

Sampling and Analysis Plan

South Corvallis Glass Fiber Monitoring

August 2017



**Laboratory and
Environmental
Assessment Program**
7202 NE Evergreen
Parkway, Suite 150
Hillsboro, OR 97124
Phone: 503-693-5700
Fax: 503-693-4999
www.oregon.gov/DEQ



State of Oregon
Department of
Environmental
Quality

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Corvallis Glass Fiber Air Sampling

This Sampling and Analysis Plan was prepared by:

Oregon Department of Environmental Quality
7202 NE Evergreen Parkway, Suite 150
Hillsboro, OR 97124
1-503-693-5700
www.oregon.gov/deq

Contacts:
Anthony Barnack
503-693-5708

Documents can be provided upon request in an alternate format for individuals with disabilities or in a language other than English for people with limited English skills. To request a document in another format or language, call DEQ in Portland at 503-229-5696, or toll-free in Oregon at 1-800-452-4011, ext. 5696; or email deqinfo@deg.state.or.us.

Project Approvals

Prepared By _____ Date: _____
Anthony Barnack, DEQ Air
Quality Monitoring Coordinator

Reviewed by _____ Date: _____
Chris Moore, DEQ Quality
Assurance Officer

Reviewed by _____ Date: _____
Lori Pillsbury, DEQ Resource
Assessment and Technical
Support Manager

Reviewed by _____ Date: _____
Tom Roick, DEQ Air Quality
Monitoring Section Manager

Signed Copy on File

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1. Project management

1.1. Distribution list

The following personnel will be emailed regarding all aspects of this sampling and 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 to the distribution list.

Table 1: Distribution List

Name	Phone	Email
Anthony Barnack, DEQ AQM Coordinator	503-229-5713	Barnack.anthony@deq.state.or.us
Zach Koch, DEQ AQM Air Monitoring Specialist	503-693-5711	Koch.zachary@deq.state.or.us
Karen White-Fallon , DEQ NWR Project Manager	503- 378-5315	White-fallon.karen@deq.state.or.us
Claudia Davis, DEQ WR AQ Manager	503-378-5078	Davis.claudia@deq.state.or.us
Susanna Wegner, OHA Public Health	971-673-1210	susanna.wegner@state.or.us
Julie Sifuentes, OHA Public Health Manager	971-673-0438	Julie.sifuentes@state.or.us
Eric Feeley, DEQ Particulate Matter Analyst	503-693-5761	Feely.eric@deq.state.or.us
Chris Moore, DEQ Air QA Officer	503-693-5722	moore.chris@deq.state.or.us
Tom Roick, DEQ AQM Manager	503-693-5719	Roick.tom@deq.state.or.us
Eli Murphy, DEQ AQM Coordinator	503-693-5717	Murphy.eli@deq.state.or.us
Lori Pillsbury, DEQ RATS Manager	503-693-5735	Pillsbury.lori@deq.state.or.us
Scott Peerman, DEQ Data Assessment Specialist	503-693-5782	Peerman.scott@deq.state.or.us
Sarah Rockwell, DEQ Sample Coordinator	503-693-5784	Rockwell.sarah@deq.state.or.us
Zach Mander, DEQ Inorganic Section Manager	503-693-5757	Mander.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 and laboratory work, DEQ air monitoring personnel must use the Q-Time number 45498.

1.2. Project oversight

Project coordinators will be responsible for oversight as follows:

- Anthony Barnack/ Zach Koch: Site access, maintenance, and monitoring through sample receipt at the DEQ or contract lab
- Chris Moore: Sample analysis through data review and QA
- Scott Peerman: Data assessment and presentation
- Karen White-Fallon: Source Permit Writer and Inspector

Laboratory oversight will be provided by DEQ LEAP management and quality assurance officers as defined in the LEAP quality manual or for cause. Any analytical anomalies or delays encountered during laboratory operations will be communicated to the project coordinators in writing (email is acceptable). Project coordinators will also be notified in writing of any data quality limitations that may be the result of laboratory operations.

