UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

December 21, 1998

Mr. Calvin Hopper
Oak Ridge National Labs
P.O. Box 2008
Oak Ridge, TN 37831-6370

Dear Mr. Hopper:

On December 16, 1998, you and Cecil Parks met with U.S. Nuclear Regulatory Commission staff to discuss your letter report entitled "Candidate Methodologies for Criticality Safety LLW Emplacement Guidance," dated November 1998. A copy of the meeting summary is enclosed for your records. In addition, we have the following comments on the proposed methodologies discussed in your letter report.

1. In section 3.1 (2), you note that a to-be-specified dilution limit will be provided for isotopic uranium mixtures and plutonium-thorium mixtures. In the meeting, you discussed this approach in the context of setting a minimum enrichment below which criticality safety would be ensured. While we support the use of enrichment as a means of ensuring safety, it is NRC's policy not to dilute material to allow for disposal. We therefore request that the guidance be developed to permit safety via enrichment control and not rely on dilution.

2. In the report several references are made to mitigating post-emplacement separation. Since your letter report was issued, the Commission has provided staff direction concerning post-disposal criticality in Staff Requirements Memorandum (SRM) SECY-98-239. That SRM states that staff should consider, to the degree appropriate, the recommendations concerning mitigative factors in the Oak Ridge National Laboratory reports when developing this guidance.

In accordance with your revised proposal, an annotated outline of the guidance will be submitted by January 13, 1999. The above comments should be incorporated into this outline.

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If you have any questions, please call me at (301) 415-6613.

Sincerely,
[original signed by]
Timothy Harris, Acting Project Manager
Low-Level Waste and Regulatory
Issues Section
Low-Level Waste and Decommissioning
Projects Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

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If you have any questions, please call me at (301) 415-6613.

Sincerely,

Timothy E. Harris, Environmental Engineer
Low-Level Waste and Regulatory
Issues Section
Low-Level Waste and Decommissioning
Projects Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

Enclosures: As stated

cc: V. Autry, SCDHEC
M. Elsen, WADRH
W. Sinclair, UDRC
W. House, CNSI
M. Ait, USEcology
M. Ledoux, Envirocare

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MEETING REPORT

Date: December 16, 1998

Time: 1:00 PM to 3:00 PM

Place: US Nuclear Regulatory Commission
Two White Flint North
11545 Rockville Pike
Rockville, MD 20852

Attendees: See Attachment 1

Discussion:

The meeting was held at the request of NRC to discuss ORNL's report entitled "Candidate Methodologies for Criticality Safety LLW Emplacement Guidance," dated November 1998 (Attachment 2). NRC has contracted with ORNL to develop guidance relative to emplacement criticality safety at LLW disposal facilities. NRC is considering revising the compatibility of 10 CFR 61.16. This guidance is intended to be used by LLW disposal facility operators to demonstrate that emplacement criticality safety is maintained and by Agreement State or NRC licensing staff to verify compliance with 10 CFR 61.16. The guidance is intended to be applicable to a wide range of disposal practices including both existing and currently proposed facilities.

ORNL made a presentation (Attachment 3) and discussed the technical approach to support the guidance development. New analyses will performed by ORNL to augment previous studies in NUREGs 6285, 6505 (vols 1 and 2), and 5342. They also reviewed preliminary results for infinite media of SiO_2, water, and either U-235, U-233, or Pu-239. ORNL described a graded approach. Category 1 would limit areal density and would be based on NUREG-6284. For example, the areal density of U-235 would be limited to about 94 grams per square foot. Category 2 would limit concentration and would be based partially on the infinite media concentration values presented. An additional "margin" would be applied to these values to account for operational uncertainty. ORNL intends to evaluate finite systems to determine the volume over which this limiting concentration should be measured or known. Category 3 would limit concentration for a hypothetical concrete vault system and would be based on infinite media calculations.

Action Item:

None

Enclosure

MEETING ATTENDEES

Date: December 16, 1998

Topic: Emplacement Criticality Guidance

NAME	AFFILIATION	PHONE NUMBER
Tim Harris	NMSS / DWM	301 415 6613
Calvin Hopper	Oak Ridge Nat'l Lab	423-576-2617
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VANICE A. PERIN	NMSS/DWM/ENGB	301-415-8143
Diane D'ARRIGO	NIRS	202-328-0002x2

ATTACHMENT 1