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ACCEPTABILITY UNDER THE RCRA LAND DISPOSAL RESTRICTIONS OF TWO METHODS OF MACROENCAPSULATION

United States Environmental Protection Agency
Washington, D.C. 20460
Office of Solid Waste and Emergency Response

February 16, 1994

MEMORANDUM

SUBJECT: Macroencapsulation of Mixed Wastes at Rocky Flats

FROM: Michael Shapiro, Director Office of Solid Waste

TO: Robert L. Duprey, Director Hazardous Waste Management Division

I am pleased to respond to Region VIII's December 21, 1993 inquiry regarding the acceptability under the RCRA Land Disposal Restrictions (LDRs) of two methods of macroencapsulation. According to the letter from Martin Hestmark of your staff, these methods are under review at Region VIII, for possible application to low-level radioactive hazardous debris wastes at the Department of Energy's (DOE's) Rocky Flats Plant. The two methods described in Region VIII's letter involve: (1) applying a heated polymer to the surface of the debris, and (2) using a sealed preformed polymer container into which the waste has been placed. As your letter notes, the major difference between the two final waste forms is the lack of any physical/chemical bonding under the second method between the container and the polymer.

Your first question asks whether the preformed container method discussed above meets the definition and performance criteria for macroencapsulation under the LDRs.

Macroencapsulation is defined as "Application of surface coating materials such as polymeric organics or use of a jacket of inert inorganic materials to substantially reduce surface exposure to potential leaching media" in the following sections of 40 CFR

Part 268:

(1) Table 1.- Technology Codes and Description of Technology-based Standards in §268.42; and

(2) Table 1 - Alternative Treatment Standards For Hazardous Debris in §268.45

The definition in Table 1 of §268.42 contains the additional statement that "Macroencapsulation specifically does not include any material classified as a container or tank according to 40 CFR 260.10."

The second method of using a preformed container does not meet the definition of macroencapsulation because it would contain void spaces between the debris and container. In addition, placement in tanks and containers is not considered treatment. The preformed container also would not qualify as a jacket under the definition. EPA purposely included "jackets of inorganic materials" in the definition in order to specifically account for submarine reactor compartments that are subject to the treatment standard for D008 radioactive lead solids.

If the second method is the preferred option to treat this waste then a treatability variance, equivalency demonstration under §268.42(b), or a no-migration petition may be options that might allow this treatment method to be legally applied to the radioactive debris wastes. However, Rocky Flats will have to demonstrate that: 1) the use of the preformed container is the only alternative process available for a particular waste or waste type; 2) the process substantially reduces surface exposure to potential leaching media; and 3) the jacket of material would not be classified as a tank or container under the definitions at 40 CFR 260.10." In addition, detailed information on the content of the debris would need to be submitted. If DOE wishes to develop a treatment process which would include adding other encapsulating materials to debris, so that there would be no void spaces in the preformed container, we could reevaluate this proposal.

Your second question asks whether a method of macroencapsulation on that meets the performance criteria (i.e., the performance described in Table 1 of §268.45) is acceptable regardless of whether it strictly meets the regulatory definition of macroencapsulation. A proposed technology should clearly fall

within the definition of macroencapsulation and meet the performance standard to qualify for the "macroencapsulation" treatment standard for these debris. The purpose of including a performance standard for an immobilization technology such as macroencapsulation is to ensure that the technology "substantially reduces the likelihood of migration of hazardous constituents from debris, as required by RCRA section 3004(m)(1)," while allowing some flexibility to design or operate the unit to treat the contaminant of concern. See 57 FR 37235, August 18, 1992.

Your letter also suggests concerns you have that there could be site-specific factors at individual disposal sites that might adversely affect the performance of the required macroencapsulation technology. In such instances, EPA policy allows any limitations on technologies attributable to site specific factors to be addressed in the facility permit by the appropriate State or EPA permit writer. My staff in the Waste Management Division, which developed these standards, is available to provide you with additiona1 clarification on this question.

Thank you for bringing these issues to my attention. If you need more information in this area, please call Susan Jones of the state and Regional Programs Branch at (703) 308-8762, or Larry Rosengrant of the Waste Treatment Branch at (703) 308-8468.

cc: Matt Straus; Richard Kinch; Dev Barnes; Richard L. Shier