ALMOST FIVE YEARS
HOW THE WIPP PERMIT HAS CHANGED

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ABSTRACT

The Hazardous Waste Facility Permit was issued for the Waste Isolation Pilot Plant (WIPP) in October, 1999. It will soon be time for the first 5 year review of the permit by the New Mexico Environment Department (NMED). Since its issuance, there have been substantial changes to the permit and many more are anticipated in the next year.

Since late 1999 the WIPP Permittees (the Department of Energy and Washington TRU Solutions LLC) have submitted almost 200 requests for modifications to the permit. These changes were identified after discussions with users such as the transuranic waste generator sites and the facility operations staff. About two thirds of the changes were Class 1 modifications that can be implemented when they are submitted to the regulatory agency. Nearly one third of the changes were Class 2 modification requests, which require public notice and a 60-day public comment period. NMED must approve or deny these requests within 120 days of submittal. A total of ten Class 3 modification requests have been submitted to NMED. These requests have no regulatory timeframe. Only one Class 3 modification has completed the administrative process and took almost two years to finalize. Each modification can effect several physical changes throughout the permit.

The majority of these modifications have focused on operational efficiencies and changes to the waste characterization processes. The Permittees have submitted a modification that will revise the WIPP Hazardous Waste Facility Permit (HWFP) to comply with the recently enacted Section 311 of the Energy and Water Projects Appropriations for FY 2004 Act (Public Law 108-137). This change limits waste confirmation activities to radiography or visual examination consistent with the Section 311 by eliminating headspace gas and solids sampling and analysis. Another major modification recently submitted to NMED involves an increase in storage space and storage volume at WIPP. This is required due to the accelerated shipping schedule from the generator sites. Both of these modifications were submitted as Class 3 modification requests in January 2004.

This paper discusses the process by which the Permittees have systematically improved the Hazardous Waste Facility Permit through the permit modification process. A review of the strategies employed to improve the modification process and lessons learned are also provided.

INTRODUCTION

When the New Mexico Environment Department (NMED) issued the Hazardous Waste Facility Permit (HWFP) [1] for the Waste Isolation Pilot Plant (WIPP) in October 1999, it marked the culmination of a 12-year process aimed at defining the manner in which the hazardous waste regulations would be applied to transuranic (TRU) waste. The four-volume permit contained detailed permit conditions covering a number of topical areas such as waste characterization, waste handling, waste storage, waste disposal, and record keeping. As would be expected with any document developed over a long period of time, there were details in the HWFP that were not consistent with the actual conditions at the WIPP facility when the HWFP was issued. In addition, the process of waste characterization underwent a significant metamorphosis as the result of the HWFP—evolving from a process that relied principally on radiography

and process knowledge for waste information to one that involved sampling, analysis and testing of every container of waste. In addition, the cost of implementing the HWFP requirements at the generator sites was high, requiring new equipment, additional operators, redefined practices, and higher levels of external scrutiny.

Generator sites, as well as the WIPP facility operating staff were asked by the Department of Energy (DOE) to identify the areas of the HWFP where there were discrepancies with actual practices, or where implementation was problematic. For example, the HWFP required the analysis of groundwater for gross alpha and gross beta. However, the high salinity of the groundwater around WIPP made these determinations difficult because of the need to significantly dilute the samples in order to remove the masking effect of the high dissolved solids in the water. The analysis performed by the sites and the operating staff was referred to as a "Gap Analysis" because it represented the gap between the HWFP and the actual implementation. HWFP users proposed over 500 changes, ranging from minor wording modifications to the inclusion of new equipment and processes. These were segregated into three categories based on when they were needed. The near term items were considered those that had to be addressed in order to facilitate the initiation of waste shipments from generator sites or those that were relatively easy to accomplish. Mid-term items were those that would make waste characterization and waste management more efficient but did not require major changes to the HWFP. Longer-term goals are those that would provide optimization of the waste characterization process, minimizing cost, worker exposure, while increasing throughputs which could be accomplished only by making major changes to the HWFP.

