



Air Toxics

Questions and Answers

What is going on?

Possibly unsafe levels of arsenic and cadmium were found in the air near Bullseye Glass Company in Southeast Portland. Cadmium was found in the air around Uroboros Glass in North Portland. Chromium -6 (also known as hexavalent chromium) is also used at these glass factories and can be dangerous to health. The week of Feb. 15, 2016, Bullseye Glass and Uroboros Glass voluntarily agreed to stop using arsenic, cadmium, and chromium.

Since the air toxics were found, the Oregon Health Authority (OHA) and Multnomah County Health Department have worked with the Oregon Department of Environmental Quality to find out the risks to health and to tell the public.

The investigation is continuing, but as of March 17, 2016, the results of air and soil tests around Bullseye and Uroboros; a review of cancer rates around both glass companies; and urine tests all showed that residents are at no immediate or urgent risk of health problems from these emissions.

The agencies will continue to collect air samples and share those with the community on the SaferAir.oregon.gov website every Thursday. A full public health assessment is expected by fall 2016.

How did this happen?

In late 2013, the U.S. Forest Service studied moss samples to measure air pollution in Portland. The moss results showed two hot spots for cadmium. Researchers shared the preliminary data with the Oregon DEQ in May 2015. DEQ then performed their own air monitoring near Bullseye Glass in Southeast Portland, collecting 24-hour samples every few days for 30 days in October 2015.

The air monitoring confirmed that the glass company was the likely source of the metals. When those results became available on January 21, 2015, DEQ shared the findings with the OHA and the Multnomah County Health Department. The DEQ also identified a second area of concern near a second company, Uroboros Glass, in North Portland.

The glass companies were operating in compliance with the current law. Bullseye Glass was operating within its permit. Uroboros is not required to have a permit.

The OHA and the Multnomah County Health Department are looking into what these air toxics can do to people's health and informing the public.

What can the Forest Service moss maps tell me about health risks?

Many people are concerned about hot spots they saw on maps printed in the media that were created from the Forest Service moss data. With the exception of cadmium, there is no way to use those maps to predict or estimate health risks to people. The moss maps for metals other than cadmium only show where in Portland that tree moss has higher concentrations of



metals in relation to moss in other parts of the city. The presence of metals in moss does not necessarily mean that these metals, when in the air, are or were above levels that would be a risk to people's health.

In the case of cadmium only, the Forest Service was able to find a mathematical correlation between moss concentrations and air concentrations that existed in October 2015.

The Forest Service has not yet worked to find correlations between moss concentrations and air concentrations for any other metals. This means that moss maps for metals other than cadmium cannot be used to predict air or soil concentrations in those areas. Because health risk is based on exposure by breathing contaminated air and not eating moss, the moss maps cannot be used to accurately predict health risks.

OHA, DEQ and Multnomah County are working on a fair and clear system for prioritizing those areas that are identified based on current air, soil and moss data and other factors in deciding where to do additional testing. Currently, state agencies are focused on the area around Bullseye and Uroboros glass companies, because those areas had the highest concentrations of verified levels of cadmium in the air. State agencies focused first on the area around Bullseye and Uroboros glass companies, because those areas had the highest concentrations of verified levels of cadmium in the air

What are the health risks of these metals?

So far, agencies have focused on three heavy metals that were found to be at higher-than-acceptable levels near the glass companies.

Arsenic: Arsenic is not currently thought to be a public health risk in North Portland. Arsenic was found at higher-than-acceptable levels in Southeast Portland. Arsenic can come from many sources including vehicle engines, glass and metal facilities, and local volcanic soils. Long-term arsenic exposure is linked to skin color changes, nerve damage, skin cancer, and cancers of the lung, bladder, and liver.

Cadmium: Cadmium was detected at higher-than-acceptable levels in Southeast Portland and estimated at higher levels in North Portland. Long-term cadmium exposure is linked to kidney disease, fragile bones, and lung cancer.

