



# **Bullseye source test results, DEQ's actions to identify and control the unknown hexavalent chromium source**

## **Question and answers**

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### **What does DEQ know about hexavalent chromium sources detected in the vicinity of the Bullseye Glass facility?**

An analysis of meteorological data during periods of higher chromium detections indicates that the source is likely at or in the vicinity of Bullseye Glass. Even so, DEQ has completed in-depth analyses to identify other permitted and unpermitted sources of hexavalent chromium in the vicinity of Bullseye Glass. Actions include review of permit files and city tax maps and on-site tours, which led to three formal inspections but no other viable leads. The leading potential other source, the Electro-Chem facility, does use hexavalent chromium (and limited amounts of trivalent chromium) but based upon its location, and an analysis of its processes and controls and wind data), it does not appear to be a likely source of the monitor spikes.

DEQ also notes a presence of many mobile, diffuse sources of hexavalent chromium in the area, namely the transportation infrastructure adjacent to a daycare center. This includes a busy rail yard, high-trafficked thoroughfares, a TriMet bus barn and several trucking dispatch yards. Diesel exhaust from these sources likely contributes to an elevated background of hexavalent chromium but is not likely to cause the spikes.

### **Why would hexavalent chromium be emitted from Bullseye? Aren't they prohibited from using chromium? What is DEQ doing to control these emissions?**

Bullseye Glass voluntarily ceased using chromium in February, and currently cannot use chromium in glass making in accordance with DEQ's temporary rules. However, on May 18, 2016, DEQ conducted a multi-media inspection of the Bullseye Glass facility. DEQ evaluated the facility's materials handling protocol, waste management practices, furnace management during melting and other process details related to emissions.

DEQ inspected the roof vents hoping to better understand the degree to which vent stacks have build ups of residual coatings related to the furnaces below. There was evidence in several vent stacks of substantial build up of caked, cooled particulate matter that forms crystalline solid structures within the stacks. DEQ viewed the drum into which Bullseye Glass accumulated these solids when individual vent stacks are cleaned out.

DEQ also analyzed a report on when each vent was cleaned, and pulled a sample for analysis of the drum containing the cleanout solids. Review of the results, which were received in early June, indicated substantial concentrations of lead, arsenic, total chromium and cadmium in the residuals. Upon further testing, in late June, DEQ found the concentration of hexavalent chromium in these solids was elevated, at 278 parts per million.

If these residuals remain in the vent stacks, it is possible that this is the source of monitored readings. To address this possibility, DEQ is requiring Bullseye Glass to complete a thorough cleanout and replacement of potentially contaminated stacks in July and August. Some of this work will be performed in conjunction with the installation of additional baghouses at the facility in August.

**What about the cement processing facility across the street from the daycare center?**

During the same time period of the Bullseye inspection in May, DEQ and the U.S. Environmental Protection Agency (EPA) inspected the Lehigh Cement Company, which is located across the street from the daycare center. Cement powders, the feedstock for this transfer facility, contain naturally occurring concentrations of hexavalent chromium.

The agencies conducted series of inspections of railcar unloading procedures based on production records detailing which days cars were unloaded. Inspections revealed that dusts are at times released into the air during railcar unloading. Given the close proximity of the facility to a daycare center, the dusts likely have some impact on the monitored readings prompting DEQ to obtain two different samples from Lehigh cement shipments. The results for each of these samples showed 17 parts per million hexavalent chromium in the cement from a California shipment and 53 parts per million from a shipment from Vancouver, B.C.

To address this, DEQ is working with Lehigh cement to install additional control devices to minimize dust emissions during off loading. Some of this work is complete, and DEQ expects new controls to be completed in the coming weeks.

**DEQ has the results of testing of the baghouse control device at Bullseye Glass. Is the baghouse operating safely?**

DEQ has completed a review of the testing results. According to verified test results, the baghouse is controlling particulate (dust) emissions properly, at a rate of 99.8 percent. This meets the rule requirement which says that the control rate must be 99 percent or greater.

While the vast majority of the chromium used in the melting process remains in the glass, one of the objectives of the source test was to understand the conversion of trivalent chromium (used in some glass making recipes at Bullseye Glass) to hexavalent chromium when particulate emissions leave the furnace. Tests indicate that on average 98 percent of trivalent chromium emitted from the furnaces is converted to hexavalent chromium.

Tests also were performed to understand how much of the chromium leaving the furnace is captured by the baghouse. A full analysis for this was not possible during the testing, and more testing is needed to better understand this rate, and Bullseye Glass remains prohibited from using chromium in glass making at this time.

DEQ's comprehensive analysis of the test results is available here:

[Bullseye Glass Source Test Review Report, June 20, 2016](#)

**I'm worried about chromium emissions from factories like this. Does DEQ have an inventory of permit holders who use chromium? Who are they?**

Many sources that may emit chromium are known, and appropriate controls, set forth both in EPA and DEQ rules are in place. However, to ensure all sources have been considered, DEQ has developed and

published a list of all permit holders who are known, or have the potential to emit metal hazardous air pollutants. A significant portion of these permit holders will be inspected in the coming months to evaluate whether there are any previously unknown emissions of concern. Based on what we learn, our ongoing regulatory reform process will be designed to make sure we identify and properly control those emissions in a way that is protective of public health.

**How does DEQ know that chromium is not being converted into hexavalent chromium in every manufacturing process in which chromium is used in a furnace? How do you know this?**

The use of chromium in a furnace, such as at Bullseye Glass, as an addition as a raw ingredient, is a relatively unique manufacturing process that DEQ is continuing to learn more about as more data becomes available. DEQ has found that certain conditions, unique to Bullseye Glass, are likely encouraging the conversion of chromium to hexavalent chromium. In fact, the test was designed to encourage this conversion so that worst case reading could be made. Other types of furnaces may not produce as much hexavalent chromium because they are smaller, and are heated electrically, without adding oxygen to the furnace. Other manufacturing furnaces that may emit chrome do so because chrome is present as a naturally occurring element, such as in metal smelting.

DEQ's review of these sources is ongoing, and coupled with ongoing monitoring and review of moss data (in the Portland area) should allow us to better identify sources of chromium emissions that we don't know about, and ensure they are well understood and controlled.

**Does DEQ know whether every glass maker that uses chromium is converting it to hexavalent chromium in the same way as Bullseye is doing? If DEQ does not know, how many other glass manufacturers are there in Oregon, and what can DEQ do to determine whether or not their conversion rate is like that apparently detected at Bullseye?**

DEQ is learning more all the time about the colored art glass manufacturing process, and glass melting in general. DEQ has identified all the glass making companies in Oregon that produce art glass on a commercial scale, and is working with them to ensure they come into compliance with the new temporary rules. Based on our understanding of the different glass making processes, it is unlikely that chromium is being converted to hexavalent chromium in smaller furnaces, since they do not add oxygen as part of the melting process. It remains important, however, to ensure the emissions are controlled since other metals may be present.

## **Accessibility**

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