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Pierce County

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March 21, 2011
WP57614

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Vince McGowan, Municipal Stormwater Permit Manager
Department of Ecology
P.O. Box 47775
Olympia, WA 98504-7775

Subject: Quality Assurance Project Plan Submittal, Pierce County
Phase I Municipal Stormwater Permit #WAR04-4002

Dear Mr. McGowan:

Enclosed please find two copies of the Quality Assurance Project Plan for Stormwater Characterization, Permit Condition S.8, Phase I Municipal Stormwater Permit.

I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for willful violations.

If you have any questions, please call Mr. Dan Wrye, Water Quality Manager. His number is 253-798-4672.

Sincerely,

A handwritten signature in cursive script that reads "Pat McCarthy".

Pat McCarthy
Pierce County Executive

PM:DDW:kj
Enclosures

cc: Dan Wrye, PW&U, Surface Water Management Division
File





Pierce County

Public Works and Utilities

2702 South 42nd Street, Suite 201
Tacoma, Washington 98409-7322
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Brian J. Ziegler, P.E.
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March 21, 2011
WP57613

Vince McGowan
Washington State Department of Ecology
PO Box 47775
Olympia, WA 98504-7775

Subject: Phase I Permit #WAR04-002, Permit Condition S8 QAPP Submittal

Dear Mr. McGowan:

Attached are two (2) copies of the final Quality Assurance Project Plan (QAPP) for stormwater monitoring, S8.F Best Management Practice Evaluation Monitoring. In your Special Condition letter (2/10/11) you gave Pierce County the option to either meet the conditions in a finalized QAPP or submit a QAPP addendum. Attached is Pierce County's QAPP addendum addressing Ecology's comments. Please attach this Addendum and incorporate it by reference to the QAPP.

Please attach and replace the following errata pages into the QAPP:

- Attach March 21, 2011, Addendum at end of QAPP
- page iii
- page 10
- page 29
- page 43

Windy Kruse is available to meet or discuss this with you at your convenience. Her phone number is 253-798-3092.

Sincerely,

A handwritten signature in black ink, appearing to read "Dan D. Wrye".

Dan D. Wrye
Watershed and Water Quality Manager

DDW:kj
Attachments

cc: File



QUALITY ASSURANCE PROJECT PLAN

Pierce County Phase I Municipal Stormwater Permit Stormwater BMP Performance Monitoring

Prepared for

Pierce County



Surface Water Management

January 2011

March 21, 2011, Addendum 1
to
Quality Assurance Project Plan (QAPP)
for
Pierce County Phase I Municipal Stormwater
Permit Stormwater BMP Performance
Monitoring, January 2011

Pierce County Introduction

This is an Addendum to Pierce County, Washington's Quality Assurance Project Plan (QAPP) for the County's compliance with its NPDES Phase I Municipal Stormwater Management Permit concerning Permit Section S8.F., BMP Performance Monitoring. This Addendum modifies that QAPP as authorized by the Washington Department of Ecology and is incorporated by reference into that QAPP.

The Addendum is formatted to include and provide specific modifications to the QAPP in response to February 10, 2011, written comments received from Department of Ecology on the County's January 24, 2011, QAPP submittal.

Pierce County's responses are shown in *red italics*.

February 10, 2011

CERTIFIED MAIL 7010 0780 0002 3400 1946

Mr. Dan Wrye
Pierce County
Public Works and Utilities Surface Water Management
2702 South 42nd Street, Suite 201
Tacoma, WA 98409-7322

Re: Phase I Municipal Stormwater Permit #WAR04-4002
Comments on S8.F revised draft Quality Assurance Project Plan (QAPP)

Dear Mr. Wrye,

This letter transmits the Department of Ecology's (Ecology) comments on a revised draft QAPP submitted by Pierce County on January 24, 2011, in accordance with Special Condition S8.F (Best Management Practice Evaluation Monitoring) of the Phase I Municipal Stormwater Permit (Permit).