Chromium: Chromium comes in different forms. Chromium-3 (chromium three) is a nutrient required by our bodies. Hexavalent chromium (chromium-6) was used at both glass companies and was also likely to have been released into the air. Experts are currently researching how much of the total chromium detected could be hexavalent chromium. Hexavalent chromium exposure is linked to anemia (low iron in the blood), asthma, skin allergies, and cancers of the lung and stomach/intestinal tract.

More information on these heavy metals is available at the Oregon Health Authority. (www.healthoregon.org/metalsemissions).

Is it safe to spend time outdoors in these neighborhoods?

Yes. Both glass makers have stopped using arsenic, cadmium, and chromium, so there is no ongoing risk of exposure from those pollutants through the air. Air sampling taken near Bullseye and Uroboros show significant reductions in the levels of metals in air concentrations. Being outdoors also encourages physical activity, which is important for improving well-being and preventing chronic diseases.



Is the soil in my yard or garden safe?

Yes. Recent dose and risk calculations for arsenic and chromium-6 indicate that metals in soil are too low to harm the health of people living and working near both Bullseye Glass and Uroboros, including children attending nearby daycare centers. Gardening near the glass companies, including growing and consuming your own produce in nearby soil, can be done with no significant risk to health. Because Portland is an urban environment and all urban soils have heavy metals to some degree, public health officials recommend that people follow the guidelines in the OHA Healthy Gardening fact sheet and webpage. This includes washing hands after working in the soil, and thoroughly washing all produce before consuming it.

I have small children and live in one of the affected areas. Should I be worried?

The health effects of exposure to cadmium, arsenic, and chromium depend on how much of these metals a child is exposed to and for how long. Exposure to high levels of cadmium and arsenic over a long period of time may cause developmental delay (low IQ) in children, but it's not known for sure. Soil sampling from SE Portland confirms that metals concentrations in those areas are too low to cause these kinds of health effects in children.

Young children who play in dirt and frequently put their hands in their mouths are at risk of eating metals that have settled in the soil.

Making sure that all children wash their hands before eating, and after playing outdoors, can significantly lower their risk of exposure. Follow safe gardening practices, including washing produce before eating.

To help keep kids healthy it is important that they **1)** avoid tobacco smoke - tobacco smoke contains heavy metals including cadmium and arsenic; **2)** eat a healthy diet with calcium and iron; and **3)** wash their hands before eating or drinking.

I'm pregnant and live in one of the affected areas. Should I be worried?

We do not know for sure what the health effects are of these metals in pregnant women who have been exposed. Arsenic, cadmium, and chromium are all known to cross the placenta (move from mother to baby).

Arsenic and cadmium may contribute to low birth weight in babies. There are no studies showing that chromium causes birth defects in humans.

If you are pregnant, and have been exposed, it's important to **1)** avoid tobacco smoke - tobacco smoke contains heavy metals including cadmium and arsenic; **2)** continue regular prenatal care with a health care provider; and **3)** eat a healthy diet with plenty of calcium, iron, and folic acid. Those nutrients help protect the body against some of the bad effects heavy metals can have.

I'm breastfeeding and live in one of the affected areas. Should I stop?

Arsenic, cadmium, and chromium can all be found in breast milk. We are just beginning to understand the situation in Portland neighborhoods and what it means to people's health. Breastfeeding offers many health benefits to mom and baby, so nursing mothers should continue to breastfeed. We will review this advice regularly as we get more information.



I've had a cancer diagnosis. Was my cancer caused by emissions from one of these glass companies?

Many types of cancer have many different causes. Arsenic exposure is linked to skin, bladder, lung, and liver cancers. Cadmium exposure is linked to lung cancer. Chromium exposure is linked to lung and gastrointestinal cancers. These links are generally based on studies of animals and of people with heavy, direct exposures for long periods of time. It is extremely difficult to link one individual's diagnosis to an environmental exposure like this one. OHA investigates cancer clusters (groups of cancer in the same area) and tries to find out if there are more cases than we would expect for any one group of people. But, cancer clusters rarely find a clear environmental exposure responsible for that higher-than-expected number.

