



Department of Energy

Carlsbad Area Office
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Dear Colleague:

The Department of Energy, Carlsbad Area Office, is preparing a Remote-Handled Transuranic Waste Study in accordance with the Land Withdrawal Act. The specific requirements for this study are addressed in the Land Withdrawal Act, Section 6(c)(2)(B), under the WIPP test phase activities limitations.

Enclosed is a copy of the RH-TRU Implementation Plan for your review and comment. Please submit comments for consideration to this office by March 15, 1995.

For additional information regarding this document, please contact Robert A. Bills at (505) 234-7481.

Sincerely,

George E. Dials
George E. Dials
Manager

Enclosure



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IMPLEMENTATION PLAN FOR THE REMOTE HANDLED TRU WASTE PERFORMANCE ASSESSMENT AND COMPARISON TO CONTACT HANDLED TRU WASTE

1. PROJECT REQUIREMENTS AND OBJECTIVES

The Waste Isolation Pilot Plant (WIPP) Land Withdrawal Act (LWA), P.L. 102-579, requires that a study be conducted on remote-handled (RH) transuranic (TRU) waste. The specific project requirements for the RH TRU waste study are addressed in the LWA, Section 6(c)(2)(B) under the WIPP test phase activities limitations. The RH TRU waste Performance Assessment (PA) and comparison of RH and contact-handled (CH) TRU waste study plan shall include:

- An analysis of the impact of RH TRU waste on the PA of the WIPP.
- A comparison of RH TRU waste with CH TRU waste on such issues as gas generation, flammability, explosiveness, solubility, and brine and geochemical interactions.

6(c)(2)(B)(ii)

The objective is to determine the impact of repository compliance of the RH TRU waste. The study will be limited in scope to post-closure repository performance and will be an analysis of issues associated with RH TRU waste subsequent to emplacement at WIPP using the current baseline design. It will analyze the similarities and differences between RH and CH TRU waste material characteristics in regard to the above mentioned issues. The assumption used to plan this study is that the primary difference between RH and CH TRU waste is the RH fission product inventory and the associated beta/gamma radiation. Other differences will be determined through evaluation of current inventory data as documented in the Baseline Inventory Report and supporting data. If any other differences are determined, they also will be analyzed in regard to gas generation, flammability, explosiveness, solubility, and brine and geochemical interactions. The study will use System Prioritization Method (SPM) modeling developed by the Sandia National Laboratories (SNL) to derive the results of the study. The study report will document the calculations, modeling, and other analyses performed as part of the comparison activity.

The study plan will also include an analysis of the impact of RH TRU waste on the PA of the WIPP through the SPM modeling process. This impact assessment will be used to comply with the LWA Section 6(c)(2)(B). The study plan will be used to support the application for a certification of compliance for 40 CFR 191, Subpart B disposal standards, and to assess the current design for the WIPP relative to RH TRU waste.

2. TECHNICAL APPROACH

Section 6(c)(2)(B) of the LWA requires that two main analyses be prepared. These analyses include 1) an analysis of the impact of RH waste on the performance assessment of WIPP and 2) a comparison of RH and CH waste for various issues. The technical approach to each of these activities are discussed separately below.

Impact of RH TRU Waste on the Performance Assessment of the WIPP

This study will discuss the compliance impacts of RH waste as determined through the WIPP performance assessment. The performance assessment will evaluate the baseline RH TRU waste configuration, including packaging, shielding, and actual waste volumes. In order to prepare the concluding analysis, the following steps are necessary:

1. Define the design for the RH waste as it will be emplaced in the WIPP. The RH design base has not changed since 1989, and therefore the baseline is well defined. [Reference the RH TRU Waste Technical Baseline Report by IT Corp.] The baseline design will be identified and described in sufficient detail, and the design will be converted to parameters that the SPM will accommodate and assess. Example parameters include metal surface area and total metals weight.
2. Identify the waste parameters that are significant to the performance assessment. This task will require working with Sandia's modeling personnel to help identify those parameters and the types of units they should be reported in.
3. The volumes, weights and other units of the various components of RH waste will be identified along with applicable parameters such as the corrosion rate of metals and gas generation rates. Once these parameters have been defined, they will be supplied to the SPM team for inclusion in long term performance modeling.
4. Sandia will run the SPM code with the supplied RH parameters and provide the results to the project team.
5. The results of the modeling will be evaluated to determine the relationship of the baseline configuration with the compliance requirements. The final report will describe the status of that compliance.
6. The Department of Energy (DOE) will publish the findings of the report in the Federal Register.

