Uroboros Area-Wide Air Sampling and Analysis Plan

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Laboratory and Environmental Assessment Program
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DEQ is a leader in restoring, maintaining and enhancing the quality of Oregon's air, land and water.

State of Oregon
Department of Environmental Quality

Quality Project Plan

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This Quality Assurance Project Plan was prepared by:

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Project Approvals

Prepared By: _____ Date: _____

Anthony Barnack, DEQ Project Manager

Reviewed By: _____ Date: _____

Chris Moore, DEQ Quality Assurance Officer

Reviewed By: _____ Date: _____

Kathleen, Schuckman, Interim Air Quality Section Manager

Signed Copy on File at DEQ

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Distribution List

The following personnel will be emailed regarding all aspects of this sampling analysis plan (SAP). Deviations from this SAP must be communicated in writing (email is acceptable) to all individuals identified in Table 1. Final reports from the DEQ laboratory will be emailed and mailed to the project manager, regional monitoring coordinator and laboratory monitoring coordinator/data manager. Final reports from the DEQ contract laboratory (Desert Research Institute and Chester Labs) will be emailed to the DEQ lab project manager.

Table 1. Distribution list

Name	Phone	Email
Anthony Barnack, DEQ Lab Project Manager	503-693-5708	Barnack.anthony@deq.state.or.us
Chris Moore, DEQ Air QAO	503-693-5722	moore.chris@deq.state.or.us
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Steve Kohl, DRI Technical Service Representative	775-673-7300	Steve.Kohl@dri.edu
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Sarah Rockwell, DEQ Sample Coordinator	503-693-5784	rockwell.sarah@deq.state.or.us
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To track the time and expenses spent on this project associated with the ambient monitoring, DEQ personnel must use the **Q-Time number: 44763**. To track the time and expenses spent on this project associated with the non-laboratory aspects, including permitting, technical, communication and coordination work, DEQ personnel must use the **Q-Time number: 44764**.

Problem Definition/Background

DEQ is collecting air samples to determine the PM_{10} metals (inhalable coarse particles that are smaller than 10 micrometers in diameter) and TSP Cr6+ (total suspended particulate chromium) levels in the vicinity of N. Kirby Ave. and N. Thompson St. in Portland to determine if heavy metals associated with emissions from stained-glass production are present above human health risk-based concentrations. Previous survey monitoring and a moss study by the U.S. Forest Service showed elevated levels near Uroboros Glass. The Oregon Health Authority has requested that DEQ collect more samples in the area to determine risk to the community, specifically at nearby schools, daycares, businesses, and residences. DEQ is performing the sampling in response to concerns related to particulate emission deposition associated with the Uroboros Glass Company in North Portland.

In February 2016, DEQ staff will use air monitors to collect samples at properties adjacent to and in the vicinity of the Uroboros Glass Company for the following metals that are likely associated with stained glass production at the facility:

- Arsenic (As)
- Beryllium (Be)
- Cadmium (Cd)
- Total Chromium (Cr) and Cr+6 (subcontracted)
- Cobalt (Co)
- Lead (Pb)

- Manganese (Mn)
- Nickel (Ni)
- Selenium (Se)

DEQ will collect the samples for 24 hours averages every weekday and when access permits, on the weekends.

DEQ will also collect wind speed and wind direction data in the area to help determine the source of any pollutants.

Data from this project may also be used to determine the area of distribution of the potential contaminant deposition from air emissions from the facility. Oregon Health Authority may also utilize some of the data generated from this project as part of an OHA Health Consultation.

For additional information, refer to the DEQ Ambient Air Quality Monitoring for Criteria Air Pollutants QAPP for meteorology sampling and the DEQ Air Toxics Monitoring Project QAPP for metals sampling and analysis.

Project/Task Description

Sampling Organization:

Oregon DEQ Laboratory and Environmental Assessment Program
3150 NW 229th Avenue, Suite 150
Hillsboro, Oregon 97124
Phone: 503-693-5700
Contact: Chris Moore

Analytical Organization:

Oregon DEQ Laboratory and Environmental Assessment Program
3150 NW 229th Avenue, Suite 150
Hillsboro, Oregon 97124
Phone: 503-693-5700
Contact: Chris Moore

Desert Research Institute (DRI)
2215 Raggio Parkway
Reno, NV 89512
Contact: Steve Kohl
Phone: 775-673-7300

Chester Labs
12242 SW Garden Pl
Tigard, OR 97223
Contact: Paul Duda
Phone: 503-624-2183

Quality Objectives and Criteria

DEQ will conduct all sampling activities performed under this work plan in accordance with DEQ's Air Toxics Monitoring Project QAPP (DEQ01-LAB-0004-QAPP) and EPAs Technical Assistance Document for the National Air Toxics Trends Station Program (NATTS TAD). DRI and Chester Labs will analyze the samples and report results following EPA methods outlined in the TAD as well as standard DRI and Chester Labs Laboratory procedures.