Have the affected neighborhoods had an unusually high number of people diagnosed with cancer?

The Oregon Health Authority reviewed lung and bladder cancers in Southeast and North Portland neighborhoods near the glass manufacturers and found no evidence of an increase in the disease. The Southeast study was published February 18, 2016 (see *Cancer Incidence Evaluation Southeast Portland*). On March 14, 2016, the OHA reported the incidence of cancer was no higher than expected in North Portland.

Should I get tested for arsenic, cadmium, or chromium?

The Oregon Health Authority is not recommending that you get tested. Talk to your doctor to make the best choice for your health. Urine testing does not always detect arsenic and chromium-6. This is because the body passes these metals fast.

Results from urine testing are not always clear because these tests were designed to detect higher levels due to constant exposure, such as people who work with these metals every day.

So far, more than 300 people have been tested. Very few have shown any levels of cadmium. Cadmium can be found in the urine of someone who has been exposed over time. This leads to a build-up in the kidneys. High levels can cause kidney damage and may increase the risk for some cancers. These results are encouraging to public health officials.

If you choose to get tested, your doctor may order a test for cadmium. They will then discuss the results with you. If cadmium is detected, that does not mean that kidney damage is likely. Your doctor will decide if follow-up testing is needed. If cadmium is detected, a public health investigator will follow up with you to ask you about your exposure to the companies and about other potential exposures.

Experts at the federal Centers for Disease Control and Prevention (CDC) do not recommend testing of hair or nails because of frequent contamination with dirt and dust.

I want my family tested. Who will pay for it?

Talk to your doctor about the need for a test, and the potential benefits and limitations. Most private insurance will cover the cost of cadmium testing for people who live near the glass companies. The Oregon Health Plan (OHP) also will cover urine cadmium testing for members who live in the highest-risk areas. For persons living, working, or going to school or daycare within one-half mile of either glass manufacturing plant, the OHA is in the process of contracting with a health care system to arrange for urine cadmium testing. By March 18, 2016 details will be posted at www.SaferAirPortland.Oregon.gov.



My health care provider has questions. Who should they call?

State and county public health agencies are regularly updating guidance for health care providers. Physicians who want more information on test interpretation can call the Oregon Poison Center (1-800-222-1222). If necessary, the Poison Center will refer calls related to children or pregnancy to the NW Pediatric Environmental Health Specialty Unit (1-877-KID-CHEM).

Does the emergency rule make it mandatory for laboratories to report the results of these cadmium tests?

Yes, on February 18, 2016, OHA amended the rules to require that cadmium tests be reportable, and established a way to electronically report these results.

Where can I learn more about the findings and effects?

You can visit www.saferairportland.oregon.gov for the latest updates.

I understand there are treatments that remove metals from the body. Should I do this?

This type of treatment is usually only for individuals with a known high-dose exposure who have symptoms. Medicines, known as chelating agents, bind to metals and put them into the bloodstream so the body can get rid of them. Chelating agents can lower calcium and iron, both of which are important for health. Even with medical supervision, this treatment has serious risks like allergic reaction, dehydration, kidney failure, and death.

State and local public health doctors are **not** recommending routine chelation treatment for people tested as a result of this exposure. Health care providers needing additional information on test interpretation can contact experts at the Oregon Poison Center (1-800-222-1222), NW Pediatric Environmental Health Specialty Unit (1-8777-KID-CHEM), or a Board Certified Medical Toxicologist.

When will we be able to identify the “hot spots” for residents for whom you promised to cover the cost of urine cadmium testing?

DEQ is working to identify other “hot spots” around the city and will work with OHA to determine potential health risks in those areas. Based on that information, OHA will alert community members about their risks, whether OHA recommends testing, and if so, where and how to get tested.

Do you have any urine test results so far? What are the results? What are you doing with the results of these tests?

