UIC Stormwater Monitoring Plan: Sampling and Analysis
Quality Assurance
Underground Injection Control Systems
Water Pollution Control Facility Permit

Public Works Department

Stormwater Utility
April 2013
Revised - 10/28/2014
The City of Bend would like to thank the Cities of Portland and Gresham along with the Oregon Department of Transportation for the use of their monitoring plans which were used as models for this document.
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Appendix A
Nalgene Storm Water Sampler Information
1.0 Introduction and Purpose

1.1 Introduction and Purpose
The Underground Injection Control (UIC) program was enacted in 1974 as part of the Safe Drinking Water Act, which is administered by 40 Code of Federal Regulations part 144. The Oregon Department of Environmental Quality (DEQ) regulates this program under Oregon Administrative Rules Chapter 340, Division 44. The intent of the program is to protect groundwater aquifers from contamination. In Oregon, all groundwater aquifers are considered potential drinking water sources.

The City of Bend is classified as a large municipality with more than 50 City-owned or operated Class V UICs. The City has applied for a Water Pollution Control Facilities (WPCF) Permit for Class V Stormwater UIC Systems from DEQ, which is anticipated to be effective from 2013 through 2023.

The purpose of this monitoring plan is to appropriately sample stormwater being discharged to City-owned underground injection controls in a representative manner to ensure compliance with the City’s WPCF Permit for UICs. This plan represents a cooperative effort between the City of Bend’s Stormwater Division and its NELAC Institute (TNI) accredited Water Quality Laboratory. The plan is part of the laboratory’s quality system as detailed in the Laboratory Quality Assurance Manual. All sampling and testing performed as part of this plan is performed according to the Laboratory’s Quality System standards. Additionally, this plan has been drafted to comply where applicable and possible with TNI’s Volume 1: General Requirements for Field Sampling and Measurement Organizations.

1.2 Background
The City of Bend operates two types of UIC facilities: drywells and drill holes. Drywells are typically 3 to 4 feet in diameter and typically range in depth from a minimum of 10 to 20 feet. Drill holes are 6 to 8 inches in diameter and range in depth from 20 to over 100 feet. The City’s newly adopted design standards for UICs require pre-treatment upstream of all new UICs. The majority of the City’s UICs was constructed in accordance with old design standards and did not include pretreatment besides catch basins.

1.3 Monitoring Considerations
The City of Bend has significantly different rainfall patterns and events compared to many of the other cities within Oregon. This monitoring plan has incorporated Bend specific weather data into its rationale for stormwater monitoring. The City asks the following
considerations be reviewed as part of this plan.

1.3.1 Precipitation Amounts
Figure 1-1 provides an example of how precipitation rates vary across Oregon and shows the impact that the Cascade Mountain range has in our region. The lack of rain combined with the cold climate and summer thunderstorms make stormwater monitoring extremely difficult to implement and manage.

1.3.2 Weather Forecasting
Weather forecasting can be challenging. Central Oregon has very poor radar coverage. The nearest radar station is located in Portland, over 145 miles from Bend on the other side of the Cascade Mountains (see Figures 1-2 and 1-3). Local weather forecasts are often not accurate, vary among sources and tend to change frequently as storms approach.
1.3.3 Winter Monitoring Considerations
The City receives on average 11.63 inches of precipitation per year (see Table 1-1). November through March is the five wettest months of the year but is also the coldest months. The average low temperature during this period of time is 20.5° with an average day time high temperature of 49.6°. During this five month period the City typically receives 6.97 inches of precipitation (59% of the total annual precipitation), which includes 30.7 inches of snow fall. Therefore 43% of the precipitation that Bend receives during the wet season falls in the form of snow. Cold weather combined with heavy snow fall make collecting stormwater runoff samples challenging. Even though the average winter snow depth is only 1-2 inches between December and February these storms normally come in higher amounts and melt off after a period of time; the average includes time without snow. Finally, winter street operations plow snow from the roadways onto the shoulders creating large snow berms up to 3’ to 4’ in height. The snow banks end up covering stormwater features including catch basins and UIC access lids, preventing access to the facility for days and sometimes even weeks without additional specified clearing work.

Table 1-1

<table>
<thead>
<tr>
<th>BEND, OREGON (350694)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monthly Climate Summary</td>
</tr>
<tr>
<td>Period of Record: 1/1/1928 to 12/31/2005</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Average Max. Temperature (°F)</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40.6</td>
<td>45.2</td>
<td>51</td>
<td>57.9</td>
<td>65.5</td>
<td>72.7</td>
<td>82.1</td>
<td>81.1</td>
<td>73.8</td>
<td>63</td>
<td>49.1</td>
<td>41.8</td>
<td>60.3</td>
</tr>
<tr>
<td>Average Min. Temperature (°F)</td>
<td>21.7</td>
<td>24</td>
<td>26.5</td>
<td>29.7</td>
<td>35.4</td>
<td>40.9</td>
<td>45.6</td>
<td>44.6</td>
<td>38.4</td>
<td>32.1</td>
<td>27.1</td>
<td>23.4</td>
<td>32.5</td>
</tr>
<tr>
<td>Average Total Precipitation (in.)</td>
<td>1.78</td>
<td>1.05</td>
<td>0.82</td>
<td>0.65</td>
<td>0.98</td>
<td>0.93</td>
<td>0.47</td>
<td>0.49</td>
<td>0.41</td>
<td>0.72</td>
<td>1.42</td>
<td>1.9</td>
<td>11.63</td>
</tr>
<tr>
<td>Average Total Snowfall (in.)</td>
<td>10.6</td>
<td>5.3</td>
<td>3.3</td>
<td>1.2</td>
<td>0.2</td>
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<td>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>3.6</td>
<td>7.9</td>
</tr>
<tr>
<td>Avg. Snow Depth (in.)</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

(Data provided by the Western Regional Climate Center)

1.3.4 Summer Monitoring Considerations
During the summer months (June through August), the climate in Bend is generally sunny and dry. On average the City receives 1.91 inches of precipitation during the summer months (16% of the annual rain fall). In addition to the limited precipitation, storms during the summer months are typically short duration thunderstorms that often last less than 15 minutes in length (see graph below). Thunderstorms produce rain sporadically in small sections of the City. Collecting samples during a thunderstorm can also be hazardous to employees if lightening is present. The short duration of thunderstorms make it difficult to mobilize a monitoring team and collect a sample before the precipitation subsides (see Figure 1-4).
1.3.5 Considerations Summary
The climate and weather patterns in Bend make collecting stormwater samples challenging. To increase the likelihood of collecting runoff the City has selected fixed monitoring locations. This will allow staff to select large drainage areas that are more likely to produce runoff during small rain events or take grab samples. The fixed stations will allow the City to use ISCO flow monitors and Flow link software to monitor flow rates at the sample locations. Monitoring staff will deploy Nalgene® Stormwater Samplers prior to a rain event. When flow is detected by the ISCO equipment, the equipment will send a text message to the monitoring team members. Monitoring teams will then go out and gather the Stormwater samples.

Based on the considerations outlined above the City has selected a subset of 6 high risk UICs as a representative population and will collect 2 samples per year, per location. See Chapter 2.0 for additional information on the subset selection process. Samples will be collected at the end of pipe (EOP) discharge point into the UICs.