Conditional QAPP Approval

At this time, Ecology is granting approval of your QAPP for S8.F based on the following conditions. These conditions must be met in a finalized QAPP or QAPP addendum submitted to Ecology within 60 days from receipt of this letter.

- *Project Schedule* (page 10): Update current monitoring schedule in final QAPP to ensure adequate timeframes. *Page 10, last full sentence under the section heading "Project Schedule" is hereby revised to read as follows: "Actual monitoring will then initiate at the start of water year 2011 (i.e., October 2010) and continue until the permit-listed statistical goals have been met **and** until a maximum of 35 samples have been collected from the influent or effluent monitoring stations."*
- *Sampling Process Design Section*: The last paragraph in this section under the Magnolia Storm Filter implies that a total of 12 storms are needed for this study. The QAPP indicates that six storms will be sampled, then the media will be removed and replaced with the XLP media and another six storms will then be sampled to characterize system performance with the XLP media. This is acceptable at a minimum but the permittee is required to continue sampling until the permit-required statistical goals are met in the permit or a maximum of 35 sample sets are collected. The QAPP cannot limit this study

to a total of 12 storm events. The same comment applies to page 29 in the Canyon Road StormFilter section. *Comment acknowledged. See response above. Page 10, last full sentence under the section heading "Project Schedule" is hereby revised to read as follows: "Actual monitoring will then initiate at the start of water year 2011 (i.e., October 2010) and continue until the permit-listed statistical goals have been met **and** until a maximum of 35 samples have been collected from the influent or effluent monitoring stations." This applies to the Magnolia and Canyon Road sampling described under this comment.*

- There appears to be a typo on page 29, in the Canyon Road StormFilter section. Please clarify the number of filter cartridges (46 or 47) used to operate the system. *Page 29, first full paragraph is hereby revised to read as follows: "The system was constructed with **66** cartridges in a double-vaulted StormFilter system based on 15 gpm used for design before the StormFilter GULD was issued in January 2005; **33** cartridges are housed in each half of the vault (Figure 9). Based on the above calculation and a design flow of 2.32 cfs, only 46 cartrides are required for water quality treatment with the revised flow rate operated with **66** cartridges so that the associated data will reflect the performance of a system that is appropriately sized."*
- There appears to be a typo on page 43 under Water Quality Monitoring, the term "sort" instead of "short". *The first sentence on Page 43 last full paragraph under the section heading "Water Quality Monitoring – Short Detention Time BMPs" is hereby revised to read as follows: "At the **short** detention time BMPs (Canyon Road StormFilter and Magnolia StormFilter) flow weighted composite samples will be collected from monitoring stations established at each BMP **for** characterizing influent and effluent pollutant concentrations."*

If you need technical assistance or have general questions, please contact me at 360-407-7320.

Sincerely,

Vincent McGowan
Municipal Stormwater Permit Manager
Southwest Regional Office
Water Quality Program

cc: Julie Lowe, Municipal Stormwater Planner, Ecology

Statistical Comparisons of Influent and Effluent Pollutant Concentrations and Loads.....	72
Calculation and Evaluation of Pollutant Reduction Efficiencies.....	73
Evaluation of Effluent Concentrations.....	74
References.....	75
Appendix A	Crimson Plat Wetpond Design Details
Appendix B	Sunrise Long Detention Pond Design Details
Appendix C	Magnolia StormFilter Design Details
Appendix D	Canyon Road StormFilter Design Details
Appendix E	Standardized Field Form
Appendix F	Standard Operating Procedure for Water Quality Monitoring of Long Detention Time BMPs
Appendix E	March 21, 2011 Addendum to BMP QAPP

above. Pursuant to Ecology (2007b) design guidance for a StormFilter in an off-line configuration, 47 StormFilter cartridges are required to treat this design flow based on the sizing equation recommended by the manufacturer and the correction factor provided in Figure 9.6b of the Ecology (2005) manual:

$\text{Number of Cartridges} = \frac{Q_{\text{treat}}}{3} \times \frac{449 \text{ gpm/cfs}}{7.5 \text{ gpm/cartridge}}$

The system was constructed with 70 cartridges in a double-vaulted StormFilter system based on 15 gpm used for design before the StormFilter GULD was issued in January 2005; 35 cartridges are housed in each half of the vault (Figure 9). Based on the above calculation and a design flow of 2.32 cfs, only 46 cartridges are required for water quality treatment with the revised flow rate per cartridge and the Figure 9.6b conversion factor. During this monitoring, the system will be operated with only 47 cartridges so that the associated data will reflect the performance of a system that is appropriately sized.

