Department of Community Services
MULTNOMAH COUNTY OREGON

Land Use and Transportation Program
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November 1, 2013

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

SUBJECT: NPDES MS4 Permit Annual Report 2013

Dear Mr. Benninghoff:

I am pleased to submit the enclosed *NPDES Phase I Permit - Annual Compliance Report 2013(Permit Year 18)*. 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 FY2013.

If you have any questions concerning this report, please contact Roy Iwai, Water Resources Specialist at (503) 988-5050 ext 28031, or by email at roy.iwai@multco.us.

Sincerely,

Kim Peoples
Department of Community Services Director

Enclosures: (1)

Multnomah County NPDES MS4 Phase I Permit
Stormwater Management Program

Annual Report 2013
Permit year 18

Submitted to:
Oregon Department of Environmental Quality
November 2013

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 18 (Fiscal year 2013 - July 1, 2012 – June 30, 2013).

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).

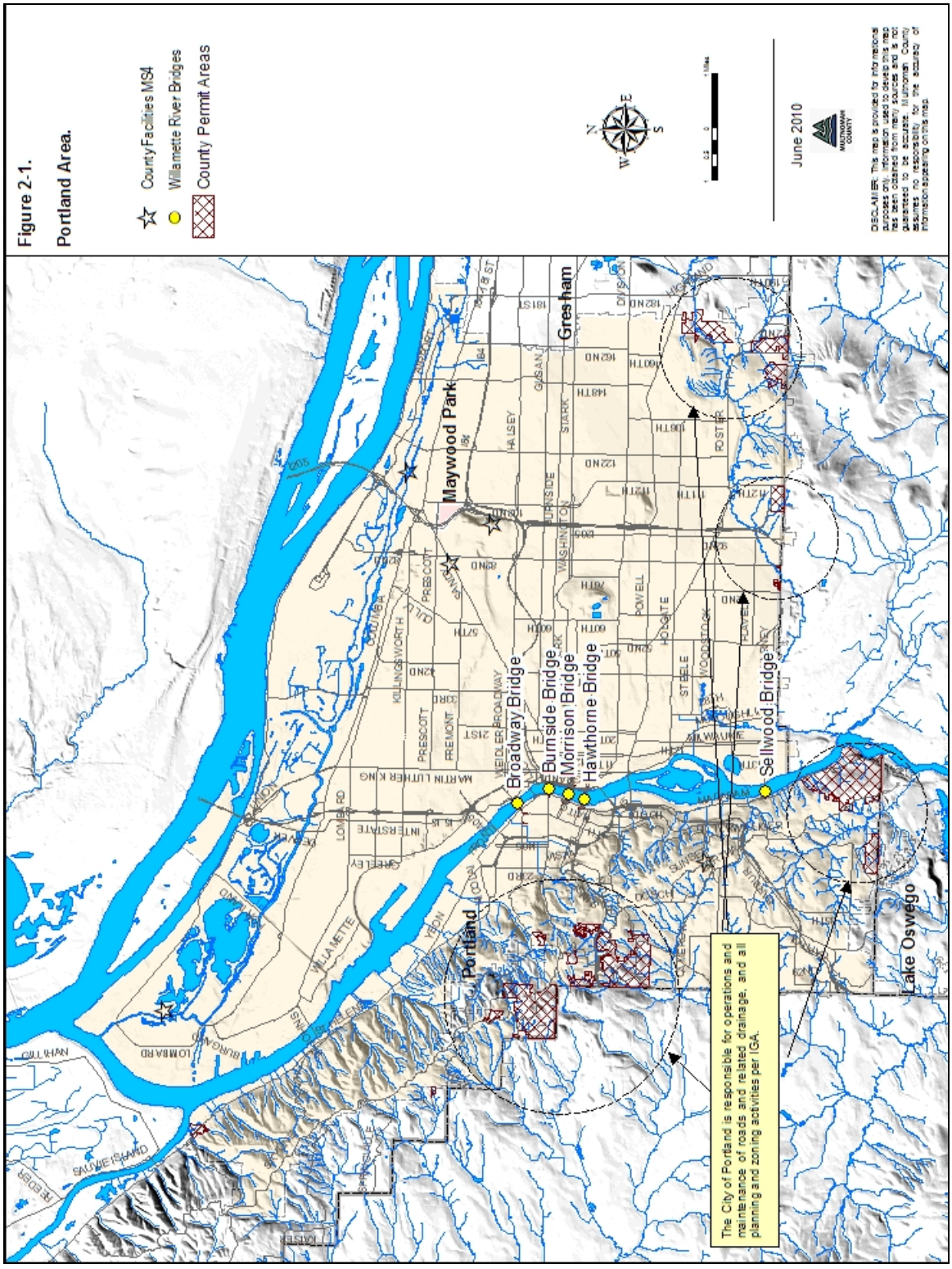
Figure 2-1.
Portland Area.
County Facilities MS4
Willamette River Bridges
County Permit Areas
June 2010
Gresham
Maywood Park
Portland
Lake Oswego
Broadway Bridge
Burnside Bridge
Morrison Bridge
Hawthorne Bridge
Sellwood Bridge
The City of Portland is responsible for operations and maintenance of roads and related drainage, and all planning and zoning activities per IGA.

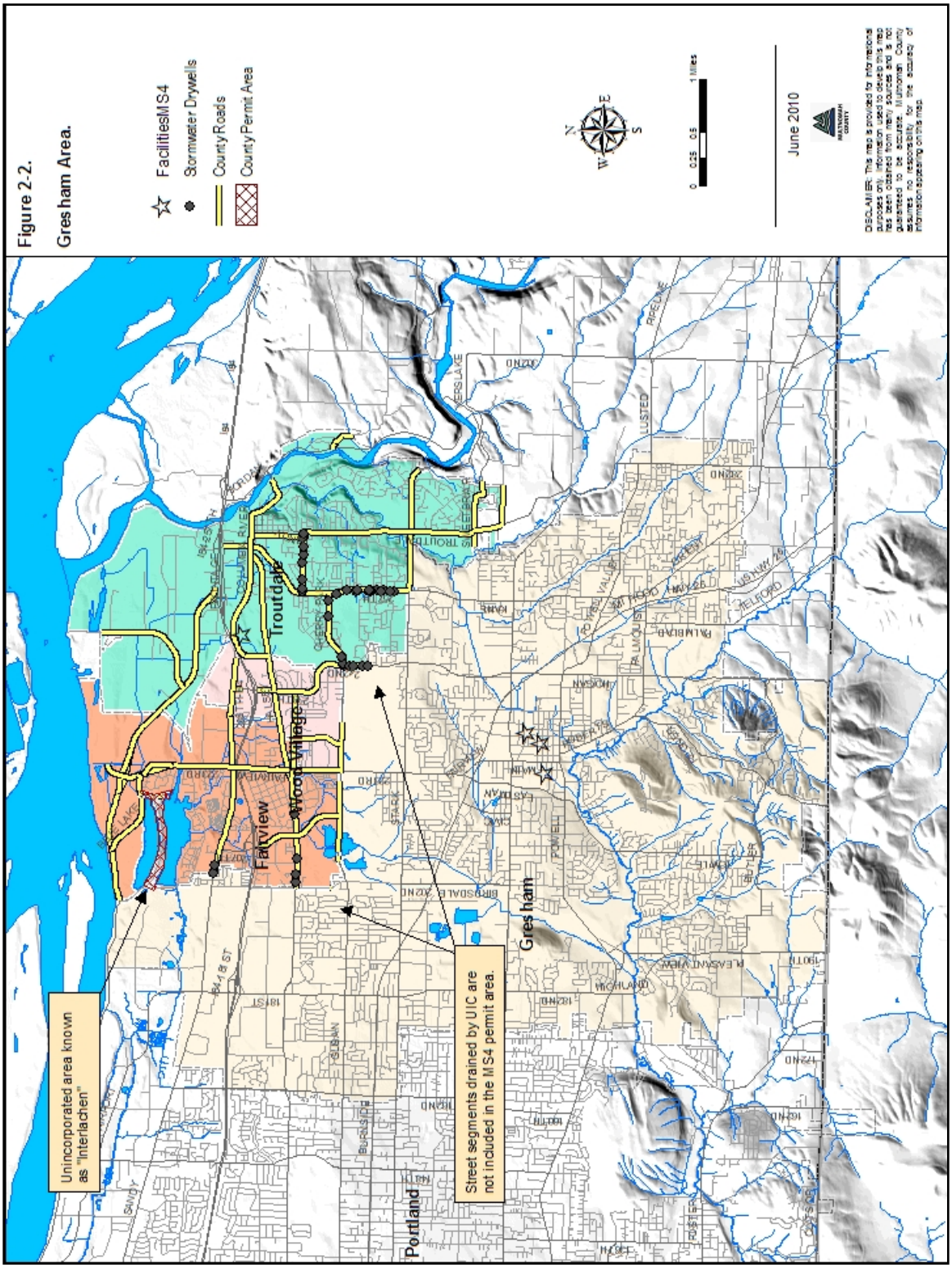
Figure 2-2.
Gresham Area.
FacilitiesMS4
Stormwater Drywells
CountyRoads
CountyPermit Area
June 2010
Unincorporated area known as "Interlachen"
Street segments drained by UIC are not included in the MS4 permit area.
Troutdale
Fairview
Wood Village
Gresham
Portland

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.

Mercury monitoring

The mercury monitoring requirement is part of a special study to further the development of the Mercury TMDL. Two full years of Hg monitoring were completed during 2011-2013, which fulfills the mercury monitoring requirement as described in Table B-1 of the NPDES permit. To date, the Hg monitoring conducted by Multnomah County (and other MS4 Phase I permittees) has contributed to the characterization of urban stormwater runoff, a stormwater monitoring program objective. DEQ will review the monitoring data once all of the results from the MS4 permittees have been submitted. DEQ anticipates that additional Hg monitoring will not be required for the remainder of Multnomah County's permit term; however written request that the monitoring be eliminated is needed to end the current phase of the study.

The mercury monitoring data analysis by the City of Gresham is included as an appendix to this Annual Report. Until further Mercury TMDL monitoring strategies are developed by DEQ, the County requests the elimination of further monitoring of mercury and methyl mercury during this permit term.

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.

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

Managers and staff in several Multnomah County workgroups implement the Stormwater Management Program. The functional groups are:

Public Affairs	Public Affairs Office
Bridge Engineering	Department of Community Services
Bridge Maintenance	Department of Community Services
Land Use and Transportation Planning	Department of Community Services
Code Compliance	Department of Community Services
Facilities	Department of County Assets
Emergency Response	Department of Community Services
Right-of Way Permits	Department of Community Services
Road Maintenance	Department of Community Services
Road Engineering	Department of Community Services
Asset Management	Department of Community Services
Nuisance Code	Health Department, Community Health Services
Program Management	Department of Community Services

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 continued to contract with EviroIssues to manage the outreach campaign. 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 30,226,000 impressions for all media outlets. Additionally, the County's watershed model was used at the Children's Clean Water Festival during the permit term.	The RCCRS membership is decreasing as a result of budget cuts and other priorities. Future discussions to stabilize the coalition are 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 participates in the Interjurisdictional Committee for Johnson Creek, a technical workgroup that coordinates stream monitoring and analysis for Johnson Creek watershed. WQ staff facilitates a similar group, known informally as the Beaver Creek Partnership.	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 45 brochures were taken on various topics from septic maintenance, riparian management and livestock care, during the last permit year.	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 (11-12, 2012), IVM training (6/2013), Vactor training (2/2013), Contech Stormfilter training (9/2012), pipe inspection camera training (11/2012). WQ staff attended the regional Urban Ecology symposium (2/2013), ACWA conference (7/2012) and ACWA Stormwater Summit (5/2013). 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. Eleven groups are active in the NPDES area. Clean ups range from once a month to once a year depending on the group. Adopt a Road is a trash pickup, 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 in 2012. 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 FY13 with review of stormwater treatment among criteria for road, bicycle and pedestrian priorities to develop rankings. Public outreach for the CIP was conducted through a variety of different venues. This included attendance of public open houses held around the county. Transportation capital program information and the proposed CIP were posted online and were available for public review and comment on the County's website. Additionally, information was also made available on the city websites of Fairview, Troutdale, and Wood Village. The cities of Fairview, Troutdale, Gresham and Wood Village reviewed the CIP, and it was presented to the East Multnomah County	No change

