Kelly Creek @ Detention Pond (KCI4) *Two (2) sites in the Johnson Creek subbasin:* 1. Johnson Creek @ Jenne Rd (JCI1) 2. Johnson Creek @ Palmblad (JCI2) 3. Kelley Creek @ Pleasant Valley Grange (KI1) 4. Kelley Creek @ Rodlun Rd (KI2)	One (1) event/year during summer/low flow conditions	*Macroinvertebrates*	Collected at same time as instream water quality data collection occurred in summer 2011.
Structural BMP Monitoring	*One (1) site - inlet and outlet:* 1. Fairview Creek Water Quality Facility (FCWQF-1 and FCWQF-2) 2. Columbia Slough Water Quality Facility (CSWQF-1, CSWQF-2 and CSWQF-3)	*Two (2) events/year through Dec 31, 2013*	*DO, pH, temperature, conductivity, turbidity, E. coli, hardness, BOD, TSS; nutrients (nitrate, ammonia, Total P, o-Phos); Total recoverable and dissolved metals (copper, lead and zinc)*	In 2010-11, collected additional locations and constituents within both regional water quality facilities. These are reported in data summary, but include legacy pesticides, herbicides, VOCs, PAHs, phthalates, particle size distribution and add'l metals

C. Summary of Monitoring Program Results

The data collected in PY 17 are provided in the Appendix. The in-stream data have been compared to the relevant DEQ water quality criteria, and values that do not meet those standards are highlighted. Data from Stormwater (wet weather sampling) and Structural BMP Evaluation monitoring have not been compared to water quality standards because of the mixing that occurs in-stream.

Review of the data collected in PY 17 identified a couple of notable findings.

Instream Monitoring

Instream monitoring results are generally within expected ranges. Some sites were above the temperature standard in August, and some sites had periodic exceedances of the 406 colony forming units (CFU/100ml) E. coli standard. All of these streams currently have TMDLs for both of these pollutants. The lower Kelley Creek location (KI1) is the only site that had a Table 20 metal exceedance (chronic level), which occurred in December. Note that the pH sensor on the City's multi-meter was reading low (and did not meet the post-measurement accuracy criteria), despite being replaced the previous year. The City purchased a new multi-meter prior to beginning 2012-13 sampling.

Continuous Instream Monitoring

The continuous instream monitoring being conducted by USGS is available on their web site. In addition to the data collected at the two USGS gages on Johnson and Fairview Creeks, the City of Gresham also collected continuous temperature data at all of the instream monitoring locations, as well as other locations throughout the Johnson Creek watershed. The continuous temperature data files are too long to include in Appendix C, but summaries of the data collected by Gresham and other Johnson Creek Interjurisdictional Committee members was included in both a presentation to the Urban Ecology Research Consortium Symposium in winter 2012 and the Johnson Creek State of the Watershed report (JCWC 2012). The latter is included in the Appendix of this report.

Stormwater Monitoring

Stormwater monitoring data is similar to the findings of the Kennedy/Jenks stormwater assessment titled, *Compilation and Evaluation of Existing Stormwater Quality Data from Oregon,* prepared for ACWA in December 2009. (This report is available at: http://www.oracwa.org/r-studies-reports.html). Gresham's data reveals higher traffic sites (trips per day) have higher pollutant concentrations for many pollutants (e.g. TSS, total lead, phthalates, benzo(a)pyrene, pentachlorophenol) in comparison to residential streets. Pesticide detections were minimal, with none of the 30 sites having even a detection of 2,4-D (<0.04 ug/L) or glyphosate (<0.025 ug/L), & only 10 of the 30 sites had a detection of pentachlorophenol above 0.04 ug/L. Triclopyr was one of the other pesticides identified as an herbicide of interest in Gresham's pesticide assessment, & all 30 samples were less than the MRL of 0.04 ug/L.

Structural BMP Evaluation & Mercury Monitoring

Structural BMP monitoring during 2011-12 included monitoring inlet and outlet locations at both the Fairview Creek and Columbia Slough regional facilities. A number of additional parameters (see table above) and sampling locations within the regional facilities were included this year as part of a special study that resulted in a Portland State University master's project entitled, "A Performance Assessment of Two Multi-component Stormwater Management Facilities in the Columbia Slough and Fairview Creek Watersheds." Based on a recommendation from that study, the City will likely monitor both facilities again in 2012-13 before determining whether or not to focus on just the Columbia Slough facility. This report is included in the Appendix of this report.

The low level mercury and methyl mercury sampling was conducted as part of the Structural BMP monitoring efforts in order to optimize the scientific value of the data and maximize staff resources. Samples were taken from both the Fairview Creek and Columbia Slough regional facilities. The first suitable event for Structural BMP monitoring occurred during the beginning of November & was used to comply with the seasonal first flush/2 events per year for mercury as described in Schedule B. Table B-1. In addition to the inlet locations, the City also collected outflow samples to determine whether regional facilities with some wetland characteristics to them would change the levels of mercury (particularly methyl mercury). Based on the two events monitored in 2010-11, the results are similar for in/out, and in general, dissolved phase is about half of total phase mercury & methyl mercury. During the second event in March 2012, the City collected a second grab sample & had it analyzed using the same total mercury method used for other monitoring; we will continue to do this during 2012-13 in an effort to compare results between total mercury results obtained using the low level EPA 1631E method versus EPA 200.8.

Macroinvertebrate Sampling

Macroinvertebrates were collected at all of the instream monitoring locations (not Fairview Lake). Results look similar to previous years, with the greatest abundance and highest number of sensitive species being present at the upstream Kelley Creek location (KI2), which is surrounded in large part by undeveloped forested area. Most of the other locations have biological communities that indicate moderate to severe impairment according to the statewide Benthic Index of Biological Integrity (B-IBI).

D. Adaptive Management

No changes to the current monitoring approach are being proposed. The City of Gresham is currently updating its Stormwater Monitoring Plan to go out for public comment in October with the Water Pollution Control Facility permit for Underground Injection Control devices (UICs). The permittees plan to continue using the probabilistic monitoring study design for the 1,100 publicly-owned UICs, in order to meet the stormwater monitoring requirement of the NPDES permit. In order to comply with the pending WPCF permit (draft as of this writing), staff submitted a Stormwater Monitoring Plan. When this plan is approved by DEQ, it will also comply with the MS4 Stormwater Monitoring-Storm Event (wet weather sampling) requirements as described in Schedule B Table B-1. For administrative purposes, the existing Environmental Monitoring Plan will be edited to point to the Stormwater Monitoring Plan for this required element of the MS4 permit.

Water Quality Monitoring Site Locations & Criteria

Instream-Longterm & Macroinvertebrate Site Locations

FCI0	Fairview Creek @ West of Blue Lake Rd in Trailer Park
FCI1	Fairview Creek @ Conifer Park Subdivision, N of Stark
FVL1	Fairview Lake @ Public Dock on NE 217th
JCI1	Johnson Creek @ 174th Ave
JCI2	Johnson Creek @ 252nd (Palmblad) Ave
KI1	Kelley Creek @ Foster Rd. (trib of JC)
KI2	Kelley Creek @ Rodlun Rd (trib of JC)
KCI1	Kelly Creek @ Mt. Hood Community College Pond Outflow
KCI4	Kelly Creek @ Detention Pond Inflow
BCI1	Beaver Creek @ Lower Bridge
BCI2	Beaver Creek @ Division x. Troutdale Rd

Structural BMP Evaluation Monitoring Locations

FCWQF-1	FCWQF inlet
FCWQF-2	FCWQF Outlet
CSWQF-1	CSWQF Stormdrain Creek
CSWQF-2	CSWQF East Inlet
CSWQF-3	CSWQF Outlet

Analysis Coding for the Reported Data

Bold = < than detection value or an Estimated value for bacteria

NA = constituents not sampled due to equipment failure or other extenuating circumstance

Exceedance of TMDL or Water Quality Criteria

Chronic exceedance of metal (Table 20)

Acute exceedance of metal (Table 20)

TMDL Constituent	Water Quality Criteria
Fairview Creek & Lake	
Temperature	No designated salmon and steelhead spawning use. Rearing: 18 C
E. coli	406 organisms/100mL (OAR 340-41)
Phosphorus	0.1549 mg/L (Columbia Slough 1998 TMDL)
Mercury	Aquatic life: 2.4 ug/L acute; 0.012 ug/L chronic. MCL: 2 ug/L
Johnson Creek (including Kelley Creek trib)	
Temperature	Spawning: 13 C (55.4 F) - October 15 to May 15; Rearing 18 C
E. coli	406 organisms/100mL (OAR 340-41)
PCBs	Acute 2.0 ug/L, Chronic 0.014 ug/L (per Table 20)
PAHs	Table 20 lists only water ingestion & fish consumption 2.8 ng - fish consumption only 31.1 ng
Dieldrin	Acute 2.5 ug/L, Chronic 0.0019 ug/L (per Table 20)
DDT	Acute 1.1 ug/L, Chronic 0.001 ug/L (per Table 20)
Mercury	Aquatic life: 2.4 ug/L acute; 0.012 ug/L chronic. MCL: 2 ug/L
Kelly Creek	
Temperature	Spawning: 13 C (55.4 F) - October 15 to May 15; Rearing 18 C
E. coli	406 organisms/100mL (OAR 340-41)

Columbia Slough

Temperature	No designated salmon and steelhead spawning use. Rearing: 18 C
E. coli	406 organisms/100mL (OAR 340-41)
pH	between pH 6.5 - 8.5
DO	No spawning 6.5 mg/L: cool-water aquatic life (avg) 4.0 mg/L: absolute minimum (Columbia Slough TMDL) 5.5 mg/L: warm-water aquatic life
Phosphorus	0.1549 mg/L (Columbia Slough 1998 TMDL)
Chlorophyll-*a*	0.015 mg/L
Pb	Based on hardness, see toxicity values spreadsheet
PCBs	Fish Tissue Acute 2.0 ug/L, Chronic 0.014 ug/L (per Table 20) - not presented in this data set (see note below)
Dieldrin	Fish Tissue Acute 2.5 ug/L, Chronic 0.0019 ug/L (per Table 20) - not presented in this data set (see note below)
DDT/DDE	Fish Tissue Acute 1.1 ug/L, Chronic 0.001 ug/L (per Table 20) - not presented in this data set (see note below)
Dioxins	Fish tissue 0.07 ng/kg (Columbia Slough 1998 TMDL) - not presented in this data set (see note below)
Mercury	Aquatic life: 2.4 ug/L acute; 0.012 ug/L chronic. MCL: 2 ug/L

Non-TMDL WQ Constituents from OAR 340-41 Table 20

Metals	Based on hardness, see toxicity values spreadsheet
pH	Between 6.5-8.5: same for all watersheds in the permit area (OAR 340-41)
DO	Not evaluated, since the criteria are for averages. Cold water aquatic life; spawning: 11 mg/L; nonspawning 8.0 mg/L

