

WIPP REMOTE-HANDLED TRU WASTE PROGRAM REGULATORY UPDATE

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ABSTRACT

There are two major regulatory approvals necessary in order to commence disposal operations for remote-handled transuranic (RH TRU) waste at the Waste Isolation Pilot Plant (WIPP)—the RH TRU hazardous waste permit modification request must be approved by the New Mexico Environment Department (NMED) and the radiological characterization plan must be approved by the US Environmental Protection Agency (EPA). One of those milestones has been achieved. On March 26, 2004, the EPA issued its final decision to approve the Department of Energy's RH TRU radiological characterization plan along with the RH TRU Waste Characterization Program Implementation Plan (WCPIP) [1]. The RH TRU hazardous waste permit modification request, submitted to NMED on June 27, 2002, still awaits agency approval.

In EPA's decision to approve DOE's RH TRU radiological characterization plan, the EPA also set forth the process for approving site-specific RH TRU waste characterization programs. Furthermore, EPA recorded its deliberative process in another document entitled: "Technical and Regulatory Support Document EPA's Remote Handled Waste Characterization Determination"[2].

The NMED issued a Notice of Deficiency (NOD) [3] to the Permittees on the "Class 3 Permit Modification Request for RH TRU Waste" on March 5, 2003. Generally, the NOD comments focused upon the areas of enforceability, a reasoned departure from the Contact-Handled (CH) TRU waste analysis plan, use of acceptable knowledge, waste stream identification criteria, and facility operation and closure. On May 5, 2003, the WIPP submitted its response to all comments in the NOD. The response restructured the modification to address the enforceability questions, clarified the waste stream identification criteria and included technical justification for the approach taken for RH TRU waste characterization. WIPP is still awaiting the reply from the agency regarding the WIPP's NOD response. A review of both the NOD and the WIPP's response highlights the issues important to both the regulator and the Permittees. Through such examination, technical issues regarding facility readiness and waste analysis can be assessed in order to be ready for the anticipated second NOD.

INTRODUCTION

The Department of Energy's (DOE's) Waste Isolation Pilot Plant (WIPP) is a deep geologic repository for the safe and environmentally sound disposal of TRU) and TRU mixed waste from defense activities of the United States. This TRU mixed waste is disposed in ancient salt beds 2150 feet below the surface of the earth. Mixed waste is a combination of both hazardous and radioactive waste and each of these two constituents is regulated by a different agency. In the case of WIPP, the NMED regulates the hazardous component of the waste, the EPA Office of

Radiation and Indoor Air (ORIA) regulates the radiological component of mixed waste. The WIPP received all necessary radioactive and hazardous waste permits for CH TRU waste in 1999 and commenced disposal operations. To dispose of RH TRU waste the WIPP has submitted waste analysis plans to the respective agencies for their review and approval.

While the EPA has approved WIPP's plan to characterize the radiological portion of RH TRU waste, WIPP is still awaiting approval of the hazardous waste permit modification request that proposes the RH TRU waste analysis plan and facility changes. A new federal law, limiting the nature of waste confirmation activities for waste bound for the WIPP, went into effect after the submittal of the RH TRU waste permit modification request. The new law is likely to impact the content of the RH TRU waste permit modification request's second Notice of Deficiency (NOD).

Radiological and Hazardous Characterization Authorization

EPA's Approval of the RH TRU Radiological Characterization Program

The DOE submitted two documents to EPA in seeking approval of their RH TRU waste radiological characterization program. In April 2003, the "Notification of Planned Change to the EPA 40 CFR Part 194 Certification of the Waste Isolation Pilot Plant", Remote-Handled Transuranic Waste Characterization Plan [4] provided the required information to the EPA. After technical exchanges, DOE submitted the WCPIP. The WCPIP provides the RH TRU waste generator sites with guidance with the requirements of the radiological waste characterization program implementation.

The RH TRU waste radiological characterization plan is performance driven. The data quality objectives (DQOs) are based upon the information required by the 40 CFR 194, "Criteria for the Certification and Re-Certification of the Waste Isolation Pilot Plant's Compliance With the 40 CFR Part 191 Disposal Regulations." Some of the DQOs are qualitative in nature. For example, either the waste is defense related or it isn't; and some are quantitative, for example either the waste is TRU or it isn't. Because generator sites have varied waste streams and facilities, generator sites must determine what characterization method will provide the necessary information allow a determination that the DQOs are met and justify the method in their characterization program.