Comparison of RH and CH TRU waste for such issues as gas generation, flammability, explosiveness, solubility, and brine and geochemical interactions.

This study will identify and discuss the significant differences between RH and CH TRU waste in such areas as gas generation, flammability, explosiveness, and brine and geochemical interactions.

1. The first step in the technical approach will be to identify the significant parameters for each issue and the quantities of each parameter for CH and RH TRU waste.
2. Once the parameters are identified, a determination will be made as to which issues can be evaluated by modeling and which can be evaluated by discussion or simple calculations. At this time, it is estimated that the gas generation and brine and geochemical interactions issues will be solved using existing models. The issues of flammability and explosiveness will not be applicable due to the restrictions of these characteristics in the WIPP waste acceptance criteria.
3. Findings will be presented in a table that clearly details the similarities and differences in the two types of waste. This report will assume that the LWA requires this comparison be made in regards to the long term potential, and not operational phase comparisons.
4. The DOE will publish the findings of the report in the Federal Register.

Consultation

The LWA requires that this study be conducted in consultation with affected States, the Administrator, and after the solicitation of views of other interested parties. To accommodate concerns, the DOE/Carlsbad Area Office (CAO) will solicit technical reviews by stakeholders through regularly scheduled forums or comment periods. The DOE/CAO, with the support of the SNL, will provide status charts on progress for presentations before interested parties.

3. PROJECT BASELINE ASSUMPTIONS

This section addresses key baseline assumptions that are necessary for planning this project.

A. Accuracy of Inventory Data.

The RH performance assessment will require inventory data not only on the total volume of RH waste, but constituents of the waste which are important to the SPM. These constituents include such items as radionuclide amounts, RCRA waste volumes, total metals weight, etc.

Currently, these numbers are being collected as part of the Baseline Inventory Report. It is assumed that these numbers will be available in time to support this project and that values will be available for the necessary parameters.

B. Performance Assessment Model Will Accommodate RH Parameters.

In modeling the RH TRU waste, it is possible that parameters may be defined which are not currently accommodated by the SPM. Such a parameter might include the configuration of the RH layout. Another possibility might be in the SPM programming and how it evaluates the identified parameters. The existing algorithms might not be appropriate or sufficient for the RH portion. In the event that any of these situations arise, the SPM will be adjusted to accommodate the needs for RH TRU waste modeling.

C. Quality Assurance of Performance Assessment Codes Will Not Impact This Study.

Once SPM-2 has been run, the SNL will begin the task of quality assurance for all of the performance assessment computer codes. This project assumes that the Quality Assurance (QA) activity will not result in significant changes nor invalidation of the RH-related results.

4. MANAGEMENT APPROACH

This section describes the management organization for the project, how the project will interface with external organizations for which assistance will be necessary, and what role those external organizations are anticipated to have.

Project Team. Described below are the three organizations that constitute the project team.

DOE/CAO. The DOE Carlsbad Area Office has overall responsibility for meeting the requirements of the LWA, and specifically the requirements for the subject project. DOE/CAO established the project milestones detailed in the next section.

SANDIA NATIONAL LABORATORIES (SNL). The SNL has been designated by the DOE/CAO to prepare the RH performance assessment study. The project is being managed in Department 6348. In addition to managing the subcontractor for this project, Department 6348's primary responsibility is to coordinate with the other relevant SNL departments to ensure that the RH performance assessment study is completed on schedule. Described below are the other SNL organizations with which coordination is required, and the nature of that coordination.

There are several departments within the SNL that are expected to provide support to the RH study.

Performance Assessment.

The PA department is expected to accommodate RH TRU waste parameters for inclusion in the SPM computer runs. The project team will work with the PA department to identify the applicable parameters for inclusion in the SPM.

Gas Generation.

The most important issue that will be examined for this project is the comparison of gas generation rates and volumes between RH and CH TRU wastes. The SNL has prepared detailed models to calculate those rates and volumes for CH waste. The project team will need to work with the Sandia gas generation experts to define the important parameters for RH gas generation and to determine the adequacy of the existing algorithms for processing the RH parameters.

