



U.S. Department
of Transportation

**Pipeline and
Hazardous Materials Safety
Administration**

400 Seventh Street, S.W.
Washington, D.C. 20590

JAN 24 2006

Mr. Mark Ledoux
Corporate Radiation Safety Officer
Envirocare of Utah, LLC
605 North 5600 West
Salt Lake City, Utah 84116

Ref. No.: 05-0241

Dear Mr. Ledoux,

This is in response to your September 13, 2005 letter requesting clarification of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180) regarding the applicability of fissile material exceptions. Specifically, you ask whether § 173.453(c) of the HMR applies to waste generated at the Eastern Tennessee Technology Park (ETTP). You describe the waste as demolition debris from the K-25 and K-27 buildings with enriched uranium fluoride as surface contamination on structural steel and as scale within process piping and equipment. Prior to transportation structural foam filling is placed in process equipment voids to restrict geometry changes.

The fissile material exception provided in § 173.453(c) applies when there are low concentrations of solid fissile material commingled with solid non-fissile material provided that there are at least 2000 grams of non-fissile material for every gram of fissile material and there are no more than 180 grams of fissile material distributed within 360 kg of contiguous non-fissile material.

Uranium fluoride is highly soluble in water and is susceptible to changes from a solid to liquid state under conditions normally incident to transportation. The potential for preferential movement of the fissile material separate from the non-fissile material gives no assurance that there will be no more than 180 grams of fissile material distributed within 360 kg of contiguous non-fissile material. Preparation of the metal debris to fill voids with structural foam is a step towards improved safety assurance, but such foam



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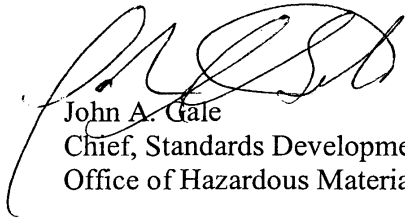
172.101
173.403
173.453 (c)

does not eliminate the potential for the uranyl fluoride changing from a solid state to a liquid state because of its high solubility in water.

Therefore, the exception in 173.453(c) does not apply to the situation you have described.

I hope this satisfies your inquiry. If we can be of further assistance, please contact us.

Sincerely,

A handwritten signature in black ink, appearing to read 'J. A. Gale', is written over the typed name and title.

John A. Gale
Chief, Standards Development
Office of Hazardous Materials Standards



ENVIROCARE OF UTAH, LLC

SAFE AND SECURE

Eichenlaub
§ 172.101
§ 173.453(c)
RAM
CD05-0441
05-0241

September 13, 2005

Associate Administrator for Hazardous Materials Safety
Pipeline and Hazardous Materials Safety Administration
U.S. Department of Transportation
400 7th Street, S.W.
Washington, DC 20590-0001

Attention: Richard Boyle, PHH-23

Dear Mr. Boyle:

Envirocare of Utah, LLC (Envirocare), hereby requests an interpretation of the applicability of the exception found in 49 CFR 173.453(c) to waste generated at the Eastern Tennessee Technology Park (ETTP). Specifically, Envirocare has determined that demolition debris with surface contamination, primarily enriched uranium fluoride, meets the intent of the fissile exception given in the reference. However, Envirocare and the waste generator would like concurrence on this determination from DOT – RSPA.

The following information is provided to assist you in this determination:

The waste material is primarily metal debris including steel building materials and segmented process equipment, which are generated from the demolition of the K-25 and K-27 buildings at the East Tennessee Technology Park. The fissile material in question is enriched uranium fluoride. The fissile material is present primarily as contamination on the structural steel and as scale within the process piping and equipment.

Envirocare reviewed NUREG/CR-5542, prepared by Oak Ridge National Laboratory (ORNL) for US NRC. Specifically, Section 5.1.2 "Fissile-Material Exemptions," Section 5.3.3 "Recommendations for Fissile-Material Exemptions," and Appendix G "Recommended New Criteria for Fissile-Material Exemptions." ORNL performed various models to evaluate criticality safety during transportation to support rulemaking activities with respect to 10CFR 73.15, et al.

ORNL suggests in the first bullet of Section 5.3.3 that the exemption should be based on a ratio of fissile material to non-fissile material which is insoluble-in-water and noncombustible (excluding special moderators from the ratio). (The NRC through rulemaking changed the language to "solid" in lieu of "insoluble-in-water and noncombustible") The logic for these criteria is two-fold:

"Add enhanced assurance in preventing a potential transport situation that could provide a criticality safety concern, and

Maintain flexibility for regulators, licensees, and operators by precluding the need to prescribe and use a TI for transport control."

Appendix G provides recommendations for several transportation scenarios:

- Exemptions for Packages with Small Fissile Material Mass (<15 grams with a ratio of 200:1 non-fissile to fissile-material)
- Exemptions for Packages not Meeting the Standard for NCT (normal condition of transport)
- Exemptions for Packages Meeting Standards for NCT

The applicable recommendation for the K-25/K-27 scenario is the Exemption for Packages not Meeting the Standard for NCT. This section (G.2) describes the mass density scenario of 350 g of U-235 with 2000 g of aluminum metal.

CONCLUSIONS

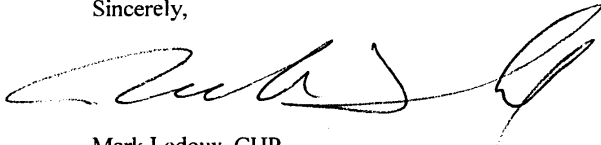
Based on the research in the previous paragraphs, it is Envirocare's opinion that the material transported by 6000 cubic-foot rail cars from ETPP (i.e. building materials, process piping, and process equipment with the exception of the compressor seals and converters) would at a minimum qualify for a specific exception from the DOT/NRC, and may be fissile excepted/exempted in accordance with 49CFR173.453(c) and 10CFR71.15. The reasoning for this opinion is that:

The solid nonfissile to fissile-material ratio is greater than 2000:1

The proposed material preparation (i.e. structural foam filling in process equipment voids) will further restrict geometry changes in transport as well in accident scenarios.

The material per rail car would be limited to 350 g of U-235 to meet our disposal license and SNM exemption.

Sincerely,



Mark Ledoux, CHP
Corporate Radiation Safety Officer