

- 1. DOE currently defers to the Occupational Safety and Health Administration (OSHA) for establishing the permissible exposure limits (PEL) and uses an action level as the administrative level to assure that controls are implemented to prevent exposures from exceeding the permissible exposure limits. Should the Department continue to use the OSHA PEL? Please explain your answer and provide evidence to support your answer.**

The OSHA PEL should continue to be the exposure limit of choice. Airborne exposures of significance have not been an issue to date due to the use of engineering and PPE controls supported by rigorous dust control procedures. Until more toxicological information is available that suggests the PEL is not adequate, the PEL should continue to be the exposure limit of choice for beryllium.

- 2. Should the Department use the 2010 ACGIH threshold limit value (TLV) of 0.05 µg/m³ (8-hour time-weighted average of 0.05 microgram of beryllium, in inhalable particulate matter, per cubic meter of air), for its allowable exposure limit? Please explain your answer and provide evidence to support your answer.**

See answer given in #1.

- 3. Should an airborne action level that is different from the 2010 ACGIH TLV for beryllium (8-hour time-weighted average of 0.05 microgram of beryllium, in inhalable particulate matter, per cubic meter of air) be established? If so, what should be the level? Please explain each of your answers and provide evidence to support your answers.**

See answer given in #1.

- 4. In the past DOE encouraged, but did not require, the use of wet wipes rather than dry wipes for surface monitoring. DOE's experience with wipe testing leads the Department to consider requiring the use of wet wipes, unless the employer demonstrates that using wet wipes may cause an undesirable alteration of the surface, in order to achieve greater comparability of results across the DOE complex and in response to studies demonstrating that wet wipes capture more of the surface contamination than do dry wipes. Should the Department require the use of wet wipes? Please explain your answer and provide evidence to support your answer.**

Ames Laboratory has considerable experience using wet wipes and, to date, has not used dry wipes for surface samples. Our experience has shown that wipe sampling data is more valuable when considered with bulk sampling data, if available. A requirement to use wet wipes would not present any issues related to future remediation efforts.

- 5. Since the use of wipe sampling is not a common occupational safety and health requirement, how do current wipe sampling protocols aid exposure assessments and the protection of beryllium workers? How reliable and accurate are current sampling and analytical methods for beryllium wipe samples? Please explain your answers and provide evidence to support your answers.**

See the response to #4. Wipe samples give an initial indication of surface contamination and the necessary worker protection procedures used. Wipe samples have limited use as an exposure assessment tool relative to evaluating airborne exposures. The connection between a surface concentration of dust and potential airborne concentration can only be made by doing air sampling.

- 6. What is the best method for sampling and analyzing inhalable beryllium? Please explain your answers and provide evidence to support your answers.**

This question doesn't apply to Ames Laboratory. To date, we have no experience sampling for the inhalable fraction of dust. Instead, we collect a "total particulate" sample using a conventional mixed cellulose ester filter. In terms of analysis, we use ALS Laboratory for all of beryllium analyses. ALS is fully accredited and does analytical work for several DOE labs.

- 7. How should total fraction exposure data be compared to inhalable fraction exposure measurements? Please explain your answer and provide evidence to support your answer.**

Any discussion of an appropriate sampling methodology must be preceded by development of analytical techniques that can successfully differentiate background and research-derived beryllium. Background, soil-based beryllium (silicate form) has been shown to be considerably less toxic than research-derived beryllium (oxide form).

- 8. Should surface area action levels be established, or should DOE consider controlling the health risk of surface levels by establishing a low airborne action level that precludes beryllium settling out on surfaces, and administrative controls that prevent the buildup of beryllium on surfaces? If surface area action levels are established, what should be the DOE surface area action levels? If a low airborne action level should be established in lieu of the surface area action level, what should that airborne action level be? What, if any, additional administrative controls to prevent the buildup on surfaces should be established? Please explain each of your answers and provide evidence to support your answers.**

Any exposure limit established must be preceded by development of analytical techniques that can successfully differentiate background and research-derived beryllium. Background, soil-

based beryllium (silicate form) has been shown to be considerably less toxic than research-derived beryllium (oxide form).

- 9. Should warning labels be required for the transfer, to either another DOE entity or to an entity to whom this rule does not apply, of items with surface areas that are free of removable surface levels of beryllium but which may contain surface contamination that is inaccessible or has been sealed with hard-to-remove substances, e.g., paint? Please explain your answer and provide evidence to support your answer.**

It would be appropriate to label items that have evidence of transferable surface contamination or accessible internal beryllium contamination.

- 10. Should the Department establish both surface level and aggressive air sampling criteria (modeled after the U.S. Environmental Protection Agency's aggressive air sampling criteria to clear an area after asbestos abatement) for releasing areas in a facility, or should the Department consider establishing only the aggressive air sampling criteria? Please explain your answers and provide evidence to support your answers.**

See previous comments about toxicity differences between background and research-derived beryllium.

- 11. Currently, after the site occupational medicine director has determined that a beryllium worker should be medically removed from exposure to beryllium, the worker must consent to the removal. Should the Department continue to require the worker's consent for medical removal, or require mandatory medical removal?**

Ames Laboratory would consult with appropriate legal counsel first before making a decision on this issue.