1.3. Problem definition/background

Hollingsworth and Vose (H&V) is a glass fiber manufacturing company that has a plant located in the southeast corner of Corvallis. H&V currently emits over 100 tons per year of carbon monoxide which places it in the Title V (TV) category. H &V is doing ambient monitoring for CO and meteorology. The plant also emits glass fibers from its manufacturing process that are below the 100 tons per year particulate matter 10 microns or smaller (PM10) level for TV permitting. The Corvallis community is concerned that these glass fiber emissions could still negatively impact their health, specifically causing respiratory problems. DEQ has agreed to monitor to determine the concentration of glass fibers outside of the plants. Glass fibers are elongated with a narrow shaft (much like a short string).

1.4. Project/task description

DEQ will collect air samples to assess glass fibers concentrations in the neighborhood adjacent to the H&V plant.

The sampling objectives are to:

- 1) Collect filter data for comparison to the NIOSH glass fiber Recommend Exposure Limit (REL)¹. The REL is 3fibers/cc where the fibers are less than 3.5 μm in diameter and greater than 10 μm in length.
- 2) Tabulate the data in relation to available human health risk-based concentrations and provide the information to DEQ Western Region, Oregon Health Authority, H&V and their consultants, and the public.

DEQ will collect filter samples in three locations in the neighborhoods adjacent to H&V and one background site at least two kilometers from H&V. These locations will be chosen using the available wind data used in the 2016 Modeling Protocol² completed by Golder & Associates and information provided in the report about plant operations. The goal is to place the monitors as close as possible and downwind of the higher concentration areas close to H&V Plant 1 and Plant 2 where emissions are occurring. DEQ staff will start air monitoring in July of 2017. Analyses will be performed for glass fibers by an independent, certified lab. DEQ will also collect background data in Corvallis for relative comparison.

H&V will be operating a wind speed and direction system nearby. This monitoring has been verified by DEQ as being properly sited and is being performed by a consulting firm and audited by a secondary group. Oregon Health Authority may also utilize some of the data generated from this project as part of an OHA Health Consultation.

Sampling Organization: Oregon DEQ Laboratory and Environmental Assessment Program
3150 NW 229th Avenue
Suite 150
Hillsboro, Oregon 97124

¹ NIOSH Pocket Guide for Fibrous glass dust, <https://www.cdc.gov/niosh/npg/npgd0288.html>

² FLUORIDE AIR DISPERSION MODELING PROTOCOL, Hollingsworth & Vose Fiber Company, Golder Associates Inc., January 2016

Analytical Organization: Phone: 503-693-5700
Contact: Anthony Barnack
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239
Phone: 503.224.5055
Contact: Stephanie Golden, Technical Manager

1.5. Quality objectives and criteria

DEQ will conduct all the glass fiber sampling activities performed under this work plan in accordance with DEQ's Ambient Air Quality Monitoring for Criteria Air Pollutants QAPP (DEQ09-LAB-0004-QAPP). This is not routine sampling, however, and DEQ will follow NIOSH Method 7400 (Appendix C, using the B counting rules)³, which will be referred to going forward as Method 7400 B, to select the sample media, flow rate, and analysis for the glass fibers. Beta-Scattering measurements will be collected simultaneously using an ARA N-FRM Sampler⁴.

The laboratory and field staff will follow their standard analytical quality assurance/quality control (QA/QC) outlined in the Ambient Air Quality Monitoring for Criteria Air Pollutants QAPP, and laboratory SOPs.

1.6. Documentation and records

Property access agreements will be obtained and maintained and field documents retained by the DEQ Air Quality Monitoring Coordinator.

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 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. 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.

2. Data generation and acquisition

2.1. Schedule

DEQ will start sampling in July of 2017. DEQ will collect 10 samples at each site on unannounced days (1 sample per day), plus one blank for each site, and five background filters. DEQ will sample for one month or until we get 10 successful samples at each site.

