Sampling and Analysis Plan

Bullseye Area-Wide Air Sampling and Analysis Plan

Feb. 24, 2016

State of Oregon
Department of Environmental Quality

Laboratory and Environmental Assessment Program
3150 NW 229th Avenue
Suite 150
Hillsboro, OR 97124
Phone: 503-693-5700
Fax: 503-693-4999
www.oregon.gov/DEQ

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

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This Quality Assurance Project Plan was prepared by:

Oregon Department of Environmental Quality
3150 NW 229th Avenue, Suite 150
Hillsboro, OR 97123
1-503-693-5700
www.oregon.gov/deq

Contact:
Anthony Barnack
(503) 693-5708

For alternative formats (Braille, large type) of this document, please call 503-229-5696, or toll-free in Oregon at 1-800-452-4011, ext. 5696.

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

Approvals on File at DEQ

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A1. 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 (e-mail 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
Paul Duda, Chester Labs Technical Service Representative	503.624.2183	pduda@chesterlab.net
Steve Kohl, DRI Technical Service Representative	775.673.7300	Steve.Kohl@dri.edu
David Farrer, OHA Public Health	971.673.0971	David.g.farrer@state.or.us
David Monro, DEQ NWR AQ Manager	503.229.5160	Monro.david@deq.state.or.us
Sarah Rockwell, DEQ Sample Coordinator	503.693.5784	rockwell.sarah@deq.state.or.us
Zach Mandera, DEQ Inorganic Section Manager	503.693.5757	Mandera.zach@deq.state.or.us
Brian Boling, DEQ Laboratory Manager	503.693.5745	Boling.brian@deq.state.or.us

To track the time and expenses spent on this project associated with the ambient monitoring, DEQ personnel must use the **Q-Time number: 44761**. 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: 44762**.

A2. PROBLEM DEFINITION/BACKGROUND

DEQ is collecting air samples to determine the PM10 metals (inhalable coarse particles that are smaller than 10 micrometers in diameter) and TSP Cr6+ (total suspended particulate chromium) levels in the vicinity of SE 22nd Ave and SE Powell Boulevard 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 Bullseye Glass. The Oregon Health Authority (OHA) 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 Bullseye Glass Company, located at 3722 SE 21st Ave in Southeast Portland.

In February, 2016, DEQ staff will use air monitors to collect samples at properties adjacent to and in the vicinity of the Bullseye Glass Co. 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 from 6a.m. to 6p.m. for the first two weeks of operation and 24 hours averages on the weekends. OHA will use the 12 hour samples to compare to their risk factors which are based on 12 hour averages.

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

Following the first two weeks of sampling, the data will be evaluated and sampling schedule may be adjusted.

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.

A3. PROJECT/TASK DESCRIPTION

Sampling Organization:	Oregon DEQ Laboratory and Environmental Assessment Program 3150 NW 229th Avenue Suite 150 Hillsboro, Oregon 97124 Ph: 503.693.5700 Contact: Chris Moore
Analytical Organization:	Oregon DEQ Laboratory and Environmental Assessment Program 3150 NW 229th Avenue Suite 150 Hillsboro, Oregon 97124 Ph: 503.693.5700 Contact: Chris Moore Desert Research Institute (DRI) 2215 Raggio Parkway Reno, NV 89512 Contact: Steve Kohl 775.673.7300 Chester Labs 12242 SW Garden Pl Tigard, OR 97223 Contact: Paul Duda 503.624.2183

A4. 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) (http://www3.epa.gov/ttnamti1/files/ambient/airtox/nattsTADRevision2_508Compliant.pdf). 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 the sample location and will be collected for 10% of the samples. Two field blanks will be collected per month.

A5. 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 e-mailed 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.

SECTION B. DATA GENERATION AND ACQUISITION

B1. SCHEDULE

On Feb. 6, 2016, Oregon DEQ will start sampling will occur every week day from 6 a.m. to 6 p.m for two weeks. One 24 hour average sample will be collected on the weekend. Following this, 24-hr samples will be collected daily over the course of 30 continuous days. Oregon DEQ and OHA will reassess the the sampling plan at the completion of the 30 day cycle to determine future monitoring locations and frequency for this SAP.

Sampling will end when DEQ management decides we have enough data to show the risks in SE Portland.

B2. 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 Oregon 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 PM10 Sampler (DEQ13-LAB-0020-SOP**)**

DEQ will collect PM10 samples on quartz filters using high volume PM10 samplers. The low volume PM10 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 PM10 quartz filters will be analyzed at the Oregon DEQ Laboratory.

Low Volume PM10 Samplers

DEQ will collect PM10 samples on teflon filters using low volume PM10 samplers. The low volume PM10 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 on the BGI PQ167R Low Volume Sampler and/or the ASA Low Volume PM10 Sampler provided by the EPA and Lane Regional Air Pollution Authority (LRAPA). The SOPs are on-file at the Oregon DEQ Laboratory.