			Transportation Committee (EMCTC) at their March 2013 public meeting for review and comment. EMCTC endorsed the CIP at their April 2013 meeting. The public involvement program for the Sellwood Bridge project also continues from previous years.	
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 October 2012. Road Maintenance supervisors and staff reviewed the winter activities in December 2012 and January 2013.	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. Data of catch basin fullness were captured for the spring and fall cleaning. Initial data shows that over half of catch basins had between 0-3" of sediment accumulation at the time of cleaning. Further data analysis is forthcoming. Parking lot CBs maintained by County Facilities were inspected and cleaned on annual basis.	New AVL equipment contracts will be pursued pending work by the City of Portland to research and select an AVL firm. This will further enhance system reliability.
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 sweeping areas by July 1, 2011	(See OM-2 and PM-3) Sweeping routes were driven approximately twice a month for County arterial roads. The next step in the program will be to evaluate catch basin fullness during cleaning intervals will allow us to associate sweeping with catch basin cleaning frequency.	See above AVL comment
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. Ditch sediment profiling continued with a range of traffic	No change

			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.	
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 eight freezing events in FY13 and were removed within two weeks after the threat of ice was gone. The effectiveness of MgCl has allowed us to reduce sanding.	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 Maintenance purchased replacement filters for Contech Stormfilters in FY13, and will be installing the units in FY14. Stormfilters on County bridges were inspected and replaced in FY13. County Facilities maintains several Vortex units which were cleaned in FY13.	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 Sweetbriar Rd in Troutdale. Absorbent material was applied to the spill, then cleaned up and disposed at a private facility. Fuel was contained on the road surface. Several other car accidents generated minor spills all of which were contained.	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	Work on the County's Morrison Bridge was completed in May 2013 following inspection processes. DEQ visited the Sellwood Bridge construction project with EPA in May 2013 during the NPDES program audit and discussed construction inspection at length with County inspectors.	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	No threats to water quality were reported from illegal dumping activity in the permit area.	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 August 2012. No flows were observed.	Several outfalls selected for inspection have limited stormwater systems and are unlikely to have cross connections, Changes to the

	2012.			outfall list will occur for FY13.

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.	No activity in the permit area.	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.	Water Quality and Road Engineering staff developed Stormwater Retrofit Criteria for capital projects. Details of the criteria are described in a memo attached to this report in Appendix A.	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 assessment 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 in FY12 included 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.	Stormwater infrastructure mapping in GIS continues with paid internships and a new limited duration staff hire. Infrastructure inventory, location and networking continue in collaboration with neighboring jurisdictions who share the County stormwater pipe system.	GIS mapping is on track with the hire of a limited duration staff in June, 2013. Funding for this position is available for one year to meet completion goals for this BMP.

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 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 mainly in the context of our catch basin and sweeping efficiency program. All deadlines were met for FY13.	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.	Work orders for Road Maintenance are captured in SAP work order system. GIS is used to capture catch basin cleaning and sweeping data.	(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, which includes includes the State gasoline tax, weight/mile tax on trucks, and vehicle registration fees. Highway Trust Funds 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 2013 and provides the anticipated budget for Fiscal Year 2014.

Program Area	*FY 2013 actual*	*FY 2014 budget*
Water Quality Program[1]	$205,600	$185,300
Asset Management[2]	$13,300	$14,500
Gresham area		
• Road Maintenance[3]	$179,900	$180,000
• Road Engineering[3]	$162,700	$166,000
• Land Use & Transportation Planning	$4,400	$4,400
Portland Area		
• Bridge Maintenance/Operations	$26,200	$43,200
• Bridge Engineering[4]	$68,615,900	$150,389,000
• Road Maintenance IGA	$88,500	$100,000
• Road Engineering[5]	$10,000	$11,600
• Transportation Planning	$0	$0

[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 water quality issues in Portland area right-of-way.*

APPENDIX A. Stormwater Retrofit memo

Department of Community Services
MULTNOMAH COUNTY OREGON

Land Use and Transportation Program
1600 SE 190th Avenue
Portland, Oregon 97233-5910
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Memorandum

Date: October 23, 2013
To: Roy Iwai, Water Resources Specialist
From: Adam Soplop, Engineer
Subject: Stormwater Retrofit Criteria

The following memorandum summarizes the strategy and criteria used to determine how stormwater retrofits are incorporated into the County's capital improvement projects.

Background

The majority of the County's capital projects are enhancements of existing roadways. Road projects address a number of improvements such as widening traffic lanes, accommodating bicycle lanes, improving pedestrian and traffic safety, and addressing flooding concerns. Stormwater quality treatment is also integrated into road projects, often as matter of course when a project involves federal funding and Endangered Species Act requirements are triggered. The result is a multi-functioning streetscape that meets the needs of a variety of users and minimizes impacts to the environment.

The benefits of stormwater treatment are clear, and as we look for various design alternatives, there are many challenges. The constraints of the physical right-of-way space for treatment areas, the potential cost of purchasing easements, and additional cost of installation and maintenance are real concerns. In order to achieve cost effective designs that meet treatment goals for current and future development, stormwater treatment must be incorporated into projects in a strategic manner. The goal for stormwater treatment is to integrate facilities with strategies that reduce impacts from stormwater to the maximum extent practicable.

Design and Construction Manual and the Stormwater Retrofit Strategy

The County Design and Construction Manual is the guidance manual for drainage design in the County right-of-way. This includes standards for the quality and quantity of stormwater generated on the roadway. The manual is currently being updated with references to the Portland Stormwater Manual, per requirements in the County National Pollutant Discharge Elimination System (NPDES) permit, such that future projects will be determined using a "stormwater hierarchy" that prioritizes site

scale infiltration as the key strategy for stormwater treatment. The hierarchy also guides projects to discharge runoff to drywells and discharge to surface waters if site limitations preclude 100% site level infiltration using low impact development techniques. This represents a new overall strategy for providing stormwater treatment to existing County roadways.

By November 1, 2014, we will have developed a new Stormwater Retrofit Strategy that considers retrofit alternatives for urban roadways. (This is a requirement of the NPDES permit and applies to the NPDES permit area.) The Stormwater Retrofit Strategy will provide a coarse look at planning costs and design alternatives for specific reaches of County roads by considering the impervious area, traffic volume, underlying geology, and other watershed characteristics. The strategy will allow us to anticipate costs, easements, and other limiting factors to help with project planning.

Criteria for integrating stormwater treatment into projects

The amount of effective impervious area from roadway surfaces that are created, or re-constructed, is a key determinant for stormwater treatment design. Any increase in impervious area (increased runoff) greater than 500 ft^2 will require runoff quantity and quality control. The amount of traffic, the size of the project area, and the site context are also important factors in determining the appropriate stormwater treatment retrofit design into projects. For road projects, both water quantity and water quality mitigation is considered, unless infiltration rates or risks of hydromodification are low or none. If a project consists of non-traffic elements such as sidewalks, separated bike paths, or guardrail installation, stormwater treatment considerations may be optional depending on the project size, location, and opportunities to coordinate with other projects. The following is a decision matrix for these cases:

	Water quantity and quality treatment considered	Water quantity treatment may be optional	Stormwater treatment may be optional
Effective Impervious area	Large - Small	Large - Small	Small
Traffic volume	High - Low	Med - Low	Very Low
Surface type	Roadway	Roadway	Sidewalks
Project size	Large - Medium	Medium - Small	Very Small
Hydromodification impacts	Yes	No	No
Infiltration rate	High	Low	NA

Successful stormwater treatment retrofits will consider innovative and cost effective designs that integrate well with multiple roadway functions and aesthetics. Stormwater elements should be part of the logical streetscape design and should be easy to maintain. Projects should achieve cost savings taking advantage of opportunities where mobilization costs might be shared, or where pavement repair is planned.

APPENDIX B - Monitoring Data and Analysis (City of Gresham)

Cities of Gresham & Fairview Environmental Monitoring Program Annual Report

A. History

Background

The data reported in this PY 18 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 summarize the Environmental Monitoring Plan implementation and permit requirements contained in Schedule B. 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 1. Elements required by the permit are *italicized* text.

Table 1. Environmental Monitoring Requirements Summary

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 location	*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 permit requirements as described by Schedule B)2)e)ii) would result in 9 data points annually. The City's approved monitoring approach results in 30 data points.
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 2012.
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)*	Inlet and outlet samples collected for low level mercury/methyl mercury at both BMP facilities. Both facilities monitored during one event in 2012/13, and only CSWQF monitored during second event.

C. Summary of Monitoring Program Results

The data collected in PY 18 are provided in the Appendix. The in-stream data have been compared to the relevant DEQ water quality criteria. Values that do not meet the water quality 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.

Instream Monitoring

Instream monitoring results are generally within expected ranges. Some sites were above the temperature standard in late July/early August, and some sites had periodic exceedances of the 406 colony forming units (CFU/100ml) *E. coli* standard, primarily after events associated with rainfall. All of the sampled streams currently have TMDLs for both of these pollutants. Sampling events associated with rainfall also exceeded some of the chronic and acute metal values in Table 20. The event on January 29, 2013 was preceeded by several inches of rain on and before the sample was collected, and levels of total copper, lead, and mercury all were high - tracking closely with turbidity/TSS in the water column (most sites were >100 mg/L TSS). The high metals observed in this event were present at all sites, including the highly forested headwater site on Kelley Creek (KI2 has drainage area with >85% forest and few low traffic residential roads), which had the highest TSS of all sites monitored that day and had as acute standard exceedance for copper and chronic exceedances for mercury and lead. While this single event has extremely high levels of metals at even the least disturbed locations, KI2 also has a very healthy macroinvertebrate community that suggest no level of biological impairment.

Continuous Instream Monitoring

The data from the continuous instream monitoring being conducted by USGS is available at www.usgs.gov. 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. A summary of the number of days that the maximum daily temperature at each continuous temperature monitoring station exceeded the temperature standard (17.8 C), as well as the highest temperature reached at each station is inlcuded in the Appendix. Very few sites had no exceedances, while Fairview Creek just downstream of Fujitsu Pond had the greatest number of days above the standard (116 days). The city is aware of the impact in-line ponds can have on temperature, which is why Kelly Creek Detention Pond is currently being retrofit and why Fujitsu Pond is a highly ranked Natural Resource CIP project, which will hopefully be resolved in the near future. Staff presented the findings from 2011 temperature and fish survey data at a Johnson Creek Watershed Council sponsored "Science Pub" in Gresham entitled "Hot Fish and Cold Beer" in September 2012.

Stormwater Monitoring

Stormwater monitoring data revealed higher traffic sites (>1000 vehicle trips per day) have higher pollutant concentrations for most pollutants (e.g. TSS, total and dissolved metals, nutrients, phthalates, and pesticides) in comparison to residential streets (<1000 trips/day). This past year, additional pesticides were analyzed based on identification in Gresham's pesticide assessment. Pesticide detections were minimal, with 10 of the 30 sites having a detection of pentachlorophenol, 7 sites having a detection of triclopyr, 6 sites having a detection of 2,4-D, and dichlobenil and pendimethalin each being detected in one sample. All other samples were less than the method reporting limits for pesticides analyzed. The values of each detected pesticide were compared to EPA aquatic life benchmarks and rinking water MCLs, and all were orders of magnitude below levels of concern.

Structural BMP Evaluation & Mercury Monitoring

Structural BMP monitoring during 2012-13 included monitoring inlet and outlet locations at both the Fairview Creek and Columbia Slough regional facilities. In general, results show that both facilities are reducing metals and other pollutants associated with sediment, as well as reducing nutrients and bacteria.

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 efficiently utilize staff resources. Samples were taken from both the Fairview Creek and Columbia Slough regional facilities. A May storm event was captured following a long dry spell and was deemed to be a "summer" event 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 wetland characteristics would change the levels of mercury (particularly methyl mercury). Based on the four events monitored between 2010 and 2013, the results are similar for in/out (facilities not increasing disssolved forms of mercury), and in general, dissolved phase is about half of total phase mercury and methyl mercury. Total methyl mercury is about 5% of total mercury. The ratios obtained during the two years of low level mercury and methyl mercury monitoring will be useful as the city plans to return to just monitoring total mercury as part of instream, stormwater, and BMP effectiveness monitoring.

Macroinvertebrate Sampling

Macroinvertebrates were collected at all of the instream monitoring locations, except Fairview Lake. Results are similar to previous years, with the Kelley Creek location (KI2) showing the least amount of impairment (i.e., the greatest abundance and highest number of sensitive species). This site is predominantly surrounded by an undeveloped forested area. All of the other locations have biological communities that indicate moderate or severe impairment according to the statewide Benthic Index of Biological Integrity (B-IBI). Data trends will be assessed on a five year basis as described in the Environmental Monitoring Plan.