2.2. Sampling

Sampling design, collection, methods, and handling will be managed by DEQ. DEQ will ensure that all samples will be collected in the appropriate sample containers, preserved as identified in the appropriate

³ ASBESTOS and OTHER FIBERS by PCM: METHOD 7400, <https://www.cdc.gov/niosh/docs/2003-154/pdfs/7400.pdf>

⁴ ARA N-FRM Sampler, <http://arainstruments.com/products/n-frm-sensor/>

reference methods, and transported to the DEQ laboratory or other analytical organization within the appropriate sample holding times, with the appropriate documentation, and under the appropriate sample transport conditions.

DEQ will sample for glass fibers at three locations near H&V. Sampling locations will be defined 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.

Low Volume Particulate Sampler

DEQ will collect Total Suspended Particles (TSP) containing glass fibers using a 0.8um MCE Filter Material with grids (PCM models). This is referred to in the NIOSH 7400 method B as the “conductive cowl on cassette”. DEQ will use an ARA particulate sampler with an external shepherd’s hook adapter to hold the filter. The 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 operation of the sampler.

The ARA particulate sampler has a programmable flow rate and start/stop time. It records volume, average temperature, average pressure, and average flow rate. It has a data logger that can hold multiple records. It operates on batteries and can be locked to ensure a secure sample. The sampler inlet probe will be placed at two meters off the ground with 360 degree exposure.

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

Site No. ⁵	Name	Lat/Long	Sample media	Number of Samples
38924	Corvallis, Natural Food Co-op	44.5537/-123.2640	TSP Glass Fiber	10 + one blank
38925	Corvallis, Crystal Lake Sports Fields	44.54980/-123.25185	TSP Glass Fiber	10 + one blank
38926	Corvallis, Crystal Lake Drive (residential)	44.55071/-123.2572	TSP Glass Fiber	10 + one blank, five Duplicate samples
38927	Corvallis, Lincoln Elementary School	44.54424/-123.26438	TSP Glass Fiber	10 + one blank
NA	Hollingsworth and Vose	44.5519 /-123.2550	Wind speed/ direction, Delta Temp	Continuous

⁵ 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.