On March 26, 2004 the EPA issued its final decision to approve DOE's radiological waste characterization plan for RH TRU waste along with the WCPIP. Furthermore, EPA recorded its deliberative process in another document entitled: "Technical and Regulatory Support Document EPA's Remote Handled Waste Characterization Determination" [2]. The EPA will authorize RH TRU waste generator sites on a site specific basis. As recognized by the National Academy of Sciences [5], there is substantial variability among RH TRU waste generator sites including:

- Variability in the composition of the waste streams,
- Variability in the extent of AK [acceptable knowledge] available,
- Variability in the characterization and repackaging facilities available, and
- Variability and uncertainties in the current and projected inventories of RH-TRU waste

In its approval, EPA did not authorize any RH TRU waste site to begin RH TRU waste characterization or shipping. Generator sites must complete several approval steps before they are authorized to ship RH TRU waste. The DOE must obtain EPA approval of site specific characterization plans including the waste characterization procedures and equipment used in characterization activities. Pre-approval of these documents is more stringent than the EPA requirements for CH TRU waste because EPA allowed for the variability of the waste inventories and facilities. These changes notwithstanding, the EPA does not consider the approval of the RH TRU waste program a significant change from the 1998 Certification Decision of the WIPP.

Status of the New Mexico Environment Department's Approval of the RH TRU Waste Permit Modification Request

The Permittees submitted the RH TRU Waste Permit Modification Request to the NMED on June 28, 2002. The NMED issued a determination of administrative completeness. To obtain the information to issue a determination of technical completeness, The NMED issued a NOD on March 3, 2003. The Permittees responded to the NOD comments 60-days later.

When NMED transmitted the NOD to the Permittees, the NMED stated that the CH TRU waste characterization process was the "current legal standard" for the RH TRU mixed waste characterization program. Furthermore, the NMED continued in the letter by saying that the RH program must be based upon a reasoned departure from the CH TRU waste characterization process. In the May 5, 2003, response letter, the Permittees claimed that they have not found any legal support for a position that the RH TRU waste analysis plan (WAP) must be based upon the CH TRU WAP as the "legal standard." The NMED responded on August 8, 2003, that from NMED's perspective it is "desirable" for the Permittees to develop an RH TRU WAP that is a reasoned departure from the existing and fully adjudicated CH TRU WAP. In its issuance of the WIPP HWFP, the NMED stated:

The WAP, the QAPP and the TRU Waste Characterization Sampling and Analysis Methods Manual, as currently written, apply only to contact-handled^a ("CH") TRU waste and do not apply to remote-handled ("RH") TRU waste. Tr. 880-81 (R. Neill); RP Nos. 15, 36 (comment 167). Applicants have not provided sufficient information regarding procedures to characterize RH TRU waste in response to prior requests and notices of NMED. Tr. 2377-78 (S. Zappe).

Due to the high radiation field (primarily gamma radiation) associated with RH TRU waste, the Permittees wrote an RH TRU waste analysis plan that took into consideration what information was necessary by the hazardous waste regulations to safely manage, store, and dispose of RH TRU waste while attempting to minimize operator exposure. The Permittees, realizing that the CH TRU WAP was insufficient to protect characterization workers, put forth a performance driven program so that RH TRU generator sites could safely provide the information required by the hazardous waste regulations. This information includes a hazardous waste determination, material parameters, and all information required by the WIPP's TSDF Waste Acceptance Criteria (TSDF-WAC). The TSDF-WAC identifies the prohibited items that are not acceptable at the WIPP.