D. Adaptive Management

The City of Gresham submitted a Stormwater Monitoring Plan to DEQ, which was approved prior to the January 14, 2013 issuance of the Water Pollution Control Facility permit for Underground Injection Control devices (UICs). As noted in the 2011-12 Annual Report, this monitoring plan complies with both the WPCF permit requirements and the MS4 Stormwater Monitoring-Storm Event (wet weather sampling) requirements as described in Schedule B Table B-1.

Based on successfully completing two years of low level mercury/methyl mercury monitoring, the city is requesting to eliminate this requirement from our monitoring program. The data obtained has been useful for establishing ratios, which the permittees will use to evaluate future data collected on total mercury samples collected during instream, stormwatern and BMP effectiveness monitoring efforts. Elimination of this monitoring requirement will allow the permittees to target a greater variety of suitable storms (short hold times for processing and shipping of samples to accredited labs greatly limits the timing of storms that can be targetted), while also saving limited resources for other monitoring activities that will better inform effectiveness of stormwater management activities.

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. (tributary of JC)
KI2	Kelley Creek @ Rodlun Rd (tributary of JC)
KCI1	Kelly Creek @ Mt. Hood Community College Pond Outflow
KCI4	Kelly Creek @ Detention Pond Inflow
BCI1	Beaver Creek @ Lower Bridge (Monitored on behalf of Multnomah County, not shown on Gresham Map of Instream Sites)
BCI2	Beaver Creek @ Division X Troutdale Rd. (Monitored on behalf of Multnomah County, not shown on Gresham Map of Instream Sites)

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

NM= not measured

ND= not detected

MRL = method reporting limits are included at the top of each data set where they are constant. For parameters were no MRL is included, this means they vary by sample.

Dup= Duplicate Sample

FD= Field Duplicate Sample

Blank=Deionized Water Sample

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 degrees Celsius
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 degrees Celsius (55.4 F) - October 15 to May 15; Rearing 18 degrees Celsius
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 degrees Celsius (55.4 F) - October 15 to May 15; Rearing 18 degrees Celsius
E. coli	406 organisms/100mL (OAR 340-41)

Columbia Slough

Temperature	No designated salmon and steelhead spawning use. Rearing: 18 degrees Celsius
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

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	BOD5 mg/L SM 5210B 2	TSS mg/L SM 2540D 2	NH3-N µg/L EPA 300.0 20	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	Total-P µg/L EPA 365.4 30	Hardness ng CaCO3/L M 2340B CA 1
W12G248-01	FCI0	7/31/2012	13:50	0.00	8.38	8.08	19.7	188.4	2.37	**2**	3	46	**2**	1000	49	250	73	77.3
W12G242-01	FCI1	7/30/2012	16:45	0.00	8.75	7.58	17.6	235.1	2.97	**2**	4	**20**	**2**	1300	45	**200**	80	107
W12G248-02	JCI1	7/31/2012	9:30	0.00	7.22	7.59	18.4	132.2	5.95	**2**	5	40	**2**	880	**20**	400	69	45.9
W12G242-02	JCI2	7/30/2012	10:10	0.00	9.37	7.91	16.5	107.0	7.2	**2**	4	**20**	**2**	1400	**20**	450	98	36
W12H025-01	KCI1	8/2/2012	11:00	0.00	7.59	7.82	19.3	266.1	4	**2**	**2**	24	3.2	520	**20**	530	57	78.6
W12H012-01	KCI4	8/1/2012	10:25	0.00	6.79	7.65	14.7	194.9	4.54	**2**	**2**	107	**2**	1200	24	340	56	75
W12G248-03	KI1	7/31/2012	11:10	0.00	4.95	7.37	16.3	170.2	6.42	**2**	2	80	**2**	980	90	470	172	60.8
W12G242-03	KI2	7/30/2012	13:05	0.00	10.05	8.15	14	160.0	5.64	**2**	2	**20**	**2**	450	**20**	**200**	31	73.8
W12H025-02	BCI1	8/2/2012	13:45	0.00	10.09	8.06	18.6	215.5	2.81	**2**	**2**	**20**	**2**	1700	51	**200**	80	81
W12H012-02	BCI2	8/1/2012	13:30	0.00	9.31	7.84	17.4	149.9	2.4	**2**	**2**	35	**2**	3000	30	350	67	50.8
W12G242-04	JCI2-FD	7/30/2012	10:10	0.00						**2**	2	**20**	**2**	1400	23	370	94	35.9
W12J253-01	FCI0	10/30/2012	15:55	0.57	9.71	7.64	14.4	65.9	24.3	**2**	20	**20**	3	560	28	530	146	35.9
W12J253-02	FCI1	10/30/2012	16:20	0.57	8.44	6.82	14.9	30.2	10.2	**2**	6	**20**	**2**	310	**20**	360	71	15.8
W12J253-03	JCI1	10/30/2012	10:25	0.57	9.75	7.18	13.5	66.6	18.9	**2**	12	**20**	**2**	3300	**20**	600	72	30.4
W12J253-04	JCI2	10/30/2012	11:55	0.57	10.29	7.18	13.2	63.6	19.7	**2**	10	33	**2**	4200	**20**	770	70	27.2
W12J253-05	KCI1	10/30/2012	14:25	0.57	10.31	7.32	14.8	43.5	18.2	2	12	**20**	**2**	1100	**20**	650	91	22.3
W12J254-02	KCI3	10/30/2012	13:05	0.57	8.76	6.95	14.1	76.8	30.6	8	17	**20**	**2**	2900	**20**	690	136	39.3
W12J253-06	KCI4	10/30/2012	13:25	0.57	9.21	6.94	14.2	77.5	41.3	5	20	**20**	**2**	3100	**20**	940	150	39.5
W12J253-07	KI1	10/30/2012	10:55	0.57	8.51	7.05	13.3	84.8	9.43	**2**	4	26	**2**	2200	27	630	112	38.1
W12J253-08	KI2	10/30/2012	11:20	0.57	10.42	7.33	12.1	58.9	46.7	2	33	**20**	**2**	1500	**20**	580	87	31.7
W12J253-09	BCI1	10/30/2012	15:10	0.57	10.45	7.61	14.5	60.9	41.3	2	30	**20**	**2**	2400	**20**	600	128	30.9
W12J253-10	BCI2	10/30/2012	14:00	0.57	10.44	7.47	13.6	94.3	151	2	70	43	**2**	5100	28	920	413	50
W12J253-11	KI1-FD	10/30/2012	10:55	0.57						2	29	44	**2**	1500	**20**	620	88	31.9
W13A212-01	FCI0	1/29/2013	14:45	1.08	13.18	7.37	6.3	83.4	21.3	**2**	21	**20**	-	1100	23	360	103	47.7
W13A212-02	FCI1	1/29/2013	15:20	1.08	11.56	6.53	7.8	49.3	10.9	**2**	4	20	-	850	28	250	70	26.8
W13A212-03	JCI1	1/29/2013	9:35	1.08	12.79	6.26	6.1	35.6	163	**2**	176	47	-	1400	**20**	1220	287	20.5
W13A212-04	JCI2	1/29/2013	10:50	1.08	12.63	6.31	6.1	34.2	212	**2**	155	45	-	1600	**20**	810	323	18.1
W13A212-05	KCI1	1/29/2013	13:15	1.08	13.26	6.87	6.5	40.6	93.9	**2**	38	56	-	880	**20**	520	210	22.9
W13A212-06	KCI3	1/29/2013	12:00	1.08	12.89	6.65	6	42.8	219	**2**	70	40	-	1200	20	640	407	26.8
W13A212-07	KCI4	1/29/2013	12:30	1.08	12.44	6.63	6.3	48.1	150	**2**	47	41	-	1300	24	570	328	27.8
W13A212-08	KI1	1/29/2013	10:00	1.08	12.49	6.43	6	35.7	113	**2**	103	50	-	980	24	720	244	18.3
W13A212-09	KI2	1/29/2013	10:25	1.08	12.92	6.52	6.3	28.5	163	**2**	224	**20**	-	2200	**20**	660	204	20.7
W13A212-10	BCI1	1/29/2013	13:50	1.08	13.28	7.16	6.5	46.1	130	**2**	125	41	-	1500	**20**	690	294	26.3
W13A212-11	BCI2	1/29/2013	12:55	1.08	13.21	6.77	6.2	44.9	113	**2**	115	40	-	1800	**20**	660	244	24.3
W13A212-12	KI1-FD	1/29/2013	10:00	1.08						**2**	88	48	-	1000	**20**	720	235	18.3
W13E001-01	FCI0	4/30/2013	15:30	0.01	10.07	7.79	14.1	156.1	4.63	**2**	5	23	-	1300	23	280	62	71
W13E001-02	FCI1	4/30/2013	15:50	0.01	10.22	7.38	13.4	215.4	23.2	**2**	16	**20**	-	1100	24	290	93	117
W13E001-03	JCI1	4/30/2013	10:20	0.01	9.89	6.55	11.2	74.8	8.88	**2**	3	32	-	1300	**20**	290	44	31.5
W13E001-04	JCI2	4/30/2013	11:20	0.01	11.69	7.32	10	68.4	7.59	**2**	**2**	**20**	-	1900	**20**	300	66	28.5
W13E001-05	KCI1	4/30/2013	13:50	0.01	10.18	7.5	13.5	89.4	7.98	3	5	30	-	570	**20**	530	62	41.3
W13E001-06	KCI3	4/30/2013	12:55	0.01	9.01	7.18	11	92.7	10.3	2	3	46	-	460	**20**	390	58	46.6
W13E001-07	KCI4	4/30/2013	13:10	0.01	11.34	7.17	10.2	103.0	6.32	**2**	**2**	45	-	590	**20**	290	47	51.6
W13E001-08	KI1	4/30/2013	10:35	0.01	8.36	6.81	10.7	94.9	7.23	**2**	2	43	-	340	21	330	67	44.1
W13E001-09	KI2	4/30/2013	10:55	0.01	11.61	7.12	8.9	89.0	9.74	**2**	4	**20**	-	920	**20**	**200**	**30**	46.1
W13E001-10	BCI1	4/30/2013	14:55	0.01	12.69	8.04	12.2	109.1	4.26	**2**	**2**	**20**	-	1300	**20**	260	41	50.4
W13E001-11	BCI2	4/30/2013	13:25	0.01	12.79	7.98	10.9	73.4	5.1	**2**	**2**	**20**	-	1800	**20**	240	32	32.4
W13E001-12	BCI2-FD	4/30/2013	13:25	0.01						**2**	**2**	**20**	-	1800	**20**	270	34	32.6