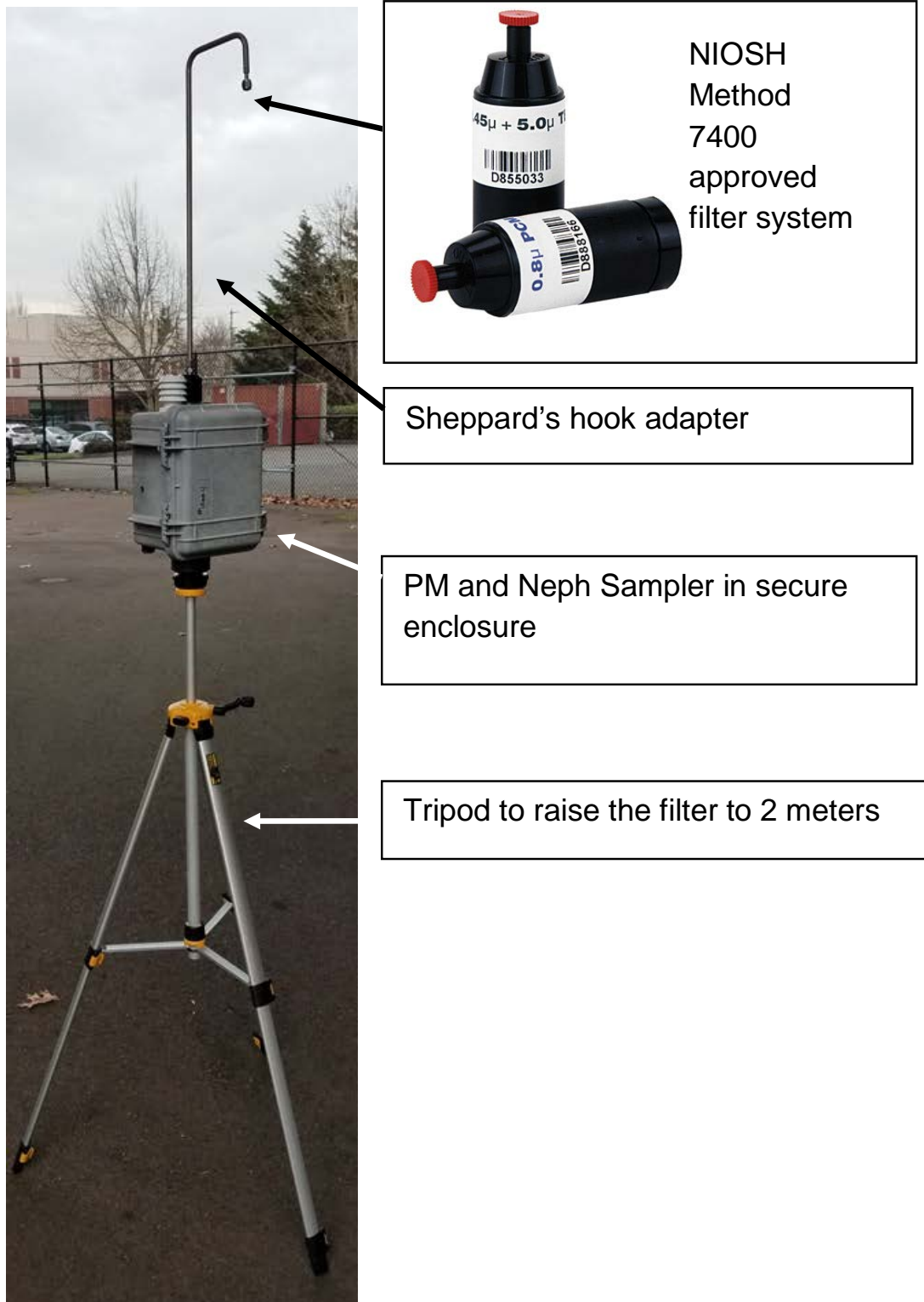


Figure 1. ARA N-FRM particulate matter sampler and nephelometer with a Method 7400 B rated filter system.