1.4 Monitoring Goals
The goal of this plan is to demonstrate that stormwater discharged into City owned and operated UICs is protective of groundwater by evaluating results against Table 1 action levels established in Schedule A.2 of the WPCF UIC permit.

1.5 Modifications to Stormwater Monitoring Plan
Potential changes or modifications to the Stormwater Monitoring Plan may be identified during sampling activities or during review and evaluation of the field and/or analytical data. Plan modifications are useful to ensure continual improvement of approaches utilized for the overall stormwater monitoring program. Modifications help ensure the ongoing protection of beneficial uses, review of available technologies and practices, and ongoing evaluation of the resources needed to successfully implement the program.
Minor changes will be summarized and submitted to DEQ as part of the Annual Report. The City interprets the following types of actions/modifications to be minor:

- Correction of typographical errors
- Incorporation of new data discovered/determined by UIC investigations/inspections, complaint responses, system-wide assessment, etc.
- Increased sampling frequency or increased analytical testing
- Schedule changes not defined by the permit
- Changes in City data management, evaluation methods, or annual report content
- Changes in field procedures or analytical methods consistent with the permit
- Change in contract laboratory
- Collection and evaluation of source identification or corrective action data
- Collection and evaluation of groundwater data
- Change in data evaluation and trend analyses
- Changes in City program staff
- Changes to sampling locations, but the representative classification must remain the same.

The following types of actions/modifications may be considered “major” and will be submitted to the DEQ for review to determine whether the proposed change is a “Category 2” action as defined by OAR 340-045-0027:

- Decrease in sampling frequency or analytical testing
- Decrease in number of sampling locations
- Decrease in number of samples collected for a particular location.

The City will submit these types of proposed modifications to DEQ for approval prior to implementation. If DEQ does not respond within 60 calendar days the proposed modifications will be deemed approved.

1.6 Relationship to Other Plans

Monitoring data collected through this Stormwater Monitoring Plan will be used to ensure compliance with action levels listed in the WPCF UIC Permit Schedule A.2 Table 1, and meets the Monitoring Plan development task of the Integrated Stormwater Management Plan 2022. The monitoring data may also help identify needed corrective actions, need for groundwater monitoring, or UIC closure. Data collected in accordance with UIC closure, groundwater, or other plans developed for the UIC program may be used to supplement the compliance monitoring data set outlined in the this plan as appropriate. All data collected under the UIC program will be used to:

- Ensure that infiltration of stormwater runoff from urban areas through City-owned UIC structures occurs in a manner that protects watershed health and the beneficial use of groundwater, including use of groundwater as drinking water
- Develop and implement strategies and actions that contribute to achieving watershed goals, objectives, and targets
- Meet regulatory mandates and permit requirements for all City-owned UICs.
2.0 Site Conditions

2.1 Study Locations
City staff will collect stormwater samples at representative locations to verify compliance of the quality of stormwater runoff from the public right-of-way and facilities that discharge to UIC systems. Six high risk representative monitoring sites have been selected. These sites were selected based on land use zoning, access safety and average daily trip (ADT) data along with likeliness to receive adequate flow for sampling. The sampling sites consist of one site in a high-traffic residential zoned area, one site in a low-traffic residential zoned area (with <1,000 ADT), one site in an industrial zoned area, one site in a commercial area, one site at a City operated corporation facility, and one site at the City-owned municipal airport. The City attempted to pick areas in each classification that had the highest ADT in an effort to select the worst case scenario except in the case of the residential <1000 ADT site for which a site with larger front landscaping was selected.

Table 2-1

<table>
<thead>
<tr>
<th>Site</th>
<th>QTY</th>
<th>Classification</th>
<th>COB UIC #</th>
<th>Nearest Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Airport</td>
<td>DDW009618</td>
<td>63136 Powell Butte Hwy.</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>Commercial &gt; 1000 ADT</td>
<td>DDW003323</td>
<td>320 Century Dr. (UIC located on SW Simpson)</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>Corporation Yard</td>
<td>DDW003355 DDW003354</td>
<td>62975 Boyd Acres Rd.</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>Industrial &gt; 1000 ADT</td>
<td>DDW008884</td>
<td>20720 Empire Ave.</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>Residential &gt; 1000 ADT</td>
<td>DDW003312</td>
<td>61270 Brookswood Blvd.</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>Residential &lt;1000 ADT</td>
<td>DDW007912 DDW003252</td>
<td>61121 Ladera Rd.</td>
</tr>
</tbody>
</table>

2.2 Access & Safety
Sample locations were selected to meet the requirements listed in Section 2.1 and provided safe access for monitoring crews. The site selection process included looking at potential traffic impacts, bike and pedestrian safety and monitoring vehicle parking. All of the proposed monitoring locations are out of the vehicle travel lanes and have a safe parking area within a reasonable distance.

2.3 Well Draining UIC Facilities
To protect equipment investments the selected UICs need to drain relatively well. UICs with evidence of surcharging above the inlet pipe are also not suited for sampling. Sampling equipment is water proof but it is not designed to be fully submerged.
2.4 UIC Layout
Another consideration for site selection is the construction of the drywell and inlet piping. In order for staff to use the Nalgene Storm Water Samplers (see Appendix A) and ISCO flow monitors outlet piping needs to extend into the UIC 12 inches and have 3 ft. clearance between the lid and the top of pipe. City staff inspected 20 potential sampling locations in order to locate feasible locations and was able to make modifications as necessary to ensure an appropriate fit.

2.5 Sampling Location Suitability
Prior to sampling, each identified potential UIC sample location was, and for any necessary replacement sites will be, investigated and inspected for the purpose of determining if the UIC is suitable for sampling. The pre-sampling and field investigation will obtain and/or confirm the following information:

- City’s system identification number
- Street address or intersection location
- Latitude and longitude in decimal degrees
- The type of construction
- Street functional classification and field review
- Predominant land use in UIC drainage area
- UIC accessibility
- Potential health and safety concerns for sampling activities (e.g., traffic, UIC location, visibility (e.g., blind corners))
- General stormwater system condition
- Maintenance (e.g., cleaning) or repair needed prior to initiating sampling
- The type of pretreatment BMP (if any)
- Potential pollutant sources (e.g., site activities, construction, unimproved street) in the estimated UIC drainage area.

The results of either the pre-sampling investigation or field inspection is/will be used to determine whether or not a UIC location is suitable for sampling. UICs may be determined to be unsuitable for sampling, based on one of the following factors, or other unforeseen factors approved by DEQ:

- Unsafe sampling conditions
- Incorrect traffic categorization or otherwise not a high risk member of the representative class
- Physical barrier or denied access to the location or structural constraints making sampling infeasible
- UIC has been decommissioned, could not be found or no longer exists
- Maintenance or repair needed prior to initiating sampling or conditions that prevent collection of representative samples
- UIC does not receive adequate flow during rain events.
3.0 Sampling Locations
The City is focusing on sampling six representative highest risk sites, described in Section 2.0.

3.1 Set Standard Sampling Locations
The following pages provide maps of the six UICs that are the proposed set of high-risk sampling locations, representing each category. These sites have been found to be acceptable so long as adequate runoff flow during rain events can be routinely confirmed.