Bold = < than detection value

Sample ID	Site ID	Date	Hg-Total µg/L EPA 200.8 0.002	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	Cu-Diss µg/L EPA 200.8 0.2	Pb-Diss µg/L EPA 200.8 0.1	Zn-Diss µg/L EPA 200.8 0.5	E. coli MPN/100ml SM 9223B 10	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
W12G248-01	FCI0	7/31/2012	**0.0020**	0.807	0.209	2.39	0.631	**0.10**	1.35	210							
W12G242-01	FCI1	7/30/2012	**0.0020**	1.510	0.823	4.16	0.733	**0.10**	1.51	5200							
W12G248-02	JCI1	7/31/2012	**0.0020**	1.360	0.250	3.50	1.24	**0.10**	2.2	130	**1.1**	0.46	**1.1**	**1.1**	**1.1**	1.7	**1.1**
W12G242-02	JCI2	7/30/2012	**0.0020**	1.930	0.189	1.56	1.67	**0.10**	0.575	160	**1.0**	**1.0**	**1.0**	2.6	**1.0**	**1.0**	**1.0**
W12H025-01	KCI1	8/2/2012	**0.0020**	1.790	**0.100**	6.37	1.47	**0.10**	3.13	10							
W12H012-01	KCI4	8/1/2012	**0.0020**	1.200	**0.100**	5.11	0.954	**0.10**	2.47	230							
W12G248-03	KI1	7/31/2012	**0.0020**	1.360	0.156	1.66	1.26	**0.10**	1.06	190							
W12G242-03	KI2	7/30/2012	**0.0020**	0.482	**0.100**	2.50	0.417	**0.10**	0.954	41							
W12H025-02	BCI1	8/2/2012	**0.0020**	1.130	**0.100**	1.83	0.877	**0.10**	1.64	190							
W12H012-02	BCI2	8/1/2012	**0.0020**	2.260	**0.100**	2.28	2.22	**0.10**	3.36	2500							
W12G242-04	JCI2-FD	7/30/2012	**0.0020**	1.980	0.199	1.64	1.69	**0.10**	0.735	200	**1.0**	**1.0**	**1.0**	2.6	**1.0**	**1.0**	**1.0**
W12J253-01	FCI0	10/30/2012	0.0060	3.360	1.270	16.60	2	0.257	6.28	1500							
W12J253-02	FCI1	10/30/2012	0.0040	2.820	0.965	19.60	1.94	0.132	14.7	2600							
W12J253-03	JCI1	10/30/2012	0.0045	2.310	0.585	10.30	1.52	**0.100**	4.92	680	**0.99**	**0.99**	**0.99**	**0.99**	**0.99**	**0.99**	**0.99**
W12J253-04	JCI2	10/30/2012	0.0063	1.760	0.413	3.93	1.09	**0.100**	1.6	810	**0.99**	**0.99**	**0.99**	**0.99**	**0.99**	**0.99**	0.23
W12J253-05	KCI1	10/30/2012	0.0041	3.420	1.090	26.60	1.98	**0.100**	15.3	1100							
W12J254-02	KCI3	10/30/2012	0.0047	3.900	0.525	11.90	2.38	**0.100**	6.44	1100							
W12J253-06	KCI4	10/30/2012	0.0062	4.620	0.808	12.30	2.6	**0.100**	4.71	960							
W12J253-07	KI1	10/30/2012	0.0038	2.290	0.236	82.10	1.93	**0.100**	74.3	1100							
W12J253-08	KI2	10/30/2012	0.0075	2.720	1.230	9.51	1.39	0.131	2.56	530							
W12J253-09	BCI1	10/30/2012	0.0076	3.350	1.010	18.20	1.75	**0.100**	6.32	960							
W12J253-10	BCI2	10/30/2012	0.0115	4.770	1.950	14.90	1.33	**0.100**	0.639	8700							
W12J253-11	KI1-FD	10/30/2012	0.0069	2.600	1.000	9.11	1.38	0.133	2.42	280							
W13A212-01	FCI0	1/29/2013	0.0031	2.180	1.070	12.50	0.903	**0.100**	4.58	140							
W13A212-02	FCI1	1/29/2013	**0.0020**	1.880	0.771	17.20	0.959	**0.100**	12.7	170							
W13A212-03	JCI1	1/29/2013	0.0167	5.520	3.770	26.10	1.11	**0.100**	3.54	560	3.9	16	18	**0.99**	**0.99**	**0.99**	3.8
W13A212-04	JCI2	1/29/2013	0.0153	5.260	3.610	21.70	0.862	**0.100**	2.59	630	2	14	22	**0.99**	**0.99**	**0.99**	**0.99**
W13A212-05	KCI1	1/29/2013	0.0082	3.650	1.670	27.40	1.48	**0.100**	15.7	860							
W13A212-06	KCI3	1/29/2013	0.0127	5.330	2.610	23.00	1.09	**0.100**	2.23	910							
W13A212-07	KCI4	1/29/2013	0.0094	4.210	1.800	17.50	1.09	**0.100**	2.24	730							
W13A212-08	KI1	1/29/2013	0.0104	3.750	2.200	16.90	1.03	**0.100**	3.06	1100							
W13A212-09	KI2	1/29/2013	0.0154	4.300	2.860	24.20	0.492	**0.100**	3.18	73							
W13A212-10	BCI1	1/29/2013	0.0117	4.470	2.250	22.30	0.951	**0.100**	2.55	660							
W13A212-11	BCI2	1/29/2013	0.0127	3.690	1.900	14.80	0.737	**0.100**	1.41	480							
W13A212-12	KI1-FD	1/29/2013	0.0109	3.890	2.390	17.90	1.09	**0.100**	2.99	830							
W13E001-01	FCI0	4/30/2013	**0.0020**	1.270	0.248	5.32	0.853	**0.100**	2.19	20							
W13E001-02	FCI1	4/30/2013	0.0021	2.520	1.490	10.80	1.01	**0.100**	3.45	360							
W13E001-03	JCI1	4/30/2013	0.0021	1.250	0.216	5.44	0.9	**0.100**	3.16	610	**0.98**	**1.5**	**3**	**2.5**	**0.98**	**0.98**	**0.98**
W13E001-04	JCI2	4/30/2013	**0.0020**	1.330	0.138	1.44	1.08	**0.100**	0.805	160	**5**	**5**	**5**	9	**5**	**5**	**5**
W13E001-05	KCI1	4/30/2013	0.0037	3.720	0.786	26.00	2.6	0.107	16.4	180							
W13E001-06	KCI3	4/30/2013	**0.0020**	2.450	0.129	24.20	1.89	**0.100**	18.4	960							
W13E001-07	KCI4	4/30/2013	**0.0020**	1.740	**0.100**	11.80	1.26	**0.100**	9.68	230							
W13E001-08	KI1	4/30/2013	**0.0020**	1.080	0.123	2.45	0.905	**0.100**	1.76	1200							
W13E001-09	KI2	4/30/2013	**0.0020**	0.530	0.142	2.90	0.311	**0.100**	0.899	**10**							
W13E001-10	BCI1	4/30/2013	**0.0020**	1.350	**0.100**	3.06	1.18	**0.100**	1.61	75							
W13E001-11	BCI2	4/30/2013	**0.0020**	1.110	**0.100**	1.06	0.96	**0.100**	0.557	230							
W13E001-12	BCI2-FD	4/30/2013	**0.0020**	1.110	**0.100**	0.89	0.973	**0.100**	**0.5**	370							

Bold = < than detection value

Sample ID	Site ID	Date	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	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
W12G248-01	FCI0	7/31/2012											
W12G242-01	FCI1	7/30/2012											
W12G248-02	JCI1	7/31/2012	**1.1**	2	**1.1**	**1.1**	**1.1**	0.66	**1.1**	**1.1**	0.73	**1.1**	**1.1**
W12G242-02	JCI2	7/30/2012	**1.0**	3.8	**1.0**	**1.0**	2.6	**1.0**	**1.0**	0.5	**1.0**	**1.0**	**1.0**
W12H025-01	KCI1	8/2/2012											
W12H012-01	KCI4	8/1/2012											
W12G248-03	KI1	7/31/2012											
W12G242-03	KI2	7/30/2012											
W12H025-02	BCI1	8/2/2012											
W12H012-02	BCI2	8/1/2012											
W12G242-04	JCI2-FD	7/30/2012	**1.0**	3.8	**1.0**	**1.0**	2.7	**1.0**	**1.0**	0.4	**1.0**	**1.0**	**1.0**
W12J253-01	FCI0	10/30/2012											
W12J253-02	FCI1	10/30/2012											
W12J253-03	JCI1	10/30/2012	**0.99**	4.4	**0.99**	**0.99**	6	1.2	**0.99**	**0.99**	**0.99**	**0.99**	**0.99**
W12J253-04	JCI2	10/30/2012	1.2	6.5	**0.99**	1.2	4.1	**0.99**	**0.99**	**0.99**	**0.99**	**0.99**	**0.99**
W12J253-05	KCI1	10/30/2012											
W12J254-02	KCI3	10/30/2012											
W12J253-06	KCI4	10/30/2012											
W12J253-07	KI1	10/30/2012											
W12J253-08	KI2	10/30/2012											
W12J253-09	BCI1	10/30/2012											
W12J253-10	BCI2	10/30/2012											
W12J253-11	KI1-FD	10/30/2012											
W13A212-01	FCI0	1/29/2013											
W13A212-02	FCI1	1/29/2013											
W13A212-03	JCI1	1/29/2013	**0.99**	7.8	**0.99**	**0.99**	2.8	**0.99**	**0.99**	**0.99**	5	1.2	**0.99**
W13A212-04	JCI2	1/29/2013	**0.99**	10	**0.99**	**0.99**	3.4	**0.99**	**0.99**	**0.99**	6.8	1.1	**0.99**
W13A212-05	KCI1	1/29/2013											
W13A212-06	KCI3	1/29/2013											
W13A212-07	KCI4	1/29/2013											
W13A212-08	KI1	1/29/2013											
W13A212-09	KI2	1/29/2013											
W13A212-10	BCI1	1/29/2013											
W13A212-11	BCI2	1/29/2013											
W13A212-12	KI1-FD	1/29/2013											
W13E001-01	FCI0	4/30/2013											
W13E001-02	FCI1	4/30/2013											
W13E001-03	JCI1	4/30/2013	**1.4**	**2.5**	**0.98**	**0.98**	2.6	**2**	**1.6**	**0.98**	**0.98**	2.1	**0.98**
W13E001-04	JCI2	4/30/2013	**5**	**5**	**5**	**5**	15	**5**	**5**	**5**	**5**	**5**	**5**
W13E001-05	KCI1	4/30/2013											
W13E001-06	KCI3	4/30/2013											
W13E001-07	KCI4	4/30/2013											
W13E001-08	KI1	4/30/2013											
W13E001-09	KI2	4/30/2013											
W13E001-10	BCI1	4/30/2013											
W13E001-11	BCI2	4/30/2013											
W13E001-12	BCI2-FD	4/30/2013											

Bold = < than detection value

Sample ID	Site ID	Date	Time	24-hr Rain fall 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 ıg CaCO3/ 2340B C/	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	MeHg-Total ug/L EPA 1630	Cu-Dissolved ug/L EPA 200.8	Pb-Dissolved ug/L EPA 200.8	Zn-Dissolved ug/L EPA 200.8
					20	2	100	20	20	30	2	1	0.002	0.0005	0.0005	0.00005	0.00005	0.2	0.1	0.5
W13C168-01	CSWQF-1	3/19/2013	comp	0.49	70	3	280	**20**	470	92	18	14.6	0.00383					2.33	**0.1**	106
W13C168-13	CSWQF-1	3/19/2013	20:00	0.49										0.00074	0.00397	0.000068	0.000210			
W13C168-04	CSWQF-1	3/19/2013	20:12	0.49																
W13C168-05	CSWQF-1	3/19/2013	22:27	0.49																
W13C168-06	CSWQF-1	3/20/2013	0:45	0.49																
W13C168-02	CSWQF-2	3/19/2013	comp	0.49	65	2	320	23	350	68	10	23.9	0.00283					2.31	**0.1**	29.3
W13C168-14	CSWQF-2	3/19/2013	19:30	0.49										0.00050	0.00420	0.000073	0.000230			
W13C168-07	CSWQF-2	3/19/2013	20:03	0.49																
W13C168-08	CSWQF-2	3/19/2013	22:20	0.49																
W13C168-09	CSWQF-2	3/20/2013	0:35	0.49																
W13C190-01	CSWQF-3	3/20/2013	comp	0.49	92	9	410	**20**	590	76	24	24.4	0.00289					3.52	0.129	36
W13C168-15	CSWQF-3	3/19/2013	23:00	0.49										0.00066	0.00295	0.000051	0.000120			
W13C186-02	CSWQF-3	3/20/2013	11:20	0.49																
W13C190-03	CSWQF-3	3/20/2013	20:20	0.49																
W13C168-03	FCWQF-1	3/19/2013	comp	0.49	73	3	**100**	**20**	520	80	24	8.22	0.00338					2.47	**0.1**	106
W13C168-16	FCWQF-1	3/19/2013	20:45	0.49										0.00052	0.00238	0.000060	0.000180			
W13C168-10	FCWQF-1	3/19/2013	20:00	0.49																
W13C168-11	FCWQF-1	3/19/2013	22:15	0.49																
W13C168-12	FCWQF-1	3/20/2013	0:30	0.49																
W13C190-02	FCWQF-2	3/20/2013	comp	0.49	**10**	3	**100**	**20**	510	78	11	11.6	**0.0020**					2.16	0.118	40.4
W13C168-17	FCWQF-2	3/19/2013	23:50	0.49										0.00111	0.00254	0.000056	0.000130			
W13C186-01	FCWQF-2	3/20/2013	11:00	0.49																
W13C190-04	FCWQF-2	3/20/2013	20:00	0.49																
W13C168-18	FD	3/19/2013	20:50	0.49										0.00064	0.00292	0.000054	0.000170			
W13C168-19	Blank	3/19/2013	19:00	0.49											0.00027		0.000024			
W13C168-20	Trip Blank	3/20/2013	0:00	0.49											0.00010		0.000016			
W13E114-01	CSWQF	5/12/2013	comp	0.14	637	16	940	**20**	2250	181	12	30.6	0.0240					14	0.81	103
W13E114-13	CSWQF	5/12/2013	21:00	0.14										0.01180	0.03400	0.000140	0.000330			
W13E114-04	CSWQF-1	5/12/2013	20:45	0.14																
W13E114-05	CSWQF-1	5/12/2013	21:40	0.14																
W13E114-06	CSWQF-1	5/12/2013	22:25	0.14																
W13E114-02	CSWQF-2	5/12/2013	comp	0.14	615	10	990	**20**	1860	103	9	48.6	0.0211					8.37	0.719	88
W13E114-14	CSWQF-2	5/12/2013	20:40	0.14										0.01460	0.02040	0.000170	0.000250			
W13E114-07	CSWQF-2	5/12/2013	20:35	0.14																
W13E114-08	CSWQF-2	5/12/2013	21:30	0.14																
W13E114-09	CSWQF-2	5/12/2013	22:15	0.14																
W13E114-03	CSWQF-3	5/12/2013	comp	0.14	474	13	1200	32	1890	165	9	53.7	0.0155					8.88	0.445	50.4
W13E114-15	CSWQF-3	5/12/2013	23:15	0.14										0.00707	0.01550	0.000079	0.000200			
W13E114-10	CSWQF-3	5/12/2013	22:50	0.14																
W13E114-11	CSWQF-3	5/13/2013	1:50	0.14																
W13E114-12	CSWQF-3	5/13/2013	4:50	0.14																
W13E114-16	FCWQF-1	5/12/2013	22:00	0.14										0.00776	0.01550	0.000120	0.000360			
W13E114-17	FCWQF-2	5/12/2013	22:20	0.14										0.00038	0.00121	0.000071	0.000150			
W13E114-18	FD	5/12/2013	20:40	0.14										0.01280	0.01600	0.000170	0.000350			
W13E114-20	Trip Blank	5/12/2013	21:45	0.14											0.00010		0.000017			
W13E114-19	Blank	5/12/2013	21:45	0.14											0.00020		0.000014			

