



Use of Arsenic-73 and Other Radioactive Metals/Metalloids in Research to Support US EPA's Regulatory Decisions

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Proposal

- **DOE continue its production of arsenic-73**
- **DOE consider producing radioisotopes of chemicals listed on the US EPA's drinking water Contaminant Candidate List (CCL)**

US EPA

- **Safeguards the environment and protects human health**
- **Develops and enforces regulations that implement environmental laws enacted by Congress**
- **Uses data from laboratory research to develop and support its regulatory decisions**

Inorganic Arsenic in Drinking Water

- A natural contaminant of drinking water
- A human carcinogen after chronic exposure
- Non-cancer effects include cardiovascular disease, diabetes, keratoses and others
- Maximum Contaminant Level (MCL) of inorganic arsenic in drinking water lowered from 50 to 10 $\mu\text{g/L}$
- Laboratory data from NHEERL using arsenic-73 was used to support this decision
- The arsenic MCL is reexamined every 5-6 years

NHEERL and Arsenic-73

- **Procured from DOE since the early 1990s**
- **Used in a variety of molecular, biochemical, cellular and whole animal studies**
- **Use arsenic-73 to understand the mechanism of metabolism and toxicity of inorganic arsenic**
- **Cost effective**
- **Sensitivity of methods**

NHEERL and Arsenic-73

- **More than 25 peer-reviewed publications used arsenic-73**
- **Several publications referenced in National Academy of Science documents (Arsenic in Drinking Water; Arsenic in Drinking Water: 2001 Update)**

Projected Needs of Arsenic-73

- **NHEERL – 10 - 20 mCi every year over next 2 years**
- **Collaborator – 5 mCi every year over next 2 years**

Contaminant Candidate List

- **A list of unregulated contaminants that may pose a risk for drinking water**
- **EPA must decide whether to regulate five of these contaminants on a five year cycle**
- **Radioisotopes of several of the contaminants can be produced by DOE (Strontium, Germanium and Cobalt)**
- **These radioisotopes would be used to study the disposition of these contaminants**

Summary

- **EPA/NHEERL has a continuing need for arsenic-73 to conduct laboratory experiments**
- **There is a potential need for other radioactive metals/metalloids from DOE**
- **Results from the experiments that use radioactive metals/metalloids are used to support regulatory decisions made by EPA to protect human health**

Collaborators

- **Dr. David Thomas, EPA/NHEERL**
- **Dr. Kirk Kitchin, EPA/NHEERL**
- **Dr. Mirek Styblo, UNC-CH**