PERMIT MODIFICATION PROCESS

Fortunately for the Permittees, the US Environmental Protection Agency (EPA) anticipated that permits would need to change over time. They codified procedural requirements for modifying permits in 40 CFR 270.42 [2]. In defining the modification process, EPA identified three classes of modifications. Class 1 modifications are the least substantive permit changes. They involve routine changes and correction of errors. The regulatory requirements for obtaining Class 1 modifications involve minimal regulator oversight and public notification/participation. Class 2 modifications are substantive permit changes needed to maintain a facility's capability to manage wastes safely or to conform to new requirements. The regulatory requirements for obtaining Class 2 modifications involve considerable regulator input and public notification/participation. Class 3 modifications are the most substantive permit changes. These modifications are required to significantly alter the facility or its operations. The regulatory requirements for obtaining Class 3 permit modifications involve considerable regulator input, public notification/participation, and adherence to the administrative permitting procedures applicable to the processing of applications for full Resource Conservation and Recovery Act permits. EPA provided a table of changes and associated classifications in Appendix 1 of 40 CFR 270.42 [2]. Changes not on the list are dealt with as "Other Changes" and may be submitted as Class 1, Class 2, or Class 3 depending on the nature of the change.

Class 1 permit modification notifications are submitted within 7 days of implementation of a change that qualifies as a Class 1. These do not need prior Agency approval. While agencies do not have to approve Class 1 modifications prior to implementation, they may determine that the change is misclassified and reject the change. In such cases, the facility must go back to operating as it was prior to implementing the change. One type of Class 1 permit modification, referred to in the regulations as Class 1 star (Class 1*) cannot be implemented until approved by the Agency. Class 1 changes do not require a public comment period, although notification of the public is mandated.

Class 2 modifications require a 60-day public comment period prior to Agency consideration. During this period, the applicant must conduct a public information meeting. The agency has up to 60 days to

consider the modification request and the public comments prior to making a decision of approve, approve with changes, deny, or process as a Class 3 modification.

Class 3 modifications undergo the 60 day public comment period similar to class 2 modifications. At the end of the 60 day period, the agency will decide whether or not to proceed with modification of the permit or to deny the request. If the process continues, the agency then implements its administrative procedures, which are similar to procedures for obtaining a permit. The process may involve a public hearing.

Public participation in the permit modification process is important and in New Mexico, public comment is highly valued by the NMED. To this end, the NMED has applied the modification process in a manner that empowers the public. This includes encouraging applicants such as the Permittees to involve the public during the presubmittal process and to conduct more than the minimum number of public meetings.

PERMIT MODIFICATION GUIDING PRINCIPLES

As the permit modification process has progressed with the NMED, the Permittees have learned several important lessons with regard to the preparation and processing of permit modifications. These are incorporated in the following guiding principles.

1. Submit only permit modification requests that have a high probability for approval
2. Work with regulatory agencies 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 regulator workloads in planning meetings, hearings, and submissions
4. Recognize that classification of permit modifications is a matter of regulatory agency discretion.

To improve the likelihood that a modification request will be approved, the Permittees are careful to adequately justify the request. Whenever available, the Permittees use data obtained during actual operating conditions to substantiate the claims made in the request. Furthermore, to increase the regulators' trust in the Permittees intents, care is given to assure that only those portions of the permit that are intended to be modified are actually changed. That is, in complex permits such as WIPP's, the chances of collateral effects are carefully evaluated. For example, changes to the manner in which data are recorded and reported should not affect the manner in which the data are generated unless such changes are specifically intended. Any changes noted in a suggested redline/strikeout version of the affected permit text are described and justified in the accompanying text.

Stakeholder and regulatory agency understanding and input greatly enhance the probability that a modification will be approved. To understand their concerns, the Permittees go beyond the letter of the regulations for public involvement and post draft permit modification requests to a web page. Presubmittal meetings may also be held to solicit early feedback from the affected community. In these ways the Permittees are able to strengthen the modification requests to address stakeholder questions and concerns before the modification requests are submitted.

To avoid agency overload, the Permittees have been submitting modification requests on a semiannual basis after discussing the schedule for the submittals with the regulator. Finally, when classifying modification requests, the Permittees review each, as much as possible, from the perspective of the regulator. The Permittees realize that under-classification of modifications only delay the administrative process for approval. Furthermore, the agency can elevate a modification to higher class if the level of

public concern is high or if the agency believes the modification is sufficiently complex to merit detailed consideration and extended public comment.