Sample ID	Site ID	Date	Cu-Total ug/L EPA 200.8 0.2	Pb-Total ug/L EPA 200.8 0.1	Zn-Total ug/L EPA 200.8 0.5	E. coli MPN/100m SM 9223B 10	Particle Size Distribution PartSize 1-2 um/100 mL	PartSize 2-5 um/100ml	PartSize 5-15 um/100ml	PartSize 15-25 um/100ml	PartSize 25-50 um/100ml	PartSize 50-100 um/100 ml	PartSize >100 um/100ml
W13C168-01	CSWQF-1	3/19/2013	4.86	2.28	130		17.54	26.15	29.57	9.01	5.58	1.55	0.108
W13C168-13	CSWQF-1	3/19/2013											
W13C168-04	CSWQF-1	3/19/2013				2400							
W13C168-05	CSWQF-1	3/19/2013				1300							
W13C168-06	CSWQF-1	3/20/2013				1000							
W13C168-02	CSWQF-2	3/19/2013	5.32	1.45	50.8		27.85	32.37	17.36	2.44	1.22	0.391	0.016
W13C168-14	CSWQF-2	3/19/2013											
W13C168-07	CSWQF-2	3/19/2013				140							
W13C168-08	CSWQF-2	3/19/2013				150							
W13C168-09	CSWQF-2	3/20/2013				120							
W13C190-01	CSWQF-3	3/20/2013	4.02	1.27	54.6		0.6	2.5	9.3	6.9	9	7.8	64
W13C168-15	CSWQF-3	3/19/2013				2200							
W13C186-02	CSWQF-3	3/20/2013				1200							
W13C190-03	CSWQF-3	3/20/2013				620							
W13C168-03	FCWQF-1	3/19/2013	5.57	2.16	147		23.57	27.65	24.84	5.6	3.24	1.08	0.151
W13C168-16	FCWQF-1	3/19/2013											
W13C168-10	FCWQF-1	3/19/2013				860							
W13C168-11	FCWQF-1	3/19/2013				1100							
W13C168-12	FCWQF-1	3/20/2013				980							
W13C190-02	FCWQF-2	3/20/2013	5.72	1.46	54.6		1.48	4.68	16.8	12.4	24	18.8	21.8
W13C168-17	FCWQF-2	3/19/2013				440							
W13C186-01	FCWQF-2	3/20/2013				1200							
W13C190-04	FCWQF-2	3/20/2013				1500							
W13C168-18	FD	3/19/2013											
W13C168-19	Blank	3/19/2013											
W13C168-20	Trip Blank	3/20/2013											
W13E114-01	CSWQF	5/12/2013	17.8	2.37	126		2.44	9.23	26.9	10	8.6	18.5	24.3
W13E114-13	CSWQF	5/12/2013											
W13E114-04	CSWQF-1	5/12/2013				2900							
W13E114-05	CSWQF-1	5/12/2013				2500							
W13E114-06	CSWQF-1	5/12/2013				2400							
W13E114-02	CSWQF-2	5/12/2013	10.2	1.41	102		2.62	7.6	17.2	8.6	8	9.1	47
W13E114-14	CSWQF-2	5/12/2013											
W13E114-07	CSWQF-2	5/12/2013				180							
W13E114-08	CSWQF-2	5/12/2013				220							
W13E114-09	CSWQF-2	5/12/2013				410							
W13E114-03	CSWQF-3	5/12/2013	12.1	1.35	64.6		3.3	11.1	30.7	10.1	4.4	12.5	27.9
W13E114-15	CSWQF-3	5/12/2013											
W13E114-10	CSWQF-3	5/12/2013				4400							
W13E114-11	CSWQF-3	5/13/2013				2800							
W13E114-12	CSWQF-3	5/13/2013				4600							
W13E114-16	FCWQF-1	5/12/2013											
W13E114-17	FCWQF-2	5/12/2013											
W13E114-18	FD	5/12/2013											
W13E114-20	Trip Blank	5/12/2013											
W13E114-19	Blank	5/12/2013											

Lab ID	System_ID	Trips per Day	Date	Time	Rainfall Previous 24 hrs	DO	pH	Temp	Cond	Turbid	E. coli 10 MPN/100 mL	BOD 2 mg/L	TSS 2 mg/L	Ammonia 10 ug/L	Nitrate 100 ug/L	o-Phos 20 ug/L	TKN 200 ug/L	T-Phos 30 ug/L	Hardness mg/L CaCO3	Total Antimony 0.100 ug/L
W12K086-01	3153-F-040	<1000	11/11/2012	18:50	0.28	12.1	7.07	7.8	5.7	4.13	230	**2**	2	20	**100**	**20**	220	**30**	1.71	0.165
W12K086-02	3251-F-013	<1000	11/11/2012	19:15	0.28	12.31	7.12	11.3	13.2	3	98	2	4	10	**100**	**20**	230	43	6.13	0.128
W12K086-04	3049-W-013	<1000	11/11/2012	20:10	0.39	13.08	7.22	7.4	6.8	4.05	10	**2**	3	15	**100**	**20**	230	**30**	3.01	**0.100**
W12K086-05	2947-W-031	<1000	11/11/2012	20:30	0.39	12.65	7	7.1	7.9	4.71	3400	2	5	48	**100**	**20**	250	41	3.83	0.177
W12K086-06	3047-W-062	<1000	11/11/2012	21:10	0.49	11.91	6.86	7	14.7	8.08	2900	8	10	40	**100**	53	570	146	5.15	0.158
W12K086-07	3448-J-020	<1000	11/11/2012	21:55	0.49	11.89	6.5	7.7	8.7	1.56	120	**2**	**2**	22	**100**	**20**	**200**	**30**	4.14	**0.100**
W12K086-08	3348-W-013	<1000	11/11/2012	22:15	0.51	11.8	6.66	7.8	9.6	4.23	430	5	5	**10**	**100**	**20**	**200**	40	2.37	0.104
W13B183-01	3248-W-064	<1000	2/22/2013	11:10	0.23	9.83	5.93	7.4	19.8	40.7	170	5	22	152	**100**	**20**	1060	159	10.9	0.659
W13B183-05	2947-W-066	<1000	2/22/2013	11:55	0.27	12.6	6.37	7.3	17	11.6	97	5	6	88	100	80	820	196	9.31	0.187
W13B183-02	3048-W-055	<1000	2/22/2013	12:20	0.27	12.16	6.27	7.7	7.3	47.7	150	3	23	114	**100**	**20**	580	122	4.24	0.728
W13B183-12	3049-W-036	<1000	2/22/2013	12:45	0.35	10.74	6.45	7.4	8.5	19	31	4	11	49	**100**	**20**	380	51	4.74	0.348
W13D110-04	3153-F-078	<1000	4/10/2013	13:30	0.41	12.11	6.71	15	15.6	35.5	180	12	98	56	**100**	**20**	1580	243	8.02	0.539
W13D110-05	3055-B-009	<1000	4/10/2013	13:50	0.42	11.84	6.37	15	18.2	22	7700	11	21	65	**100**	**20**	920	136	7.48	0.436
W13D181-05	3152-F-097	<1000	4/19/2013	7:42	0.52	8.87	6.48	11.8	10	5.5	110	3	3	33	**100**	**20**	330	40	3.12	0.106
W13D181-01	2950-W-068	<1000	4/19/2013	8:10	0.52	9.32	5.58	11.3	19.2	2.08	31	2	**2**	31	140	**20**	520	55	9.81	0.153
W12K086-03	3151-F-064	>1000	11/11/2012	19:40	0.39	10.74	7.1	9.1	32.4	16.7	3300	3	9	625	150	**20**	970	54	16	1.100
W12K086-09	3148-W-014	>1000	11/11/2012	22:30	0.51	12.11	6.65	7	6.3	8.39	74	**2**	3	48	**100**	**20**	**200**	**30**	3.21	0.276
W13B183-09	3449-J-065	>1000	2/22/2013	10:50	0.23	12.48	7.04	9.4	28.9	176	560	10	106	952	250	**20**	2660	308	19.4	2.53
W13B183-06	3147-W-002	>1000	2/22/2013	11:35	0.23	12.12	6.57	7.7	11.6	215	5500	9	243	434	**100**	**20**	2200	433	17.6	3.6
W13B183-08	3149-W-034	>1000	2/22/2013	13:45	0.40	13.4	6.41	7.2	9.7	39	880	3	22	77	**100**	**20**	510	76	6.5	0.622
W13B183-03	3050-F-010	>1000	2/22/2013	14:00	0.40	13.08	6.28	7.4	9.6	199	86	12	233	518	100	**20**	2790	636	17	2.66
W13B183-04	3252-F-057	>1000	2/22/2013	14:30	0.40	12.1	6.5	7.5	10.3	113	10	3	56	281	**100**	**20**	790	176	8.53	1.96
W13B183-11	3054-F-015	>1000	2/22/2013	14:55	0.45	13.28	6.52	7.6	16.6	95.7	75	4	32	324	**100**	**20**	700	117	10.7	1.97
W13B183-07	3052-F-010	>1000	2/22/2013	15:05	0.45	12.26	6.88	7.5	25.5	154	97	5	56	674	140	**20**	1460	169	16.8	2.98
W13D110-01	3349-W-033	>1000	4/10/2013	10:40	0.06	13.14	7.06	12.9	45.2	39.8	780	18	34	763	640	**20**	2070	156	16.8	2.02
W13D110-02	3149-W-078	>1000	4/10/2013	10:55	0.06	12.63	6.67	12.5	64.8	86.3	1000	26	40	839	470	**20**	2910	243	25.1	2.43
W13D181-03	2948-W-028	>1000	4/19/2013	8:39	0.52	8.17	6.37	11.2	13.7	17.3	5200	3	6	272	**100**	**20**	640	52	6.31	0.945
W13D181-02	2748-W-044	>1000	4/19/2013	9:10	0.56	8.25	6.53	12	21.1	118	24000	5	62	311	150	**20**	1070	167	12.7	1.52
W13D181-04	3047-W-015	>1000	4/19/2013	9:52	0.56	10.27	6.35	11.1	24.6	50.2	14000	5	14	487	250	**20**	1250	97	10.9	1.38
W13E115-01	3047-W-107	>1000	5/13/2013	2:15	0.13	8.27	6.72	16.2	58	26.9	520	16	16	1420	730	**20**	3130	206	21	2.27