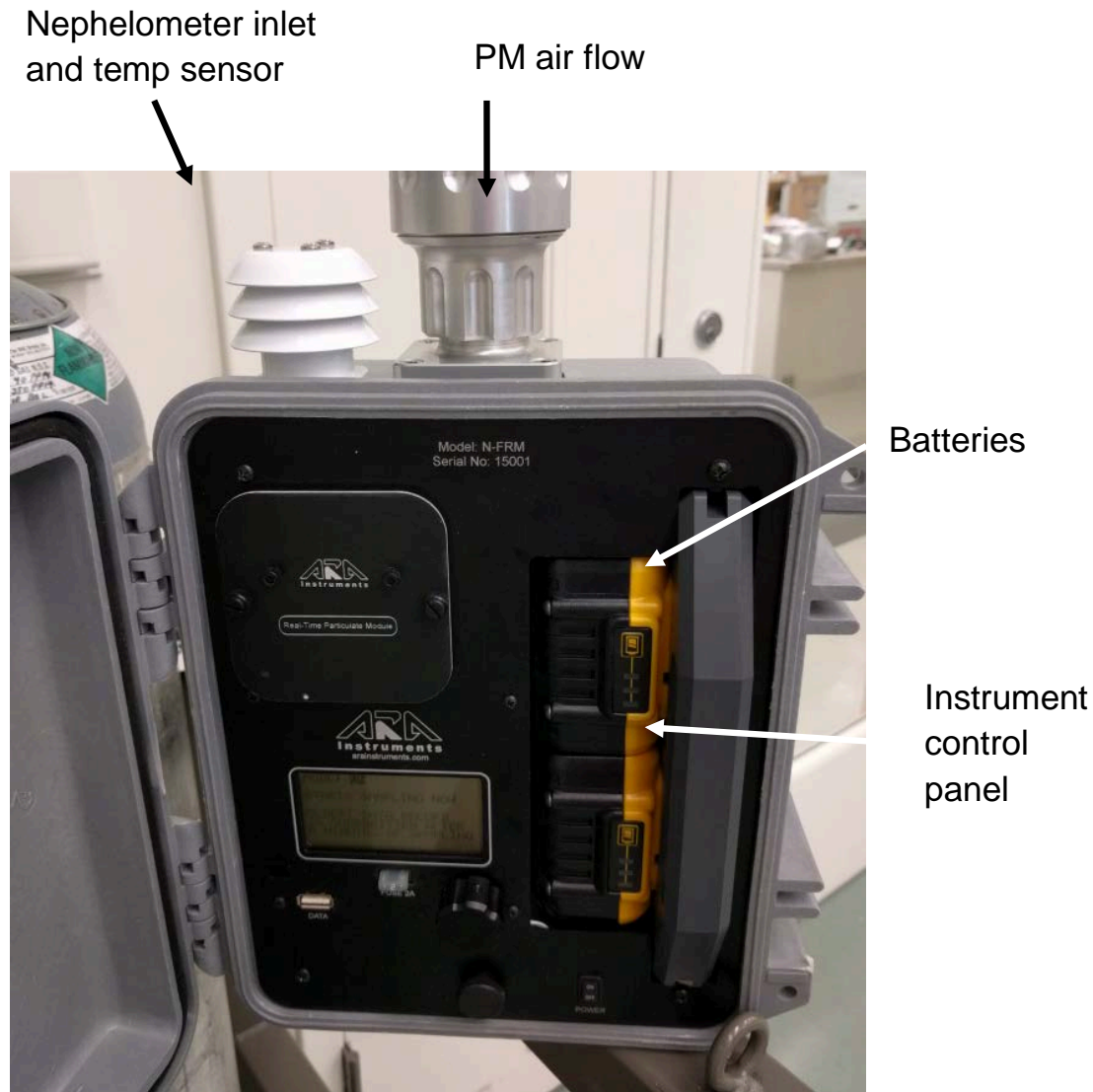


Figure 2. ARA N-FRM particulate matter sampler and nephelometer interior.

2.3. Sampling methods, sample handling, and custody

All field data will be collected on a chain of custody for each site, accompanying the samples to and from the laboratory, and to the subcontracted lab. The locations to be sampled are summarized in Table 2 and were selected based on proximity to Plant 1 and Plant 2 and the available wind direction information. An image of the proposed sites are listed in Appendix A.

Air samples submitted for laboratory analysis will be collected by and Oregon State University PhD candidate who will be trained and supervised by DEQ staff. All air samples will be transported to and from the sites in adherence to temperature requirements outlined in Method 7400 B. All samples will be transported using DEQ chain-of-custody procedures for the DEQ Laboratory.

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
TSP	None Required	No holding time restrictions

2.4. Analytical parameters, methods, and quality control

A summary of the requested analytical parameters and methods is provided in Table 4.

DEQ will hire an ORELAP certified laboratory to analyze the filters for fiber count as outlined in Method 7400 B.

Table 4: Summary of analytical parameters and methods

Sample Type	Analytical Parameters	Reference Method
TSP Teflon Filter	Fiber count.	NIOSH Method 7400 B

2.5. Data management

The DEQ laboratory will maintain hard copies of the analytical reports, including all analytical QC measurements. Unless otherwise arranged, data generated by the DEQ laboratory will be moved to the laboratory online database following release. Data in this database is publically available.

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 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 if 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.

DEQ will run at least four field blanks (or 10% of the total samples, whichever is greater) as prescribe by Method 7400 B.