As of March 11, 2016, OHA has received urinary cadmium results for 316 Oregonians statewide; 281 (89%) are Multnomah County residents. Of these, 10 (4%) had detectable cadmium in their urine. Two were in children younger than 18 and eight were adults. Four results, or 1 percent, were at levels that would indicate need for clinical follow-up. OHA is interviewing these people to better understand their risk factors for cadmium exposure. Of the 271 Multnomah County residents with no cadmium detected in their urine, 183 (68%) are children (younger than 18).

OHA and Multnomah County Health Department are working to ensure health care providers are informed about appropriate screening testing procedures and follow-up agencies have issued the fourth in a series of clinician updates to clinicians about testing for heavy metals.



OHA is also contacting health care providers for each individual with cadmium levels above the threshold of clinical concern to ensure appropriate follow-up.

Is it safe to eat fruits, vegetables and herbs grown in this neighborhood?

Yes. In general, vegetables should be washed or peeled before eating them, and anyone working or playing in soil should wash their hands before eating or drinking. The main risks from your garden are through eating the soil.

Local and state health officers advised people living within a half mile of the glass factories not to eat backyard produce until further notice. When will these residents be able to eat produce from their gardens?

Today! Based on the soil data collected by DEQ in late February 2016, OHA concludes that the levels of metals in soil around Bullseye Glass and Uroboros are *too low to harm the health of people in the surrounding community*. OHA analyzed 67 soil samples collected by DEQ near Bullseye Glass and 21 soil samples near Uroboros. OHA focused on samples that were collected at shallow depth (0-6 inches) because they represent what people in the area would likely be exposed to. All samples were collected from public spaces and often from under a layer of sod. Samples were not collected from garden soil and did not include food grown in garden soil.

All soils contain some levels of metals, minerals and microorganisms. Arsenic, lead, cadmium and other metals occur naturally in soils. In Oregon, some metals occur in the soil at higher levels because of volcanic activity in the state's landscape. It is also common for soil in city neighborhoods to have contaminants that come from building materials, vehicles and roadways, pesticides/herbicides, and nearby industrial and commercial uses nearby.

We recommend that people follow the guidelines in our [Healthy Gardening fact sheet and webpage](#).

Should I have my soil tested?

OHA is not recommending soil testing at this time. If you choose to have your soil tested, the agency has produced an information sheet with a list of soil testing companies. It is available at www.SaferAirOregon.oregon.gov. There are laboratories serving Oregon that will test soil for heavy metals. They will provide you with best practices for sampling your soil. It is common for soil in urban areas to have contamination from heavy metals, petroleum products, pesticides and other pollutants. It's also important to consider that a test showing a positive result for the presence of metals does not necessarily mean the levels are abnormally high for the region, or that they pose a risk to your health. OHA's [Healthy Gardening fact sheet and webpage](#) provide additional information.

I had tests done by an independent laboratory that performed soil and air monitoring. Would state and local agencies investigating metals emissions in Southeast and North Portland be interested in my results?

There are many parties independently collecting environmental data. These include Portland State University, Portland Public Schools, daycares, media outlets, and individuals who are having soil and urine tested. Several of these are analyzing the data they collect, or distributing the results widely. This has created opportunities for a range of people to weigh in on what this initial data may mean. All this information can potentially help us understand the public health



risks, but it is not without limitations. The collection must be done in a way that meets the state's standards so we are not comparing apples to oranges.

The OHA, DEQ and MCHD are fully committed to providing the public with accurate information to address the broad range of concerns heard. In response to community concern, public health officials are speeding up the regular assessment process in order to provide this scientific information as quickly as possible. All data provided will be fully considered to determine its validity and whether it enhances the understanding of the public health risk associated with exposure to these metals in our environment. Protecting the health of people who have been, and may be, exposed to the emissions from the glass companies is top priority.

What are you advising parents and teachers about whether children should use the playground in areas with high levels of air toxics?