Bold = < than detection value

System_ID	Total Copper 0.200 ug/L	Total Lead 0.100 ug/L	Total Mercury 0.00200 ug/L	Total Zinc 0.500 ug/L	Diss Copper 0.200 ug/L	Diss Lead 0.100 ug/L	Diss Zinc 0.500 ug/L	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene
3153-F-040	1.32	0.364	0.00509	11.3	0.938	**0.100**	8.09	**0.020**	0.026	**0.020**	**0.010**	**0.010**	0.011	0.014	**0.010**	**0.010**	**0.010**	0.020	0.035	**0.010**
3251-F-013	5.81	0.122	0.00437	50.4	4.42	**0.100**	46.7	**0.020**	**0.020**	**0.020**	**0.010**	**0.010**	**0.010**	**0.010**	**0.010**	**0.010**	**0.010**	0.012	**0.020**	**0.010**
3049-W-013	1.03	0.354	0.00357	8.37	0.586	**0.100**	5.96	**0.020**	**0.020**	**0.020**	**0.010**	**0.010**	**0.010**	**0.010**	**0.010**	**0.010**	**0.010**	0.011	0.021	**0.010**
2947-W-031	1.36	0.575	0.00386	10.4	0.739	**0.100**	6.39	**0.020**	0.021	**0.020**	**0.010**	**0.010**	**0.010**	0.017	**0.010**	**0.010**	**0.010**	0.019	0.025	**0.010**
3047-W-062	2.97	0.777	0.00763	14.7	1.68	**0.100**	8.41	**0.020**	**0.020**	**0.020**	**0.010**	**0.010**	**0.010**	**0.010**	**0.010**	**0.010**	**0.010**	0.014	0.020	**0.010**
3448-J-020	0.517	0.101	0.00251	6.71	0.316	**0.100**	5.11	**0.020**	**0.020**	**0.020**	**0.010**	**0.010**	**0.010**	**0.010**	**0.010**	**0.010**	**0.010**	**0.010**	**0.010**	**0.010**
3348-W-013	1.15	0.582	0.00358	6.53	0.859	**0.100**	5.08	**0.020**	0.023	**0.020**	**0.010**	**0.010**	**0.010**	**0.010**	**0.010**	**0.010**	**0.010**	**0.010**	0.027	**0.010**
3248-W-064	7.25	1.86	0.00565	65.1	4.03	**0.100**	45.2	**0.020**	**0.020**	**0.020**	0.015	0.018	0.030	0.044	0.010	0.028	**0.010**	0.054	**0.010**	0.018
2947-W-066	2.77	0.572	0.00381	17.8	1.79	**0.100**	8.89	**0.020**	**0.020**	**0.020**	**0.010**	**0.010**	**0.010**	0.012	**0.010**	**0.010**	**0.010**	0.015	**0.010**	**0.010**
3048-W-055	11.1	7.91	0.00527	41.4	4.52	0.313	12.3	**0.020**	**0.020**	**0.020**	0.020	0.022	0.033	0.079	0.013	0.039	**0.010**	0.087	**0.010**	0.021
3049-W-036	6.22	1.52	0.00233	20.6	2.76	**0.100**	9.46	**0.020**	**0.020**	**0.020**	0.014	**0.010**	0.013	0.026	**0.010**	0.022	**0.010**	0.038	**0.010**	**0.010**
3153-F-078	18.6	8.6	0.00937	99.6	6.53	**0.100**	17.7	**0.020**	**0.020**	**0.020**	0.014	0.020	0.030	0.074	**0.010**	0.026	**0.010**	0.039	**0.010**	0.021
3055-B-009	10.4	1.57	0.00673	69.4	7.17	**0.100**	44.9	**0.020**	**0.020**	**0.020**	**0.010**	0.010	0.013	0.031	**0.010**	0.014	**0.010**	0.020	**0.010**	**0.010**
3152-F-097	1.24	0.234	0.00400	7.81	0.913	**0.100**	5.66	**0.020**	**0.020**	**0.020**	**0.010**	**0.010**	**0.010**	**0.010**	**0.010**	**0.010**	**0.010**	**0.010**	**0.010**	**0.010**
2950-W-068	1.56	0.117	0.00427	101	1.23	**0.100**	100	**0.020**	**0.020**	**0.020**	**0.010**	**0.010**	**0.010**	**0.010**	**0.010**	**0.010**	**0.010**	**0.010**	**0.010**	**0.010**
3151-F-064	7.02	1.03	0.00570	32.2	4.27	**0.100**	19.7	**0.020**	0.029	**0.020**	0.013	0.013	0.022	0.042	**0.010**	0.018	**0.010**	0.043	0.041	0.012
3148-W-014	1.71	0.488	0.00298	12.3	0.982	**0.100**	8.91	**0.020**	**0.020**	**0.020**	**0.010**	**0.010**	**0.010**	0.011	**0.010**	**0.010**	**0.010**	0.017	**0.010**	**0.010**
3449-J-065	27.5	11.2	0.01000	255	5.58	0.225	35.4	**0.020**	**0.020**	**0.020**	0.140	0.180	0.260	0.590	**0.010**	0.260	**0.010**	0.620	**0.010**	0.160
3147-W-002	42.9	30.4	0.02930	343	3.59	0.173	30.6	**0.020**	**0.020**	**0.020**	0.190	0.220	0.340	0.810	0.120	0.370	**0.010**	0.840	**0.010**	0.210
3149-W-034	5.17	4.45	0.00450	44.3	1.92	0.153	15.1	**0.020**	**0.020**	**0.020**	0.031	0.035	0.058	0.095	0.016	0.058	**0.010**	0.120	**0.010**	0.034
3050-F-010	31.2	22.6	0.01370	253	2.31	0.106	21.5	**0.020**	**0.020**	**0.020**	0.100	0.140	0.210	0.590	**0.010**	0.220	**0.010**	0.540	**0.010**	0.140
3252-F-057	14.3	3.95	0.00439	71.5	2.84	**0.100**	19.6	**0.020**	0.027	**0.020**	0.035	0.044	0.068	0.150	0.023	0.069	**0.010**	0.170	0.028	0.043
3054-F-015	13.8	2.78	0.00356	58.9	4.1	**0.100**	21.5	**0.020**	**0.020**	**0.020**	0.021	0.026	0.042	0.091	0.012	0.051	**0.010**	0.097	0.027	0.027
3052-F-010	20.3	6.62	0.00510	116	5.99	0.267	36.8	**0.020**	0.026	0.033	0.039	0.042	0.065	0.150	0.025	0.086	**0.010**	0.180	0.034	0.041
3349-W-033	20.8	2.11	0.01110	104	14.8	0.129	69.2	**0.020**	**0.020**	0.043	0.120	0.150	0.330	0.290	0.090	0.260	0.045	0.590	**0.010**	0.180
3149-W-078	27.4	3.52	0.01020	160	19.1	0.443	110	**0.020**	0.042	0.027	0.031	0.034	0.065	0.130	0.017	0.066	**0.010**	0.140	**0.010**	0.036
2948-W-028	7.01	1.64	0.00307	30.6	4.19	**0.100**	18	**0.020**	**0.020**	**0.020**	**0.010**	**0.010**	**0.010**	0.022	**0.010**	0.011	**0.010**	0.020	**0.010**	**0.010**
2748-W-044	16.6	24	0.00807	103	4.4	0.382	31.9	**0.020**	**0.020**	**0.020**	0.015	0.025	0.050	0.110	0.011	0.046	**0.010**	0.095	**0.010**	0.028
3047-W-015	13.9	2.41	0.00585	58.6	8.21	0.205	32.4	**0.020**	**0.020**	**0.020**	**0.010**	0.011	0.021	0.057	**0.010**	0.057	**0.010**	0.046	**0.010**	0.015
3047-W-107	34.5	2.6	0.03510	106	25.6	0.329	70.4	**0.020**	**0.020**	**0.020**	**0.010**	0.015	0.021	0.036	**0.010**	0.019	**0.010**	0.034	0.055	0.017

Bold = < than c

System_ID	Naphthalene	Phenan-threne	Pyrene	Butyl benzyl phthalate	Di-n-butyl phthalate	Diethyl phthalate	Dimethyl phthalate	Di-n-octyl phthalate	Bis(2-ethylhexyl) phthalate	2,4,5-T 0.040 ug/L	2,4,5-TP (Silvex) 0.040 ug/L	2,4-D 0.040 ug/L	2,4-DB 0.040 ug/L	3,5-Dichlorobenzoic acid 0.040 ug/L	Acifluorfen 0.040 ug/L	Bentazon 0.040 ug/L	Clopyralid	Dicamba 0.040 ug/L	Dichlorprop 0.040 ug/L	Dinoseb 0.040 ug/L
3153-F-040	0.120	0.041	0.025	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	1.1	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
3251-F-013	0.047	0.026	0.013	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
3049-W-013	0.060	0.029	0.013	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	0.71	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
2947-W-031	0.047	0.035	0.025	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	0.63	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
3047-W-062	0.048	0.030	0.017	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	0.84	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
3448-J-020	0.043	0.026	0.011	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
3348-W-013	**0.010**	**0.010**	**0.010**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
3248-W-064	**0.010**	0.046	0.075	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	2.7	<0.080	<0.080	0.17	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
2947-W-066	**0.010**	0.025	0.021	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	0.72	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
3048-W-055	**0.010**	0.059	0.140	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	4.8	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
3049-W-036	**0.010**	0.045	0.047	**1.0**	**1.0**	**1.0**	**1.0**	0.55	2.5	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
3153-F-078	**0.010**	0.042	0.055	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	1.2	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
3055-B-009	0.170	0.038	0.034	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	1.1	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
3152-F-097	**0.010**	**0.010**	**0.010**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
2950-W-068	**0.010**	**0.010**	**0.010**	**1.0**	**1.0**	0.52	**1.0**	**1.0**	**1.0**	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
3151-F-064	0.067	0.053	0.070	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	3.1	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
3148-W-014	0.052	0.031	0.023	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	0.89	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
3449-J-065	**0.010**	0.460	1.100	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	24.0	<0.080	<0.080	0.11	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
3147-W-002	**0.010**	0.570	1.400	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	34	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
3149-W-034	0.051	0.087	0.170	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	3.8	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
3050-F-010	**0.010**	0.400	0.980	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	30	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
3252-F-057	0.065	0.130	0.290	**1.0**	**1.0**	**1.0**	**1.0**	1.4	9.6	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
3054-F-015	0.047	0.083	0.180	**1.0**	**1.0**	**1.0**	**1.0**	1.3	9.9	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
3052-F-010	0.065	0.130	0.350	**1.0**	**1.0**	**1.0**	**1.0**	2.3	12.0	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
3349-W-033	0.055	0.250	0.490	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	5.0	<0.16	<0.16	0.82	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
3149-W-078	0.056	0.099	0.230	0.95	**1.0**	**1.0**	**1.0**	0.62	6.3	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
2948-W-028	**0.010**	0.026	0.035	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	3.1	<0.080	<0.080	6.2	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
2748-W-044	**0.061**	0.079	0.170	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	5.2	<0.080	<0.080	0.54	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
3047-W-015	0.052	0.041	0.079	**1.0**	**1.0**	**1.0**	**1.0**	1.1	5.9	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
3047-W-107	**0.010**	0.031	0.034	**1.0**	**1.0**	**1.0**	**1.0**	0.5	5.7	<0.080	<0.080	0.092	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080