3.2 Replacement Locations – Oversample Panel
In the event any UIC described herein is determined to be unsuitable for sampling (e.g., incorrect traffic categorization, decommissioned, unsafe conditions, continual lack of runoff flow), a replacement UIC (i.e., location) that meets the specific criteria for the site being replaced will be selected based on the results of a pre-sampling investigation or field inspection, and will be reported in the annual report, along with the reasoning for the change.

If necessary, replacement locations will be selected using the following process:
- If it is determined that a UIC is unsuitable for sampling, a replacement UIC will be selected from high-risk sites with the same category criteria; and
- The replacement UIC will be investigated and field verified as described in Section 2 to confirm its suitability for sampling.
SET STANDARD SAMPLING LOCATIONS

Figure 3-1  Monitoring Location # 1
Airport
UIC #DDW009618
63136 Powell Butte Hwy.

Sample Location notes: Receives water from longitudinal trench drain.
Figure 3-2 Monitoring Location # 2  
Commercial > 1000 ADT  
UIC #DDW003323  
320 Century Dr.

Sample Location notes:
Revised Sample Location

Figure 3-3 Monitoring Location # 3
City Facility/Corporation Yard
DDW003355 DDW003354
62975 Boyd Acres Rd.

Sample Location notes:
Figure 3-4 Monitoring Location # 4
Industrial > 1000 ADT
DDW008884
20720 Empire Ave..

Sample Location notes:
Figure 3-5 Monitoring Location # 5
Residential > 1000 ADT
DDW003312
61270 Brookswood Blvd.

Sample Location notes: Parking available in Bronze Meadow Ln. cul de sac with access walkway.
Figure 3-2 - Monitoring Location #6
Residential <1000 ADT
DDW007912
61121 Ladera Rd.

Site Location

Sample Location notes:
Revised Sample Location

Figure 3-2  Monitoring Location # 6
Residential <1000 ADT
DDW003252
61225 Ladera Rd.

Sample Location notes:
4.0 Sampling Techniques and Equipment
The City will incorporate Nalgene Stormwater Samplers or grab samples

4.1 Nalgene Stormwater Samplers
The Nalgene Storm Water Samplers are specially designed for organic and metals analysis, to capture first-flush samples. Fluorinated upper structure prevents oil and grease from sticking. The sampler collects a full one liter first flush grab sample into a 1,000 ml amber glass sample bottle within the first minutes of stormwater pipe outfall flow. Floating ball valve automatically closes off sample port after bottle is full to prevent comingling with later run-off and volatile analyte loss. The sampler meets EPA NPDES MSGP (Fed. Reg. FRL-6880-5 10/20/00) (See Appendix A).

Up to four 1,000 ml amber glass stormwater samplers are mounted into a single Teflon container with a retaining Teflon plate to prevent floatation. The container is then suspended in the UIC directly under the inlet pipe using a stainless steel bracket.

4.2 Grab Samples
Grab samples are taken using BEL-ART Long-Handled 16 oz HDPE dipper that is chemical and corrosion resistant. The sampling bowl is welded to the handle at a 45 degree angle for easier sampling from an elevated position. Grab samples will be taken at the pipe outfall inside the UIC.

4.3 Sample Coolers
There will be one sample cooler per site. At the lab the samples are split and sent by cooler for further testing. The sampler cooler generally contain the following:
- Chain of Custody form
- Nitrile gloves
- (2) 1 L Amber Glass Bottles with Thiosulfate pres - EPA 8270
  - 500 ml HDPE No Pres - Trace Metals
  - 500 ml HDPE No Pres – PH, Temperature, Conductivity
- Ice

4.4 Flow Monitors
ISCO 2150 Flow Modules are used to measure pipe flow velocity at the end of pipe in the UIC. The 2150 is connected to a cellular modem that allows users to remotely download data. The downloaded data is saved to a City server and is accessed using FlowLink. This program is setup to send a text message to monitoring staff when flow is detected at the UIC sample location. Flow monitors may be used with either battery or solar power.
5.0 Monitoring Frequency and Event Targeting

Weather monitoring should occur throughout the year, or until the desired number of events have been sampled. However, since the sites are located in an area that receives snowfall in the winter, monitoring will likely occur during the spring and fall seasons when runoff is more likely to occur.

5.1 Event Targeting

Prior to initiating a sampling event, the storm will be predicted and evaluated against the criteria listed below to assess whether the predicted storm should be targeted as a potential compliance-sampling event. Based on the City’s historical experience with stormwater monitoring in this region, storms meeting these criteria are expected to provide the volume of runoff necessary to implement sampling. Smaller storms, or storms of shorter duration, are considered to have a low probability of producing sufficient runoff to warrant the extensive preparation and mobilization time required for this project. It is likely that a targeted and sampled storm may not meet the criteria below when the sampling event is completed, or that unpredicted events will occur that do meet the criteria. Thus, the criteria will be used as general guidance to determine when forecasted storms should be targeted for sampling during this project. Storm event criteria are as follows:

- Precipitation Potential for rain is ≥70% within 4 hours of event
- Predicted rainfall amount of ≥ 0.1 inches per storm within a 12 hour period
- Predicted rainfall event duration ≥ 3 hours
- Antecedent dry period ≥ 8 hours
  (As defined by <0.05 inches of precipitation over the previous 8 hours).

5.2 Weather Forecasting and Monitoring

The storm event coordinator will use up to four resources to monitor or forecast storm activity, as appropriate:

- National Weather Service (www.noaa.gov)
- AgriMet Station (BEWO) (www.usbr.gov/pn/agrimet/agrimetmap/bewoda.html)
- Weather Underground (www.wunderground.com)
- KTVZ News Channel 21 (www.ktvz.com/weather)

Weather monitoring will include both monitoring of precipitation and monitoring of temperature to predict whether runoff will occur at the site.

5.3 Weather Anomalies

In the event of a drought year or other weather anomalies where, despite the best efforts of the City to collect data, there is not enough flow to collect the minimum number of storms at each facility, the City will document the situation in the annual report.
6.0 Selection of Analytical Parameters
The purpose of the monitoring program is to demonstrate compliance with the City of Bend WPCF UIC Permit.

6.1 Action Levels
Action levels are established for pollutants in Table 6-1. The action levels are guideline concentrations, not limitations; an action level exceedance, therefore, is not a permit violation. The exceedance of an action level, however, may require corrective action and/or additional monitoring per permit conditions. The action levels apply at the point of discharge into the underground injection system.

<table>
<thead>
<tr>
<th>Monitoring Parameter</th>
<th>Method</th>
<th>Action Level μg/L</th>
<th>MRL μg/L</th>
<th>MDL μg/L</th>
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<td>Benzo(a)pyrene</td>
<td>EPA 8270</td>
<td>2</td>
<td>1.0</td>
<td>0.50</td>
</tr>
<tr>
<td>Di(2-ethylhexyl)phthalate</td>
<td>EPA 8270</td>
<td>300</td>
<td>1.0</td>
<td>0.50</td>
</tr>
<tr>
<td>Pentachlorophenol</td>
<td>EPA 8270</td>
<td>10</td>
<td>1.0</td>
<td>0.50</td>
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<td>2.0</td>
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</tr>
<tr>
<td>Lead (Total)</td>
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<td>2.0</td>
<td>0.40</td>
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<td>Zinc (Total)</td>
<td>EPA 6020</td>
<td>50,000</td>
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<td>6.0</td>
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</table>
7.0 The Sampling Team
The Sampling Team refers to all personnel who are involved in logistical support, sample collection, traffic control, and safety during the actual storm event being monitored. There may be backup personnel to cover for employees that have other obligations when a monitoring event is scheduled, but at a minimum the Sampling Team should include: Storm Event Coordinator (1 person, can be remote), Monitoring Team (2 persons).