Solubility.

Another important issue is the solubility of RH waste and its transportability through the geologic strata leading to possible non-compliance with the WIPP performance assessment. In order to address this issue, the project team will work with the Sandia's waste solubility team to determine which parameters are needed for the SPM code and if the existing algorithms are satisfactory, for processing the RH parameters.

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION. Science Applications International Corporation (SAIC) is the subcontractor to the SNL and is responsible for completion of the project. The SAIC is responsible for the technical work and where needed, for identifying to SNL any roadblocks or necessary Sandia support. The SAIC meets with the SNL on a regular basis to provide status on the project and identify short term goals.

Interfacing Organizations. The following organizations are expected to provide input, knowledge or technical support for the project. Their support will be solicited on an as needed basis.

WIPP TECHNICAL ASSISTANCE CONTRACTOR. The WTAC is the DOE/CAO's direct contractor support. As such, they are conducting activities that support the project team directly and indirectly. These activities include preparation of the TRU waste inventory and the RH strategy.

Inventory Data.

The WTAC is preparing the Baseline Inventory Report (BIR) which will include waste volumes for both CH and RH TRU wastes. Besides total volumes, the BIR will include values for various constituents of the TRU wastes. This information will directly impact the results of the RH performance assessment and the comparison of RH to CH waste. The project team will work with the WTAC to obtain the necessary data.

RH Strategy.

The WTAC is also responsible for preparing the RH strategy. This effort primarily involves evaluating alternatives for the RH operational phase, including generation, storage, characterization, treatment, transportation, and disposal. While the RH performance assessment project is concerned with long term impacts, it will be important to maintain communication with the WTAC RH Strategy Team. If the WTAC determines that the baseline disposal design should be modified, this will impact the RH performance assessment. In addition, if the treatment process is defined such that it creates a waste stream that is different from how the BIR identifies it, then that could also have an impact on the RH performance assessment. The RH strategy may be impacted by the RH performance assessment as well. If the RH baseline design results in a performance assessment non-compliance, then the design or the types of RH waste that can be accepted at WIPP may be changed.

WESTINGHOUSE ISOLATION DIVISION (WID). Westinghouse is the Management and Operation contractor for the WIPP site. Westinghouse personnel have the best knowledge of the RH handling equipment and containers. Their knowledge will be used to verify the RH baseline design and address any technical questions regarding the design.

RH WASTE GENERATOR SITES. Oak Ridge National Laboratory, Hanford Site, Idaho National Engineering Laboratory, and Los Alamos National Laboratory are the primary RH waste generators. In conducting the project, it will be necessary to determine various constituents and their quantities. If the BIR does not provide the necessary data, and a parameter is significant to the project, then it may be necessary to discuss those parameters with the sites. In addition, the sites may play a review role for the project study.

STAKEHOLDERS. The DOE/CAO and the SNL will be responsible for addressing stakeholders. The SAIC will provide project technical and status information as needed to support stakeholder involvement. Stakeholder comments will be solicited for the project report.

5. PROJECT SCHEDULE

Initiative #177 has several project milestones that are listed below. In addition, other milestones that impact this project are listed to provide a frame of reference and to indicate impacts should other milestones be postponed. Finally, several overall WIPP milestones are provided to show the relation between this project and the total WIPP effort.

PROJECT MILESTONES

January 1995	Begin consultations with the States, EPA and Stakeholders on RH Performance Assessment Issues
May 1995	Complete the Performance Assessment Sensitivity Study
June 1995	Submit the Study Results
August 1995	Incorporate comments into the final RH Study
October 30, 1995	Publish findings of the Study in the Federal Register

In addition to the project milestones determined by the DOE/CAO above, the following milestones are also important to the project and relate to activities or reports for which this project must either provide information or from which information is received.

SYSTEM PRIORITIZATION MODEL MILESTONES

March 31, 1995	SP2 Model Run Complete
April 1995	SP2 Model Report Complete

BASELINE INVENTORY REPORT

November 1994	Baseline Inventory Report, Preliminary Data Available
January 1995	Baseline Inventory Report, Revision 1

OTHER RH RELATED MILESTONES

March 1995	Complete the RH Strategy
March 1995	WID complete WIPP RH Handling Equipment Status and Operability Report.