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System_ID	MCPA	MCPP	Pentachlorophenol	Picloram	Quinclorac	Triclopyr	Bifenthrin	Chlorothanonil	Chlorpyrifos	Cypermethrin	DDE	DDT	Dieldrin	Dichlobenil	Pendimethalin	Permethrin	Propiconazole	Trifluralin	Other 8081B
	0.040 ug/L	0.040 ug/L	0.040 ug/L	0.040 ug/L	0.040 ug/L	0.040 ug/L	0.12 ug/L	0.12 ug/L	0.12 ug/l	0.60 ug/L	0.12 ug/L	0.12 ug/L	0.12 ug/L	0.12 ug/L	0.12 ug/L	0.60 ug/L	0.30 ug/L	0.12 ug/L	0.12 ug/L
3153-F-040	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.12	<0.12	<0.12	<0.60	<0.12	<0.12	<0.12	<0.12	<0.12	<0.60	<0.30	<0.12	<0.12
3251-F-013	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.12	<0.12	<0.12	<0.60	<0.12	<0.12	<0.12	<0.12	<0.12	<0.60	<0.30	<0.12	<0.12
3049-W-013	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.12	<0.12	<0.12	<0.60	<0.12	<0.12	<0.12	<0.12	<0.12	<0.60	<0.30	<0.12	<0.12
2947-W-031	<0.080	<0.080	0.17	<0.080	<0.080	<0.080	<0.12	<0.12	<0.12	<0.60	<0.12	<0.12	<0.12	<0.12	<0.12	<0.60	<0.30	<0.12	<0.12
3047-W-062	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.12	<0.12	<0.12	<0.60	<0.12	<0.12	<0.12	<0.12	<0.12	<0.60	<0.30	<0.12	<0.12
3448-J-020	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.12	<0.12	<0.12	<0.60	<0.12	<0.12	<0.12	<0.12	<0.12	<0.60	<0.30	<0.12	<0.12
3348-W-013	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.12	<0.12	<0.12	<0.60	<0.12	<0.12	<0.12	<0.12	<0.12	<0.60	<0.30	<0.12	<0.12
3248-W-064	<0.080	<0.080	<0.080	<0.080	<0.080	0.18	<0.12	<0.12	<0.12	<0.60	<0.12	<0.12	<0.12	<0.12	<0.12	<0.60	<0.30	<0.12	<0.12
2947-W-066	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.12	<0.12	<0.12	<0.60	<0.12	<0.12	<0.12	<0.12	<0.12	<0.60	<0.30	<0.12	<0.12
3048-W-055	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.12	<0.12	<0.12	<0.60	<0.12	<0.12	<0.12	<0.12	<0.12	<0.60	<0.30	<0.12	<0.12
3049-W-036	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.12	<0.12	<0.12	<0.60	<0.12	<0.12	<0.12	<0.12	<0.12	<0.60	<0.30	<0.12	<0.12
3153-F-078	<0.16	0.22	<0.16	<0.16	<0.16	<0.16	<0.12	<0.12	<0.12	<0.60	<0.12	<0.12	<0.12	<0.12	<0.12	<0.60	<0.30	<0.12	<0.12
3055-B-009	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.12	<0.12	<0.12	<0.60	<0.12	<0.12	<0.12	<0.12	<0.12	<0.60	<0.30	<0.12	<0.12
3152-F-097	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.12	<0.12	<0.12	<0.60	<0.12	<0.12	<0.12	<0.12	<0.12	<0.60	<0.30	<0.12	<0.12
2950-W-068	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.12	<0.12	<0.12	<0.60	<0.12	<0.12	<0.12	<0.12	<0.12	<0.60	<0.30	<0.12	<0.12
3151-F-064	<0.080	<0.080	0.11	<0.080	<0.080	<0.080	<0.12	<0.12	<0.12	<0.60	<0.12	<0.12	<0.12	<0.12	<0.12	<0.60	<0.30	<0.12	<0.12
3148-W-014	<0.080	<0.080	<0.080	<0.080	<0.080	0.08	<0.12	<0.12	<0.12	<0.60	<0.12	<0.12	<0.12	<0.12	<0.12	<0.60	<0.30	<0.12	<0.12
3449-J-065	<0.080	<0.080	0.68	<0.080	<0.080	0.092	<0.12	<0.12	<0.12	<0.60	<0.12	<0.12	<0.12	<0.12	<0.12	<0.60	<0.30	<0.12	<0.12
3147-W-002	<0.080	<0.080	0.59	<0.080	<0.080	<0.080	<0.12	<0.12	<0.12	<0.60	<0.12	<0.12	<0.12	<0.12	<0.12	<0.60	<0.30	<0.12	<0.12
3149-W-034	<0.080	<0.080	0.32	<0.080	<0.080	<0.080	<0.12	<0.12	<0.12	<0.60	<0.12	<0.12	<0.12	<0.12	<0.12	<0.60	<0.30	<0.12	<0.12
3050-F-010	<0.080	<0.080	0.53	<0.080	<0.080	<0.080	<0.12	<0.12	<0.12	<0.60	<0.12	<0.12	<0.12	<0.12	0.19	<0.60	<0.30	<0.12	<0.12
3252-F-057	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.12	<0.12	<0.12	<0.60	<0.12	<0.12	<0.12	<0.12	<0.12	<0.60	<0.30	<0.12	<0.12
3054-F-015	<0.080	<0.080	0.51	<0.080	<0.080	0.085	<0.12	<0.12	<0.12	<0.60	<0.12	<0.12	<0.12	<0.12	<0.12	<0.60	<0.30	<0.12	<0.12
3052-F-010	<0.080	<0.080	0.5	<0.080	<0.080	<0.080	<0.12	<0.12	<0.12	<0.60	<0.12	<0.12	<0.12	<0.12	<0.12	<0.60	<0.30	<0.12	<0.12
3349-W-033	<0.16	0.22	0.49	<0.16	<0.16	<0.16	<0.12	<0.12	<0.12	<0.60	<0.12	<0.12	<0.12	<0.12	<0.12	<0.60	<0.30	<0.12	<0.12
3149-W-078	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.12	<0.12	<0.12	<0.60	<0.12	<0.12	<0.12	<0.12	<0.12	<0.60	<0.30	<0.12	<0.12
2948-W-028	<0.080	<0.080	<0.080	<0.080	<0.080	1.9	<0.12	<0.12	<0.12	<0.60	<0.12	<0.12	<0.12	0.27	<0.12	<0.60	<0.30	<0.12	<0.12
2748-W-044	<0.080	<0.080	<0.080	<0.080	<0.080	0.13	<0.12	<0.12	<0.12	<0.60	<0.12	<0.12	<0.12	<0.12	<0.12	<0.60	<0.30	<0.12	<0.12
3047-W-015	<0.080	<0.080	0.18	<0.080	<0.080	<0.080	<0.12	<0.12	<0.12	<0.60	<0.12	<0.12	<0.12	<0.12	<0.12	<0.60	<0.30	<0.12	<0.12
3047-W-107	<0.080	<0.080	<0.080	<0.080	<0.080	0.14	<0.12	<0.12	<0.12	<0.60	<0.12	<0.12	<0.12	<0.12	<0.12	<0.60	<0.30	<0.12	<0.12

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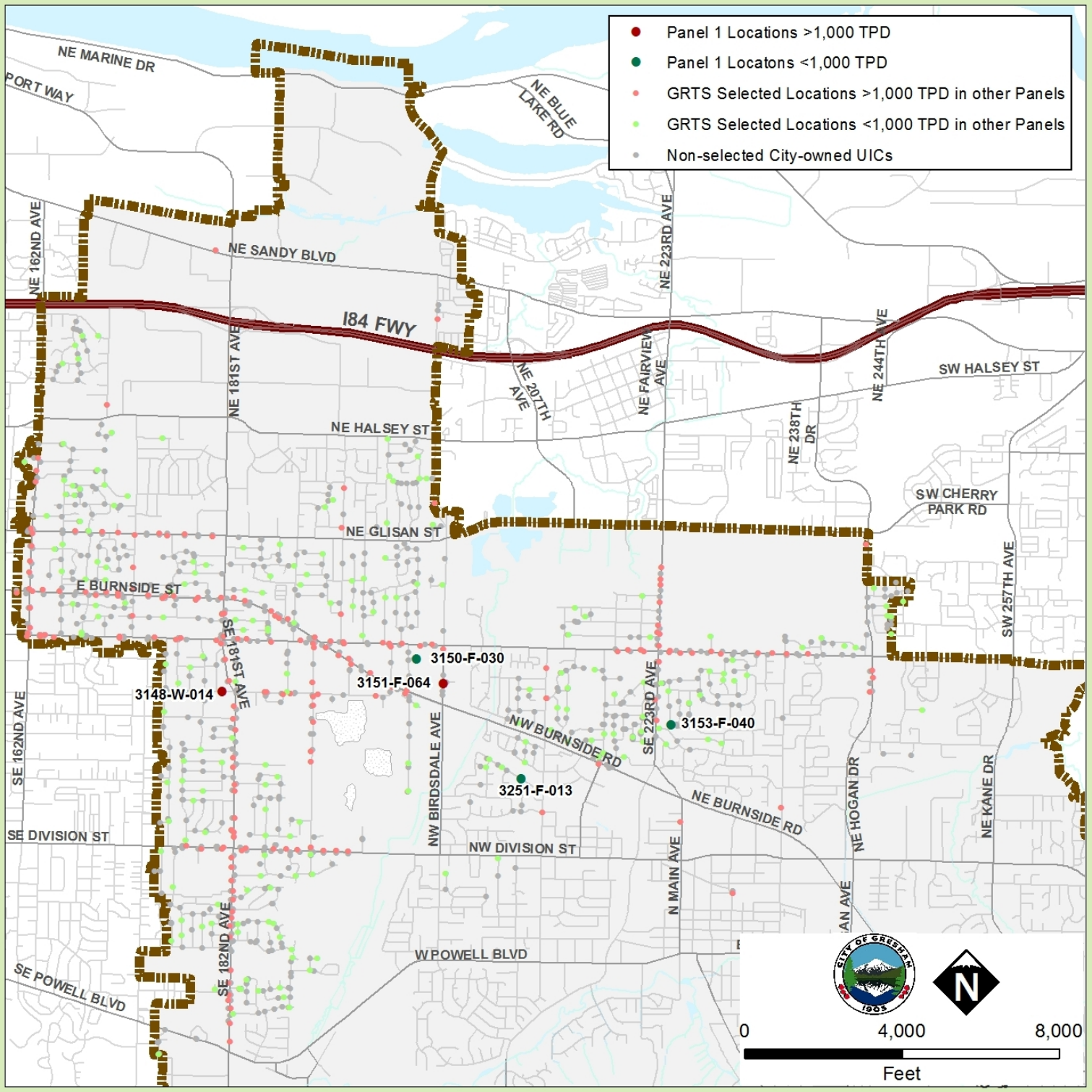
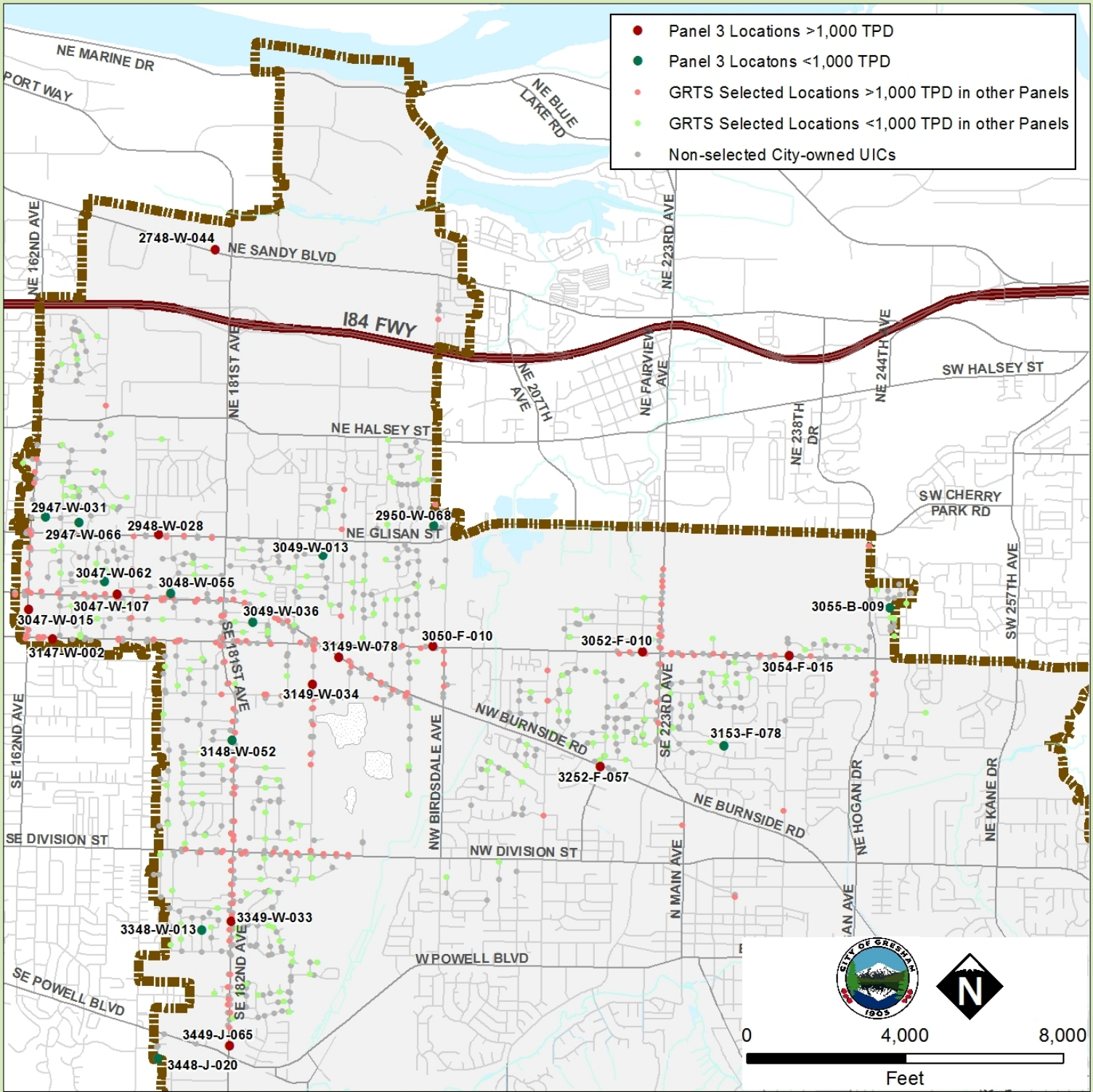
Order	Family	Genus	species	Life stage or condition	Sediment Sensitive/ Tolerant	Pollution Sensitive/ Tolerant	FCI0	FCI1	JCI1	JCI2	KCI1	KCI4	KI1	KI2	BCI1	BCI2
							7/31/2012	7/30/2012	7/31/2012	7/30/2012	8/2/2012	8/1/2012	7/31/2012	7/30/2012	8/2/2012	8/1/2012
Acari							5	16	4	2		8	19	10	1	1
Amphipoda				immature			8	11			28	50			1	
		Crangonyx					1		1	11	6	48	2		1	
Copepoda							2	2			2	7	11			
Decopoda	Astacidae	Pacifasticus					1	1	1	2	1		1		1	1
Hirudinea						Tolerant					1	63				1
Hydra						Tolerant		1			1					1
Isopoda						Tolerant	1	1							1	
Mollusca	Ancylidae	Ferressia			Tolerant	Tolerant	23	1	13	4	41				7	2
	Corbiculidae	Corbicula			Tolerant	Tolerant	1		1							
	Hydrobiidae	Fluminicola				Tolerant	58		8				2		21	
		Gyraulus			Tolerant	Tolerant					1					1
	Physidae	Physa				Tolerant	1									
	Pleuroceridae	Juga			Tolerant	Tolerant	4	88	214	59	103		15	2	39	366
	Sphaeriidae						7	30	2	2	22	18	6	2		1
Nematoda							4	1	5	15		11	7	2	10	5
Oligochaeta					Tolerant	Tolerant	21	167	55	23	14	104	51	5	20	22
Ostracoda							1							1		
Turbellaria	Planariidae							1	6	2		8	4	19	1	7
Ephemeroptera	Baetidae	Acentrella							1							
		Baetis		immature			23	38	35	45	90	2	6	4	135	30
		Baetis	tricaudatus				32	42	14	15	31	6	1	2	7	6
		Baetis	notus													
		Diphetor	hageni						2	23			1	8		
		Pseudocloeon														
	Heptageniidae			immature										2		
		Cinymga				Sensitive								1		1
		Ironodes												13		
	Leptophlebidae	Paraleptophlebia							20	248	3	1	15	17	15	4
Plecoptera	Chloroperlidae	Sweltsa												25		
	Leuctridae			immature		Sensitive								6		
	Perlodidae	Skwala												24		
	Nemouridae	Malenka												23		
		Soyedina												1		
		Zapada	cinctipes							11				145		
Coleoptera	Elmidae			immature			8			5				1		
		Lara					4	1	1	2			1	1		
		Optioservus		larva		Tolerant	29	1		15		1				1
		Heterlimnus		adult			8							1	1	1
		Narpus		larva										2		1
		Narpus		adult										1		
		Zaitzevia		larva		Tolerant				1						
	Hydrophilidae			adult								1				1