7.1 Monitoring Program Coordinator
The Stormwater Program Manager will serve as the Monitoring Program Coordinator and be responsible for the implementation of this plan. The Stormwater Program Manager must ensure that all project personnel have been properly trained by the Quality Control and Assurance Supervisor or other appropriate entity prior to conducting stormwater sampling by working with the Quality Control and Assurance Supervisor and Public Works Director, as needed. The Stormwater Program Manager and Public Works Director are ultimately responsible for the health and safety of all project personnel.

7.2 Monitoring Project Manager
The Stormwater Program Analyst shall be designated as the Project Manager for this monitoring program. The Project Manager is responsible for observing weather patterns and selecting the events to be monitored. The Project Manager directs monitoring activities with the necessary equipment to track weather conditions, re-program flow monitors as conditions change (if applicable), and access dependable two-way communication with field crews (via cell phone or radio). The Project Manager makes the decision of which storms to monitor, and when to initiate sampling. The Project Manager should try to notify the Monitoring Team at least 2 hours in advance of a potential monitoring event if possible.

7.3 QA/QC Monitoring Supervisor
The Quality Assurance & Control Supervisor is responsible for the development and implementation of Quality Assurance and Quality Control (see Section 9). The Quality Control & Assurance Supervisor is responsible for the following tasks:
- Updating stormwater sampling SOPs
- Lab testing & data verification
- Procuring outside lab services
- Training monitoring team staff on sampling techniques
- Compiling sampling results into a database.

7.4 The Monitoring Team
Monitoring Team personnel collect samples per section 8.0 and are also responsible for their own health and safety during stormwater sampling activities and are obligated to follow the safety policies described in the SOP and prescribed by the Monitoring Program Coordinator. In addition, Monitoring Team Personnel are expected to ensure the health and safety of their coworkers by doing their part working safely as a team, and to inform their coworkers of any potentially unsafe actions they observe. Monitoring Team Personnel reserve the right to refuse to conduct sampling activities if they feel site conditions are unsafe. If site conditions become
unsafe, Monitoring Team Personnel must report to the Monitoring Program Coordinator immediately.

### Table 7-1

<table>
<thead>
<tr>
<th>Position</th>
<th>Project Title</th>
<th>Phone #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stormwater Program Manager</td>
<td>Monitoring Program Coordinator</td>
<td>541-317-3018</td>
</tr>
<tr>
<td>Stormwater Program Analyst</td>
<td>Monitoring Project Manager</td>
<td>541-693-2176</td>
</tr>
<tr>
<td>Laboratory Representative</td>
<td>QA/QC Monitoring Supervisor</td>
<td>541-322-6369</td>
</tr>
<tr>
<td>Laboratory Technician</td>
<td>Monitoring Team Member</td>
<td>541-322-6366</td>
</tr>
<tr>
<td>Utility Worker I - III</td>
<td>Monitoring Team Member</td>
<td>541-317-3000</td>
</tr>
<tr>
<td>Other Trained Staff</td>
<td>Monitoring Team Member</td>
<td>541-317-3000</td>
</tr>
</tbody>
</table>

### 7.5 Required Training

All City of Bend employees that participate in stormwater sampling activities must be adequately trained to perform their job in a manner that ensures health and safety and sample quality. Employees should be trained concerning potential hazards associated with their duties and procedures necessary to minimize risk.
8.0 Sample Collection and Handling

Guidelines for sample collection procedures have been developed for this Stormwater Monitoring Plan to provide data of sufficient quality to demonstrate permit compliance and/or evaluate potential risks to human health and the environment associated with urban stormwater discharges. Adherence to the procedures described in this section will help ensure consistency among stormwater sampling events and over the duration of the permit, and prevent sample contamination from field activities.

8.1 Personal Safety

Personal safety is of primary concern while conducting all stormwater sampling related activities. Persons involved in sampling will be made aware of the hazards associated with the fieldwork and be given the opportunity to freely voice any concerns. If potential hazards become apparent; if personal safety is an issue, sampling will be terminated. The following list provides basic health and safety recommendations to minimize risks to sampling personnel:

1. Turn on Vehicle hazard lights and, if available, overhead yellow warning lights, prior to initiating field activities.
2. Each monitoring location was selected to where traffic control would not be required; but care should always be taken to eliminate the need for traffic control.
3. If a location cannot be accessed safely, or if a location becomes unsafe during sampling, proceed to other locations and return to the location later during the storm or a subsequent storm(s).
4. Remove and replace manhole covers using a manhole cover puller.
5. Never leave an open manhole unattended.
6. Avoid confined space entries (CSEs). Staff will use specialized equipment to help prevent CDE for deployment and retrieval. Sampling staff will never enter any UIC or sediment manhole.
7. Sampling teams will work in pairs for safety purposes. This is also beneficial to performing clean sampling techniques.

8.2 Sampling Equipment List

The equipment required or recommended for collecting stormwater samples includes:

Personal Safety Equipment:
- Reflective vests
- Leather gloves (recommended)
- Steel toed boots
- Orange cones – to block off UIC from pedestrians
- Insulated or non-insulated coveralls (recommended)

Sampling Equipment
- Nalgene samplers in sample bucket
- Lids for Nalgene sample containers
• Cooler with ice, (2) 1 L Amber w/Thiosulfate, (2) 500 ml no preservation, (1) decontaminated sampler containers
• Disposable gloves-nitrile(non-talc)
• Telescopic sampler, with decontaminated sampler containers
• Manhole cover puller
• Additional sample containers in case there is breakage or contamination issues

Documentation
• Chain of custody forms
• Sampling log book
• Pens and sharpies
• Camera

8.3 Sampling Equipment Preparation
With each storm event, 6 sites will be monitored, a 7th result will be designated for the field blank.

At the start of the sampling season, (14) decontaminated containers will be pre-loaded using appropriate procedures with (3) Nalgene Glass Amber samplers per container. This will allow the monitoring team enough samplers to monitor each UIC twice per monitoring season.

In the event where a site has already been sampled twice in the monitoring season, the samplers will be pre-cleaned in the laboratory and re-used in the field.

There will always be (7) containers (21) samplers available to be deployed in the anticipation of an upcoming storm.

8.4 Sample Container Preparation
All sample containers will be provided pre-cleaned and, if required, pre-preserved from the laboratory.