PERMIT MANAGEMENT STRATEGY

The complexity of the WIPP HWFP was recognized at the outset. As the result, the Permittees have developed a three-pronged strategy to manage the HWFP. This strategy includes communication, analysis, and modification as discussed below.

Communication

It was important to provide the users of the permit copies of the document to use, a forum for answering questions regarding implementation, and a vehicle for soliciting comments on proposed and pending changes. To this end, the Permittees created a Web-based Permit Page containing several elements. A menu allows the selection of the permit itself, recent permit modifications, pending modifications, and public notices and related fact sheets associated with modifications. This is available by going to the WIPP home page (www.wipp.ws) and selecting "Document Center" then following the e-links to the RCRA documents page.

In addition, the DOE established weekly calls with generator sites to discuss questions and issues. Associated with this, the Permittees established the WIPPWAP Hotline available at WIPPWAP@wipp.ws. This hotline provides a mechanism for users to submit questions relative to implementation of waste characterization requirements for WIPP waste. Hotline questions are answered in writing and the answers are archived so as to be available during audits of the implementation of the WIPP waste characterization requirements.

Analysis

The analysis portion of the permit management strategy involves determining the source of the various permit requirements, determining if there are better ways of meeting the requirements (or if the requirements are needed at all), and preparing a strategy for changing or eliminating the requirements. The implementation of the analysis is intended to identify areas of improvement in an organized, easily manageable, and complete fashion. The implementation of the strategy is derived from operational experience as well as assessments comparing permit requirements to applicable regulatory drivers. In addition, areas of optimization are identified based on the desire of the DOE to accelerate complex wide TRU waste disposal.

Operational Experience

Operations and support workers conduct day-to-day business within the conditions set forth in the permit. Their first line observations have identified and will continue to identify better ways to accomplish particular aspects of their jobs. These changes are evaluated to assure they do not decrease the protection afforded by the permit and that they are consistent with the regulatory drivers. The areas evaluated are summarized in Table I.

Table I Optimization areas of the WIPP hazardous waste facility permit

Optimization Area	Description
Operating Practices	In some instances, better operating practices may be available to enhance the efficiency of operations without compromising protection of human health or the environment. For example, the underground configuration includes booster fans that are no longer needed for their original purpose. Removal of these fans will allow easier maintenance of the roof of the mine in the vicinity of the fans.
Prescriptive Text	Some of the permit text contains excessive detail, beyond the intent of the regulations, and in turn, creates unnecessary conditions of compliance. This detail imposes an excessive administrative burden through the permit modification process in order to use a like or superior method. For example, the HWFP contains detailed descriptions of the contents of first aid kits. These descriptions meet the requirements; however, the requirements can be met with more general descriptions.
Readability and Clarity	In some instances the permit requirements are unclear or difficult to understand leading to misinterpretation. Such an error may lead to operational inefficiency and increased hazard exposure by forcing compliance with artificial requirements, or may lead to a regulatory violation because a permit condition was not recognized or was misinterpreted.
Administrative Burdens	There are several reporting requirements that cause significant administrative burden to both the New Mexico Environment Department and to the Permittees. The permit could be modified to reduce these burdens. For instance, the number/frequency of reports could be reduced, the permit could allow for the use of electronic reporting, and allow reduced groundwater reporting requirements.

Assessment of Permit Requirements

In addition to field observations, the Permittees performed an assessment of the requirements in the permit and have identified other opportunities where the permit can be optimized. The areas recommended for improvement are summarized in Table II.

Table II Areas of permit assessment

Evaluation Area	Description
Non-Regulatory Based Requirements	Often descriptive information or academic information provided for clarification in a permit application is restated in the permit, and is interpreted as a requirement. Such unnecessary requirements may lead to decreased operational flexibility and efficiency, and potential increased exposure to health and safety hazards.
Redundancy	Many themes throughout the permit overlap; therefore, many of the same discussions appear in multiple sections. This creates an unnecessary administrative burden to keep all of the descriptions consistent as the permit changes.
Extraneous Information	The permit contains superfluous information, with no intended permit condition associated with its text. Such information may be in the form of descriptive or historical reporting that can be found in controlled documents other than the permit.