Issues from NMED's First RH TRU Waste NOD on the RH TRU Waste Permit Modification Request

Although the NMED addressed several categories of issues related to facility changes in the NOD, (such as general inspection requirements, preparedness and prevention, traffic patterns, etc.) concerns relative the RH TRU waste analysis plan will be the primary focus of this discussion. This focus is warranted because most of NMED's comments deal with waste analysis. Regulatory and technical issues highlighted by the NOD are:

- Legal and regulatory basis of the RH TRU waste analysis plan
- Extent of usefulness of visual examination
- Confirming Acceptable Knowledge (AK) based hazardous waste determinations
- Volatile Organic Compounds from RH TRU waste
- Data Quality Objectives (DQOs)

The NMED acknowledges that its primary evaluation criterion for any RH TRU waste permit modification request is meeting the requirements of 40 CFR 264 (RCRA's treatment, storage, and disposal facility requirements). However, the NMED recognized that if the current CH TRU waste characterization program was employed with possibly extreme safeguards taken, then RH could be characterized in the same manner although the expense of implementing such a program might be prohibitively high. It is the NMED's position that the CH program should be the basis for the proposed RH program, with the reasonable departures from the fully adjudicated HWFP technically justified and still compliant with RCRA.

The hazardous waste regulators questioned the usefulness of visual examination in assigning EPA hazardous waste numbers; that is to say, performing the hazardous waste determination. They questioned the ability to assign hazardous waste numbers from merely looking at the waste with trained operator. Further, NMED expects the Permittees to propose verification of hazardous waste code assignments through some type of chemical analyses. The Permittees have proposed that the identification of important physical parameters, along with qualified acceptable knowledge (AK), provides for both the assignment of hazardous waste numbers for items that are visually apparent (e.g., lead lined gloves, cadmium-plated bolts) and confirm hazardous waste numbers identified in AK packages.

The NMED said it was unclear what value a visual examination technique would have when "confirming" AK-defined hazardous waste determinations except in cases where the physical attributes are representative of hazardous waste codes (i.e., leaded gloves), unless the Permittees perform as yet unspecified sampling of some sort to provide a "fingerprint" that could be linked or tied to the AK record. Although the regulator noted that the process need not be identical to the CH program, it should, nevertheless, require that some quantity of analytical data be obtained to adequately confirm AK. Currently, visual examination of CH TRU waste is one of the approved methods to confirm AK with or accompanied by radiography of the waste containers. Sampling and analytical methods for CH TRU waste require that solids sampling of homogeneous waste be performed and that except for in some waste streams, headspace gas to confirm AK is also required. Observation of physical items in a waste stream confirms that the

AK information is a valid means of confirming that a generator knows the physical and chemical properties of the waste stream.

In a technical paper supporting the RH TRU waste analysis plan to eliminate headspace gas sampling, the Permittees proposed a bounding analysis of Volatile Organic Compound (VOC) measurements of the headspace. The Permittees proposed that instead of measuring the analytes directly, that each of the 28 analytes identified in the HWFP be assigned the saturated vapor pressure concentration for that compound, thereby assuming its presence in the waste stream as a maximum concentration. Those maximum concentrations for RH TRU would then be accrued against the room based limits of VOCs presently established for CH TRU waste in the HWFP. In effect, maximizing the RH TRU waste VOCs using the saturated vapor pressure concentrations would reduce the allowable values established in the HWFP for CH VOCs. In its NOD, NMED did support modeling augment arguments, but not as a wholesale substitute for actual waste analysis. The regulators stated that the Permittees asserted that all modeling assumptions, parameters, and inputs for VOCs remain unchanged for RH TRU waste and that the previous assessment did not include RH TRU waste. This was not the case as demonstrated in the Permittees response to the NOD.

Due to the RH TRU WAP performance driven approach, the DQOs were necessarily qualitative and not method specific as with the CH TRU WAP. NMED believes the RH TRU WAP DQOs are too generalized. More specific DQOs, similar to the method specific DQOs of the CH program, were requested. The CH TRU DQOs ensure that the reasons for using specific characterization processes are justified and documented. The RH TRU waste program, as proposed, directs the generator sites to provide the information required by statute and regulations, identify and justify characterization program, including method uncertainty.

Section 311

An important piece of new legislation will undoubtedly impact the second NOD for RH TRU waste permit modification request. In November 2003, the Congress passed the Energy and Water Development Appropriations Act for Fiscal Year (FY) 2004 [6]. Section 311 of the Act states:

- (a) The Secretary of Energy is directed to file a permit modification to the Waste Analysis Plan (WAP) and associated provisions contained in the Hazardous Waste Facility Permit for the Waste Isolation Pilot Plant (WIPP). For purposes of determining compliance of the modifications to the WAP with the hazardous waste analysis requirements of the Solid Waste Disposal Act (42 U.S.C. 6901 et seq.), or other applicable laws waste confirmation for all waste received for storage and disposal shall be limited to: (1) confirmation that the waste contains no ignitable, corrosive, or reactive waste through the use of either radiography or visual examination of a statistically representative subpopulation of the waste; and (2) review of the Waste Stream Profile Form to verify that the waste contains no ignitable, corrosive, or reactive waste and that assigned Environmental Protection Agency hazardous waste numbers are allowed for storage and disposal by the WIPP Hazardous Waste Facility Permit.