Table 8-1 shows the required sample volumes, containers, and preservatives required for laboratory analyses, based on standard EPA-approved methodologies. If additional analyses are required, more samples can be collected. There will be (7) coolers, (1) cooler per site and a trip blank. Each cooler will be prepared in anticipation of an upcoming storm. Each cooler will consist of the following items:

• (2) 1-L Amber sample containers
• (1) 500-ml HDPE (double bagged – separate from other samples for metals only)
• (1) 500-ml HDPE (For PH and Conductivity)
• (1) 1-L HDPE to be used with telescopic sampler in case emergency grab samples need to be taken.
• (1) Pre-cleaned glass funnel. To be used to transfer sample from Nalgene sampler to laboratory provided sample containers.
• Nitrile gloves for “clean hand” sampler.
• Sharpie for additional labeling if required.
• (1) bag of ice from Boyd Acres freezer
(1) 500 ml HDPE filled with D.I. shall be used to determine the temperature of the samples upon arrival to the laboratory.

<table>
<thead>
<tr>
<th>Constituent</th>
<th>EPA Method</th>
<th>Sample Container</th>
<th>Preservation</th>
<th>Holding Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzo(a)pyrene</td>
<td>EPA 8270</td>
<td>2-L Amber Glass</td>
<td>Cool to 0&lt;x&lt;6° C</td>
<td>Extract within 7 Days / Analyze within 40 Days of Extraction</td>
</tr>
<tr>
<td>Di(2-ethylhexyl) phthalate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pentachlorophenol</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Trace Metals</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antimony (Total)</td>
<td>EPA 6020</td>
<td>500 ml HDPE</td>
<td>&lt; PH 2 HNO3</td>
<td>6 Months</td>
</tr>
<tr>
<td>Copper (Total)</td>
<td></td>
<td></td>
<td>Cool to 0&lt;x&lt;6° C</td>
<td></td>
</tr>
<tr>
<td>Lead (Total)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zinc (Total)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PH, Conductivity</td>
<td>SM 4500,2510 B</td>
<td>500 ml HDPE</td>
<td>Cool to 0&lt;x&lt;6° C</td>
<td>ASAP</td>
</tr>
</tbody>
</table>

### 8.6 Clean Sampling Techniques

One of the difficulties in measuring pollutants in environmental samples is preventing sample contamination during collection and transport. Clean sampling techniques will provide the level of protection necessary to prevent contamination of the samples.

The clean sampling methodology requires that a two member team participate in the collection of the samples. The “Clean Hands” member is responsible for all procedures involving direct contact with the samples and the sample container. The “Dirty Hands” member is responsible for preparing the sample containers for collection, operates samplers and takes out the Nalgene samplers from the sampling containers and any other activity that could lead to potential contamination of the sample.
Some guidelines for Clean Sampling techniques:

**Dirty Hands**
- Does not touch the sample source
- Does not touch the primary-inner sample bag
- Does not touch the sample containers
- Does not touch clean sampling equipment
- Handles all dirty materials
- Arranges sampling materials
- Opens/closes secondary-outer sample bags
- Opens/closes sample cooler
- Operates pump equipment and pole sampler
- Pulls out the Nalgene samplers and bucket from UIC
- Takes out the Nalgene samplers from the sample bucket
- Pours sample from Nalgene sampler into laboratory provided sample container
- Removes the manhole cover from UIC
- Wears nitrile gloves. Can wear heavier, leather gloves if needed

**Clean Hands**
- Does not touch dirty materials
- Does not touch the secondary-outer sample bags
- Does not touch the sample cooler
- Handles all clean materials
- Assembles the clean sampling equipment
- Handles any tubing from samplers
- Directly contacts the sample source
- Opens/closes primary-inner sample bags
- Directly comes in contact with the laboratory provided sample containers and holds the containers while the dirty hands empties the sample from the Nalgene samplers.
- If needed submerges container and collects sample.
- Wears double nitrile gloves. If the outer glove gets contaminated, they can easily take off the contaminated glove and still have on a clean glove.
- Labels sampling containers and fills out logbooks and chain of custody forms

**8.7 Sampling Location Access Procedures**
During fieldwork activities, Sampling Teams should use the following procedure to access each sampling location:

- Set up any necessary access safety precautions.
- Observe system integrity (e.g., catch basin covers in place, catch basins or inlets operational, sedimentation manhole “gooseneck” intact and operational).
- Eliminate any possible sources of contamination.
- Remove jewelry, watches, metallic items etc.
- Thoroughly cleanse and dry hands before and after sampling.
• Wear nitrile (non-talc) gloves at all times, and change frequently.
• Visually observe stormwater discharge quality and if it appears abnormal, document conditions in the sampling log book and take photos of the UIC drainage basin that affect's stormwater discharge quality (see 8.10.2). Other factors to consider:
  o System integrity
  o Debris (e.g., litter, plastic, leaves), sheen, evidence of spill, etc. in catch basins, along curbs, or in surface water sheet flow
  o Traffic volume (e.g., light, medium, heavy, unusual traffic conditions), type (e.g., passenger cars, trucks, buses)
  o Road conditions (e.g., unimproved streets, streets with unimproved shoulders, new asphalt, numerous potholes)
  o New asphalt or sealant on roads or near-by parking lots
  o Potential pollutant sources (e.g., utility poles; parked cars, sheen, landscaping, commercial/industrial activity).
• Remove manhole cover with manhole cover puller.
• Observe, is the sample bucket full after the storm event?
• In the case of taking an instant grab sample, make sure that the flow at the end-of-pipe is sufficient to sample.

8.8 Sample Collection and Handling
Due to the short duration of most storm events in Bend and the analyte sampling requirements, Nalgene Storm Water Samplers will be the primary sampling device. Samples are collected for the parameters listed in Table 8-1.

City staff will work towards deploying Nalgene Stormwater Samplers just prior to (i.e., 2 to 48 hours before) a qualifying storm event. The samplers will be deployed and retrieved during business hours Monday – Friday 7:00 AM to 3:30 PM. City staff will attempt to retrieve the deployed Nalgene Stormwater Samplers within 2 hours after notification from the ISCO flow monitoring equipment. If ISCO notification is received after 3:30 PM City staff will postpone sample retrieval until the following morning.

Grab samples may be used in place of Nalgene Stormwater Samples. Grab samples will be collected using a decontaminated pole sampler and poured directly into laboratory provided sample containers. Care will be taken by the Sampling Team not to place the decontaminated beaker on the ground or to hit the side of the UIC during sampling activities.

The pole sampler will be positioned at the sample point to collect end-of-pipe discharge and brought to the surface grade to fill sample containers. Samples will be placed in pre-cleaned bottles provided by the analytical laboratory and specified in Table 8-1. Sample bottles will be filled in the following order, after donning non-talc nitrile gloves:
  • Metals bottles
  • Inorganic analyses
  • Organic analyses
Samples will be placed in ice chests with ice immediately after sample collection and labeling pending transport to the laboratory.
End of Pipe (EOP) will be the primary sampling point for stormwater sampling. In the event a selected UIC is slow draining and fills quickly during a storm event such that the water level in the UIC rises above the EOP, the Sampling Team may opt to:

1) Use the Nalgene Storm Water sampler samples;
2) Return to the UIC on another sampling event,
3) Collect a grab sample from standing water within the UIC by dipping the sample beaker into the standing water, or

In the event a sampling location develops maintenance issues (e.g., no flow to UIC, clogged inlets, plugged inlet covers or pipes), collect a grab sample at an alternative location as close to the EOP as possible (e.g., water discharging into the sedimentation manhole, flowing into a catch basin, etc.).