728901In-Stream Monitoring Data

Sample ID	Site ID	Date	Time	24-hr Rainfall inches	Field DO mg/L	Field pH	Field Temp C	Conduc-tivity µS/cm	Turbidity NTUs	NH3-N µg/L EPA 300.0 20	BOD5 mg/L SM 5210B 2	Chloro-phyll-a mg/M3 SM 10200H 2	NO3-N µg/L EPA 300.0 100	O-PO4 µg/L EPA 365.1 20	TKN µg/L EPA 351.2 20
W11H011-01	JCI1	8/1/2011	11:23	0.00	6.92	6.81	19.49	123	4.86	38	**2**	**2**	790	28	400
W11H011-02	JCI2	8/1/2011	14:25	0.00	8.43	7.45	19.46	104	7.38	**20**	**2**	2.4	1200	57	410
W11H011-03	JCI2-FD	8/1/2011		0.00	*	*	*	*	*	**20**	**2**	**2**	1200	57	450
W11H027-01	KI1	8/2/2011	13:50	0.00	4.91	7.16	16.94	164	6.65	57	**2**	35	960	167	620
W11H027-02	KI2	8/2/2011	15:15	0.00	8.77	7.72	14.58	175	6.57	**20**	**2**	**2**	510	**20**	230
W11H045-01	KCI1	8/3/2011	14:00	0.00	6.73	7.44	22.05	164	4.85	28	2	**2**	2500	20	640
W11H045-02	KCI4	8/3/2011	9:45	0.00	7.44	7.54	15.2	193	32.8	59	**2**	**2**	240	**20**	530
W11H057-01	FCI0	8/4/2011	12:20	0.00	7.51	7.78	20.56	197	3.22	**20**	**2**	**2**	1300	46	280
W11H057-02	FCI1	8/4/2011	10:00	0.00	8.83	6.85	14.45	183	6.74	**20**	**2**	**2**	2700	67	**200**
W11H058-01	FVL1	8/4/2011	12:00	0.0	7.89	9.20	25.33	187	6.53	47	**2**	**2**	**100**	181	600
W11H083-01	BCI1	8/8/2011	10:30	0.00	8.91	7.63	15.95	210	2.15	40	**2**	**2**	1500	39	510
W11H083-02	BCI2	8/8/2011	13:45	0.00	9.91	7.98	17.88	138	5.52	**20**	**2**	**2**	1600	54	**200**
W11J217-09	BCI1	10/25/2011	13:45	0.00	13.62	7.64	10.08	184	3.57	**20**	**2**	**2**	1400	55	240
W11J217-11	BCI1-DUP	10/25/2011		0.00	*	*	*	*	*	**20**	**2**	**2**	1400	56	200
W11J217-10	BCI2	10/25/2011	12:50	0.00	15.31	7.62	7.91	121	3.24	**20**	**2**	**2**	270	29	310
W11J217-01	FCI0	10/25/2011	14:34	0.00	15.11	7.99	10.65	202	1.9	**20**	**2**	**2**	920	45	300
W11J217-02	FCI1	10/25/2011	14:55	0.00	13.45	7.61	12.35	235	10.7	**20**	**2**	**2**	1400	67	**200**
W11J218-01	FVL1	10/25/2011	14:15	0.0	16.61	9.45	13.45	222	2.58	**20**	**2**	**2**	**100**	68	320
W11J217-03	JCI1	10/25/2011	10:15	0.00	9.11	7.13	10.16	130	5.63	26	**2**	**2**	520	29	350
W11J217-04	JCI2	10/25/2011	11:25	0.00	13.04	7.71	7.78	100	5.53	**20**	**2**	**2**	730	**20**	270
W11J217-05	KCI1	10/25/2011	13:15	0.00	12.16	7.18	11.8	117	10.4	522	2	**2**	410	39	800
W11J217-06	KCI4	10/25/2011	12:30	0.00	11.16	7.49	8.73	137	6.86	**20**	**2**	**2**	450	**20**	280
W11J217-07	KI1	10/25/2011	10:35	0.00	7.95	7.52	9.18	149	7.36	195	**2**	**2**	400	132	580
W11J217-08	KI2	10/25/2011	10:55	0.00	12.63	7.67	7.58	189	6.96	**20**	**2**	**2**	370	**20**	**200**
W12A272-09	BCI1	1/31/2012	12:20	0.01	9.76	6.99	7.93	89	14.9	**20**	**2**	*	2700	**20**	380
W12A272-10	BCI2	1/31/2012	11:00	0.01	10.48	6.71	7.41	72	16.4	21	**2**	*	2900	**20**	290
W12A272-01	FCI0	1/31/2012	13:05	0.01	10.56	6.58*	7.94	120	9.98	**20**	**2**	*	1300	27	310
W12A272-02	FCI1	1/31/2012	13:20	0.01	8.94	6.82*	10.03	130	5.77	**20**	**2**	*	2000	47	320
	FVL1	1/31/2012	12:50	0.0	9.55	7.05	8.68	148	10.9	99	2	*	950	41	660
W12A272-03	JCI1	1/31/2012	9:25	0.01	10.96	5.78*	7.51	69	17.9	**20**	**2**	*	2500	**20**	270
W12A272-04	JCI2	1/31/2012	10:20	0.01	10.77	6.51*	7.51	61	15.7	**20**	**2**	*	3000	**20**	300
W12A272-05	KCI1	1/31/2012	11:20	0.01	10.62	6.85	8.06	100	17.3	39	**2**	*	1900	**20**	350
W12A272-11	KCI1-DUP	1/31/2012		0.01	*	*	*	*	*	37	**2**	*	1900	**20**	380
W12A272-06	KCI4	1/31/2012	10:45	0.01	9.75	6.7	7.46	100	8.23	31	**2**	*	2600	**20**	380
W12A272-07	KI1	1/31/2012	9:45	0.01	10.54	6.9	6.98	72	7.68	25	**2**	*	1300	**20**	300
W12A272-08	KI2	1/31/2012	10:00	0.01	10.68	7.15	7.4	71	6.78	**20**	**2**	*	2200	**20**	290
W12D211-09	BCI1	4/24/2012	13:00	0.00	8.34	6.53*	14.6	115	3.34	**20**	**2**	*	1600	**20**	210
W12D211-10	BCI2	4/24/2012	11:20	0.00	8.93	5.95*	13.8	79	4.82	**20**	**2**	*	1900	**20**	260
W12D211-01	FCI0	4/24/2012	13:40	0.00	8.8	6.72	15.31	159	6.3	**20**	**2**	*	1600	30	350
W12D211-02	FCI1	4/24/2012	14:00	0.00	7.81	6.28*	12.8	170	2.26	**20**	**2**	*	2500	72	**200**
W12D212-01	FVL1	4/24/2012	13:25	0.0	8.38	7.86	20.48	200	42.4	25	9	*	**100**	**20**	2010
W12D211-03	JCI1	4/24/2012	9:45	0.00	9.02	6.03*	14.14	80	6.75	**20**	**2**	*	1600	**20**	260
W12D211-04	JCI2	4/24/2012	10:40	0.00	9.15	5.95*	12.93	66	6.92	**20**	**2**	*	1900	**20**	250
W12D211-05	KCI1	4/24/2012	11:35	0.00	8.35	6.16*	14.72	137	4.68	30	**2**	*	1100	**20**	390
W12D211-06	KCI4	4/24/2012	11:00	0.00	8.37	5.84*	12.56	118	6.11	34	**2**	*	1100	**20**	270
W12D211-07	KI1	4/24/2012	10:00	0.00	8.12	6.15*	12.74	90	4.86	23	**2**	*	680	**20**	260
W12D211-11	KI1-DUP	4/24/2012		0.00	*	*	*	*	*	25	**2**	*	670	**20**	340
W12D211-08	KI2	4/24/2012	10:15	0.00	10.32	5.64*	10	82	8.17	**20**	**2**	*	1400	**20**	**200**

728901In-Stream Monitoring Data

Sample ID	Site ID	Date	Time	Total-P µg/L EPA 365.4 30	TSS mg/L SM 2540D 2	Hardness mg CaCO3/L SM 2340B CAI 1	Hg-Total µg/L EPA 200.8 0.002	Cu-Dissolved µg/L EPA 200.8 0.2	Pb-Dissolved µg/L EPA 200.8 0.1	Zn-Dissolved µg/L EPA 200.8 0.5	Cu-Total µg/L EPA 200.8 0.2	Pb-Total µg/L EPA 200.8 0.1	Zn-Total µg/L EPA 200.8 0.5	E. coli MPN/100ml SM 9223B 10
W11H011-01	JCI1	8/1/2011	11:23	70	4	49.9	**0.0020**	1.1	**0.10**	3.02	1.42	0.217	4.91	210
W11H011-02	JCI2	8/1/2011	14:25	108	5	36.3	0.0022	1.33	**0.10**	0.796	1.74	0.246	2.24	430
W11H011-03	JCI2-FD	8/1/2011		106	4	37.1	0.0022	1.35	**0.10**	0.686	1.74	0.250	2.24	430
W11H027-01	KI1	8/2/2011	13:50	295	4	60.1	0.0022	1.69	**0.10**	1.14	2.36	0.202	2.6	300
W11H027-02	KI2	8/2/2011	15:15	51	17	77.3	**0.0020**	0.341	**0.10**	1.16	0.98	0.130	3.8	120
W11H045-01	KCI1	8/3/2011	14:00	109	7	78.1	0.0038	2.06	**0.10**	4.2	2.78	0.593	14.0	640
W11H045-02	KCI4	8/3/2011	9:45	80	3	67.9	**0.0020**	2.29	0.124	3.83	2.20	0.310	6.6	31
W11H057-01	FCI0	8/4/2011	12:20	69	6	83.5	**0.0020**	0.721	**0.10**	0.917	0.98	0.250	2.5	250
W11H057-02	FCI1	8/4/2011	10:00	82	3	74.2	0.0022	0.346	**0.10**	2.39	1.41	0.270	1.3	720
W11H058-01	FVL1	8/4/2011	12:00	241	7	82.50	**0.00200**	0.967	**0.100**	**0.50**	0.518	0.318	3.3	3100
W11H083-01	BCI1	8/8/2011	10:30	86	**2**	48.9	0.0021	1.46	**0.10**	0.663	1.86	**0.100**	1.4	20
W11H083-02	BCI2	8/8/2011	13:45	79	**2**	87.1	**0.0020**	0.778	**0.10**	0.984	0.88	**0.100**	1.5	20
W11J217-09	BCI1	10/25/2011	13:45	76	**2**	80.4	**0.0020**	0.728	**0.10**	1.46	0.95	**0.100**	2.44	10
W11J217-11	BCI1-DUP	10/25/2011		76	4	78.5	**0.0020**	0.731	**0.10**	1.44	0.84	**0.100**	1.86	10
W11J217-10	BCI2	10/25/2011	12:50	61	**2**	43.5	**0.0020**	0.861	**0.10**	**0.50**	1.00	**0.100**	0.82	84
W11J217-01	FCI0	10/25/2011	14:34	63	**2**	87.5	**0.0020**	0.476	**0.10**	1.04	0.67	0.189	2.17	190
W11J217-02	FCI1	10/25/2011	14:55	101	8	108	**0.0020**	0.446	**0.10**	1.64	1.48	0.608	5.32	500
W11J218-01	FVL1	10/25/2011	14:15	91	3	109.00	**0.00200**	0.789	**0.100**	**0.50**	1.04	0.115	0.824	31
W11J217-03	JCI1	10/25/2011	10:15	71	3	51	**0.0020**	1.12	**0.10**	2.65	1.36	0.198	4.06	86
W11J217-04	JCI2	10/25/2011	11:25	49	**2**	35	**0.0020**	0.869	**0.10**	1.08	1.05	0.157	1.37	130
W11J217-05	KCI1	10/25/2011	13:15	87	**2**	44.4	**0.0020**	1.36	0.149	14.8	1.71	0.208	17.90	**10**
W11J217-06	KCI4	10/25/2011	12:30	33	**2**	57.6	**0.0020**	0.813	**0.10**	38.9	1.11	**0.100**	48.70	31
W11J217-07	KI1	10/25/2011	10:35	221	**2**	59.2	**0.0020**	0.819	**0.10**	1.25	1.07	0.167	2.20	460
W11J217-08	KI2	10/25/2011	10:55	32	8	84.6	0.0063	0.29	**0.10**	1.04	0.83	0.348	6.65	**10**
W12A272-09	BCI1	1/31/2012	12:20	59	6	36.4	0.0028	0.78	**0.10**	3.15	1.280	0.299	6.03	**10**
W12A272-10	BCI2	1/31/2012	11:00	55	6	27.6	0.0023	0.477	**0.10**	1.16	1.020	0.290	3.53	160
W12A272-01	FCI0	1/31/2012	13:05	70	4	59	**0.0020**	0.839	**0.10**	4.43	1.460	0.473	7.96	10
W12A272-02	FCI1	1/31/2012	13:20	92	2	55.9	**0.0020**	0.899	**0.10**	9.44	1.260	0.332	10.70	41
	FVL1	1/31/2012	12:50	127	11	68.9	0.00222	0.969	**0.100**	4.28	1.7	0.403	9.98	**10**
W12A272-03	JCI1	1/31/2012	9:25	48	8	25.9	0.0026	0.588	**0.10**	3.01	1.220	0.412	5.69	74
W12A272-04	JCI2	1/31/2012	10:20	42	5	21.7	0.0023	0.529	**0.10**	2.19	0.915	0.320	3.93	98
W12A272-05	KCI1	1/31/2012	11:20	70	2	42.3	0.0031	1.3	**0.10**	10.8	1.860	0.362	15.40	260
W12A272-11	KCI1-DUP	1/31/2012		73	4	41.9	0.0027	1.22	**0.10**	10.2	1.920	0.386	15.10	220
W12A272-06	KCI4	1/31/2012	10:45	35	**2**	41.5	**0.0020**	0.847	**0.10**	3	1.120	0.116	3.76	770
W12A272-07	KI1	1/31/2012	9:45	51	2	26.6	0.0022	0.745	**0.10**	3.6	1.210	4.640	4.17	280
W12A272-08	KI2	1/31/2012	10:00	**30**	3	28	**0.0020**	0.379	**0.10**	3.91	0.624	0.149	5.24	31
W12D211-09	BCI1	4/24/2012	13:00	42	2	44	**0.0020**	0.369	**0.100**	0.961	0.900	**0.100**	2.33	52
W12D211-10	BCI2	4/24/2012	11:20	36	**2**	28.3	**0.0020**	0.692	**0.100**	**0.5**	0.793	**0.100**	1.24	130
W12D211-01	FCI0	4/24/2012	13:40	72	11	65.8	**0.0020**	0.684	**0.100**	1.31	1.290	0.529	6.29	170
W12D211-02	FCI1	4/24/2012	14:00	85	**2**	**65.5**	**0.0020**	0.419	**0.100**	3.98	0.581	0.178	4.70	52
W12D212-01	FVL1	4/24/2012	13:25	306	59	99.70	0.00320	0.83	**0.100**	**0.50**	2.41	0.94	7.53	41
W12D211-03	JCI1	4/24/2012	9:45	35	2	28.2	0.0020	0.569	**0.100**	2.08	0.852	0.158	3.26	120
W12D211-04	JCI2	4/24/2012	10:40	32	**2**	21.9	**0.0020**	0.501	**0.100**	0.859	0.716	0.130	1.79	290
W12D211-05	KCI1	4/24/2012	11:35	46	**2**	53.6	**0.0020**	1.06	**0.100**	6.54	1.320	0.119	9.55	86
W12D211-06	KCI4	4/24/2012	11:00	**30**	**2**	46.4	**0.0020**	0.735	**0.100**	1.66	0.938	**0.100**	2.45	20
W12D211-07	KI1	4/24/2012	10:00	44	**2**	32.6	**0.0020**	0.637	**0.100**	1.71	0.797	0.103	2.48	330
W12D211-11	KI1-DUP	4/24/2012		46	**2**	33.6	**0.0020**	0.626	**0.100**	1.71	0.792	0.101	2.47	340
W12D211-08	KI2	4/24/2012	10:15	**30**	4	30.8	**0.0020**	0.367	**0.100**	2.38	0.647	0.184	4.86	20

