

**IMPROVING THE WASTE ISOLATION PILOT PLANT HAZARDOUS WASTE
FACILITY PERMIT:
TWO YEAR'S EXPERIENCE**

Robert Kehrman
and
David Streng
Westinghouse TRU Solutions, LLC

H. L. "Jody" Plum
DOE Carlsbad Field Office

Earl Potter
Potter & Mills P.A.

ABSTRACT

On October 27, 1999, the New Mexico Environment Department (NMED) issued a Hazardous Waste Facility Permit (HWFP) for the Waste Isolation Pilot Plant (WIPP). The permit contains conditions and requirements that must be met by the co-permit holders, the Department of Energy (DOE) and Westinghouse TRU Solutions, LLC (co-permittees). This paper discusses some of the modifications the co-permit holders have proposed to the permit and lessons learned in the process. Future modifications will focus on assisting acceleration of shipments to “put waste in the safest place” without sacrificing protection of human health or the environment.

Changes to the HWFP must be made within a specific regulatory process. The RCRA process consists of three classes of modification. The classification of the modification depends on the complexity of the proposed modification and the degree of public interest. It establishes the extent of public input into the decision making process. State law requires the opportunity for a public hearing for any modification which generates “significant public interest.”

As DOE and its contractors seek more efficient and less expensive ways to dispose of the nation's TRU waste, they will pursue permit modifications over the decades-long lifetime of the facility. Based on the first two years experience in the permit modification process, the co-permittees have revised their regulatory strategy to have thorough discussion of planned modifications with regulatory agencies and stakeholders prior to formal submittal. This new approach will minimize disputes with regulators regarding the determination of the classification for each modification request and make the regulator and public aware of amendments to be submitted.

BACKGROUND

When the NMED issued the HWFP for the WIPP in October 1999, the facility had been operating since March 25, 1999, actively disposing of transuranic (TRU) waste that did not contain hazardous constituents covered by the HWFP. The rate at which non-mixed TRU waste was being shipped to the WIPP was on the order of one shipment per week. At that time, only three generator/storage sites were shipping waste to the WIPP. Now, nearly 28 months later, the shipping rate is as much as 17 shipments per week from as many as five generator/storage sites. The co-permittees and the generator/storage sites have achieved this increased throughput rate by improving almost every aspect of the operating system. This paper discusses some of the most significant modifications, identifies some of the most significant issues which arose, and presents the new strategy the co-permittees have adopted.

The first step after the HWFP was issued was to determine what, if any, differences existed between programs at the generator/storage sites and the waste characterization program required by the permit. Once these were determined, the DOE identified the best approach to deal with these differences. In many cases, generator/storage sites made changes in their operations, in others, HWFP modifications were submitted. Sometimes, the co-permittees addressed the differences by issuing a clarification of the HWFP text.

Some important Modifications implemented are discussed below:

Modification to Reduce Headspace Gas Sampling and Analysis

The HWFP initially required that the headspace gases of all waste containers be sampled and analyzed for the presence of volatile organic compounds (VOCs). Several waste generator/storage sites pointed out that some waste streams have no VOC constituents. For example, some homogeneous solid or soil/gravel waste can be shown through acceptable knowledge to have no VOC-related hazardous waste codes assigned to the waste stream. Likewise, a waste processed through a thermal process is likely to have no waste matrix related VOCs in the headspace. Therefore, full characterization of these waste streams can be achieved with confidence using

representative (statistically-based) sampling as opposed to the previously mandated 100 percent sampling. Consequently, the DOE proposed a HWFP modification request to allow reduced sampling for some waste streams.

This modification request was approved in August 2000 and has significantly increased the rate of shipment for thermally treated waste from the RFETS. In addition, the modification reduces the overall cost of headspace gas sampling and analysis by about 10 percent.

Modification to Perform Visual Examination on Summary Category Groups

One of the conditions of the HWFP is the requirement that the miscertification rate be used to determine how many containers must undergo visual examination. The condition was originally implemented on a waste stream basis. The HWFP indicated that it is necessary to apply the miscertification rate to allow for adequate checking of problematic waste streams. This is because different physical waste forms may have a potential impact on radiography operations and the chance of miscertification is higher for some waste streams (such as debris) than for others (such as homogeneous solids). In the Permit this is acknowledged by indicating that radiography systems should have the capability to vary the voltage to provide "an optimum degree of penetration through the waste." In addition, this difference was anticipated by imposing visual examination requirements on a waste-stream basis as opposed to an annual throughput basis. However, experience in operations showed that the use of waste streams in this fashion was not appropriate because waste streams are identified by characteristics other than physical waste form (e.g., hazardous constituents, location of generation) that have no potential effects on radiography operations. Further, Summary Category Groups provide an effective method to categorize the overall physical form of the waste and do provide the level of discrimination needed to ensure the more problematic wastes are adequately checked. A permit modification was proposed to allow the use of Summary Category Groups instead of waste streams for applying the miscertification rate. Because the Summary Category Groups represent the overall physical form of the waste, using a Summary Category Group miscertification rate is no less protective of human health and the environment than a waste stream miscertification rate and it assures the intent of the HWFP is met. The NMED approved this modification in August 2000. It is estimated that this modification reduces the number of visual examinations by 90 percent, both streamlining the characterization process and decreasing overall costs.