Departure from the procedures previously described in this Stormwater Monitoring Plan will be documented and described in the WPCF UIC permit (Schedule B.4.) required Annual Report. DEQ will be notified if unusual sampling conditions are encountered.

8.9 Field Quality Control Sample Collection
Field QC samples are used to assess sample collection procedures, environmental conditions during sample collection and shipment, and the adequacy of equipment decontamination. Field QC samples include equipment blanks, duplicate samples, and temperature blanks. Minimum quality control samples for field sampling are summarized in Table 8-2.

<table>
<thead>
<tr>
<th>Equipment Blank/Field Blank</th>
<th>Field Duplicate</th>
<th>Temperature Blank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 per event</td>
<td>1 per event</td>
<td>1 per event</td>
</tr>
</tbody>
</table>

DI water is passed through a separate set of Nalgene samplers and into a set of laboratory provided sample containers. Of one of the 6 monitoring locations, chosen randomly, a separate set of laboratory provided sample containers will be filled and submitted as a Field Duplicate. In each cooler, (1) 500 ml sample container with D.I. will be used to verify the temperature of the samples upon delivery to the laboratory.

8.10 Sample Collection Labeling and Documentation
Each sample container will be labeled with sharpie or laboratory-supplied sample labels. Each sample container label shall have: sampling time, date, location, names of sampling team. The Chain of Custody Form must also be filled out completely at the time the sample is collected and must remain with the samples.

8.10.1 Chain of Custody
A Chain of Custody (COC) form is a legal document designed to track samples and persons who are responsible for them during preparation of the sample container, sample collection, sample delivery, and sample analysis. “Chain of Custody” refers to both the form and the documented account of changes in possession that occur for samples. For each sample
collected, sample information must be recorded on the sampling event-specific COC form. Required information on the COC includes:

- Sampling event
- Date Nalgene samplers were deployed in the field
- Time and Date ISCO notified team members of flow of water in UIC
- Sample date and time
- Sample matrix and type
- Name of person(s) collecting the samples
- Sample identification code
- Analysis requested
- Printed name, signature, date, and time for each person relinquishing or receiving the samples.

To ensure that all necessary information is documented, a COC form must be completely filled out, and accompany each set of samples. When transferring the custody of samples, the transferee will sign, and record the date and time of each transfer. Each person who takes custody will complete the appropriate portion of the COC documentation. A copy of each COC will be made and kept in the sample log book.

8.10.2 Field Data Documentation

In cases where visual observance indicates potential abnormal (e.g., unusual or noteworthy) conditions may exist (see Section 8.7, above), the Field Data Documentation section will be completed for each sample collected. The documentation details specific observations pertaining to the sample. The documentation will be recorded in a sampling log book that will be separate of the Chain of Custody forms. Required information to be recorded includes:

- Identifying sample data (e.g., chain of custody information)
- Input from visual observation portion of Section 8.7
- General weather and flow conditions at each sampling location
- Date Nalgene samplers were deployed
- Deviations to sampling procedure
- Collection of field QC samples
- Summary of sampling activities and field observations
- Missed sample events will be documented and reason for missing event.

Information recorded should be detailed enough to allow the sampling event to be reconstructed without having to rely on memory and to allow the Sampling Team for subsequent sampling events to recognize or identify any changes in the immediate proximity of the UIC that may impact the quality of stormwater data. The Sampling Team should photo-document significant site features and/or changes, note that photographs were taken in the logbook. Upon returning to the Laboratory, digital photographs must be downloaded, labeled, and electronically filed in the appropriate City network drive.

8.11 Sample Transport and Delivery to the Laboratory

Immediately following sample collection, sample containers will be placed on ice in coolers and protected from breakage. Samples will be submitted to the City Laboratory by the Sampling Team under strict chain of custody procedures, as detailed in the City Laboratory Quality
Manual. Samples analyzed at the City Laboratory and any contract laboratories are labeled with these unique codes.

After log-in, sample containers will be stored in the temperature-controlled and monitored sample receiving refrigerator. The Laboratory will accept samples as soon as possible, following chain of custody and City Laboratory Quality Manual procedures and will conduct QA parameter checks.

Monitoring team personnel will deliver the samples to the contract laboratory when necessary. The Quality Control & Assurance Supervisor or appropriately trained designee will log in the samples to the LIMS system and package the samples for shipping to the contract laboratory. Sample bottles will be placed in coolers with ice or some other package that is rigid enough to provide protection of the samples and has insulation properties to keep samples cold. During packing, the sample(s) from one monitoring location should not be separated into separate shipping containers unless bottles of one size need to be shipped together because of container size. Samples must be delivered to the analytical laboratory in sufficient time as to not exceed any laboratory hold times.

8.12 Missed Monitoring Events
If samples were not taken for throughout the year, for reasons beyond the City’s reasonable control, the City will notify the DEQ WPCF UIC Permit Manager to discuss the need for a waiver or alternative response. These conditions include atypical climatic conditions, such as drought year, rainfall 20% below three year average, infrequency of storms of sufficient magnitude to produce run-off, weather conditions that would make collection or analysis of samples unsafe or impracticable, unavoidable equipment failure, or other conditions determined by DEQ to be beyond the City’s control. Missed events will be documented in the sampling logbook.
9.0 Quality Assurance and Quality Control

Quality assurance is defined by the EPA as “the integrated system of management activities involving planning, implementation, documentation, assessment, reporting, and quality improvement to ensure that a process, item, or service is of the type and quality needed or expected by the customer.” Quality Control is defined by the EPA as “the overall system of technical activities that measures the attributes and performance of a process, item, or service against defined standards to verify that they meet the established requirements.”

This section establishes the minimum laboratory and field data quality standards and measures that will be taken to ensure that data of acceptable quality will be collected and used to document compliance with the WPCF UIC permit in a defensible manner.

9.1 Qualified Laboratory
The City of Bend will use a qualified laboratory for sample analysis, that employs standard laboratory Quality Assurance and Quality Control (QA/QC) procedures. Lab QA/QC protocols are available from the approved laboratory upon request.

UMPQUA Research Company (URC) is, at the time of development of this plan, under contract with the City to provide analytical services that the City’s laboratory is not able to provide. URC is accredited by the Oregon Laboratory Accreditation Program (ORELAP), which guarantees conformance to National Environmental Laboratory Accreditation Committee (NELAC) required standards.

The City of Bend Water Quality Laboratory is part of the Public Works Department. The laboratory is accredited by ORELAP, the National Environmental Laboratory Accreditation Program and the Oregon Health Authority to perform analyses under the regulations administered by these agencies. Laboratory staff members have many years of experience with environmental sampling and analysis in both government and private sector laboratories. Among the analyses routinely performed in the City lab are bacterial testing, nutrients, and conventional chemical and physical parameters such as pH, BOD, and TSS. All testing is done using approved methods of analyses with procedures documented through Standard Operating Procedures and the Laboratory’s Quality Assurance Manual. All data is reviewed and entered into the Laboratory Information Management System (LIMS).

9.2 Data Quality Objectives
Data quality objectives are qualitative and quantitative statements specifying the quality of the data required supporting the project objectives. Precision is the ability to reproduce measurement under a given set of conditions and is dependent on both field sampling and on laboratory processes. Accuracy is how close the measured value is to the “true” value.