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

DEQ will collect hexavalent chromium samples on ashless cellulose filters using a 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.

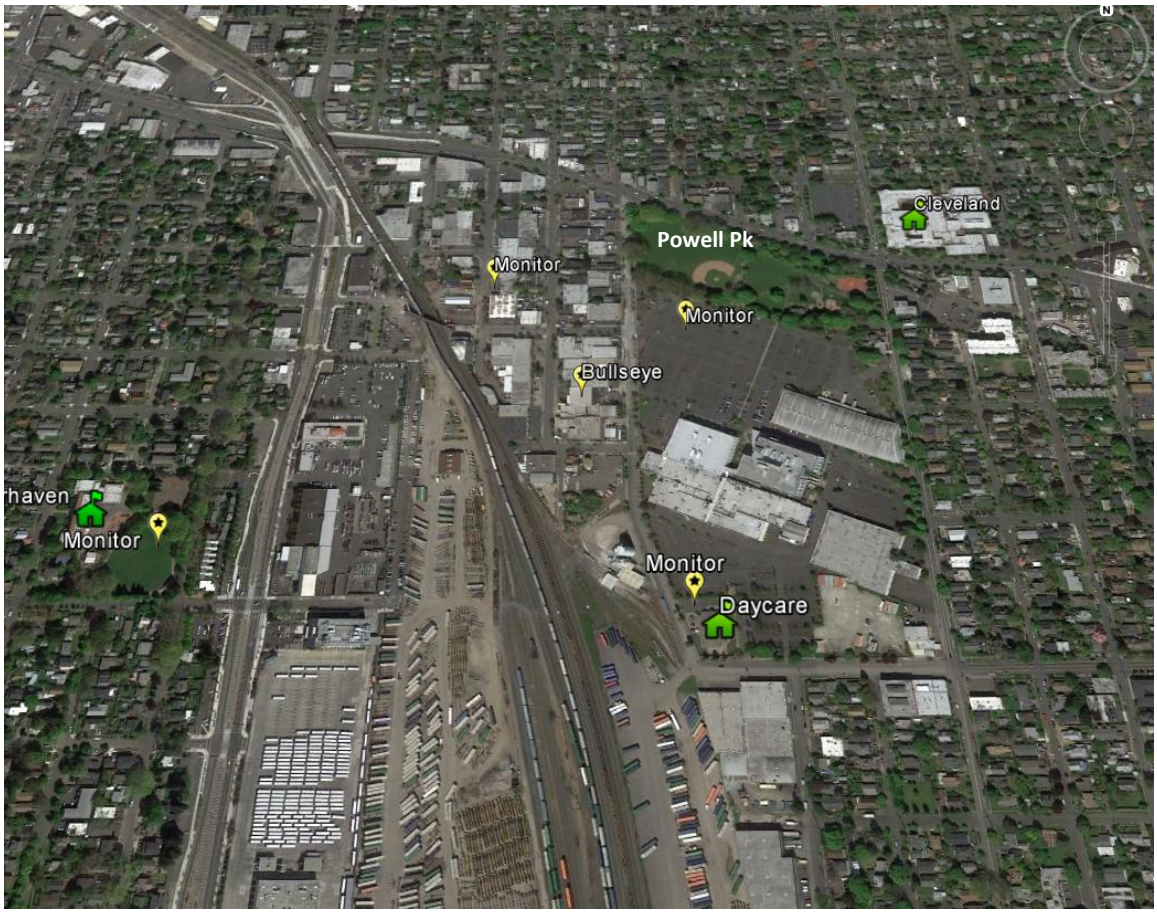
The locations and media to be sampled are summarized in Table 2. Collocated sampling will be performed at the CLCC Day Care location for all sample media.

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

LASAR No.*	Name	Description	Lat/Long	Sample media	No. of Samples
	CLCC Day Care	Fred Meyer's HQ day care	45.49395/-122.64282	PM10 Quartz	72
				PM10 Teflon	12
				Cr6+	72
	Winterhaven Elementary	Winterhaven Elementary	45.49501/-122.64964	PM10 Quartz Cr6+	30
	Portland Powell Park	Powell Park	45.49711/-122.64231	PM10 Quartz Cr6+	30
	Ellison Advertising	NW of Bullseye Glass	45.49794/-122.64528	PM10 Quartz Cr6+	30
	Reed College	Reed College	45.48353/-122.63868	Wind speed and direction	0

	Custom Incorp.	SW and Adjacent to Bullseye	45.4955/ -122.6444	Wind speed and direction Cr6+	0

**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. The monitor to the NW of Bullseye is Ellison Advertising.

B3. 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

B4. 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)

B5. 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 Portable Document Format (PDF) and in standard DEQ defined MS Excel format. The DEQ laboratory will enter all of the PM10 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.

SECTION C. 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 (e-mail is acceptable). The project manager will also be notified in writing of any data quality limitations that may be the result of laboratory operations.

SECTION D. 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.