Standard Operating Procedure

Statewide Prioritization of Air Toxics Monitoring

April 2017

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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

Last Updated: 04/10/17
DEQ17-LAB-0016-QAP
Version 1.0

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1. Summary

The Oregon Department of Environmental Quality will use this document to prioritize agency use of available air toxics monitoring resources statewide. DEQ will be placing annual full spectrum air toxics monitoring stations with meteorological equipment at locations throughout the state and requires a thoughtful process for determining where they will next be placed.

DEQ will prioritize air monitoring and meteorological stations based on several factors, including but not limited to, past and current air monitoring data, additional moss data, modeling, pollution sources, and demographics. Areas where DEQ has very little monitoring data will also be a significant consideration.

2. Background

DEQ routinely monitors air toxics at two National Air Toxics Trends Sites and one air toxics site that has rotated annually. At full spectrum air toxics monitoring stations such as these, DEQ collects meteorological data and samples to measure more than one hundred pollutants in ambient air. This may include metals, volatile organic compounds, carbonyls, polycyclic aromatic hydrocarbons as well as black carbon to evaluate particulate matter.

DEQ began evaluating air toxics data at six locations in the Portland area as part of the Portland Air Toxics Solutions project in 2009. This was done using information dating back to a 2005 regional monitoring study. The PATS model identified five priority categories of concern: residential wood combustion (e.g., smoke particulate), on-road light duty vehicles (e.g., volatile organic compounds), on-road heavy-duty vehicles (e.g., diesel particulate), construction (e.g., diesel particulate), and industrial metals (e.g., cadmium).

Subsequently, the U.S. Forest Service collaborated with DEQ in 2013 to identify sources of heavy metals in the Portland metro area using collected samples of moss. Draft results from the USFS moss study led DEQ to the siting of several air toxics monitoring stations in the spring of 2016. The purpose of these stations was for the evaluation of metals in areas of initial concern identified through the study.

DEQ partnered with the Oregon Health Authority for their assessment of health risks and input on necessary health actions in response to this new information. This partnership with OHA continues as DEQ is working with OHA on a rulemaking process — Cleaner Air Oregon — to develop a more comprehensive, risk-based regulatory system for air toxics in Oregon. At the same time, communities in northwest Portland, Swan Island, Hillsboro and Hayden Island as well as other cities such as The Dalles and Corvallis have voiced concerns about industrial air emissions in or near their neighborhoods and the need for air toxics monitoring information.

3. Prioritization Process

DEQ will consider six main categories of information to evaluate potential additional air toxics monitoring locations: 1) known or potential sources of pollution; 2) number of pollutants of concern; 3) relative toxicity; 4) the lack of data; 5) community and demographic factors such as proximity of residential neighborhoods to industrial sources; and 6) DEQ program needs such as the regional need to address local concerns. DEQ will assess and rank sites using each category and then compile the results.

This compilation will help DEQ make decisions about where air toxics monitoring resources should next be deployed.

3.1. Sources of Pollution

Air toxics may come from a variety of sources including businesses and industries of all sizes; cars and trucks; all types of burning including woodstoves, agricultural burning and forest fires; and the use of consumer products such as solvents and pesticides. To evaluate sources contributing to elevated levels of air toxic concentrations, DEQ will consider:

- Proximity and number of point sources (industrial and commercial activities) with air toxics emissions, and consideration of weather patterns.
- Potential exposure to area-wide and mobile sources, i.e., cars, trucks, construction equipment, generators, etc. and the proximity to large transportation corridors. This will include consideration of weather patterns, particularly the potential for air stagnation events.
- Prevalence of residential wood burning, a significant source of $PM_{2.5}$ and associated levels of air toxics such as benzene and PAHs which are primary air pollutants of concern for people's health.

3.2. Number of Pollutants

Air toxics can be characterized as volatile organic compounds such as benzene; semi-volatile organic compounds such as polycyclic aromatic hydrocarbons; metals such as cadmium and lead; and particulates including diesel soot. The prevalence of multiple known or expected air toxics compounds will impact the level of interest and the need to collect monitoring data.

3.3. Relative Toxicity

In conjunction with the number of priority pollutants present, the concentrations detected are important because some chemicals cause adverse effects at much lower concentrations or shorter exposure times than others. Oregon has adopted Ambient Benchmark Concentrations that serve as clean air goals for 52 air toxics known to be present in the state. Each air toxic of concern has a benchmark based on its non-cancer or cancer causing effects, whichever level would be more protective. An ABC is the annual average concentration of a toxic chemical in air that individuals, including more sensitive groups such as children or the elderly, could breathe continuously for a lifetime without experiencing any non-cancer health effects or without increasing their risk above the background cancer rate by greater than one chance in a million. In evaluating relative toxicity, DEQ will consider information including the following:

- Relevant, available air monitoring data relative to ABCs.
- The USFS and other moss data. Unlike air monitoring data, moss data is not directly comparable to Oregon ABCs. In order to evaluate these data, DEQ can use the ratio of the site concentration to the median concentration of data collected in the immediate study area and the larger study area beyond.
- Citizen monitoring and research data validated and of sufficient quality for comparison to established benchmarks.

3.4. Lack of information

In many areas of the state there is little to no information about air toxics. The lack of information is a significant factor that will be ranked based on what we do know about potential sources and demographics for a particular area.

3.5. Community Factors

Community factors are an essential consideration in determining site priority. DEQ will consider the following community factors where they apply in ranking sites:

- Environmental justice (EJ)/demographic indicators (communities of color, children, elderly, low income). OHA is working with DEQ on a process for identifying communities with potential EJ concerns.
- Potential exposure to receptor populations (RP) - certain members of the population are more sensitive to air pollution than others. In addition, pollutants may affect more people if they are present in areas where people congregate. Locations of concern include childcare facilities, educational facilities, health care facilities, places of worship, correctional facilities, residential care facilities, and city, county or state parks.
- Population density (PD) - the population density of an area directly indicates the number of people that may be potentially exposed to a pollutant.
- Complaints (C) – odor complaints, for example, do not necessarily indicate a health risk but do suggest the presence of pollutants which may have adverse effects.

3.6. DEQ Program and Regional Needs

In addition to the factors listed above, air monitoring may be valuable to DEQ programs and regions for a variety of reasons. At a minimum DEQ will consider:

- Responsiveness to a regional need for addressing local concerns including any input by federal, state or local health agencies (RC).
- Value added to DEQ programs such as nuisance odors (VA).
- Contribution to DEQ air modeling or other technical resources (TR).

4. Site Prioritization

DEQ will review any new information on an annual basis along with any newly identified areas of interest using the criteria listed above, and then update the locations where full spectrum air toxics monitoring stations will be placed next.

5. Revision History

Revision	Date	Changes	Editor
1.0	04/10/17	New Document	TR