Completeness is a measure of the amount of data that if valid compared to the actual amount that was planned for collection. Representativeness is the level to which sample data reflect environmental conditions accurately and will be described and discussed qualitatively in appropriate reports given the challenges of quantifying it due to changing temporal and hydraulic conditions of stormwater and storms. Overall data quality objectives are noted as follows in Table 9-1. The City will work towards meeting these objectives through adhering to the most recent version of the Laboratory’s Quality Manual.

<table>
<thead>
<tr>
<th>Compound Class</th>
<th>Analyte</th>
<th>Precision</th>
<th>Accuracy</th>
<th>Completeness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polynuclear Aromatic Hydrocarbons (PAHs)</td>
<td>Benzo(a)pyrene</td>
<td>+50%</td>
<td>Per method/ per analyte</td>
<td>95%</td>
</tr>
<tr>
<td>Semi volatile Organic Compounds (SVOCs)</td>
<td>Di(2-ethylhexyl)phthalate</td>
<td>+50%</td>
<td>Per method/ per analyte</td>
<td>95%</td>
</tr>
<tr>
<td>Herbicides/Pesticides</td>
<td>Pentachlorophenol</td>
<td>+30%</td>
<td>+30%</td>
<td>95%</td>
</tr>
<tr>
<td>Total Metals</td>
<td>Antimony, Lead, Zinc, Copper</td>
<td>+20%</td>
<td>+25%</td>
<td>95%</td>
</tr>
</tbody>
</table>

9.2.1 Precision
Collecting stormwater samples precisely is challenging because of changing temporal and hydraulic conditions within the drainage season. Therefore field duplicate outside the target percentages may not necessarily result in qualified data.

9.2.2 Accuracy
Accuracy objectives are noted in Table 9-1 for analytes and in Table 9-2 for field measurements. The City will seek to maximize accuracy by following standard operating procedures in the field and Laboratory Quality Manual procedures during analysis.

9.2.3 Representativeness
Stormwater samples are collected from the center of the flow to obtain a well-mixed sample representative of the stormwater conditions. Sampling sites are selected based on high risk locations within specific representative land use and vehicle trips-per-day types, so data collected using this approach is assumed to be representative of high risk area conditions within different land use categories over the entire permit area. Representativeness is a qualitative measure.

9.2.4 Completeness
Completeness is a measure of the amount of valid data obtained from the analytical measurement system compared to the amount that was expected to be obtained. It is defined as the total number of samples taken for which valid analytical data are obtained divided by the total number of samples collected and multiplied by 100.
Based on QA/QC procedures outlined in this Stormwater Monitoring Plan, the monitoring goal is to achieve a 100 percent complete data set for all analyses. Due to unforeseen circumstances some results may be lost. Field and Laboratory staff will attempt to minimize data loss to the best of their ability by carefully following all protocols and procedures, and additional attempts to sample will be made during the sampling year. If data sets are not 100 percent complete at the end of a sampling year, analyses will be evaluated on a case by case basis including review of permit requirements to determine whether additional samples are needed or procedures need to be refined.

9.2.5 Comparability
The objective is to ensure that collected data are either directly comparable, or comparable with defined limitations, to literature data or other applicable criteria. UIC stormwater samples are collected and analyzed in a similar manner as those collected for other monitoring conducted by the City, including in-stream monitoring. Laboratory samples are analyzed at the City’s laboratory and UMPQUA Research Company laboratories to minimize variability and increase comparability of data collected.

9.3 Field Quality Control Procedures
Immediately following each field event the QA/QC Monitoring Supervisor will verify that COC forms are completely filled out and correct. Changes or deletions to these forms will be made with a single line drawn through the incorrect entry and the recorder’s initials and date added next to the revised entry. Information recorded should be detailed enough to allow the sampling event to be reconstructed without having to rely on memory and to allow the sampling team for subsequent sampling events to recognize or identify any changes in the immediate proximity of the UIC that may impact the quality of stormwater quality.

Field QC samples are used to verify the sample collection procedures, environmental conditions during sample collection and shipment, and the adequacy of equipment decontamination. They are also used to estimate field precision and accuracy. Field QC samples include field blanks, duplicates and temperature blanks. If problems are identified using the field QC samples, the results may be verified by the laboratory, data may be flagged, and/or a thorough review of field and laboratory procedures may be performed to identify and correct problems, if any. A case-by-case determination will be made regarding data usability.

9.3.1 Field Blanks
Field blanks are used to evaluate the decontamination procedure and test for any contaminants introduced to the sampling system by external conditions and/or sampling activities. Field blanks are prepared by passing deionized water through the Nalgene samplers that have been secured in an extra sampler container. The samples will be transferred to laboratory provided sample containers and documented on the COC as if it were an actual sample. One field decontamination blank will be collected during each sampling event. Field blanks are considered acceptable if the concentrations of target analytes are reported as less than the MRL. If any target analyte is detected in the field blank, samples will be flagged, and the sample decontamination, collection, and handling procedures will be evaluated and corrected.
9.3.2 Field Duplicates
Field duplicate samples are collected as a check on sample collection, handling, shipment, storage, and analysis. They are also used to assess the combination of field and laboratory precision and reproducibility. In addition, duplicate samples provide an indication of the variability within a sample. Field duplicates are collected by simultaneously filling an additional Nalgene sampler that will be transferred to an extra set of sample containers that will be in the cooler. Field duplicate samples will be collected at every storm event and given a unique sample identification number, documented on the COC.

9.3.3 Temperature Blanks
Temperature blanks are containers of water packaged along with the environmental samples collected in the field and transported in the cooler. They are used to measure the temperature of the cooler upon receipt to the laboratory. The temperature will be read and recorded on the chain of custody by the Quality Control and Assurance Supervisor or designated alternate at the beginning of the sample login process. One temperature blank will be included in every cooler containing the samples. A temperature range of 4°C ± 2°C is acceptable for sample transport and receipt. Based on proximity to the laboratory, it is likely that samples will be collected and delivered to the laboratory within a relatively short period of time. Consequently, samples may not have time to sufficiently cool before they arrive at the laboratory. It is assumed that since these samples will have been placed on ice immediately after collection and stored in a chilled cooler until delivery to the laboratory, they are acceptable for analysis.
10.0 Data Management and Reporting

10.1 Data Management
The QA/QC Monitoring Supervisor will enter data into the monitoring program database. Laboratory staff will also maintain files containing any records necessary to reconstruct the analytical details associated with a particular rainfall event. Records maintained include:
- Chain of Custody forms
- Instrument calibration and tuning records (as applicable).
- ISCO flow data
- Analytical standards preparation logs
- Method SOPs
- Analytical QC results (including method blanks, internal standards, surrogates, replicates, and spike and spike duplicate results, as applicable)
- Raw data, specifically instrument printouts
- Bench work sheets and/or quantification reports
- Details of the QA/QC program in place at the time that the data analyses were conducted.

Precautions will be taken in the analysis and storage of data to prevent the introduction of errors or loss or misinterpretation of data. Original laboratory data sheets (i.e., hard copy) will be maintained in a secure location where they will not be lost or tampered with. Copies of original data should be used for compiling the data to prevent loss or damage. Data management will be conducted per Laboratory Quality Manual procedures and standards.