The laboratory and field staff will follow their standard analytical quality assurance/quality control (QA/QC) outlined in the NATTS TAD, the Air Toxics Monitoring Project QAPP, and laboratory SOPs.

Collocated samples are taken simultaneously through 2 separate collection systems at a specific sample location and will be collected for 10% of the samples. Two field blanks will be collected per month.

Documentation and Records

Samples collected from the field will be returned to the analytical laboratory with the attached "Chain of Custody" form. Policies and procedures for the maintenance of DEQ Laboratory and Environmental Assessment Program (LEAP) analytical records are described in the LEAP Quality Manual (DEQ91-LAB-0006-LQM). Final analytical reports generated by the DEQ laboratory will follow standard laboratory practices. Electronic versions of the reports will be emailed to the project manager in a Portable Document Format (PDF). An original hard copy of the report with the supporting QC documentation will be kept on file at the DEQ laboratory. Copies of the report will be available upon request.

Field documents will be maintained by the DEQ project manager.

Property access agreements will be obtained and maintained by the DEQ project manager.

Data Generation and Acquisition

Schedule

DEQ will start sampling at Tubman School on Feb. 14, 2016 and will start sampling at three additional sites around Uroboros Glass Company beginning in mid-March 2016. The sampling will be for 24-hour averages, everyday for at least one month. Weekdays may be excluded because of access restrictions to the monitoring sites. After 30 days, DEQ will reassess the sampling schedule.

Sampling

Sampling design, collection, methods, and handling will be managed by the DEQs Air Quality Monitoring Section. DEQ will ensure that all samples will be collected in the appropriate sample containers, preserved as identified in the appropriate reference methods, and transported to the DEQ laboratory, DRI, and Chester Labs with the appropriate documentation.

Sampling locations will be identified by DEQ in order to monitor the emissions and exposure to the surrounding community. Additional sites may be added to assess the emissions and exposure.

High Volume PM_{10} Sampler (DEQ13-LAB-0020-SOP)

DEQ will collect PM_{10} samples on quartz filters using high volume PM_{10} samplers. The low volume PM_{10} samplers will be calibrated in the DEQ laboratory prior to field deployment. Initial flow verification will be performed by DEQ field staff at the site prior to sampling, with routine flow verifications performed throughout the operation of the sampler.

Samples may be collected over 12- and 24-hour periods. All field data will be collected on a chain of custody for each site, accompanying the samples to and from the laboratory. All high volume PM_{10} quartz filters will be analyzed at the DEQ laboratory.

Low Volume PM10 Samplers

DEQ will collect PM_{10} samples on Teflon filters using low volume PM_{10} samplers. The low volume PM_{10} samplers will be calibrated in the DEQ laboratory prior to field deployment. Initial flow verification will

be performed by DEQ field staff at the site prior to sampling, with routine flow verifications performed throughout the operation of the sampler.

Samples may be collected over 12- and 24-hour periods. All field data will be collected on a chain of custody for each site, accompanying the samples to and from the laboratory, as well as to subcontracted labs.

The low volume samples will be collected using a BGI PQ100 or PQ200 Low Volume Sampler and/or the ASA Low Volume PM_{10} Sampler provided by the EPA and Lane Regional Air Pollution Authority (LRAPA). The SOPs are on file at the DEQ laboratory.

Hexavalent Chromium Sampler (DEQ11-LAB-0052-SOP)

DEQ will collect hexavalent chromium samples on ashless cellulose filters using low volume Cr6+ samplers. The low volume Cr6+ samplers will be calibrated in the DEQ laboratory prior to field deployment. Initial flow verification will be performed by DEQ field staff at the site prior to sampling, with routine flow verifications performed throughout the operation of the sampler.

Samples may be collected over 12- and 24- hour periods. All field data will be collected on a chain of custody for each site, accompanying the samples to and from the laboratory, as well as to subcontracted labs.

The locations and media to be sampled are summarized in Table 2.