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Sample ID	Site ID	Date	Time	4,4'-DDD ng/L EPA 8081 0.5-various	4,4'-DDE ng/L EPA 8081 0.5-various	4,4'-DDT ng/L EPA 8081 0.5-various	Aldrin ng/L EPA 8081 0.5-various	Alpha-BHC ng/L EPA 8081 0.5-various	beta-BHC ng/L EPA 8081 0.5-various	gamma-BHC ng/L EPA 8081 0.5-various	delta-BHC ng/L EPA 8081 0.5-various	Dieldrin ng/L EPA 8081 0.5-various	Endosulfan I ng/L EPA 8081 0.5-various	Endosulfan II ng/L EPA 8081 0.5-various
W11H011-01	JCI1	8/1/2011	11:23	0.77	**0.49**	**0.49**	**0.49**	**0.49**	**0.49**	**0.49**	**0.49**	2.1	**0.49**	**0.49**
W11H011-02	JCI2	8/1/2011	14:25	**0.50**	8.3	**3.5**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	4.6	**0.50**	**0.64**
W11H011-03	JCI2-FD	8/1/2011		**0.50**	**0.50**	4.2	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	5.1	**0.50**	1.2
W11H027-01	KI1	8/2/2011	13:50	*	*	*	*	*	*	*	*	*	*	*
W11H027-02	KI2	8/2/2011	15:15	*	*	*	*	*	*	*	*	*	*	*
W11H045-01	KCI1	8/3/2011	14:00	*	*	*	*	*	*	*	*	*	*	*
W11H045-02	KCI4	8/3/2011	9:45	*	*	*	*	*	*	*	*	*	*	*
W11H057-01	FCI0	8/4/2011	12:20	*	*	*	*	*	*	*	*	*	*	*
W11H057-02	FCI1	8/4/2011	10:00	*	*	*	*	*	*	*	*	*	*	*
W11H058-01	FVL1	8/4/2011	12:00	*	*	*	*	*	*	*	*	*	*	*
W11H083-01	BCI1	8/8/2011	10:30	*	*	*	*	*	*	*	*	*	*	*
W11H083-02	BCI2	8/8/2011	13:45	*	*	*	*	*	*	*	*	*	*	*
W11J217-09	BCI1	10/25/2011	13:45	*	*	*	*	*	*	*	*	*	*	*
W11J217-11	BCI1-DUP	10/25/2011		*	*	*	*	*	*	*	*	*	*	*
W11J217-10	BCI2	10/25/2011	12:50	*	*	*	*	*	*	*	*	*	*	*
W11J217-01	FCI0	10/25/2011	14:34	*	*	*	*	*	*	*	*	*	*	*
W11J217-02	FCI1	10/25/2011	14:55	*	*	*	*	*	*	*	*	*	*	*
W11J218-01	FVL1	10/25/2011	14:15	*	*	*	*	*	*	*	*	*	*	*
W11J217-03	JCI1	10/25/2011	10:15	**0.50**	0.32	**0.50**	**0.50**	**0.50**	1.1	**0.50**	**0.50**	1.2	**0.50**	**0.50**
W11J217-04	JCI2	10/25/2011	11:25	0.26	0.44	**0.50**	**0.50**	**0.50**	1.3	**0.5**	1.0	3.0	**0.50**	0.38
W11J217-05	KCI1	10/25/2011	13:15	*	*	*	*	*	*	*	*	*	*	*
W11J217-06	KCI4	10/25/2011	12:30	*	*	*	*	*	*	*	*	*	*	*
W11J217-07	KI1	10/25/2011	10:35	*	*	*	*	*	*	*	*	*	*	*
W11J217-08	KI2	10/25/2011	10:55	*	*	*	*	*	*	*	*	*	*	*
W12A272-09	BCI1	1/31/2012	12:20	*	*	*	*	*	*	*	*	*	*	*
W12A272-10	BCI2	1/31/2012	11:00	*	*	*	*	*	*	*	*	*	*	*
W12A272-01	FCI0	1/31/2012	13:05	*	*	*	*	*	*	*	*	*	*	*
W12A272-02	FCI1	1/31/2012	13:20	*	*	*	*	*	*	*	*	*	*	*
	FVL1	1/31/2012	12:50	*	*	*	*	*	*	*	*	*	*	*
W12A272-03	JCI1	1/31/2012	9:25	**0.50**	1.1	1.2	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	4	**0.50**	**0.50**
W12A272-04	JCI2	1/31/2012	10:20	**0.50**	1	1.2	0.17	**0.50**	**0.50**	**0.50**	**0.50**	4.7	**0.50**	**0.50**
W12A272-05	KCI1	1/31/2012	11:20	*	*	*	*	*	*	*	*	*	*	*
W12A272-11	KCI1-DUP	1/31/2012		*	*	*	*	*	*	*	*	*	*	*
W12A272-06	KCI4	1/31/2012	10:45	*	*	*	*	*	*	*	*	*	*	*
W12A272-07	KI1	1/31/2012	9:45	*	*	*	*	*	*	*	*	*	*	*
W12A272-08	KI2	1/31/2012	10:00	*	*	*	*	*	*	*	*	*	*	*
W12D211-09	BCI1	4/24/2012	13:00	*	*	*	*	*	*	*	*	*	*	*
W12D211-10	BCI2	4/24/2012	11:20	*	*	*	*	*	*	*	*	*	*	*
W12D211-01	FCI0	4/24/2012	13:40	*	*	*	*	*	*	*	*	*	*	*
W12D211-02	FCI1	4/24/2012	14:00	*	*	*	*	*	*	*	*	*	*	*
W12D212-01	FVL1	4/24/2012	13:25	*	*	*	*	*	*	*	*	*	*	*
W12D211-03	JCI1	4/24/2012	9:45	0.22	**0.5**	**0.55**	**0.50**	0.32	**0.50**	**0.50**	**0.50**	3.3	**0.50**	**0.50**
W12D211-04	JCI2	4/24/2012	10:40	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	3.8	**0.50**	**0.50**
W12D211-05	KCI1	4/24/2012	11:35	*	*	*	*	*	*	*	*	*	*	*
W12D211-06	KCI4	4/24/2012	11:00	*	*	*	*	*	*	*	*	*	*	*
W12D211-07	KI1	4/24/2012	10:00	*	*	*	*	*	*	*	*	*	*	*
W12D211-11	KI1-DUP	4/24/2012		*	*	*	*	*	*	*	*	*	*	*
W12D211-08	KI2	4/24/2012	10:15	*	*	*	*	*	*	*	*	*	*	*

728901In-Stream Monitoring Data

Sample ID	Site ID	Date	Time	Endosulfan Sulfate ng/L EPA 8081 0.5-various	Endrin ng/L EPA 8081 0.5-various	Endrin Aldehyde ng/L EPA 8081 0.5-various	Endrin Ketone ng/L EPA 8081 0.5-various	Heptachlor ng/L EPA 8081 0.5-various	Methoxychlor ng/L EPA 8081 0.5-various	Other 8081 ng/L EPA 8081 0.5-various
W11H011-01	JCI1	8/1/2011	11:23	2	0.69	0.73	0.65	**0.49**	0.8	**0.49**
W11H011-02	JCI2	8/1/2011	14:25	5.5	**0.50**	**2.20**	**0.50**	**2.9**	**0.50**	**0.50**
W11H011-03	JCI2-FD	8/1/2011		5.0	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**
W11H027-01	KI1	8/2/2011	13:50	*	*	*	*	*	*	*
W11H027-02	KI2	8/2/2011	15:15	*	*	*	*	*	*	*
W11H045-01	KCI1	8/3/2011	14:00	*	*	*	*	*	*	*
W11H045-02	KCI4	8/3/2011	9:45	*	*	*	*	*	*	*
W11H057-01	FCI0	8/4/2011	12:20	*	*	*	*	*	*	*
W11H057-02	FCI1	8/4/2011	10:00	*	*	*	*	*	*	*
W11H058-01	FVL1	8/4/2011	12:00	*	*	*	*	*	*	*
W11H083-01	BCI1	8/8/2011	10:30	*	*	*	*	*	*	*
W11H083-02	BCI2	8/8/2011	13:45	*	*	*	*	*	*	*
W11J217-09	BCI1	10/25/2011	13:45	*	*	*	*	*	*	*
W11J217-11	BCI1-DUP	10/25/2011		*	*	*	*	*	*	*
W11J217-10	BCI2	10/25/2011	12:50	*	*	*	*	*	*	*
W11J217-01	FCI0	10/25/2011	14:34	*	*	*	*	*	*	*
W11J217-02	FCI1	10/25/2011	14:55	*	*	*	*	*	*	*
W11J218-01	FVL1	10/25/2011	14:15	*	*	*	*	*	*	*
W11J217-03	JCI1	10/25/2011	10:15	**3.00**	**0.50**	**1.00**	**0.50**	1.7	**0.50**	**0.50**
W11J217-04	JCI2	10/25/2011	11:25	1.4	**0.50**	0.73	**0.50**	**0.72**	**0.50**	**0.50**
W11J217-05	KCI1	10/25/2011	13:15	*	*	*	*	*	*	*
W11J217-06	KCI4	10/25/2011	12:30	*	*	*	*	*	*	*
W11J217-07	KI1	10/25/2011	10:35	*	*	*	*	*	*	*
W11J217-08	KI2	10/25/2011	10:55	*	*	*	*	*	*	*
W12A272-09	BCI1	1/31/2012	12:20	*	*	*	*	*	*	*
W12A272-10	BCI2	1/31/2012	11:00	*	*	*	*	*	*	*
W12A272-01	FCI0	1/31/2012	13:05	*	*	*	*	*	*	*
W12A272-02	FCI1	1/31/2012	13:20	*	*	*	*	*	*	*
	FVL1	1/31/2012	12:50	*	*	*	*	*	*	*
W12A272-03	JCI1	1/31/2012	9:25	0.55	**0.50**	**2.00**	**0.50**	**0.50**	**0.50**	**0.50**
W12A272-04	JCI2	1/31/2012	10:20	0.56	**0.50**	**2.00**	**0.50**	**0.50**	**0.50**	**0.50**
W12A272-05	KCI1	1/31/2012	11:20	*	*	*	*	*	*	*
W12A272-11	KCI1-DUP	1/31/2012		*	*	*	*	*	*	*
W12A272-06	KCI4	1/31/2012	10:45	*	*	*	*	*	*	*
W12A272-07	KI1	1/31/2012	9:45	*	*	*	*	*	*	*
W12A272-08	KI2	1/31/2012	10:00	*	*	*	*	*	*	*
W12D211-09	BCI1	4/24/2012	13:00	*	*	*	*	*	*	*
W12D211-10	BCI2	4/24/2012	11:20	*	*	*	*	*	*	*
W12D211-01	FCI0	4/24/2012	13:40	*	*	*	*	*	*	*
W12D211-02	FCI1	4/24/2012	14:00	*	*	*	*	*	*	*
W12D212-01	FVL1	4/24/2012	13:25	*	*	*	*	*	*	*
W12D211-03	JCI1	4/24/2012	9:45	0.99	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**
W12D211-04	JCI2	4/24/2012	10:40	0.8	0.63	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**
W12D211-05	KCI1	4/24/2012	11:35	*	*	*	*	*	*	*
W12D211-06	KCI4	4/24/2012	11:00	*	*	*	*	*	*	*
W12D211-07	KI1	4/24/2012	10:00	*	*	*	*	*	*	*
W12D211-11	KI1-DUP	4/24/2012		*	*	*	*	*	*	*
W12D211-08	KI2	4/24/2012	10:15	*	*	*	*	*	*	*

