UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

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OFFICE OF
AIR AND RADIATION

Dr. Inés R. Triay, Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221

Dear Dr. Triay:

Thank you for the information provided in your October 17, 2003 letter that summarized the analysis of the predicted performance of supercompacted waste processed by the Idaho National Engineering and Environmental Laboratory's (INEEL) Advanced Mixed Waste Treatment Project (AMWTP). The comments in this letter represent our initial review of the report you provided. We may have additional comments after we are able to review the report references and have additional discussions with your staff.

As you know, the Environmental Protection Agency (EPA) approved the disposal of uncompacted waste using the AMWTP on June 11, 2003 (EPA Docket A-98-49, Item II-B3-56). However, the supercompacted waste is not currently approved for disposal at the Waste Isolation Pilot Plant (WIPP) pending the evaluation of its impacts on the disposal system. The information you provided, combined with information from the recent technical meeting at INEEL, have helped us understand the nature of the supercompacted AMWTP wastes and the pipe overpack wastes from Rocky Flats. Our review of this information identified several issues that must be addressed in order for us to make a decision regarding the disposal of super compacted waste at WIPP. The most significant issues deal with the room porosity values and the performance assessment results.

The room porosity values (porosity surfaces) are used to predict the flow of fluids in a waste room, and they represent the impact, over time, of creep closure and gas generation on the porosity of the waste area that is used in the BRAGFLO computer code. Based on the information provided to date, we are not convinced that there is no need to require multiple porosity surfaces to model different waste forms, and heterogeneous waste emplacement is unimportant and over estimates releases. We believe that the porosity surfaces generated using

the current computer code (SANTOS) may not properly represent the supercompacted waste and the pipe overpacks. Because this is an important topic, we are interested in better understanding the details of the modeling, which we have been told are in several of the references that are being developed. After we receive and review the report references, we will discuss this further with your staff before determining if additional calculations are warranted.

As you know the current WIPP certification is based on the results of the Performance Assessment Verification Test (PAVT). DOE's current analysis of the impact of the supercompacted waste was compared against the performance assessment (PA) results for the Compliance Recertification Application (CRA). The CRA PA is not the current standard for WIPP compliance, therefore, it is premature to compare supercompacted waste performance assessment with only the CRA. The AMWTP results should be compared with the PAVT. This comparison can be addressed, in part, by providing a table showing results of the AMWTP analysis and the PAVT at the compliance probabilities of 0.1 and 0.001 as was done in the comparison of the results of the original compliance certification application and the performance assessment verification test.

In addition to the concern about the porosity surface development, it appears that, even though the mean releases are similar to the releases from the PAVT, important characteristics, such as pressure have a greater range than that used for the CRA and could affect the uncertainty range of the releases as required to be considered in our 40 CFR 194.34. Therefore, DOE should also estimate the uncertainty of the releases.

We have enclosed a list of other issues requiring additional information. We believe all of this information is necessary to properly evaluate if the "normalized release is essentially unchanged" with the inclusion of the supercompacted wastes.

I appreciate the information exchange that has already occurred on this topic and I hope that we can continue to progress toward a decision on the AMWTP supercompacted waste. Until you are notified of a decision, supercompacted waste processed at the AMWTP are not approved for disposal at WIPP.

We look forward to receiving this additional information and to our technical exchange on this topic during the week of November 17. If you have any questions, please contact Tom Peake at (202) 343-9765.

Sincerely,

Frank Marcinowski, Director
Radiation Protection Division

Enclosure

cc: Russ Patterson, DOE/CBFO
Steve Casey, DOE/CBFO
Matthew Silva, EEG
Larry Allen, EEG
Steve Zappe, NMED
EPA Docket

Enclosure 1

Request for Additional Information on AMTWP Supercompacted Waste

- Please provide copies of the references used in the report, with emphasis on those that were prepared in 2003 as part of the CRA or the AMWTP report, as well as documents that have been completed since the original certification decision. We prefer to receive the reference information on compact disc.

- During the tour at INEEL, we were made aware of a Bechtel report that discusses the 3100 project and the reconciliation of the acceptable knowledge. We would like to see this report, a copy of which we were told was being transmitted to you from INEEL.

- It appears that in the AMWTP PA more vectors have higher pressures than in the PAVT PA. Therefore, DOE needs to provide evidence there is still limited transport of radionuclides into the anhydrite marker beds as an indicator that releases in the undisturbed case would be insignificant.

- The mobility of the gas and the sensitivity of the results to the type of gas needs to be re-evaluated because methanogenesis is now thought to be an important gas generation process. BRAGFLO implements the gas generation model with hydrogen as the gas. Please provide information on the sensitivity of the results to the use of hydrogen as a surrogate for carbon dioxide and methane, with tight panel closures.

- The following are related to the iron metal inventory and anoxic corrosion rates used in the modeling described in the AMWTP report:

  – Your documentation shows the base gas production potential from anoxic corrosion of iron-containing metals was estimated at 1,050 moles/drum and the base production rate was estimated at 1 mole/drum/year, gas production from anoxic corrosion was predicted to cease after 1,050 years. How is this consistent with the PAVT results that the full inventory of iron-based metal is rarely consumed?

  – How was the additional iron-based metal in 100-gallon drums containing the compressed AMWTP waste pucks and the iron-based metal in the pipe overpacks accounted for when estimating the base gas production potential relative to the standard waste?

  – How will the increased surface area of iron-based metal in the repository from the compressed AMWTP waste and the pipe overpacks affect gas generation rates from anoxic corrosion? Please provide supporting calculations.

- The waste inventory has changed substantially since the CCA with now more than 700 waste streams compared to the approximately 570 waste streams used in the CCA. The supercompacted waste stream is expected to account for approximately 15-20% of the waste streams by volume. DOE needs to provide a succinct discussion on the current inventory and how it has changed since the CCA, including the process of "blending" low-level radioactive waste with the TRU waste and its impact on repository performance, and waste volumes. Related to this, we would like to receive the documents and codes associated with EPAUNI.