Table 2. Summary of the sampling locations, media, and expected number of samples

LASAR No.*	Name	Description	Lat/Long	Sample media	No. of Samples
	North Coast Electric	Roof of building at 625 N. Thompson St., Portland, OR 97227	45.539036, -122.672503	Met – wind speed/direction Cr6+, PM10 Teflon	
	Portland Water Bureau Warehouse	East end of N. Tillamook St Portland OR	45.537525, -122.672069	Cr6+, PM10 Teflon	
	Portland Water Bureau Building	West end of N. Tillamook St Portland OR	45.537672, -122.674322	Cr6+, PM10 Teflon	
	Portland Tubman School	2231 N Flint Ave., Portland, OR 97227 Parking lot	45.539831, -122.669644	PM10 Quartz Cr6+, PM10 Teflon	

**If a LASAR station number is not available during QAPP/SAP development, the DEQ Laboratory will generate the unique identifier at the time of sample receipt.*

Map of the PM10 metals sites

Sampling Methods, Sample Handling, and Custody

Air samples submitted for laboratory analysis will be collected by air quality monitoring staff. All air samples will be transported to and from the sites, using coolers to adhere to temperature requirements outlined in the Air Toxics Monitoring Project QAPP. All samples will be transported using DEQ chain-of-custody procedures for the DEQ laboratory as well as for delivery to DRI and Chester Labs. DRI and Chester Labs will analyze the samples for the analysis following EPA methods and standard DRI and Chester Labs procedures.

A summary of the sampling containers, preservation requirements, and holding times is presented in Table 3.

Table 3: Summary of sampling parameters

Sample Type	Preservation	Holding Time
PM10 Quartz Filter (8in x 10in)	None Required	180 days, stored at 15 to 30degC
PM10 Teflon Filter (47mm)	None Required	180 days, stored at 15 to 30degC
Ashless Cellulose Filter (Whatman No. 41 47-mm)	Store in freezer (-18degC)	Extraction: Within 21 days of sampling Analysis: Within 24 hours of extraction

Analytical Parameters, Methods, and Quality Control

A summary of the requested analytical parameters and methods is provided in Table 4. Standard DEQ laboratory operating procedures will be following during the analyses of the samples, including analytical quality control measures and equipment inspection/maintenance.

Table 4: Summary of analytical parameters and methods

Sample Type	Analytical Parameters	Reference Method
PM10 Quartz Filter	Total Metals – As, Be, Cd, Cr, Co, Pb, Mn, Ni, Se	EPA Compendium Method IO-3.5 (http://www3.epa.gov/ttnamti1/files/ambient/inorganic/mthd-3-5.pdf)
PM10 Teflon Filter	Total Metals – As, Be, Cd, Cr, Co, Pb, Mn, Ni, Se	EPA Compendium Method IO-3.5 (http://www3.epa.gov/ttnamti1/files/ambient/inorganic/mthd-3-5.pdf)
Ashless Cellulose Filter	Total Metals – Cr (+3), Cr (+6)	Determination of Hexavalent Chromium In Ambient Air Analyzed By Ion Chromatography (IC)

Data Management

Analytical data generated by DRI and Chester Labs will be sent to the project manager and the DEQ LEAP data coordinator in a PDF and in standard DEQ-defined MS Excel format. The DEQ laboratory will enter all of the PM_{10} and Cr6 generated sample results into their data management system (Element™).The DEQ laboratory will maintain hard copies of the analytical reports, including all analytical QC measurements. Unless otherwise arranged, data generated by this project will be moved to the laboratory online database following release to the project manager. Data in this database is publically available. Until the online database is available, the information is available upon request.

Assessment and Oversight

Overall project assessment and oversight, including field activities, and coordination with DRI and Chester Labs will be the responsibility of the project manager. Data assessment/evaluation may also be provided by the DEQ quality assurance officer and/or data coordinator (LEAP) upon DEQ project manager request. Any analytical anomalies or delays encountered during laboratory operations must be communicated to the project manager in writing (email is acceptable). The project manager will also be notified in writing of any data quality limitations that may be the result of laboratory operations.

Data Validation and Usability

The DEQ laboratory will provide standard data review, verification, and validation on all analytical data generated by this project. The extent of the data review, verification, and validation is limited to the analytical processes only. However, in the best judgment of the DEQ quality assurance officer (QAO), any data that may be inaccurate, misleading, or otherwise fails the DEQ laboratory's quality standards due to field or sampling activities will be identified in the final analytical report. Moreover, this data will be appropriately qualified when transferred to the laboratory online database. Data quality levels (DQL) will be assigned in accordance to DEQ guidance document *Data Validation and Qualification* (DEQ09-LAB-0006-QAG). Generally, only DQLs of A, or B will be acceptable for this project unless the basis for the data acceptability is approved and documented by the project manager. All data verification, validation, and assessment activities for project purposes are the responsibility of the project manager.