Analysis Coding for the Reported
Bold = < than detection value or an
NA = constituents not sampled due
Exceedance of TMDL or Water
Chronic exceedance of metal (Table 20)
Acute exceedance of metal (Table 20)

06-040BMP Effectiveness Monitoring-Fairview Creek and Columbia Slough Water Quality Facilities

Sample ID	Site ID	Date	Time	24-hr Rainfall inches	NH3-N mg/L EPA 300.0	BOD5 mg/L SM 5210B	NO3-N mg/L EPA 300.0	O-PO4 mg/L EPA 365.1	TKN mg/L EPA 351.2	Total-P mg/L EPA 365.4	TSS mg/L SM 2540D	Hardness mg CaCO3/L SM 2340B CAL	Hg-Total ug/L EPA 200.8	Hg-Dissolved ug/L EPA 1631E	Hg-Total ug/L EPA 1631E	MeHg-Dissolved ug/L EPA 1630
					20	2	100	20	20	30	2	1	0.002	0.0005	0.0005	0.00005
W11K032-18	CSWQF-1	11/3/2011	1:00	0.69										0.00122	0.00235	**0.00005**
W11K032-07	CSWQF-1	11/3/2011	3:00	0.69												
W11K032-17	CSWQF-1	11/2-11/3/2(	comp	0.69	54	3	280	39	35	79	6	12.3	*			
W11K032-20	CSWQF-2	11/3/2011	1:00	0.69										0.00094	0.00165	**0.00005**
W11K032-08	CSWQF-2	11/3/2011	3:00	0.69												
W11K032-19	CSWQF-2	11/2-11/3/2(	comp	0.69	38	2	240	21	36	57	5	17.7	*			
W11K032-21	CSWQF-3	11/3/2011	1:00	0.69										0.00166	0.00324	**0.00005**
W11K046-08	CSWQF-3	11/3/2011	10:00	0.69												
W11K046-09	CSWQF-3	11/3/2011	16:00	0.69												
W11K046-03	CSWQF-3	11/2-11/3/2(	comp	0.69	27	3	550	53	39	99	12	29.8	*			
W11K032-10	FCWQF-1	11/2/2011	22:00	0.69										0.00251	0.00424	**0.00005**
W11K032-01	FCWQF-1	11/2/2011	23:30	0.69												
W11K032-02	FCWQF-1	11/3/2011	2:00	0.69												
W11K032-09	FCWQF-1	11/2-11/3/2(	comp	0.69	83	6	**100**	39	52	114	16	7.37	*			
W11K032-15	FCWQF-2	11/3/2011	2:00	0.69										0.00274	0.00339	**0.00005**
W11K046-04	FCWQF-2	11/3/2011	8:00	0.69												
W11K046-05	FCWQF-2	11/3/2011	14:00	0.69												
W11K046-01	FCWQF-2	11/2-11/3/2(	comp	0.69	**20**	3	**100**	30	43	88	6	11.6	*			
W11K032-12	FCWQF-3	11/2/2011	22:00	0.69										0.00237	0.00417	**0.00005**
W11K032-03	FCWQF-3	11/2/2011	23:30	0.69												
W11K032-04	FCWQF-3	11/3/2011	2:00	0.69												
W11K032-11	FCWQF-3	11/2-11/3/2(	comp	0.69	75	7	**100**	40	52	105	11	7.51	*			
W11K032-16	FCWQF-4	11/3/2011	2:00	0.69										0.00171	0.00288	**0.00005**
W11K046-06	FCWQF-4	11/3/2011	8:00	0.69												
W11K046-07	FCWQF-4	11/3/2011	14:00	0.69												
W11K046-02	FCWQF-4	11/2-11/3/2(	comp	0.69	**20**	4	**100**	30	44	88	6	11.9	*			
W11K032-14	FCWQF-5	11/2/2011	22:30	0.69										*	*	*
W11K032-05	FCWQF-5	11/2/2011	23:30	0.69												
W11K032-06	FCWQF-5	11/3/2011	2:00	0.69												
W11K032-13	FCWQF-5	11/2-11/3/2(	comp	0.69	96	6	**100**	41	51	100	28	6.99	*			
W11K032-23	Field Blank	11/3/2011	2:30	0.69												
W11K032-22	Trip Blank	11/3/2011	0:00	0.69											**0.0005**	
W12C039-05	CSWQF-1	3/5/2012	comp	0.36	51	3	750	**20**	560	120	20	33.1				
W12C029-05	CSWQF-1	3/5/2012	11:20	0.36										0.00170	0.00370	0.00011
W12C029-22	CSWQF-1	3/5/2012	11:20	0.36									0.00518			
W12C029-06	CSWQF-1-1	3/5/2012	12:00	0.36												
W12C029-14	CSWQF-1-2	3/5/2012	13:30	0.36												
W12C039-17	CSWQF-1-3	3/5/2012	15:30	0.36												
W12C039-06	CSWQF-2	3/5/2012	comp	0.36	39	2	450	**20**	610	140	20	30.9				
W12C029-07	CSWQF-2	3/5/2012	11:20	0.36										0.00140	0.00410	0.00013
W12C029-23	CSWQF-2	3/5/2012	11:20	0.36									0.00366			
W12C029-08	CSWQF-2-1	3/5/2012	12:00	0.36												
W12C029-15	CSWQF-2-2	3/5/2012	13:30	0.36												
W12C039-18	CSWQF-2-3	3/5/2012	15:30	0.36												
W12C039-07	CSWQF-3	3/5-3/6/12	comp	0.36	35	**2**	780	**20**	380	77	6	35				
W12C029-11	CSWQF-3	3/5/2012	12:15	0.36										0.00066	0.00210	0.000049
W12C029-24	CSWQF-3	3/5/2012	12:15	0.36									**0.00200**			
W12C039-19	CSWQF-3-1	3/5/2012	16:30	0.36												

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Sample ID	Site ID	MeHg-Total ug/L EPA 1630	TOC mg/L SM 5310C	Sb-Diss ug/L EPA 200.8	As-Diss ug/L EPA 200.8	Cd-Diss ug/L EPA 200.8	Cu-Dissolved ug/L EPA 200.8	Pb-Dissolved ug/L EPA 200.8	Ni-Dissolved ug/L EPA 200.8	Zn-Dissolved ug/L EPA 200.8	Sb-Total ug/L EPA 200.8	As-Total ug/L EPA 200.8	Cd-Total ug/L EPA 200.8	Cu-Total ug/L EPA 200.8	Pb-Total ug/L EPA 200.8	Ni-Total ug/L EPA 200.8
		0.00005	1				0.2	0.1	0.5	0.5				0.2	0.1	0.2
W11K032-18	CSWQF-1	0.000085	1.55													
W11K032-07	CSWQF-1															
W11K032-17	CSWQF-1						1.82	0.237	**0.50**	26.9	0.319	0.332	0.124	3.33	1.26	0.617
W11K032-20	CSWQF-2	0.000077	**1.0**													
W11K032-08	CSWQF-2															
W11K032-19	CSWQF-2						1.7	**0.10**	**0.50**	26	0.337	0.316	0.13	3.38	0.864	0.622
W11K032-21	CSWQF-3	0.000088	2.55													
W11K046-08	CSWQF-3															
W11K046-09	CSWQF-3															
W11K046-03	CSWQF-3						2.01	0.114	**0.50**	17.3	0.346	0.39	**0.100**	3.3	1.22	0.69
W11K032-10	FCWQF-1	0.000110	2.48													
W11K032-01	FCWQF-1															
W11K032-02	FCWQF-1															
W11K032-09	FCWQF-1						2.27	0.135	**0.50**	27.5	0.400	0.380	**0.100**	4.67	2.26	0.805
W11K032-15	FCWQF-2	0.000079	3.12													
W11K046-04	FCWQF-2															
W11K046-05	FCWQF-2															
W11K046-01	FCWQF-2						2.35	**0.10**	**0.50**	32.2	0.3	0.345	**0.100**	3.4	0.647	0.579
W11K032-12	FCWQF-3	0.000100	2.46													
W11K032-03	FCWQF-3															
W11K032-04	FCWQF-3															
W11K032-11	FCWQF-3						2.37	0.14	**0.50**	26.7	0.375	0.377	**0.100**	4.65	1.38	0.724
W11K032-16	FCWQF-4	0.000072	2.86													
W11K046-06	FCWQF-4															
W11K046-07	FCWQF-4															
W11K046-02	FCWQF-4						2.49	**0.10**	**0.50**	30.2	0.287	0.365	**0.100**	3.48	0.476	0.5
W11K032-14	FCWQF-5	*	3.1													
W11K032-05	FCWQF-5															
W11K032-06	FCWQF-5															
W11K032-13	FCWQF-5						2.24	0.133	**0.50**	25.8	0.407	0.421	**0.100**	5.2	1.9	0.855
W11K032-23	Field Blank	**0.000050**														
W11K032-22	Trip Blank	**0.000050**														
W12C039-05	CSWQF-1		3.07	0.298	0.301	**0.100**	2.22	0.135	**0.50**	40.2	0.512	0.448	0.148	5.08	2.39	1
W12C029-05	CSWQF-1	0.000220														
W12C029-22	CSWQF-1															
W12C029-06	CSWQF-1-1															
W12C029-14	CSWQF-1-2															
W12C039-17	CSWQF-1-3															
W12C039-06	CSWQF-2		2.12	0.382	0.256	0.103	1.96	**0.100**	**0.50**	70.8	0.62	0.418	0.191	4.78	1.97	1.13
W12C029-07	CSWQF-2	0.000280														
W12C029-23	CSWQF-2															
W12C029-08	CSWQF-2-1															
W12C029-15	CSWQF-2-2															
W12C039-18	CSWQF-2-3															
W12C039-07	CSWQF-3		3.21	0.326	0.244	**0.100**	2	**0.100**	**0.50**	32.3	0.469	0.348	**0.100**	3.79	1.28	0.663
W12C029-11	CSWQF-3	0.000084														
W12C029-24	CSWQF-3															
W12C039-19	CSWQF-3-1															