National TRU Program Experience

The DOE conducted a top-to-bottom review of its waste management practices and concluded, among other things, that significant progress was needed to reduce the risk associated with legacy TRU waste

stored at various facilities throughout the DOE Complex. In response, sites were required to prepare "Performance Management Plans" which addressed the acceleration of waste disposal. These have led to the need for the WIPP facility to handle on the order of 100 TRUPACT-IIs per week. Several permit changes will accommodate this throughput. Changes that are identified are prioritized depending on a number of factors as shown in Table III.

Table III Priorities assigned to permit changes

Change	Priority	Rationale
Mitigate Immediate Potential Health And Safety Risks	1	The objective is to reduce worker exposure to health and safety hazards. Unnecessary requirements may lead to activities that expose the worker to hazards, both occupational and radiological.
Avoid Regulatory Compliance Deficiencies	2	The objective is to correct permit language that is unclear or to remove unnecessary detail that may lead to compliance issues.
National TRU Program Priorities	3	The objective is to remove constraints on the number of shipments per week.
Cost Savings	4	The objective is to implement less expensive alternatives for performing work while maintaining the level of quality and protection. For example, reducing the administrative reporting burden will reduce costs and compliance liability
Improve Operational Efficiency	5	This objective is to improve operational efficiency by allowing alternate compliance methods and by eliminating unnecessary conditions. Increased efficiency will result in increased flexibility in operations and manpower assignments.

Along with the analysis, the Permittees developed a form of schedule referred to as a Roadline (combination of roadmap and time line). The Roadline simply showed the sequence in which modifications were anticipated and the relative time periods over which they would be submitted. The Roadline was shared with stakeholders and regulatory agencies to allow planning of work activities. One DOE commitment that is reflected in the Roadline is the intent to submit modifications on a semi-annual basis (unless circumstances such as compliance requirements dictated another frequency).

Modifications

Neither the NMED nor the EPA prescribes the format for modification submittals. General prescriptions are provided in the modification regulations in 40 CFR 270.42 [2]. The Permittees experimented with several formats and finally settled on one that includes a point by point response to the regulatory requirements in 40 CFR 270.42, a table of changes, and a redline/strikeout version of the permit showing the changes proposed in the modification. This process makes communicating the changes relatively easy. Many times, the Permittees will include supplemental information with the modification request to support the request.

WIPP HWFP MODIFICATION HISTORY

To date, the Permittees have submitted 56 different modifications to the HWFP. These have included over 200 separate items, dealing with over 1,000 physical changes to the HWFP. Success has been excellent, although some changes have required several submittals due to denials by the NMED.

Furthermore, the time for processing permit modifications has been very lengthy. For example, to date only one Class 3 modification has been decided. The administrative process took over 600 days to complete. Class 2 modifications have a mandatory timeframe associated with them that can be as long as 120 days and may be extended by agreement. The average for these Class 2 modifications has been about 111 days. Class 1 modifications are self-implementing, although the NMED will make a determination of completeness prior to incorporating them into the permit. This determination has taken an average of 226 days.

The WIPP "top-ten" list of approved permit modification accomplishments is shown in Table IV.

Table IV WIPP "Top-Ten" list of approved permit modifications

Number	Title
1	Compositing of container headspace gas samples for analysis
2	Drum age criteria (DAC) for specific packaging
3	Removal of the prohibition on the disposal of mixed waste containing PCBs
4	No gross alpha and beta measurements in groundwater
5	The approval of an Online Headspace Gas Sampling (LANL System)
6	The reduction of headspace gas sampling frequency for thermally treated and non-VOC waste
7	Use of a single core (vs composite of three sections) for solids analysis on homogenous solid waste
8	The determination of the radiography miscertification rate on Summary Category Group Basis
9	Addition of new hazardous waste numbers to the permit
10	Elimination of Financial Assurance requirements for the WIPP management and operating contractor

These changes meet several of the priorities in Table III, particularly those established by the National TRU Program to accelerate waste shipment to WIPP for disposal.

