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Radioactive Waste Management*

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August 19, 1998

Mr. Robert Nelson
United States Nuclear Regulatory Commission
US Nuclear Regulatory Commission
11555 Rockville Pike
Washington DC 20555

Subject: Transportation of Kiski Valley Sewage Treatment Samples to B. Koh & Associates, Inc. Mobile Laboratory

Dear Mr. Nelson:

This letter is in response to my telephone conference with Mr. Bob Neal, NRC HQ on August 10, 1998 regarding shipment of Kiski Valley Sewage Treatment samples to the B. Koh & Associates, Inc. mobile laboratory located in Newburgh Heights, Ohio (approximately 5 miles from Cleveland). Mr. Neal requested that B. Koh & Associates, Inc. propose to the NRC a protocol under which the subject samples could be transported to the B. Koh & Associates, Inc. mobile laboratory for analysis via gamma spectroscopy.

The requested proposal is presented below:

Based on the fact that the Kiski Valley Sewage Treatment samples contain approximately less than 5% (~2 - 3%) enriched uranium, we propose to ship the samples as limited quantities of Class 7 material. Specifically, we propose to ship the samples under 49 CFR Sections 173.421 and .422. The package/material will comply with the following:

Under 49 CFR 173.421

- (1) The samples are stored in the original plexiglass tubes that they were collected in. The ends of the tubes have been secured with end caps and/or duct tape. The tubes will be placed in a conventional ice cooler/chest (or equivalent) with handles. The chest will be locked and the chest will be secured with duct tape around the chest. By packaging the samples in this manner, each package will meet the general design requirements of 49 CFR 173.410.

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- (2) The radiation levels over the package will be measured and recorded. This survey will demonstrate that any point on the external surface of the package (chest/container) does not exceed 0.5 mRem/hr.
- (3) Smears of the external surface of the packages will be obtained to demonstrate that the non-fixed (removable) surface contamination does not exceed the limits specified in 49 CFR 173.433(a).
- (4) The inside or outside of the package will contain the marking "Radioactive".
- (5) A calculation has been performed to demonstrate that the package does not contain more than 15 grams of Uranium-235.

Based on the following assumptions:

- Maximum U-235 concentration of ash is 34 pCi/g (based on ORISE report, May 1995).
 - Average dry weight of each 1 foot soil sample is approximately 100 g.
 - Collected 594 1 foot soil sample.
 - $594 \text{ samples} \times 100 \text{ gram/sample} \times 34 \text{ pCi/g} = \underline{2.02 \times 10^6 \text{ pCi of U-235}}$.
 - $2.02 \times 10^6 \text{ pCi of U-235} / 2.7 \times 10^6 \text{ pCi/g (Specific Activity U-235 at 5\% from 173.434)} = \underline{0.8 \text{ g U-235}}$
- (6) The material will be prepared for shipment as specified in accordance with 49 CFR 173.422.
 - (b) Based on our discussion with Kiski Valley Sewage Authority the ash is not considered a hazardous substance or a hazardous waste.

Under 49 CFR 173.422(a)

- (1) A notice will be enclosed in the package which will include the name of the consignor or consignee and the following statement:

"This package conforms to the conditions and limitations specified in 49 CFR 173.421 for radioactive material, excepted package - limited quantity of material, UN 2910".
- (b) As applicable.

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Under 49 CFR 173.425

For uranium material package limit = $10^3 A^2$

From Table A₁ and A₂ values in 49 CFR 173.435, the A₂ value for enriched uranium of 5% or less is unlimited.

However, 49 CFR 173.421(a)(5) limits the package to 15 grams of U-235.

Based on the above, it is concluded that the subject samples can be safely transported to the B. Koh & Associates, Inc. mobile laboratory location (or any other location) consistent with the applicable US DOT requirements.

If you have any questions, please don't hesitate to call me at (716) 592-3431.

Very truly yours,



Theodore G. Adams
Project Manager

cc: T. Johnson
B. Koh
B. Neal
D. Nelson
D. Raffel

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