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Sample ID	Site ID	Zn-Total ug/L EPA 200.8	Chloroform ug/L EPA 8260	Other VOCs ug/L EPA 8260	E. coli MPN/100ml SM 9223B	Particle Size Distribution PartSize	PartSize	PartSize	PartSize	PartSize	PartSize	PartSize	PartSize	Acenaphthene mg/L PA 8270-SI	Acenaphthylene mg/L PA 8270-SI	Anthracene mg/L PA 8270-SI	Benzo(a)anthracene mg/L PA 8270-SI	Benzo(a)pyrene mg/L PA 8270-SI
		0.5	0.2	0.2	10	1-2 um/100 mL	2-5 um/100ml	5-15 um/100ml	15-25 um/100ml	25-50 um/100ml	50-100 um/100 ml	>100 um/100ml	Total	0.02	0.02	0.02	0.01	0.01
W11K032-18	CSWQF-1				1400													
W11K032-07	CSWQF-1				1500													
W11K032-17	CSWQF-1	34.9	ND	ND		44320000	18800000	9980000	1400000	900000	380000	70000	75900000	ND	ND	ND	0.012	0.011
W11K032-20	CSWQF-2				86													
W11K032-08	CSWQF-2				98													
W11K032-19	CSWQF-2	34.7	ND	ND		30520000	18100000	14100000	2100000	950000	310000	**20000**	66100000	ND	ND	ND	ND	ND
W11K032-21	CSWQF-3				1300													
W11K046-08	CSWQF-3				1000													
W11K046-09	CSWQF-3				180													
W11K046-03	CSWQF-3	25.5	ND	ND		49870000	16870000	12200000	3020000	1880000	530000	160000	84500000	ND	ND	ND	ND	ND
W11K032-10	FCWQF-1				2600													
W11K032-01	FCWQF-1				4400													
W11K032-02	FCWQF-1				3900													
W11K032-09	FCWQF-1	43.3	ND	ND		20370000	17700000	17500000	3690000	2160000	330000	40000	61800000	ND	ND	ND	ND	ND
W11K032-15	FCWQF-2				3900													
W11K046-04	FCWQF-2				2000													
W11K046-05	FCWQF-2				1100													
W11K046-01	FCWQF-2	36.5	ND	ND		29990000	17540000	16300000	3470000	2400000	750000	40000	70500000	ND	ND	ND	ND	ND
W11K032-12	FCWQF-3				5200													
W11K032-03	FCWQF-3				3700													
W11K032-04	FCWQF-3				1900													
W11K032-11	FCWQF-3	41.8	ND	ND		35220000	23100000	18300000	3740000	1800000	590000	100000	82800000	ND	ND	ND	0.015	0.023
W11K032-16	FCWQF-4				3900													
W11K046-06	FCWQF-4				1700													
W11K046-07	FCWQF-4				1300													
W11K046-02	FCWQF-4	35.7	ND	ND		51570000	29190000	22250000	4100000	2760000	1100000	170000	111000000	ND	ND	ND	ND	ND
W11K032-14	FCWQF-5				3300													
W11K032-05	FCWQF-5				3400													
W11K032-06	FCWQF-5				1600													
W11K032-13	FCWQF-5	46.2	ND	ND		45710000	23640000	18300000	3260000	1950000	730000	200000	93800000	ND	ND	ND	ND	ND
W11K032-23	Field Blank																	
W11K032-22	Trip Blank																	
W12C039-05	CSWQF-1	66.6				50314000	41830000	41140000	8870000	4590000	830000	100000	148000000	ND	ND	ND	0.017	0.015
W12C029-05	CSWQF-1		ND	ND														
W12C029-22	CSWQF-1																	
W12C029-06	CSWQF-1-1				2300													
W12C029-14	CSWQF-1-2				930													
W12C039-17	CSWQF-1-3				1200													
W12C039-06	CSWQF-2	102				97600000	60960000	32560000	3800000	1100000	100000	40000	196000000	ND	ND	ND	ND	0.013
W12C029-07	CSWQF-2		ND	ND														
W12C029-23	CSWQF-2																	
W12C029-08	CSWQF-2-1				85													
W12C029-15	CSWQF-2-2				52													
W12C039-18	CSWQF-2-3				10													
W12C039-07	CSWQF-3	46.8				42470000	29580000	24730000	4730000	1850000	370000	10000	104000000	ND	ND	ND	ND	ND
W12C029-11	CSWQF-3		ND	ND														
W12C029-24	CSWQF-3																	
W12C039-19	CSWQF-3-1				860													

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Sample ID	Site ID	Benzo(b)fluoranthene mg/L	Benzo(ghi)perylene mg/L	Benzo(k)fluoranthene mg/L	Chrysene mg/L	Dibenzo(a,h)anthracene mg/L	Fluoranthene mg/L	Fluorene mg/L	Indeno(1,2,3-cd)pyrene mg/L	Naphthalene mg/L	Phenanthrene mg/L	Pyrene mg/L	Butyl benzyl phthalate mg/L	Di-n-butyl phthalate mg/L	Di-n-octyl phthalate mg/L	Diethyl phthalate mg/L	Dimethyl phthalate mg/L	Bis(2-ethylhexyl) phthalate mg/L	4,4'-DDD ng/L
		EPA 8270-SIM	EPA 8270-SIM	EPA 8270-SIM	EPA 8270-SIM	EPA 8270-SIM	EPA 8270-SIM	EPA 8270-SIM	EPA 8270-SIM	EPA 8270-SIM	EPA 8270-SIM	EPA 8270-SIM	EPA 8270-SIM	EPA 8270-SIM	EPA 8270-SIM	EPA 8270-SIM	EPA 8270-SIM	EPA 8270-SIM	EPA 8081
		0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.04	0.02	0.01	1	1	1	1	1	1	1.9
W11K032-18	CSWQF-1																		
W11K032-07	CSWQF-1																		
W11K032-17	CSWQF-1	0.027	0.024	ND	0.027	ND	0.029	ND	0.013	ND	0.041	0.047	ND	ND	ND	ND	ND	1.3	ND
W11K032-20	CSWQF-2																		
W11K032-08	CSWQF-2																		
W11K032-19	CSWQF-2	ND	ND	ND	ND	ND	0.011	ND	ND	0.042	0.027	0.018	ND	ND	ND	ND	ND	1.1	ND
W11K032-21	CSWQF-3																		
W11K046-08	CSWQF-3																		
W11K046-09	CSWQF-3																		
W11K046-03	CSWQF-3	0.011	0.011	ND	0.011	ND	0.013	ND	ND	0.042	0.022	0.019	ND	ND	ND	ND	ND	ND	ND
W11K032-10	FCWQF-1																		
W11K032-01	FCWQF-1																		
W11K032-02	FCWQF-1																		
W11K032-09	FCWQF-1	0.015	0.027	ND	0.015	ND	0.035	ND	ND	0.041	0.039	0.039	ND	ND	ND	ND	ND	1.6	ND
W11K032-15	FCWQF-2																		
W11K046-04	FCWQF-2																		
W11K046-05	FCWQF-2																		
W11K046-01	FCWQF-2	ND	ND	ND	ND	ND	0.012	ND	ND	ND	ND	0.017	ND	ND	ND	ND	ND	ND	ND
W11K032-12	FCWQF-3																		
W11K032-03	FCWQF-3																		
W11K032-04	FCWQF-3																		
W11K032-11	FCWQF-3	0.038	0.043	0.013	0.031	ND	0.072	ND	0.021	0.041	0.052	0.063	ND	ND	ND	ND	ND	1.8	ND
W11K032-16	FCWQF-4																		
W11K046-06	FCWQF-4																		
W11K046-07	FCWQF-4																		
W11K046-02	FCWQF-4	ND	ND	ND	ND	ND	0.012	ND	ND	ND	ND	0.017	ND	ND	ND	ND	ND	1	ND
W11K032-14	FCWQF-5																		
W11K032-05	FCWQF-5																		
W11K032-06	FCWQF-5																		
W11K032-13	FCWQF-5	0.017	0.033	ND	0.018	ND	0.039	ND	0.01	0.049	0.041	0.045	ND	ND	ND	ND	ND	1.3	ND
W11K032-23	Field Blank																		
W11K032-22	Trip Blank																		
W12C039-05	CSWQF-1	0.029	0.034	ND	0.027	ND	0.038	ND	0.015	ND	0.037	0.071	ND	ND	ND	ND	ND	1.2	ND
W12C029-05	CSWQF-1																		
W12C029-22	CSWQF-1																		
W12C029-06	CSWQF-1-1																		
W12C029-14	CSWQF-1-2																		
W12C039-17	CSWQF-1-3																		
W12C039-06	CSWQF-2	0.021	0.027	ND	0.019	ND	0.045	ND	0.013	ND	0.043	**0.053**	ND	ND	ND	ND	ND	1.5	ND
W12C029-07	CSWQF-2																		
W12C029-23	CSWQF-2																		
W12C029-08	CSWQF-2-1																		
W12C029-15	CSWQF-2-2																		
W12C039-18	CSWQF-2-3																		
W12C039-07	CSWQF-3	0.011	0.013	ND	0.01	ND	0.017	ND	ND	0.051	0.02	0.031	ND	ND	ND	ND	ND	ND	ND
W12C029-11	CSWQF-3																		
W12C029-24	CSWQF-3																		
W12C039-19	CSWQF-3-1																		

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Sample ID	Site ID	4,4'-DDE ng/L EPA 8081	4,4'-DDT ng/L EPA 8081	Aldrin ng/L EPA 8081	Alpha-BHC ng/L EPA 8081	Gamma-BHC (Lindane) ng/L EPA 8081	Dieldrin ng/L EPA 8081	Endosulfan I ng/L EPA 8081	Endosulfan II ng/L EPA 8081	Endosulfan Sulfate ng/L EPA 8081	Endrin ng/L EPA 8081	Endrin Aldehyde ng/L EPA 8081	Endrin Ketone ng/L EPA 8081	Heptachlor ng/L EPA 8081	Methoxychlor ng/L EPA 8081	Other 8081 ng/L EPA 8081	2,4,5-T mg/L EPA 515.3	2,4-D mg/L EPA 515.3	2,4-DB mg/L EPA 515.3
		0.52	0.78	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.02	0.02	0.09
W11K032-18	CSWQF-1																		
W11K032-07	CSWQF-1																		
W11K032-17	CSWQF-1	ND	ND	0.64	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.19	ND
W11K032-20	CSWQF-2																		
W11K032-08	CSWQF-2																		
W11K032-19	CSWQF-2	ND	ND	0.17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0975	ND
W11K032-21	CSWQF-3																		
W11K046-08	CSWQF-3																		
W11K046-09	CSWQF-3																		
W11K046-03	CSWQF-3	ND	ND	0.35	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.114	ND
W11K032-10	FCWQF-1																		
W11K032-01	FCWQF-1																		
W11K032-02	FCWQF-1																		
W11K032-09	FCWQF-1	ND	ND	ND	0.66	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.314	ND
W11K032-15	FCWQF-2																		
W11K046-04	FCWQF-2																		
W11K046-05	FCWQF-2																		
W11K046-01	FCWQF-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.42	ND
W11K032-12	FCWQF-3																		
W11K032-03	FCWQF-3																		
W11K032-04	FCWQF-3																		
W11K032-11	FCWQF-3	ND	ND	ND	0.61	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.305	ND
W11K032-16	FCWQF-4																		
W11K046-06	FCWQF-4																		
W11K046-07	FCWQF-4																		
W11K046-02	FCWQF-4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.527	ND
W11K032-14	FCWQF-5																		
W11K032-05	FCWQF-5																		
W11K032-06	FCWQF-5																		
W11K032-13	FCWQF-5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.227	ND
W11K032-23	Field Blank																		
W11K032-22	Trip Blank																		
W12C039-05	CSWQF-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.2	ND	ND	ND	0.18	ND
W12C029-05	CSWQF-1																		
W12C029-22	CSWQF-1																		
W12C029-06	CSWQF-1-1																		
W12C029-14	CSWQF-1-2																		
W12C039-17	CSWQF-1-3																		
W12C039-06	CSWQF-2	ND	ND	ND	ND	ND	ND	0.27	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
W12C029-07	CSWQF-2																		
W12C029-23	CSWQF-2																		
W12C029-08	CSWQF-2-1																		
W12C029-15	CSWQF-2-2																		
W12C039-18	CSWQF-2-3																		
W12C039-07	CSWQF-3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	ND	0.68	ND	ND	ND	0.11	ND
W12C029-11	CSWQF-3																		
W12C029-24	CSWQF-3																		
W12C039-19	CSWQF-3-1																		

06-040BMP Effectiveness Monitoring-Fairview Creek and Columbia Slough Water Quality Facilities