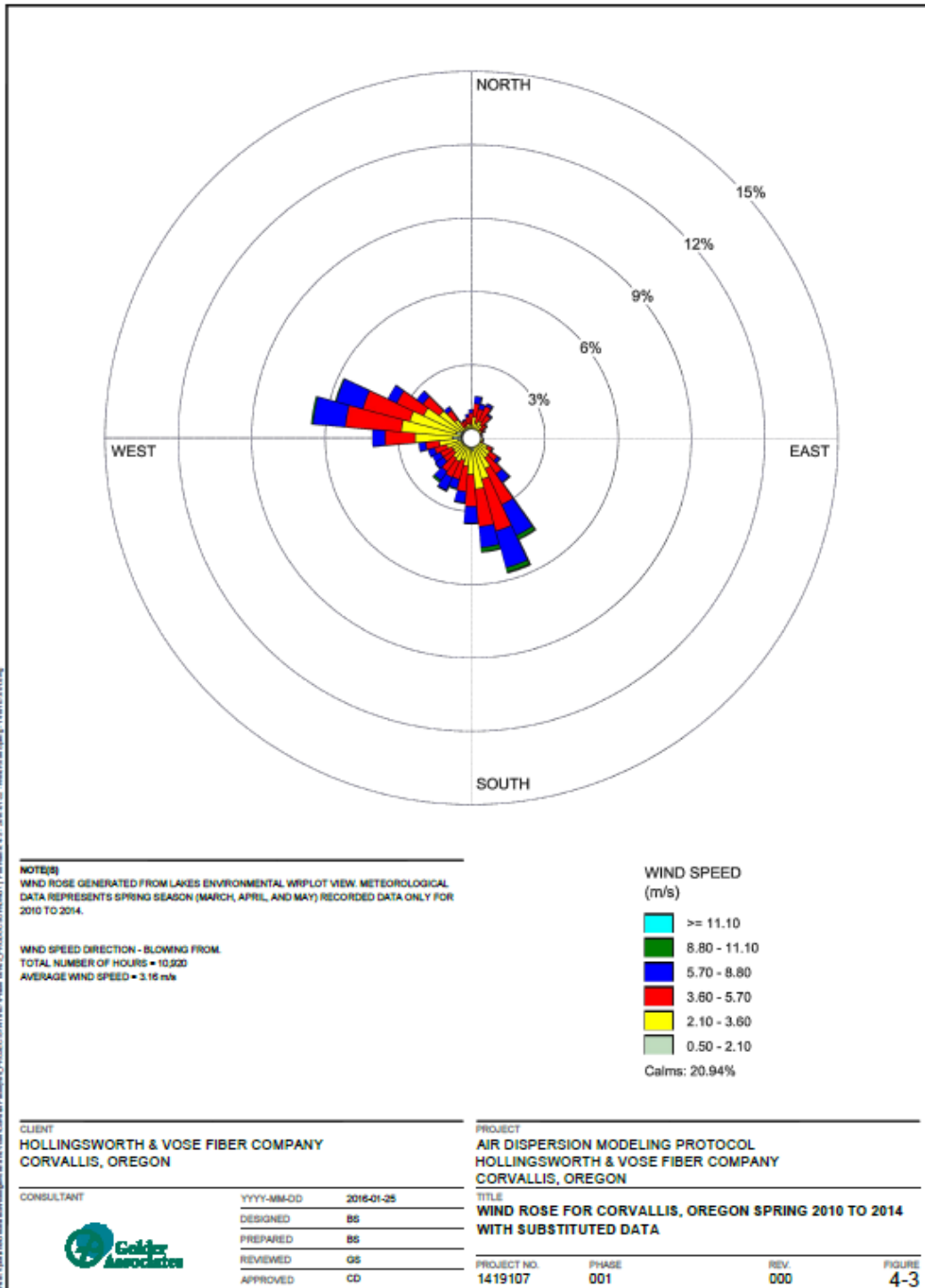
3. Data assessment

DEQ's Resource Assessment section will prepare summary statistics of the collected data and make a comparison to available screening values, if any. DEQ may evaluate the available wind data (from the