10.2 Annual Reporting
The stormwater annual report required under the City’s WPCF UIC permit will include a monitoring section that shall include the following:
- Stormwater monitoring results
- Analytical laboratory reports
- Action level exceedances if any and actions taken to address the exceedances
- Proposed modifications to the monitoring plan
- Description of any actions described in this plan that the City was not able to complete or had to modify, if any, and why.
11.0 References


Oregon State University, Pacific Northwest Average Annual Precipitation, 1961-1990, Oregon Climate Service.


Western Regional Climate Center, Monthly Climate Summary: Bend, OR, 1928-2005.
Appendix A: Nalgene Storm Water Sampler Information

![Storm Water Sampler by NALGENE®](image)

**Ordering Information - Storm Water Sampler/Kit**

<table>
<thead>
<tr>
<th>Cat. No.</th>
<th>Description</th>
<th>Qty / ea</th>
<th>Nominal Volume (in.³)</th>
<th>Outlet Size (in. O.D., in. I.D.)</th>
<th>Suggested List Price / ea</th>
</tr>
</thead>
<tbody>
<tr>
<td>110-10</td>
<td>Storm Water Sampler, entire unit, OPT.</td>
<td>4</td>
<td>10.12 (257)</td>
<td>3/8 in. I.D., 1/2 in. O.D.</td>
<td>$469.00</td>
</tr>
<tr>
<td>110-15</td>
<td>Storm Water Sampler, single bottle (2)</td>
<td>4</td>
<td>3.94 (100)</td>
<td>3/8 in. I.D., 1/2 in. O.D.</td>
<td>$469.00</td>
</tr>
<tr>
<td>110-20</td>
<td>Storm Water Sampler, single bottle (3)</td>
<td>4</td>
<td>1.92 (50)</td>
<td>3/8 in. I.D., 1/2 in. O.D.</td>
<td>$469.00</td>
</tr>
</tbody>
</table>

How to Order Storm Water Sampler or Mounting Kit

NALGENE® Brand Products are available through NALGENE authorized distributors, or online at www.Stormwatersampler.com.

Press, product specifications and availability are subject to change without notice. For complete specifications, see the manufacturer’s catalog. NALGENE is not responsible for claims made by the manufacturer or distributor.

**NALGENE®**

75 Pershing Road, Manhasset, NY 11030-2505 U.S.A.

Phone: 1-800-425-4603
Fax: 1-800-425-4603
E-mail: technical@nalgene.com

Other Countries (USA): 1-800-899-7718
Other Countries (Europe): 1-800-376-5661
E-mail: sales@nalgene.co.uk

Japan: Tel: 03-3810-3305
Fax: 03-3810-6766
E-mail: info@nalgene.co.jp

EUROPE: Tel: 011-44-1604-920662
Fax: 011-44-1604-920667
E-mail: sales@nalgene.co.uk

Europe (UK): Tel: 011-44-1604-920662
Fax: 011-44-1604-920667
E-mail: sales@nalgene.co.uk

Europe (B): Tel: 011-44-1604-920662
Fax: 011-44-1604-920667
E-mail: sales@nalgene.co.uk

**Features**

- Unattended First Flush Grab Sample Collection
- Economical and EPA Compliant
- Easy and Convenient
- Ditch, storm grate or stream mounting
- Improved mounting tube design collects only the runoff, not the rain (ditch & stream)
Storm Water Sampler by NALGENE®

The NALGENE Storm Water Sampler is a convenient and affordable device for collecting quarterly storm water grab samples in compliance with EPA sampling requirements. The Storm Water Sampler can collect a full one liter grab sample of first flush storm water through a storm water ditch, stream or storm grate outfall. Position the sampler in its protective mounting tube at a convenient time prior to a rain event, and leave it in place until after the storm. The sampler automatically collects the sample into a NALGENE plastic or glass sample bottle, shutting off after the bottle is full to prevent dilution with later runoff. The sample can be conveniently retrieved after the storm. No more standing in the rain waiting for water to flow or missing sampling events.

Affordable

Compare with other mechanical or automated samplers. The NALGENE Storm Water Sampler is affordable enough to sample multiple outfalls in one rain event. The lowest cost EPA compliant alternative starts at over $5000.

Satisfies EPA Sampling Requirements

The NALGENE Storm Water Sampler collects a full liter of sample within the first 30 minutes of a qualifying rain event. The sampling mechanism closes after sample collection to prevent contamination with later runoff or volatile analytes. Use the DEPE Sampler unit for inorganic and volatile analysis.

Choose the amber glass bottle with the collection unit for organic analyses such as oil and grease. The integrated mounting tube collects only the runoff not the rain, when mounted in ditch or stream outfalls.

Easy to Use

Position the reusable Mounting Kit once, then just revisit with samples. No programming or complicated trip-wire mechanisms. Water simply flows through the sampler’s collection funnel, and directly into a NALGENE HDPE or glass sample bottle. When the bottle is full, a floating ball valve shuts off the sample collection port.

When the sample is retrieved, the collection funnel is discarded and replaced with a standard dome for leakproof lab transport. Suspended solids are either collected in the bottle or trapped by the mounting tube’s collection screen for visual evaluation.

Stream Mount

Ditch Mount

Grate Mount
14 December 2012

Re: Thermo Fisher Scientific Nalgene Storm Water Sampler

Dear Customer:

The Thermo Scientific Nalgene Storm Water Sampler meets EPA NPDES MSGP (Frd. Reg. FRL-6880-5 10/20/00). This EPA method details the sampling conditions for National Pollutant Discharge Elimination System and Multi Sector General Permit.

The Storm Water Sampler collects a full liter of sample within the first 30 minutes of a qualifying rain event. The sampling mechanism closes after sample collection to prevent co-mingling with later run-off or volatile analyte loss. These important features qualify the unit to meet the requirements for EPA storm water sampling.

Please contact me if you have any further questions or concerns.

Sincerely,

Roxann Augustine
Regulatory Support Specialist
Thermo Fisher Scientific
75 Panorama Creek Drive
Rochester, NY 14625 USA
Office: +1 585 899 7192
Fax: +1 585 899 7196
Email: Roxann.Augustine@thermofisher.com
EPA regulation statement
Zapotocznyj, Lisa M.
to:
jbustvedt@ci.bend.or.us
12/10/2012 11:09 AM
Cc:
ROCregr Support
Show Details

History: This message has been replied to.
Hi Jeff,

I spoke with our Regulatory/Compliance group, and it appears the EPA regulation statement is not included on our standard product certificate for the 1120-1000 storm water sampler. I have copied the group on this message – a separate statement letter will be created for you.

ROCregr – Jeff’s phone number is (541) 420-6892, if you need any further information. He is looking for a document stating the EPA regulations for which our storm water sampler is certified. The catalog description states that it meets EPA NPDES MSGP sampling requirements.

Thanks,
Lisa

Lisa Zapotocznyj
Sr. Technical Applications Specialist
Laboratory and Specialty Plastics
Thermo Fisher Scientific
75 Panorama Creek Drive
Rochester, NY 14620
585-895-7312 phone
800-625-4363 fax
lisa.zapotocznyj@thermofisher.com

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www.mlaresetbank.com

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