Significant pending modifications include the remote-handled TRU waste authorization; redesign of Panel closures; sealed sources; new drum age criteria values for 100-gallon drums, 85-gallon drums, and direct loaded ten drum overpacks; and expanding the storage capacity of the WIPP facility storage units to accommodate accelerated waste shipment. These modifications are important for many reasons, including the following:

- WIPP will continue its mission of disposing all of the wastes intended
- Panel closures will be constructed that serve their intended purpose without undue operational impacts and costs
- Potential radiation exposure to workers will be reduced for those who will be responsible for characterizing sealed sources
- Appropriate drum age criteria will be established for containers such that the characterization process is not delayed for these drums.

In addition, in response to a Public Law 108-137 [3], the Permittees recently submitted a modification to eliminate headspace gas sampling and analysis, solids sampling and analysis, and visual examination as a quality control check on radiography as waste confirmatory techniques. In addition, this modification reduces the use of radiography from 100 percent to 10 percent for confirming the acceptable knowledge used to characterize the waste; revises the way material parameter weights are estimated for the waste; and enhances the volatile organic compound monitoring program at the WIPP repository. This

modification uses the results of the data collected for over 40,000 containers of TRU waste and the experience in performing characterization activities at the generator sites for these waste to shape justifications for a reduction in the characterization program. If this modification is approved, it will provide additional benefits in the form of $700 million savings [4] in characterization program costs, and 443,000 hours of exposure to workers [5] will be eliminated.

PLANNED MODIFICATIONS

Several major modifications are planned for the WIPP permit including ones to streamline the training program and the Contingency Plan, and to remove several solid waste management units from the permit's corrective action section.

LESSONS LEARNED AFTER FIVE YEARS

Experience since the issuance of the HWFP in October 1999 has taught the Permittees some valuable lessons as follows.

Involve the Users in the Solution

The Permittees have learned that modifications must be based on input from the permit users. For WIPP this includes both the generator sites and the plant operating staff. Users understand the day-to-day problems associated with compliance to permit requirements and can generally identify those requirements that need to be changed to facilitate compliance or eliminated because they are not needed. Once modifications are drafted, the users review them to assure the proposed regulatory language accomplishes the goal and does not further exacerbate the situation. Finally, once modifications are approved, users are provided clear guidance for implementation, which may include conducting implementation workshops or visiting the users in their workplace to assist in implementation.

Open Discussions with the Regulator

Good policy is not to surprise the regulatory agency and to make sure that the NMED is regularly apprised of the Permittees' goals for the permit. The Permittees discuss plans to submit permit modifications well in advance of submittal and let the agency suggest the best time frames in order to prevent work overload. In technical discussions with the NMED, the Permittees determine the amount of justification that will be required to support the modification request. It is also important that the regulator know what the Permittees' priorities are with regard to permit changes. The regulator is invited to meetings with stakeholders to keep everyone on the same page.

Discussions with Stakeholders

Stakeholder involvement is a regulatory mandate. The Permittees have made it a priority to go beyond required publications and meetings and solicit early input from stakeholders. The Permittees have learned that this makes the process easy for the stakeholders and useful. The more comments identified and addressed early in the process, the easier it is for the regulator to provide a favorable ruling. Over-communicating is a virtue in the modification process. The Permittees provide access to copies of modifications, including drafts of some, to stakeholders. Technical presentations with technical experts available are held to respond to stakeholder questions.

CONCLUSIONS

The WIPP permit has changed much since its issuance in 1999. In part, this has been due to the large number of modifications that were needed to bring the permit, generator sites activities and WIPP facility operations into alignment. In addition, many improvements were needed to the permit to achieve the following goals:

- Mitigate potential health and safety risks
- Avoid regulatory compliance deficiencies
- Facilitate National TRU Program priorities
- Achieve costs savings
- Improve operational efficiency
- Eliminate non-regulatory based requirements
- Reduce administrative burdens
- Clarify the permit

The Permittees believe that significant improvements that have already been made through the modification process and more will be realized in the months to come. The process for modifying the permit does work, though at times it may seem that progress is slow. It is important for Permittees that the permit changes do not appear to be haphazard or reactionary. The Permittees believe that following a systematic strategy for modifying the permit and sharing this strategy as it evolves with the regulator and stakeholders have been the key to success for the first five years.

REFERENCES

1 Hazardous Waste Facility Permit Issued to the Waste Isolation Pilot Plant EPA No. NM4890139008, New Mexico Environment Department, Santa Fe, NM (1999).

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