Parents and teachers can feel confident allowing children to play outside. Based on results of tests on soil in the neighborhood surrounding Bullseye Glass and Uroboros, OHA concludes that exposure to the levels of metals in soils around Bullseye Glass are too low to harm the health of the community, including children at the daycare center and lifelong residents.

OHA added the estimated cancer risks for arsenic and chromium-6 for children at the daycare center near Bullseye and lifelong residents. They found the combined cancer risk to be 60 in 1 million over an 80-year lifespan for daycare children and 30 in 1 million for lifelong residents. Even combined, these cancer risks would cause no detectable increase in cancer rates over baseline.

OHA is awaiting up-to-date results on additional air monitoring in the areas near the glass factories. Since they both stopped using the chemicals that were detected at high levels, OHA is not anticipating that levels have continued to be high.

What steps should students follow when they come inside the house or return to the school classroom after playing outside?

Regardless of neighborhood, kids should wash their hands when returning inside after playing, before eating, and any other time that their hands are visibly dirty.

Is the produce from school gardens safe to eat?

Yes. Gardens tend to be a mixture of soil, compost, and other amendments. This makes garden soil very different from soil found in parks or your lawn. Garden soils that are amended with compost create healthier plants and make it harder for contaminants to get absorbed. The only way to know what is in your garden soil is to test for the contaminants of concern. A person must come into contact with, or be exposed to, a high enough level of contamination in soil for it to cause harm to their health. To be exposed to metals in soil, a person must swallow the contaminated soil. This is of most concern for young children who play on the ground, in dirt, and frequently put their hands in their mouths. Children and adults should wash their hands before eating and after playing outdoors.

Should schools test the dust in the schools for cadmium and arsenic?

Additional indoor testing will not be necessary unless outdoor tests identify metals at abnormally high levels. Regular cleaning also helps prevent dust build-up. Wet cleaning methods, or vacuuming with HEPA-equipped equipment, would reduce the amount of dust that gets stirred up into the air during cleaning.



Are my pets at risk? How can I keep them safe?

Like people, animals can be exposed through the air and environment. Talk to your veterinarian if you have questions or concerns.

Should we be worried about our water supply?

Portland's main source of water is the Bull Run Watershed, a protected area outside the city. Portland Water Bureau regularly tests for water pollutants including arsenic and chromium, which occur naturally in the environment. Water quality test results from recent years show levels that would be unlikely to have a negative effect on health.

What can I do to stay well?

People are less likely to suffer health problems from exposure to heavy metals if they take care of themselves in other ways:

- Avoid tobacco smoke
- Eat a healthy diet with a lot of different foods
- Get plenty of exercise
- Get enough sleep
- Wash hands well before you eat or drink

I'm feeling anxious about this situation. What can I do?

Learning about an environmental exposure like this can be very stressful because of the uncertainty and the worry it causes people about their loved ones and properties.

Take care of yourself by **1)** talking to loved ones and neighbors about your concerns; **2)** staying informed; and **3)** maintaining your daily routines, especially the healthy habits listed above.

If your stress becomes too much and gets in the way of your daily activities, see your health care or mental health provider for more information and support. You can also call the Multnomah County Crisis Line 24 hours a day at 503-988-4888. There is also a helpful fact sheet on stress and potential environmental exposures at (<http://saferair.oregon.gov/Pages/Stay-Informed.aspx>).

Where can I find information in other languages?

Information is being developed in other languages and shared on the agencies' websites. You can visit (www.saferairportland.oregon.gov) for the latest updates.

What are the different agencies involved?

DEQ - Oregon Department of Environmental Quality is a state agency that makes rules to protect the quality of our air, water, and land.

OHA - Oregon Health Authority is a state agency that works to ensure the health and health care of all Oregonians.

MCHD - Multnomah County Health Department is a local county agency focused on promoting and protecting the health of everyone in Multnomah County.

USFS - The U.S. Forest Service is the agency that manages and protects national forests and grasslands. Forest Service researchers discovered that moss collected from trees around art glass companies in the Portland area had much higher concentrations of heavy metals than other areas in the city.