Sample ID	Site ID	2,4,5-TP (Silvex) mg/L EPA 515.3	Acifluorfen mg/L EPA 515.3	Bentazon mg/L EPA 515.3	Dicamba mg/L EPA 515.3	Picloram mg/L EPA 515.3	Dichlorprop mg/L EPA 515.3	Dinoseb mg/L EPA 515.3	Pentachlorophenol mg/L EPA 515.3	3,5-Dichlorobenzoic acid mg/L EPA 515.3
		0.02	0.03	0.07	0.03	0.07	0.03	0.02	0.02	0.07
W11K032-18	CSWQF-1									
W11K032-07	CSWQF-1									
W11K032-17	CSWQF-1		ND	ND	ND	ND	ND	ND	0.138	ND
W11K032-20	CSWQF-2									
W11K032-08	CSWQF-2									
W11K032-19	CSWQF-2		ND	ND	ND	ND	ND	ND	0.0769	ND
W11K032-21	CSWQF-3									
W11K046-08	CSWQF-3									
W11K046-09	CSWQF-3									
W11K046-03	CSWQF-3		ND	ND	ND	ND	ND	ND	0.0581	ND
W11K032-10	FCWQF-1									
W11K032-01	FCWQF-1									
W11K032-02	FCWQF-1									
W11K032-09	FCWQF-1		ND	ND	ND	ND	ND	ND	0.159	ND
W11K032-15	FCWQF-2									
W11K046-04	FCWQF-2									
W11K046-05	FCWQF-2									
W11K046-01	FCWQF-2		ND	ND	ND	ND	ND	ND	0.0852	ND
W11K032-12	FCWQF-3									
W11K032-03	FCWQF-3									
W11K032-04	FCWQF-3									
W11K032-11	FCWQF-3		ND	ND	ND	ND	ND	ND	0.113	ND
W11K032-16	FCWQF-4									
W11K046-06	FCWQF-4									
W11K046-07	FCWQF-4									
W11K046-02	FCWQF-4		ND	ND	ND	ND	ND	ND	0.09	ND
W11K032-14	FCWQF-5									
W11K032-05	FCWQF-5									
W11K032-06	FCWQF-5									
W11K032-13	FCWQF-5		ND	ND	ND	ND	ND	ND	0.119	ND
W11K032-23	Field Blank									
W11K032-22	Trip Blank									
W12C039-05	CSWQF-1	ND	ND	ND	ND	ND	ND	ND	0.13	ND
W12C029-05	CSWQF-1									
W12C029-22	CSWQF-1									
W12C029-06	CSWQF-1-1									
W12C029-14	CSWQF-1-2									
W12C039-17	CSWQF-1-3									
W12C039-06	CSWQF-2	ND	ND	ND	ND	ND	ND	ND	0.045	ND
W12C029-07	CSWQF-2									
W12C029-23	CSWQF-2									
W12C029-08	CSWQF-2-1									
W12C029-15	CSWQF-2-2									
W12C039-18	CSWQF-2-3									
W12C039-07	CSWQF-3	ND	ND	ND	ND	ND	ND	ND	0.081	ND
W12C029-11	CSWQF-3									
W12C029-24	CSWQF-3									
W12C039-19	CSWQF-3-1									

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Sample ID	Site ID	Date	Time	24-hr Rainfall inches	NH3-N mg/L EPA 300.0	BOD5 mg/L SM 5210B	NO3-N mg/L EPA 300.0	O-PO4 mg/L EPA 365.1	TKN mg/L EPA 351.2	Total-P mg/L EPA 365.4	TSS mg/L SM 2540D	Hardness mg CaCO3/L SM 2340B CAL	Hg-Total ug/L EPA 200.8	Hg-Dissolved ug/L EPA 1631E	Hg-Total ug/L EPA 1631E	MeHg-Dissolved ug/L EPA 1630
					20	2	100	20	20	30	2	1	0.002	0.0005	0.0005	0.00005
W12C039-20	CSWQF-3-2	3/5/2012	22:30	0.36												
W12C039-21	CSWQF-3-3	3/6/2012	4:30	0.36												
W12C039-01	FCWQF-1	3/5/2012	comp	0.36	114	6	430	**20**	650	95	28	17.7				
W12C029-01	FCWQF-1	3/5/2012	11:00	0.36										0.00260	0.00520	0.00011
W12C029-18	FCWQF-1	3/5/2012	11:00	0.36									0.00758			
W12C029-02	FCWQF-1-1	3/5/2012	12:00	0.36												
W12C029-12	FCWQF-1-2	3/5/2012	13:30	0.36												
W12C039-09	FCWQF-1-3	3/5/2012	15:00	0.36												
W12C039-02	FCWQF-2	3/5-3/6/12	comp	0.36	96	2	220	**20**	440	65	9	14				
W12C029-09	FCWQF-2	3/5/2012	12:00	0.36										0.00078	0.00340	0.000061
W12C029-19	FCWQF-2	3/5/2012	12:00	0.36									0.00223			
W12C039-10	FCWQF-2-1	3/5/2012	16:00	0.36												
W12C039-11	FCWQF-2-2	3/5/2012	22:00	0.36												
W12C039-12	FCWQF-2-3	3/6/2012	4:00	0.36												
W12C039-03	FCWQF-3	3/5/2012	comp	0.36	114	5	470	**20**	770	108	28	18.4				
W12C029-03	FCWQF-3	3/5/2012	11:00	0.36										0.00280	0.00460	0.00014
W12C029-20	FCWQF-3	3/5/2012	11:00	0.36									0.00471			
W12C029-04	FCWQF-3-1	3/5/2012	12:00	0.36												
W12C029-13	FCWQF-3-2	3/5/2012	13:30	0.36												
W12C039-13	FCWQF-3-3	3/5/2012	15:00	0.36												
W12C039-04	FCWQF-4	3/5-3/6/12	comp	0.36	124	3	280	**20**	470	72	7	14.5				
W12C029-10	FCWQF-4	3/5/2012	12:00	0.36										0.00180	0.00360	0.00012
W12C029-21	FCWQF-4	3/5/2012	12:00	0.36									0.00329			
W12C039-14	FCWQF-4-1	3/5/2012	16:00	0.36												
W12C039-15	FCWQF-4-2	3/5/2012	22:00	0.36												
W12C039-16	FCWQF-4-3	3/6/2012	4:00	0.36												
W12C039-08	FCWQF-5	3/5/2012	comp	0.36	72	3	**100**	**20**	660	118	36	9.57				
W12C039-22	FCWQF-5-1	3/5/2012	12:30	0.36												
W12C039-23	FCWQF-5-2	3/5/2012	13:00	0.36												
W12C029-16	FD	3/5/2012												0.00260	0.00470	0.00010
W12C029-17	Blank	3/5/2012													0.00016	

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Sample ID	Site ID	MeHg-Total ug/L EPA 1630	TOC mg/L SM 5310C	Sb-Diss ug/L EPA 200.8	As-Diss ug/L EPA 200.8	Cd-Diss ug/L EPA 200.8	Cu-Dissolved ug/L EPA 200.8	Pb-Dissolved ug/L EPA 200.8	Ni-Dissolved ug/L EPA 200.8	Zn-Dissolved ug/L EPA 200.8	Sb-Total ug/L EPA 200.8	As-Total ug/L EPA 200.8	Cd-Total ug/L EPA 200.8	Cu-Total ug/L EPA 200.8	Pb-Total ug/L EPA 200.8	Ni-Total ug/L EPA 200.8
		0.00005	1				0.2	0.1	0.5	0.5				0.2	0.1	0.2
W12C039-20	CSWQF-3-2															
W12C039-21	CSWQF-3-3															
W12C039-01	FCWQF-1		5.79	0.329	0.234	**0.100**	3.1	0.112	**0.50**	37	0.614	0.421	**0.100**	7.27	2.61	1.21
W12C029-01	FCWQF-1	0.000240														
W12C029-18	FCWQF-1															
W12C029-02	FCWQF-1-1															
W12C029-12	FCWQF-1-2															
W12C039-09	FCWQF-1-3															
W12C039-02	FCWQF-2		3.24	0.21	0.191	**0.100**	1.72	**0.100**	**0.50**	27.8	0.331	0.292	**0.100**	3.17	1.21	0.665
W12C029-09	FCWQF-2	0.000140														
W12C029-19	FCWQF-2															
W12C039-10	FCWQF-2-1															
W12C039-11	FCWQF-2-2															
W12C039-12	FCWQF-2-3															
W12C039-03	FCWQF-3		7.31	0.325	0.245	**0.100**	3.16	0.115	**0.50**	36.8	0.568	0.394	**0.100**	6.45	2.36	1.14
W12C029-03	FCWQF-3	0.000250														
W12C029-20	FCWQF-3															
W12C029-04	FCWQF-3-1															
W12C029-13	FCWQF-3-2															
W12C039-13	FCWQF-3-3															
W12C039-04	FCWQF-4		3.56	0.219	0.198	**0.100**	1.89	**0.100**	**0.50**	27.2	0.312	0.291	**0.100**	3.13	0.901	0.599
W12C029-10	FCWQF-4	0.000270														
W12C029-21	FCWQF-4															
W12C039-14	FCWQF-4-1															
W12C039-15	FCWQF-4-2															
W12C039-16	FCWQF-4-3															
W12C039-08	FCWQF-5		2.33	0.184	0.232	**0.100**	2.21	**0.100**	**0.50**	22.8	0.487	0.437	**0.100**	5.79	3.32	1.15
W12C039-22	FCWQF-5-1															
W12C039-23	FCWQF-5-2															
W12C029-16	FD	0.000300														
W12C029-17	Blank	0.000010														

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Sample ID	Site ID	Zn-Total ug/L EPA 200.8	Chloroform ug/L EPA 8260	Other VOCs ug/L EPA 8260	E. coli MPN/100ml SM 9223B	Particle Size Distribution PartSize	PartSize	PartSize	PartSize	PartSize	PartSize	PartSize	PartSize	Acenaphthene mg/L PA 8270-SI	Acenaphthylene mg/L PA 8270-SI	Anthracene mg/L PA 8270-SI	Benzo(a)anthracene mg/L PA 8270-SI	Benzo(a)pyrene mg/L PA 8270-SI
		0.5	0.2	0.2	10	1-2 um/100 mL	2-5 um/100ml	5-15 um/100ml	15-25 um/100ml	25-50 um/100ml	50-100 um/100 ml	>100 um/100ml	Total	0.02	0.02	0.02	0.01	0.01
W12C039-20	CSWQF-3-2				930													
W12C039-21	CSWQF-3-3				1000													
W12C039-01	FCWQF-1	66.5				36930000	25540000	23260000	3870000	1800000	870000	100000	92400000	**ND**	**ND**	**ND**	0.018	0.019
W12C029-01	FCWQF-1		ND	ND														
W12C029-18	FCWQF-1																	
W12C029-02	FCWQF-1-1				800													
W12C029-12	FCWQF-1-2				750													
W12C039-09	FCWQF-1-3				500													
W12C039-02	FCWQF-2	37.8				54470000	29820000	22430000	3270000	1400000	350000	50000	112000000	**ND**	**ND**	**ND**	**ND**	0.012
W12C029-09	FCWQF-2		2.52	ND (other than chloroform)														
W12C029-19	FCWQF-2																	
W12C039-10	FCWQF-2-1				550													
W12C039-11	FCWQF-2-2				480													
W12C039-12	FCWQF-2-3				170													
W12C039-03	FCWQF-3	61.9				35480000	27480000	23150000	4090000	1600000	380000	70000	92300000	**ND**	**ND**	**ND**	0.017	0.016
W12C029-03	FCWQF-3		ND	ND														
W12C029-20	FCWQF-3																	
W12C029-04	FCWQF-3-1				1400													
W12C029-13	FCWQF-3-2				680													
W12C039-13	FCWQF-3-3				740													
W12C039-04	FCWQF-4	36.5				26690000	25880000	20840000	2880000	1000000	100000	20000	77400000	**ND**	**ND**	**ND**	**ND**	**ND**
W12C029-10	FCWQF-4		4.08	ND (other than chloroform)														
W12C029-21	FCWQF-4																	
W12C039-14	FCWQF-4-1				770													
W12C039-15	FCWQF-4-2				600													
W12C039-16	FCWQF-4-3				330													
W12C039-08	FCWQF-5	51.4				23610000	21170000	22610000	4940000	2620000	850000	180000	76000000	**ND**	**ND**	**ND**	0.039	0.057
W12C039-22	FCWQF-5-1				960													
W12C039-23	FCWQF-5-2				560													
W12C029-16	FD		ND	ND														
W12C029-17	Blank																	