(b) Compliance with the disposal room performance standards of the WAP shall be demonstrated exclusively by monitoring airborne volatile organic compounds in underground disposal rooms in which waste has been emplaced until panel closure.

The President signed the Energy and Water Development Appropriations Act for Fiscal Year 2004 on December 1, 2003. Similar language appears in the FY 2005 appropriations bill. Accordingly, the Section 311 Permit Modification Request was submitted to the NMED on January 9, 2004.

In that permit modification request to implement the new law, the Permittees interpreted that new law as prohibiting the use of headspace gas and solids sampling and analysis for confirming the contents of waste containers. A disposal room based VOC monitoring program is to provide for the compliance with the environmental performance standards. The new law also limits what confirmation activities can be performed for waste to be disposed of in the WIPP. Because the new law did not distinguish between RH TRU and CH TRU waste, it is believed that the RH TRU waste permit modification request must be revised to take into account the mandate of the new law.

What Will the Second Nod Likely Contain?

On May 5, 2003, the Permittees provided their response to the NOD. It included incorporation of many comments the regulator made, and offered clarification and continued additional of technical justification. To the extent that the Permittees provided sufficient justification or offered persuasive logical arguments to the major concerns the NMED identified in the first NOD, additional explanation or different approaches to satisfying the regulatory and statutory requirements will be given. Obviously, the basis for some waste analysis plan elements will change because of the statutory requirement of Section 311 and will have to be included in the Permittees response in any NOD comment regarding waste conformation requirements and environmental performance standards.

All other authorization basis documentation requiring agency approval has been prepared. Facility readiness at the WIPP and generator sites is awaiting the final permit conditions of the RH TRU permit modification request. The RH TRU waste permit modification request remains the last hurdle in fulfilling the intent of Congress that the Waste Isolation Pilot Plant be the solution to defense-related RH TRU waste disposal. The Permittees are at the ready to respond to the second NOD, achieve technical completion or the permit modification request and receive a draft permit for RH TRU waste characterization.

REFERENCES

1. RH TRU Waste Characterization Program Implementation Plan, Revision 0D, DOE-WIPP 02-3214, October 30, 2003.
2. Technical and Regulatory Support Document EPA's Remote Handled Waste Characterization Determination, U.S. Environmental Protection Agency, Office of Radiation and Indoor Air, Washington, DC 20460, March 2004

3. Notice of Deficiency (NOD), Class 3 Permit Modification Request for Remote Handled Waste, WIPP Hazardous Waste Facility Permit, EPA I.D. Number NM4890139088, New Mexico Environment Department, March 5, 2003.
4. Notification Of Planned Change to the EPA 40 CFR Part 194 Certification of the Waste Isolation Pilot Plant Remote-Handled Transuranic Waste Characterization Plan, US Department of Energy, Carlsbad Field Office, April 30, 2003.
5. Characterization of Remote-Handled Transuranic Waste for the Waste Isolation Pilot Plant, Final Report, National Research Council, National Academy Press, Washington DC, 2002.
6. Pub. L. 108-137, Energy and Water Development Appropriations Act for Fiscal Year 2004, Section 311.
7. Report Of The Hearing Officer Statement Of The Case Issue Findings Of Fact Discussion Conclusions Of Law Recommended Decision And Proposed Final Order; In The Matter Of The Final Permit Issued To The United States Department Of Energy And Westinghouse Electric Company Waste Isolation Division For A Hazardous Waste Act Permit For The Waste Isolation Pilot Plant; USEPA No. NM4890139088; HRM 98-04(P).

FOOTNOTES

- ^a CH TRU waste is TRU waste with a surface dose rate not greater than 200 millirem per hour. RP 1 (Fact Sheet, pg. 1); Proposed Final Permit of June 25, 1999 (Module I.D.1).