Similar to the Magnolia StormFilter, monitoring at the Canyon Road StormFilter will be performed to compare the performance of the XLP media and ZPG media for TSS removal. Monitoring will initially be performed with only the XLP media installed in the system. After approximately 6 storms have been sampled, the XLP media will be removed and replaced with the ZPG media. Another 6 storms will then be sampled to characterize system performance with the ZPG media. Effluent concentrations from the two monitoring periods will then be compared to assess the relative performance of each media type. An orifice will be installed in association with each cartridge to restrict flow rates to a maximum of 7.5 gpm per cartridge.

Note that this monitoring method is nearly identical to the Magnolia StormFilter; however, both StormFilters will not be monitoring the same media at the same time. The Canyon Road StormFilter will first evaluate the ZPG media, while at the Magnolia StormFilter, the XLP media will be tested first.

Monitoring Procedure Overview

In order to meet the monitoring objectives that are identified in the *Project Description* section of this QAPP, hydrologic, water quality, and sediment monitoring will be performed in connection with each of the BMPs identified above. The following subsections provide an overview of the procedures that will be used in connection with this monitoring. In general, these procedures were developed based on requirements identified in the Phase I Municipal Stormwater Permit (Ecology 2007a) and guidance from Ecology (2008) in *Guidance for Evaluating Emerging Stormwater Treatment Technologies: Technology Assessment Protocol – Ecology (TAPE)*.

Sampling Procedures

The following subsections describe the procedures that will be followed by field personnel during the implementation of required hydrologic, water quality and sediment monitoring for this project.

Hydrologic Monitoring

As described above, flows will be monitored continuously at influent and effluent monitoring stations for each BMP. In addition, precipitation depths will also be monitored continuously at each BMP. Specific details regarding the monitoring equipment that will be installed in connection with each BMP are presented in the *Sample Process Design* Section. All equipment will be tested prior to installation to ensure that sensors are accurately measuring water levels and velocities in accordance with manufacturer's specifications. The actual installations will then be thoroughly documented by field crews and appropriate measurements will be collected to ensure monitoring accuracy (e.g., elevations of transducers relative to primary measurement devices such as weirs).

One week after the equipment is installed at a particular station, field personnel will visit the station to confirm that the equipment was installed correctly and is functioning as designed. After this initial check, field personnel will perform monthly site visits to check and replace batteries as necessary, visually inspect all system components, and perform calibration checks as necessary (see *Quality Control* section). Any operational problems that are identified during these site visits will be addressed immediately. Field personnel will use standardized field forms to document maintenance, calibration, and troubleshooting activities (Appendix E).

Water Quality Monitoring – Short Detention Time BMPs

At the sort detention time BMPs (Canyon Road Stormfilter and Magnolia Stormfilter) flow weighted composite samples will be collected from monitoring stations established at each BMP to characterizing influent and effluent pollutant concentrations. To facilitate collection of these samples, long-range precipitation forecasts from the Center for Ocean-Land-Atmosphere Studies (<http://wxmaps.org/pix/meteograms.html>) will be examined daily to determine if specific storms should be tracked for sampling based on the criteria identified in the Quality Objectives section for representative storms. Within 72 hours of an approaching storm, short-range precipitation forecasts will be examined for a more accurate assessment of the storm characteristics relative to these criteria. The short-range forecasts will be obtained primarily from Quantitative Precipitation Forecasts (QPF) that are generated by the National Oceanic and Atmospheric Administration (NOAA) and accessible via the following website: http://www.weather.gov/forecasts/xml/SOAP_server/ndfdXML.htm. The QPFs show forecasted