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Sample ID	Site ID	Benzo(b)fluoranthene mg/L	Benzo(ghi)perylene mg/L	Benzo(k)fluoranthene mg/L	Chrysene mg/L	Dibenzo(a,h)anthracene mg/L	Fluoranthene mg/L	Fluorene mg/L	Indeno(1,2,3-cd)pyrene mg/L	Naphthalene mg/L	Phenanthrene mg/L	Pyrene mg/L	Butyl benzyl phthalate mg/L	Di-n-butyl phthalate mg/L	Di-n-octyl phthalate mg/L	Diethyl phthalate mg/L	Dimethyl phthalate mg/L	Bis(2-ethylhexyl) phthalate mg/L	4,4'-DDD ng/L
		PA 8270-SI	PA 8270-SI	PA 8270-SI	PA 8270-SI	PA 8270-SI	PA 8270-SI	PA 8270-SI	PA 8270-SI	PA 8270-SI	PA 8270-SI	PA 8270-SI	PA 8270-SI	PA 8270-SI	PA 8270-SI	PA 8270-SI	PA 8270-SI	PA 8270-SI	EPA 8081
		0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.04	0.02	0.01	1	1	1	1	1	1	1.9
W12C039-20	CSWQF-3-2																		
W12C039-21	CSWQF-3-3																		
W12C039-01	FCWQF-1	0.031	0.057	**ND**	0.031	**ND**	0.086	0.021	0.019	0.04	0.057	0.11	**ND**	**ND**	**ND**	**ND**	**ND**	2.2	**ND**
W12C029-01	FCWQF-1																		
W12C029-18	FCWQF-1																		
W12C029-02	FCWQF-1-1																		
W12C029-12	FCWQF-1-2																		
W12C039-09	FCWQF-1-3																		
W12C039-02	FCWQF-2	0.018	0.026	**ND**	0.015	**ND**	0.037	**ND**	0.012	**ND**	0.027	**0.045**	**ND**	**ND**	**ND**	**ND**	**ND**	1	**ND**
W12C029-09	FCWQF-2																		
W12C029-19	FCWQF-2																		
W12C039-10	FCWQF-2-1																		
W12C039-11	FCWQF-2-2																		
W12C039-12	FCWQF-2-3																		
W12C039-03	FCWQF-3	0.029	0.049	0.01	0.029	**ND**	0.075	0.02	0.017	**ND**	0.05	0.086	**ND**	**ND**	**ND**	**ND**	**ND**	1.8	**ND**
W12C029-03	FCWQF-3																		
W12C029-20	FCWQF-3																		
W12C029-04	FCWQF-3-1																		
W12C029-13	FCWQF-3-2																		
W12C039-13	FCWQF-3-3																		
W12C039-04	FCWQF-4	**ND**	0.017	**ND**	**ND**	**ND**	0.024	**ND**	**ND**	**ND**	0.024	0.03	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
W12C029-10	FCWQF-4																		
W12C029-21	FCWQF-4																		
W12C039-14	FCWQF-4-1																		
W12C039-15	FCWQF-4-2																		
W12C039-16	FCWQF-4-3																		
W12C039-08	FCWQF-5	0.11	0.12	0.03	0.085	0.017	0.19	0.021	0.059	0.049	0.098	0.19	**ND**	**ND**	**ND**	**ND**	**ND**	2.8	**ND**
W12C039-22	FCWQF-5-1																		
W12C039-23	FCWQF-5-2																		
W12C029-16	FD																		
W12C029-17	Blank																		

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Sample ID	Site ID	4,4'-DDE ng/L EPA 8081	4,4'-DDT ng/L EPA 8081	Aldrin ng/L EPA 8081	Alpha-BHC ng/L EPA 8081	Gamma-BHC (Lindane) ng/L EPA 8081	Dieldrin ng/L EPA 8081	Endosulfan I ng/L EPA 8081	Endosulfan II ng/L EPA 8081	Endosulfan Sulfate ng/L EPA 8081	Endrin ng/L EPA 8081	Endrin Aldehyde ng/L EPA 8081	Endrin Ketone ng/L EPA 8081	Heptachlor ng/L EPA 8081	Methoxychlor ng/L EPA 8081	Other 8081 ng/L EPA 8081	2,4,5-T mg/L EPA 515.3	2,4-D mg/L EPA 515.3	2,4-DB mg/L EPA 515.3
		0.52	0.78	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.02	0.02	0.09
W12C039-20	CSWQF-3-2																		
W12C039-21	CSWQF-3-3																		
W12C039-01	FCWQF-1	ND	ND	ND	ND	1.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.15	ND
W12C029-01	FCWQF-1																		
W12C029-18	FCWQF-1																		
W12C029-02	FCWQF-1-1																		
W12C029-12	FCWQF-1-2																		
W12C039-09	FCWQF-1-3																		
W12C039-02	FCWQF-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.2	ND	ND	ND	ND	ND	ND	ND
W12C029-09	FCWQF-2																		
W12C029-19	FCWQF-2																		
W12C039-10	FCWQF-2-1																		
W12C039-11	FCWQF-2-2																		
W12C039-12	FCWQF-2-3																		
W12C039-03	FCWQF-3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
W12C029-03	FCWQF-3																		
W12C029-20	FCWQF-3																		
W12C029-04	FCWQF-3-1																		
W12C029-13	FCWQF-3-2																		
W12C039-13	FCWQF-3-3																		
W12C039-04	FCWQF-4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.6	ND	ND	ND	ND	ND	ND	ND
W12C029-10	FCWQF-4																		
W12C029-21	FCWQF-4																		
W12C039-14	FCWQF-4-1																		
W12C039-15	FCWQF-4-2																		
W12C039-16	FCWQF-4-3																		
W12C039-08	FCWQF-5	ND	0.62	ND	ND	ND	ND	ND	0.47	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
W12C039-22	FCWQF-5-1																		
W12C039-23	FCWQF-5-2																		
W12C029-16	FD																		
W12C029-17	Blank																		

06-040BMP Effectiveness Monitoring-Fairview Creek and Columbia Slough Water Quality Facilities

Sample ID	Site ID	2,4,5-TP (Silvex) mg/L EPA 515.3	Acifluorfen mg/L EPA 515.3	Bentazon mg/L EPA 515.3	Dicamba mg/L EPA 515.3	Picloram mg/L EPA 515.3	Dichlorprop mg/L EPA 515.3	Dinoseb mg/L EPA 515.3	Pentachlorophenol mg/L EPA 515.3	3,5-Dichlorobenzoic acid mg/L EPA 515.3
		0.02	0.03	0.07	0.03	0.07	0.03	0.02	0.02	0.07
W12C039-20	CSWQF-3-2									
W12C039-21	CSWQF-3-3									
W12C039-01	FCWQF-1	ND	ND	ND	ND	ND	ND	ND	0.21	ND
W12C029-01	FCWQF-1									
W12C029-18	FCWQF-1									
W12C029-02	FCWQF-1-1									
W12C029-12	FCWQF-1-2									
W12C039-09	FCWQF-1-3									
W12C039-02	FCWQF-2	ND	ND	ND	ND	ND	ND	ND	0.13	ND
W12C029-09	FCWQF-2									
W12C029-19	FCWQF-2									
W12C039-10	FCWQF-2-1									
W12C039-11	FCWQF-2-2									
W12C039-12	FCWQF-2-3									
W12C039-03	FCWQF-3	ND	ND	ND	ND	ND	ND	ND	0.18	ND
W12C029-03	FCWQF-3									
W12C029-20	FCWQF-3									
W12C029-04	FCWQF-3-1									
W12C029-13	FCWQF-3-2									
W12C039-13	FCWQF-3-3									
W12C039-04	FCWQF-4	ND	ND	ND	ND	ND	ND	ND	0.095	ND
W12C029-10	FCWQF-4									
W12C029-21	FCWQF-4									
W12C039-14	FCWQF-4-1									
W12C039-15	FCWQF-4-2									
W12C039-16	FCWQF-4-3									
W12C039-08	FCWQF-5	ND	ND	ND	ND	ND	ND	ND	ND	ND
W12C039-22	FCWQF-5-1									
W12C039-23	FCWQF-5-2									
W12C029-16	FD									
W12C029-17	Blank									

728901Macroinvertebrate Monitoring Data

Order	Family	Genus	species	Life stage or condition	FCI0	FCI1	JCI1	JCI2	KCI1	KCI4	KI1	KI2	BCI1	BCI2
					8/4/2011	8/4/2011	8/1/2011	8/1/2011	8/3/2011	8/3/2011	8/2/2011	8/2/2011	8/8/2011	8/8/2011
Acari					4	23	3	14	1	50	32	7		4
Amphipoda				immature	29	9			51		0		3	
		Crangonyx							9	12	1			
		Hyalella						1						
Collembola														
Copepoda					1	2		2		4	7	3	1	
Decopoda	Astacidae	Pacifasticus			1	LR	2	1	LR		LR		LR	
Hirudinea									LR	4				LR
Hydra					1	1			1	1	1			1
Isopoda					1	1							LR	
Mollusca	Ancylidae			no shell					80				6	
		Ferressia			25		5	5			2			4
	Corbiculidae	Corbicula			7		3							
	Hydrobiidae	Fluminicola			155		8				5		163	2
		Gyraulus										7		5
		Pristinicola												
	Lymnaeidae									1		1		
	Margaritanidae	Margaritifera												
	Physidae	Physa							LR					1
	Pleuroceridae	Juga			37	551	189	357	323		261	17	59	313
	Sphaeriidae				27	46		1	14	24	56	12		LR
Nematoda					45	10	15	67	2	55	30	3	18	12
Oligochaeta					25	291	126	48	103	172	124	23	34	46
Ostracoda												5		3
Turbellaria	Planariidae						1	LR	5	15	2	61		12
	Baetidae	Baetis		immature	4	67	19	80	47	3	0	5	214	87
		Baetis	tricaudatus		17	43	10	29	13	1	42	1	156	8
		Diphetor	hageni				4	47			3	3		
		Pseudocloeon												
Ephemeroptera	Heptageniidae			immature								4		
		Cinymga										LR		
		Epeours		immature								3		
		Heptagenia										1		
		Ironodes										LR		
	Leptophlebidae	Paraleptophlebia					17	64		8	115	35	10	8
Plecoptera	Capniidae			immature								1		
	Chloroperlidae	Sweltsa										30		
	Leuctridae			immature								12		
		Perlomyia												
	Perlodidae	Skwala										3		
	Nemouridae	Malenka										22		
		Soyedina										5		
		Zapada	cinctipes					5				159		
	Pteronarcyidae	Pternonarcella										1		
Coleoptera	Elmidae			immature	75			2						1
		Cleptelmis		adult							1			
		Lara			6		1	3				1		
		Optioservus		larva	7			7			11	LR		
				adult	7			3					1	1
		Heterlimnus		larva										
		Heterlimnus		adult										
		Narpus		larva										
		Narpus		adult								LR		
		Zaitzevia		larva										
				adult				1						
	Dytiscidae			adult							LR			
	Halipidae	Peltodytes		adult		LR								
	Hydrophilidae			adult						LR	LR	LR		LR
				larva						1				
Lepidoptera	Pyralidae								1					LR
Odonata	Zygoptera			Immature					1					
	Coenagrionidae	Agria			1									
Megaloptera		Sialis			2							1		
Neuroptera	Sisyridae						2							
Trichoptera				pupa					LR				LR	
	Glossosomatidae			immature										
				pupa								3		
		Glossosoma										7		
	Hydroptilidae			immature	1	10								
				pupa		23							3	
		Hydroptila				3							15	
	Hydropsychidae			immature			84	48	6		0		1	
				pupa			1		1				LR	
		Cheumatopsyche				2	113	49	33		33		18	
		Parapysche										1		
	Lepidostomatidae			pupa		1								
		Lepidostoma			3	8					3	3		
	Limnephilidae	Cryptochia												
		Ecclisocosmoecus												
		Onocosmoecus			LR									
		Pseudostenphylax										1		
		Psychoglypha				LR				LR		LR		
	Philopotamidae	Wormaldia										11		
	Rhyacophilidae	Rhyacophila		immature								8		
				pupa								LR		
		Rhyacophila	betteni									2		
		Rhyacophila	narvae									1		
	Uenoidae	Neophylax										LR		
Diptera				immature										
	Ceratopogoninae							LR		1		8		
	Forcipomyinae											4		
	Chironomidae			larva	46	267	124	266	50	444	430	280	233	232
				pupa	1	11	5	7	3	2	32		24	7
	Dixidae			pupa										
		Dixa										17		
	Empididae			immature								2		
				pupa	1	2	LR		LR	LR			LR	2
		Chelifera				3	1	3			LR		1	2
		Clinocera				3				2	1		2	LR
		Neoplasta				3		LR	LR	10	3			LR
		Hemerdromia			1									
	Pelecorhynidae	Glutops										3		
	Pyschodidae	Pericoma								1				
	Simuliidae			immature		49	3	17	2		0		56	23
				pupa		6					1		2	
		Simulium				4			LR		32	LR	2	2
	Thaumaleidae											1		
	Tipulidae	Dicanota						3		5	LR	14		
		Hexatoma										1		
		Limnophila										2		
		Limonia						4	LR	5	LR			
		Orsomia												
		Tipula				LR		1		2	8	1	LR	
				Total	530	1439	736	1135	746	823	1236	796	1022	776
LR = Large and rare species	"Large and rare" macroinvertebrates are those that are >0.5 inches (>12.7mm) long and occur infrequently in the grid used for sub-sampling.													

