Standard Operating Procedure

Statewide Prioritization of Air Toxics Monitoring

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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**

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1. Summary

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

DEQ prioritizes air monitoring and meteorological stations based on several factors, including but not limited to, past and current air monitoring data, modeling, hazardous air pollutant 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, six state air toxics trend sites and, one to four air toxics sites that are rotated annually. At these full spectrum air toxics monitoring stations, DEQ collects meteorological data and samples to measure more than one hundred pollutants in ambient air. Air toxics 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 (PATS) project in 2009. This was done using information dating back to a 2005 regional monitoring study. In developing the PATS model, five priority categories of concern were identified: 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 (OHA) for their assessment of health risks and input on necessary health actions in response to this new information. Cleaner Air Oregon, a collaboration between DEQ and OHA, developed 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 voiced concerns about industrial air emissions in or near their neighborhoods and the need for air toxics monitoring information.

3. Prioritization Process

DEQ considers 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 in the area; 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 uses a matrix to assess and rank sites using each category and then compile the results. This compilation helps DEQ make decisions about air toxics monitoring priorities.

3.1. Sources of Pollution

Air toxics may come from a variety of sources including businesses and industries of all sizes; hospitals using industrial disinfectants; vehicle traffic emissions; 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 considers:

- 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 includes 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 naphthalene (aka, mothballs); metals such as cadmium and lead; and particulates including diesel soot and woodsmoke. The prevalence of multiple known or expected air toxics compounds impacts 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 (ABC) 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 considers information including relevant air monitoring data and validated research or community monitoring data.

3.4. Lack of information

In many areas of the state, there is little to no data for 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 considers the following community factors where they apply in ranking sites:

- Environmental justice (EJ)/demographic indicators (communities of color, children, elderly, low income).
- 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 considers:

- 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 reviews any new information on an annual basis along with any newly identified areas of interest using the criteria listed above using a rating of low medium or high priority. DEQ then updates the locations where full spectrum air toxics monitoring stations will be placed next.

5. Revision History

Revision	Date	Changes	Editor
1.0	04/10/2017	New Document	TR
1.1	09/15/2020	Changes in collaboration with planning	BA