Order	Family	Genus	species	Life stage or condition	Sediment Sensitive/ Tolerant	Pollution Sensitive/ Tolerant	FCI0	FCI1	JCI1	JCI2	KCI1	KCI4	KI1	KI2	BCI1	BCI2
				larva			1									
Lepidoptera	Pyralidae					Tolerant						1				
Odonata	Zygoptera			Immature												
	Coenagrionidae	Agria				Tolerant	1									
Megaloptera		Sialis				Tolerant	2									
Trichoptera				pupa										1		
	Glossosomatidae			immature										12		
				pupa										10		
		Glossosoma			Sensitive									2		
	Hydroptilidae			immature				8								
				pupa				23								
		Hydroptila				Tolerant	2	8								
	Hydropsychidae			immature		Tolerant	1		64	7	18		14	1	91	1
				pupa		Tolerant										
		Cheumatopysyche				Tolerant		1	38	9	35		13	1	91	
		Parapysche												1		
	Lepidostomatidae	Lepidostoma					1	2					1	3		
		Mystacides					1									
	Limnephilidae	Dicosmoecus					1									
		Onocosmoecus					10									
		Psychoglypha										1				
	Philopotamidae	Wormaldia			Sensitive									10		
	Rhyacophilidae	Rhyacophila		immature										4		
		Rhyacophila	betteni											7		
		Rhyacophila	narvae											2		
	Uenoidae	Neophylax												5		
Diptera				immature												
	Ceratopogoninae													2		
	Forcipomyinae													2		
	Chironomidae	Boreochlus												1		2
		Brillia								1		12	2	7	2	
		Chaetocladius										1				
		Cricotopus					4		1						1	
		Corynoneura											3		2	
		Cryptochironomus				Tolerant		1								
		Diplocladius										1			1	1
		Eukiefferiella claripennis group								1		1		2		2
		Eukiefferiella devonica group						13								
		Eukiefferiella pseudomontana group							1	1					18	
		Krenosmittia												2		
		Limnophyes				Tolerant	1		1			3				
		Micropsectra					114	52		12	44	12	39	108	4	26
		Nanocladius														
		Nilotanypus							5	1			11			

Order	Family	Genus	species	Life stage or condition	Sediment Sensitive/ Tolerant	Pollution Sensitive/ Tolerant	FCI0	FCI1	JCI1	JCI2	KCI1	KCI4	KI1	KI2	BCI1	BCI2
		Orthocladius complex					2	1							1	
		Orthocladius (Symposiocladius)												1		
		Parametriocnemus					1		4	1	54		139	4		2
		Paratanytarsus					7									
		Paratendipes				Tolerant						1				
		Phaenopsectra					10									
		Polypedilum					12	6	24	22	9	20	115		3	13
		Prodiamesa										4				
		Psilometriocnemus												1		
		Rheocricotopus														
		Rheotanytarsus					40		7				12		3	
		Stempellinella					1						1			
		Synorthocladius				Sensitive	5				1				1	
		Tanytarsus								2		54	8			
		Thienemanniella					2							1	2	
		Thienemannimyia complex					43	47	3	15	78	57	43		13	10
		Tvetenia bavarica group					4	36			1		3	19	9	5
		Xenochironomus							2							
	Dixidae			pupa			4		2	1				1	1	1
		Dixa										1		24		
	Empididae			immature				1								
				pupa			1	1						1	1	1
		Clinocera						1				11	2		2	
		Neoplasta						1	1		1	2	1		1	
		Hemerdromia					9	1								
	Muscidae					Tolerant		1								
	Pelecorhynidae	Glutops				Sensitive								2		
	Psychodidae	Pericoma										1				
		Psychoda												1		
	Sciomyzidae			pupa								1			1	
	Simuliidae			immature				7	1	7	13		1		55	37
				pupa				2	1	1	3				2	1
		Simulium						5	1	7	9				8	16
	Thaumaleidae													4		
	Tipulidae			immature								2				
		Antocha			Tolerant					1						
		Dicanota			Tolerant				1	1		5		14	1	1
		Hexatoma			Tolerant									1		
		Limonia			Tolerant	Tolerant										
		Pedicia			Tolerant											
		Tipula			Tolerant			1				1	1	1	1	
Benthic Index of Biological Integiry (B-IBI) score							**24**	**20**	**16**	**20**	**18**	**18**	**20**	**44**	**18**	**14**
IBI Stream Condition (Level of Impairment)							**Moderate**	**Moderate**	**Severe**	**Moderate**	**Severe**	**Severe**	**Moderate**	**None**	**Moderate**	**Severe**

Site	Watershed	# days > 17.8	Max Temp	Notes
Burlingame @ Hogan	Beaver	23	20.4	
Kelly @ Above MHCC Pond	Beaver	27	19.4	
Kelly below MHCC Pond	Beaver	68	25.1	Not deployed entire summer
Kelly @ Ironwood	Beaver	1	18.1	Above pond
Kelly @ KCDP Outlet	Beaver	6	18.7	Below pond
Beaver @ Lower Footbridge	Beaver	53	21.1	
Beaver @ Division/Troutdale	Beaver	53	24.2	
Fairview @ Glisan	Fairview	116	26.5	Below Fujitsu Pond
Fairview @ Conifer	Fairview	42	22.1	Not deployed entire summer
Fairview @ Mobile Estates	Fairview	79	24.0	Not deployed entire summer
Badger Cr	Johnson	38	21.4	Upstream of Gresham
Botefuhr Cr	Johnson	0	13.4	
Chastain Cr	Johnson	3	19.8	
Heiney Cr	Johnson	43	21.3	
Hogan Cr	Johnson	89	24.5	
Jenne Cr	Johnson	0	17.4	
Johnson @ Telford	Johnson	57	23.3	Upstream of Gresham
Johnson @ Palmblad	Johnson	50	23.7	Not deployed entire summer
Johnson @ Ambleside	Johnson	52	22.3	
Johnson @ Main City	Johnson	63	23.9	
Johnson @ Gresham Woods	Johnson	78	25.1	
Kelley @ Rodlun	Johnson	2	17.9	Not deployed entire summer
Kelley @ PV Grange	Johnson	39	20.9	Not deployed entire summer
Meadow Cr	Johnson	8	20.7	
Miller Cr	Johnson	0	17.2	Dry 8/10-10/12
N Fk Johnson	Johnson	6	18.5	U/S of Gresham. Dry 8/24-10/12
Nechacokee Cr	Johnson	21	20.9	
Sunshine Cr	Johnson	50	20.8	Upstream of Gresham
Thom Cr	Johnson	14	19.4	
Thompson Cr	Johnson	16	27.4	High temp likely air temp


Panel 1 Locations >1,000 TPD
Panel 1 Locatons <1,000 TPD
GRTS Selected Locations >1,000 TPD in other Panels
GRTS Selected Locations <1,000 TPD in other Panels
Non-selected City-owned UICs
NE MARINE DR
PORT WAY
NE BLUE LAKE RD
NE 162ND AVE
NE SANDY BLVD
I84 FWY
NE 181ST AVE
NE 223RD AVE
NE 207TH AVE
NE FAIRVIEW AVE
NE 244TH AVE
SW HALSEY ST
NE HALSEY ST
NE 238TH DR
SW CHERRY PARK RD
NE GLISAN ST
E BURNSIDE ST
SW 257TH AVE
SE 181ST AVE
3150-F-030
3151-F-064
3148-W-014
3153-F-040
NW BURNSIDE RD
SE 223RD AVE
SE 162ND AVE
NW BIRDSDALE AVE
3251-F-013
NE BURNSIDE RD
NE HOGAN DR
NE KANE DR
SE DIVISION ST
NW DIVISION ST
N MAIN AVE
SE 182ND AVE
W POWELL BLVD
SE POWELL BLVD
0
4,000
8,000
Feet


Panel 3 Locations >1,000 TPD
Panel 3 Locatons <1,000 TPD
GRTS Selected Locations >1,000 TPD in other Panels
GRTS Selected Locations <1,000 TPD in other Panels
Non-selected City-owned UICs
NE MARINE DR
PORT WAY
NE BLUE LAKE RD
NE 162ND AVE
2748-W-044
NE SANDY BLVD
I84 FWY
NE 181ST AVE
NE 223RD AVE
NE 207TH AVE
NE FAIRVIEW AVE
NE 244TH AVE
SW HALSEY ST
NE HALSEY ST
NE 238TH DR
SW CHERRY PARK RD
2947-W-031
2947-W-066
2948-W-028
2950-W-068
NE GLISAN ST
3049-W-013
3047-W-062
3048-W-055
3047-W-107
3047-W-015
3049-W-036
3055-B-009
SW 257TH AVE
3147-W-002
SE 181ST AVE
3149-W-078
3050-F-010
3052-F-010
3054-F-015
3149-W-034
NW BURNSIDE RD
SE 162ND AVE
3148-W-052
SE 223RD AVE
3153-F-078
3252-F-057
NE BURNSIDE RD
NW BIRDSDALE AVE
NE HOGAN DR
NE KANE DR
SE DIVISION ST
NW DIVISION ST
N MAIN AVE
3348-W-013
3349-W-033
W POWELL BLVD
SE POWELL BLVD
SE 182ND AVE
3449-J-065
3448-J-020
0
4,000
8,000
Feet