Multnomah County TMDL Implementation Plan
for the Lower Willamette and Sandy River Basins

Annual Report 2012

November 2012

Water Quality Program
Land Use and Transportation Division
Department of Community Services
Multnomah County

Organization of this Report

This report is organized into three principle sections based on the actions developed to reduce the TMDL pollutants:

1) Temperature
2) Bacteria
3) Sediment (Mercury, DDT and Dieldrin surrogate)

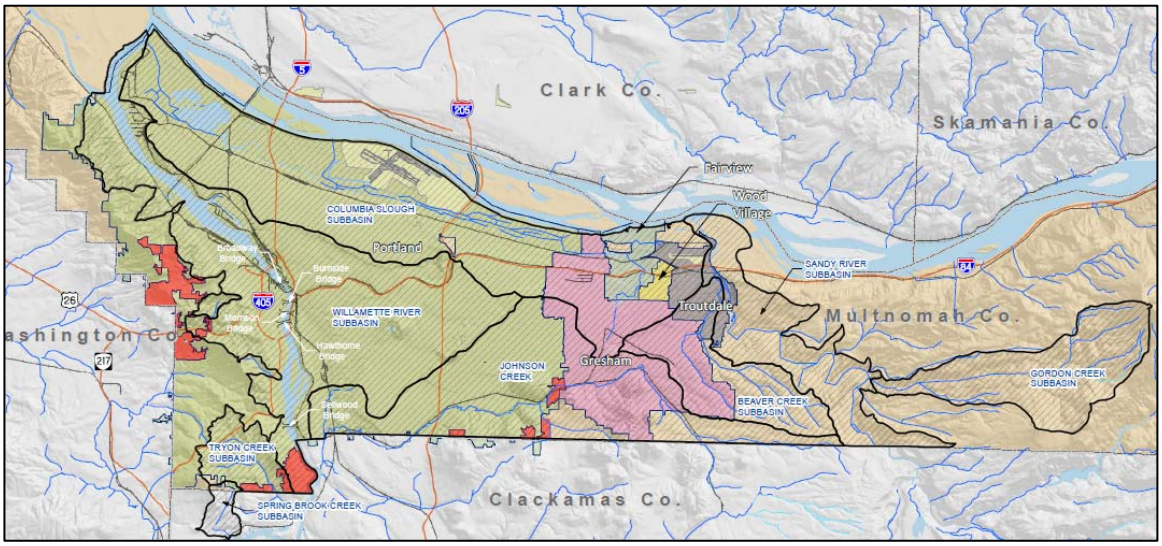
A summary of monitoring activities and adaptive management strategies and a matrix of implementation actions is included at the end of the report.

Introduction

Several waterbodies in Multnomah County fail to meet State standards for water quality. These standards assure that beneficial uses of the waterbody, such as swimming, fish consumption, and aquatic life, are protected. When water quality standards are not met, the beneficial uses are *impaired*. The Oregon Department of Environmental Quality establishes a Total Maximum Daily Load (TMDL) for those impaired waterbodies.

In 2005 and 2006, the Oregon Department of Environmental Quality (DEQ) established TMDLs in the mainstem and tributaries of the Lower Willamette River and Sandy River, respectively (figure 1). The TMDL pollutants in the Multnomah County jurisdiction include bacteria, temperature, mercury, and the legacy pesticides, DDT and dieldrin (table 1).

Figure 1. 2005 and 2006 TMDL waterbodies in Multnomah County.



The overall goal of Multnomah County's TMDL Implementation Plan is to prevent, reduce, and eliminate, wherever practicable, sources of pollution to protect and restore impaired waterbodies within the County's jurisdiction and authority. The County's strategy includes land use planning, monitoring, interagency coordination, public education, and road maintenance operations. The following report summarizes the County's actions and evaluations of progress in achieving this goal.

Table 1. Water quality pollutants and TMDL reduction targets for streams within Multnomah County jurisdiction.

Pollutant	Waterbody	Reduction	*TMDL*
Temperature	Sandy River	Riparian shade	*Sandy*
	Gordon Creek	Riparian shade	*Sandy*
	Beaver/Kelly Creek	Riparian shade	*Sandy*
	Lower Willamette River	n/a[1]	*L. Willamette*
	Johnson Creek	Riparian shade	*L. Willamette*
	Tryon Creek	n/a	*L. Willamette*
	Columbia Slough	n/a	*L. Willamette*
Bacteria	Beaver /Kelly Creek	86% load reduction	*Sandy*
	Johnson Creek	78% load reduction	*L. Willamette*
	Springbrook Creek	n/a	*L. Willamette*
Mercury	Lower Willamette River	27% load reduction*	*L. Willamette*
DDT, Dieldrin	Johnson Creek	78% urban stormwater 94% nonpoint sources	*L. Willamette*

[1]*n/a: not applicable. See details in plan regarding the particular conditions for each pollutant.*
**phased TMDL. This is a guidance value, not a WLA*

Temperature implementation action summary

The actions in the County's TMDL Implementation Plan for the Sandy and Lower Willamette TMDLs include land use plan review, education, and coordination with the Oregon Department of Agriculture (ODA) for enforcement of agricultural rules on agricultural lands and the Oregon Department of Forestry (ODF) for forest practices.

Three permits were issued by the County during the reporting period regarding stream buffers (Significant Environmental Concern Permit). Also, no violations of forest or agricultural rules were observed by the County.

The EMSWCD Stream Care program works in the rural residential areas of unincorporated Multnomah County to restore riparian areas impacted by invasive weeds. The EMSWCD assisted the County to install native plants in the County right-of-way area on Beaver Creek at the intersection of Division St and Troutdale Rd where a short section of stream was exposed between two culverts.

Bacteria

Failing onsite septic systems and illegal dumping are concerns for the County regarding the bacteria loading in Beaver and Johnson Creeks. The County Road Maintenance crews work regularly in the basins maintaining the road surface, vegetation and drainage infrastructure in the right-of-way, and provide the Water Quality Program with visual observation of potential problems. Water Quality staff coordinate with the appropriate regulatory authorities.

During the past year, no bacteria incidences were reported in Johnson or Beaver Creek.

Education efforts through the Regional Coalition of Clean Rivers and Streams is ongoing.

The County participated in the planning for an intensive bacteria monitoring study on Johnson Creek through the Interjurisdictional Committee. Bacteria sampling and analysis occurred in FY2013, and will be reported in the next annual report.

Sediment – Mercury, DDT and Dieldrin surrogate

Sediment erosion best management practices are implemented through two primary mechanisms, the County Road Maintenance & Operations Manual (RMOM) and the NPDES stormwater permit. The NPDES annual report covers land used planning activities, road maintenance practices, vegetation maintenance, and public education efforts during the past fiscal year. The RMOM is a guidance document created in response to the ESA listing of salmon in the area, and was submitted in May 2010 to NOAA Fisheries for a programmatic exemption to the 4(d) rules for take related to road practices. Although the manual is still under review by NOAA Fisheries, the County is implementing the practices to minimize and avoid sediment erosion in drainage and right-of-way areas.

Erosion problems from one agricultural area were reported to ODA and a suspicious in-line pond excavation (no erosion control) was reported to Clackamas County.

Monitoring and Adaptive Management

Water quality monitoring in the County TMDL watersheds is a shared activity between the County, the City of Gresham, and the EMSWCD. Monitoring is conducted in Beaver Creek and the upper Johnson Creek for the following: continuous temperature and periodic monitoring for field, conventional parameters, metals, and E. coli bacteria. The County conducts monitoring in lower Beaver Creek in conjunction with NPDES Phase I responsibilities. This ambient monitoring occurs four times per year, during wet and dry weather. Follow up to the upper Johnson Creek monitoring by DEQ during 2007-2008 will be conducted by the EMSWCD, and will provide reach scale data for temperature, field parameters, and E. coli bacteria.

The County plans to continue TMDL implementation and monitoring through a coordinated effort of both rural and urban jurisdictions. Ambient monitoring will provide long term trends which may inform the RMOM and NPDES Stormwater Plan effectiveness, while the EMSWCD reach scale monitoring may help inform future site level investigations.

Biological monitoring is also conducted in Beaver and upper Johnson Creek. The County concluded a grant-funded fish survey on both streams during 2010-2012. Juvenile coho salmon, rainbow trout (steelhead), and cutthroat were found throughout the watershed, among other native fishes. The final reports are posted online at the Multnomah County Water Quality Program website (https://multco.us/roads/fish-surveys).

Macroinvertebrate monitoring occurs annually in both watersheds. Three years of watershed-wide macroinvertebrate data has been collected on Johnson Creek through the Interjurisdictional Committee of Johnson Creek (IJC), a multi-jurisdictional committee to discuss and coordinate watershed scale issues and activities.

Multnomah County TMDL Implementation 2011			
Source	**Strategy**	**How**	**2012**
Temperature: Sandy River, Gordon Creek, Beaver Creek, Kelly Creek, Johnson Creek			
1. Lack of stream shading	a. Ensure stream buffers requirements are met through plan review	Continue plan review for new development and redevelopment	Three permits were issued, reviewed and approved for stream buffer protection
	b. Enforce County stream buffer requirement for new development	Continue County code enforcement	No activity to report
	c. Address riparian vegetation in agricultural areas through Agricultural Water Quality Plans	Notify local Soil & Water Conservation Districts of runoff issues and ODA for enforcement on agricultural	No activity to report
	e. Educate landowners and encourage riparian vegetation maintenance and restoration	Work with East Multnomah Soil & Water Conservation Districts to provide technical assistance and disseminate grant opportunities	EMSWCD Stream Care planting in County right-of-way intersection of Division st with Beaver Creek
2. Improper implementation of timber harvest practices	a. Ensure permit violations are enforced	Notify Oregon Department of Forestry about suspected permit violations and other negative impacts from	No activity to report
Bacteria: Beaver Creek, Kelly Creek, Johnson Creek			
1. Failing septic systems	a. Conduct reach scale investigations in Johnson Creek	Follow the Agricultural Water Quality Plan baseline sampling (2007-2008) with analysis and additional	EMSWCD conducts monitoring in upper Johnson Creek and Beaver Creek
	b. Conduct reach scale investigation in Beaver and Kelly Creek	Partner with City of Gresham to collect data	County mointoring program data collected by City of Gresham under IGA at mouth and Division St. New monitoring by EMSWCD anticipated soon.
	b. Inspect OSS systems suspected of failure	County contracts with City of Portland sanitarian to provide inspection services	No reports made to City of Portland for suspected activity. City of Portland does not have incidents with water quality concerns.
	c. Educate homeowners about septic system maintenance	Partner with East Multnomah Soil & Water Conservation District (EMSWCD) to develop and	Partnered wth EMSWCD on Beaver Creek State of Watershed Report
2. Non-point source from agricultural lands	a. Conduct reach scale investigations based on TMDL study	Follow the Agricultural Water Quality Plan baseline sampling (2007-2008) with analysis and additional	EMSWCD conducts monitoring in upper Johnson Creek; County conducts monitoring on lower Beaver Creek.
	b. Address runoff issues via Agricultural Water Quality Plans	Notify local Soil & Water Conservation Districts when problems are identified, or notify ODA for enforcement	No activity to report
3. Pet wastes	a. Educate pet owners	Partner with local Soil & Water Conservation Districts to develop and disseminate educational materials	County is a partner in the Regional Coalition for Clean Rivers and Streams to conduct clean water campaigns vis web, radio, billboards, TV, bus signs.
4. Illegal dumping	a. Enforce Solid Waste Nuisance ordinance	Report all illegal dumping to County nuisance code enforcement (See Stormwater Program components	No water quality risks or concerns to report
TSS surrogate (Mercury, DDT and Dieldrin): Lower Willamette, Johnson Creek			
1. Non-point source of sediment from agricultural lands	a. Address agricultural runoff issues via Agricultural Water Quality Plans	Notify East Multnomah Soil & Water Conservation Districts of runoff issues and ODA for enforcement on agricultural land	Erosion reoprt to ODA: Winters Farm road erosion - SE 322nd (1/11 - Beaver Creek); .
	b. Educate landowners and encourage riparian vegetation maintenance and restoration	Work with East Multnomah Soil & Water Conservation Districts to provide technical assistance and	Unpermitted in-line pond excavation report to Clackamas County (9/11); .
2. Soil erosion and sediment transport from urban area	a. Continue implementing the County Stormwater Management Plan in NPDES areas and RMOM county wide	Implement BMPs according to plan	NPDES Annual report submitted to DEQ (11/1/12)
3. Mercury-containing products used in County practices	a. Reduce use and disposal of products containing mercury	Light bulbs, batteries, e-waste	County Sustainability Program works with Purchasing and other departments for these products