On-line Integrated Sampling System

The HWFP was issued with specific conditions regarding the use of on-line integrated sampling and analysis systems. The conditions were all relative to the use of a Fourier-Transform Infrared (FTIR) Spectroscopy System and were not appropriate for other sampling and analytical methods allowed by the HWFP. For example, other types of on-line sampling and analysis systems are possible using the more conventional gas chromatography (GC) methods. This proposed modification implemented an equivalent performance-based approach using existing HWFP requirements to establish requirements for other on-line integrated system configurations to ensure that the data generated by these systems meet the data quality objectives of the HWFP. This change was submitted as a Class 1 modification, because it expanded the utility of on-line integrated headspace gas sampling/analysis system. It also resulted in more stringent requirements.

This modification paved the way for automated headspace gas sampling and analysis, which greatly reduces the time for sampling activities. These reductions are realized because up to 20 canisters of sampled gas can be staged for automatic analysis with little operator intervention. The automatic analysis increases throughput for characterizing the waste since the analyst does not have to be present when the samples are run through the instrument.

Some Permit Issues – Classification and the Drum Age Criteria Modification

A general description of the rationale used to classify permit modifications is given in Table I.

Table I. Description of Hazardous Waste Permit Modification Classes

MODIFICATION CLASSIFICATION	US EPA DESCRIPTION (1)
CLASS 1	Class 1 limited to routine changes, such as changing typographical errors, upgrading plans and records maintained by the facility, or replacing equipment. Should be easily reversible. Other changes permissible are found in Appendix 1 to 40 CFR 270.42
CLASS 1*	Prior approval of the Agency is not required for most Class 1 modifications., an asterisk in the Appendix I table indicates a Class 1 change that does require prior Agency approval
CLASS 2	Class 2 modifications address common operating changes needed to maintain a facility's ability to manage a waste safely or to conform with new regulatory requirements. Requires 60 day public comment period, then 30 to 60 day period for decision by regulator
CLASS 3	Class 3 changes cover major modifications that substantially alter the facility or its operations, such as significantly increasing the facility's capacity to treat, store, or dispose of hazardous waste. Requires draft permit to be prepared by agency, then public hearing on permit (1-2 year process)

However, the New Mexico Hazardous Waste Act classifies modifications as only “major” and “minor”. These terms are not defined in the Act . Section 74-4-4.2 NMSA 1978 states in pertinent part:

H. No ruling shall be made on... (a) major modification... without an opportunity for a public hearing at which all interested persons shall be given a reasonable change to submit data, views, or arguments orally or in writing and to examine witnesses testifying at the hearing;...

I. The secretary shall hold a public hearing on a minor permit modification request if the secretary determines that there is significant public interest in the minor modification..

Thus under State law, any permit modification (even a class 1 modification) will be the subject of a public hearing if the Secretary of NMED determines there is “ significant public interest” in it. Furthermore, classification decisions by the agency, in most cases, are not subject to judicial review.

The Drum Age Criteria Permit Modification

A fundamental portion of any sampling strategy is ensuring the sample taken is representative of the waste container. For headspace gas sampling, representativeness is ensured by requiring the container to equilibrate for a prescribed period after container closure. This period ensures that the headspace gas in the drum is approaching equilibrium with the gas in the innermost confinement layer (generally a plastic bag) in the drum. This period is referred to as the drum age criteria or DAC. When the HWFP was issued, two conditions were imposed. First, the headspace was required to reach 90 percent equilibrium with the innermost layer for confinement prior to sampling. Second, the DAC was defined as a minimum of 142 days for debris waste and 225 days for homogeneous solids and soil/gravel waste. Analyses performed for the Nuclear Regulatory Commission as part of amending the license for the TRUPACT II demonstrated that for many packaging configurations, the 90 percent equilibrium criterion is met in far fewer days than those prescribed in the HWFP. A HWFP modification was proposed that provided a revised methodology for determining the DAC based on specific packaging configurations. For example, the gases in the headspace of a 55-gallon drum of debris waste with

no rigid liner and two inner bags would reach 90 percent equilibrium in 18 days or less depending on the filter used as opposed to the 142 days mandated by the HWFP. Providing packaging-specific DAC values allows generator sites to complete characterization activities more quickly, facilitating higher throughputs.

The DAC modification was initially discussed with the NMED as a Class 1 modification. The NMED rejected this approach and required that it be submitted as a Class 2 modification. As such, it was initially denied by the NMED based on inadequate response to questions raised by the public. DOE responded to the public concerns and resubmitted the DAC modification request as a Class 2. NMED reclassified it as a Class 3 modification because of the complexity of the modification and the amount of public interest, and a draft permit is expected in March 2002, more than a year after the initial submittal, with approval possibly by December 2002.

Lessons Learned and a New Approach to Permit Modification Submittal

While many Permit Modifications have been submitted and approved without incident, the co-permit holders have learned from their experience with the DAC permit modification and others that:

1. Submittal of numerous modification requests without negotiating a schedule with the regulatory agency will have an adverse impact on gaining desired approval.
2. Determination of proper classification of permit modifications create major delays in the permitting process.
3. Regardless of its reasonability a modification request will fail if co-permittees do not listen to, assimilate and address the comments and concerns of regulators and other interested parties.

The co-permittees have adopted five guiding principles to shape their permitting strategy: they are:

- 1. Submit only permit modification requests that have a high probability for acceptance and approval by NMED.**

 - 2. Work with NMED and stakeholders to understand their concerns before submission of permit modification requests. Stakeholders include individual citizens, civic leaders and organizations, environmental activists, pro-nuclear advocacy groups, etc.**

 - 3. Always consider stakeholder availability and NMED workloads in planning meetings, hearings and submissions.**

 - 4. Recognize that classification of permit modifications is a matter of NMED discretion.**

 - 5. View proposed modifications in the context of past, present, and future modifications. Consistently communicate to the NMED and stakeholders what co-permittees are doing and propose to do.**
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