

5. Is there a health risk for people who work(ed) in areas where beryllium was found?

The primary health risk from beryllium exposure is chronic beryllium disease (CBD), which results from respiratory exposures to beryllium and affects a portion of some people exposed. This study will assess whether workers at IAAAP became sensitized to beryllium. Further medical evaluation of any sensitized workers will be needed to assess whether any have CBD.

Beryllium was detected in surface dust very near the main sander at levels above the DOE housekeeping standard. This is not a health-based standard, but rather a standard used to trigger dust removal and housekeeping in DOE facilities. (There are no OSHA standards regarding beryllium surface contamination.) Working in areas where beryllium-containing dust exists may not be hazardous if the dust remains undisturbed, but it is prudent to minimize exposure to airborne beryllium dust by keeping surfaces clean and avoiding the use of compressed air or sweeping which would disturb dust.

Employees are currently allowed to work in areas where beryllium surface dust was found. Employees should not use compressed air or sweeping for cleaning clothing or work surfaces, as this could cause settled dust to become airborne. The use of beryllium alloy tools has been discontinued at IAAAP and there is no expected risk for beryllium exposure from sanding or grinding metal components or tools currently used at IAAAP.

6. Will more beryllium samples be collected at IAAAP?

At this time, there are no plans in this study to test for beryllium surface contamination in additional areas of the plant. The data already collected, along with other information, are now being used to classify current and former job categories into tiers of potential beryllium exposure. Samples of current and former workers from these job categories will be selected for further medical evaluation to help determine the extent of possible beryllium exposure at IAAAP.

Study Contact Information

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Beryllium Surface Sampling Report Fact Sheet

1. Why was environmental sampling done at IAAAP?

Environmental sampling was conducted to investigate the presence and relative level of beryllium on surfaces in work areas at IAAAP. This project is part of a larger University of Iowa study—the IAAAP Munitions Workers Study—that looks at occupational exposures and health outcomes for people who worked at IAAAP from approximately 1950 through 2002. Beryllium exposure and beryllium sensitivity are among the exposures and health outcomes included in this study.

Tools containing beryllium were used in some manufacturing processes at IAAAP, because of the non-sparking quality of beryllium metal. Periodically, these beryllium-alloy tools (chisels, punches, screwdrivers, hammers) needed to be reshaped, or “dressed” to produce a smooth surface or sharp point. Sanders or grinders were used to reshape the tools, resulting in potential for beryllium-containing dust to be released in the process. These tools are no longer used at the IAAAP.

Surface wipe samples for beryllium were collected to identify work areas and thereby job categories at IAAAP that had potential for beryllium exposure. Sampling results confirmed that beryllium-containing dust was present at the plant in some locations.

Surface wipe sample results will be used along with other information—including historical exposure records, process information, and focus group interviews—to classify current and former job categories into three tiers of potential beryllium exposure.

These categories of potential exposure are described as

- “none expected”;
- “possible bystander or indirect exposure” for those who may have worked near, but not directly with beryllium; and
- “direct exposure” for those who periodically reshaped beryllium alloy tools, or who may have cleaned up dust generated during this process.

Samples of current and former workers will be selected from each of the three exposure categories for further medical evaluation, including a blood test called the beryllium-induced lymphocyte proliferation test, or BeLPT. Results of the BeLPT indicate if a person has been exposed and sensitized to beryllium. Using the BeLPT to test a large number of current and former workers in each category will help determine the extent of beryllium exposure at IAAAP.

2. How was the environmental sampling study done?

IAAAP locations selected for sampling focused on those areas where beryllium alloy tools could have been reshaped by sanding or grinding. Those areas included large maintenance shops and small maintenance areas on production lines.

Wipe samples were collected from other IAAAP work locations as well, to determine if beryllium dust was deposited in work areas where the tools were not reshaped; these areas included production lines where beryllium alloy tools may have been used, and support areas where beryllium tools were not known to have been used, such as administration, food service, laundry, and other maintenance facilities. A total of 95 samples were collected from 12 IAAAP buildings representing a range of building uses and ages.

Samples were collected from various IAAAP locations:

- large maintenance shops and small maintenance areas on production lines;
- production lines where beryllium alloy tools may have been used;
- support areas, such as administration, food service, laundry and other maintenance facilities; and
- reference work sites outside of IAAAP

Reference work sites outside IAAAP were selected for sampling based on comparable activities to those at IAAAP (i.e., metal working involving grinding or machining, as well as manufacturing processes that did not involve metal working), but without known historical use of beryllium-containing tools, products, or components. These samples provided information on the background levels of beryllium in surface dust from work environments where beryllium tools or components have not been used. A total of 46 samples were collected from 6 eastern Iowa work sites within 70 miles of the IAAAP.

In all locations, wipe samples were collected from horizontal surfaces such as light fixtures, rafters, and older equipment that had not been recently cleaned, to obtain dust that had accumulated over a long period of time. These samples were analyzed for the presence of beryllium by a certified industrial hygiene laboratory.

3. What were the results of beryllium sampling?

Beryllium was detected in 87 of 95 (92%) of samples collected from IAAAP buildings that included maintenance areas, production lines, administration and support services currently in use, and buildings no longer used.

Two of the 95 samples collected at IAAAP had beryllium levels that were above a surface contamination criterion that is used in Department of Energy (DOE) facilities as a house-keeping standard in areas where beryllium is processed (3.0 micrograms beryllium per 100 square centimeters, or 3.0 mg/100cm²). The two samples with beryllium levels above the DOE criterion were taken from surfaces very near the main sander used in the building where most beryllium alloy tools were reshaped.

Low levels of beryllium were detected in some IAAAP areas associated with maintenance, production, administration, and support services. The levels found in these locations were comparable to the background levels of beryllium found on surfaces at the reference work sites outside IAAAP.

Beryllium was detected in 33 of 46 (72%) of samples collected at the six reference work sites in eastern Iowa reporting no historical beryllium use. The levels of beryllium detected in samples from the reference worksites outside IAAAP were below the DOE surface limit criterion for housekeeping.

4. When were people exposed to beryllium at IAAAP? What were their levels of exposure?

This study of surface beryllium dust levels does not tell specifically when people were exposed to beryllium at IAAAP, nor does it tell what the air concentrations of beryllium may have been while beryllium-alloy tools were sanded or ground. It only confirms that beryllium dust was generated during some work processes involving beryllium alloy tools and that small particles became airborne and consequently settled on surfaces. There was potential for the beryllium dust generated to be transported to other areas on employees' shoes or clothing, or on materials or equipment that were moved from one place to another.

To our knowledge, no measurement records exist of beryllium concentrations in air or of employee beryllium exposures at IAAAP. The IAAAP Munitions Workers Study of beryllium sensitivity via the BeLPT test involving approximately 1000 current and former workers will evaluate the extent of beryllium exposure at the plant.