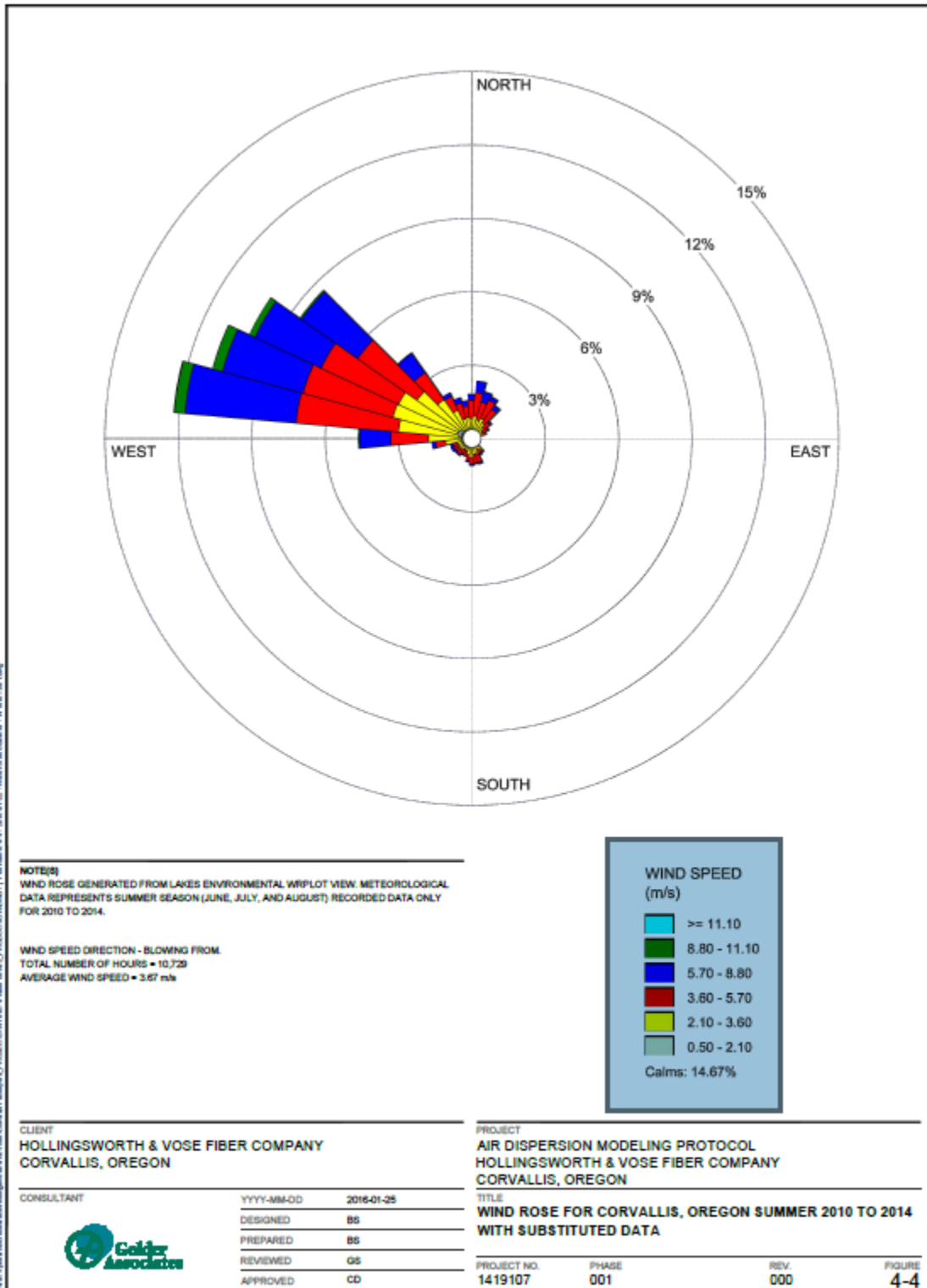
monitor located at the facility) including wind speed and direction to assess the source of the particles. In addition, modeling conducted at the facility may be used to estimate areas of impact. Given the nature of this sampling, collected data will be tabulated and provided to the Oregon Health Authority (OHA) for review. OHA may utilize these data to screen for potential health effects. OHA or DEQ may recommend additional monitoring or evaluation based on this initial data collection.

Appendix A - Wind Roses and Proposed Monitoring Locations

Spring wind rose (2010-2014 Corvallis Airport)



Summer wind rose (2010-2014 Corvallis Airport)



File: E:\proj\1419107\corvallis\windrose\windrose_2010_2014_081617.mxd
 Date: 8/16/2017 10:58:11 AM
 User: gregory.c.davis
 Project: 1419107 - Air Dispersion Modeling Protocol
 Title: Wind Rose for Corvallis, Oregon Summer 2010 to 2014 with Substituted Data
 Figure: 4-4

Proposed air sampling locations

