

**WIPP Hazardous Waste Facility Permit 2010 Update
Ten Years Old and Counting -- 10210**

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ABSTRACT

Because of the nature of the waste being stored and disposed at the Waste Isolation Pilot Plant, a hazardous waste facility permit is required. The WIPP Permit was issued over 10 years ago and has undergone significant modification during that time. Additional modification is planned, once the pending permit renewal process is completed in late 2010 or early 2011. The modification process is well established in the regulations and the enhanced process used at the WIPP facility has resulted in greater transparency with regard to permit changes. The past year saw little actual modification to the Permit as the staff focused on preparing and submitting the renewal application. This notwithstanding, several modifications were prepared and are ready to submit when the renewal process is complete. The changes all represent significant improvement in the way the facility operates and can result in reduced cost and reduced risk of missing a compliance target. Further changes are planned to accommodate new containers and shipping packages as well as adding flexibility for waste management at the disposal facility.

INTRODUCTION

The Waste Isolation Pilot Plant (WIPP) facility is located in southeastern New Mexico, 26 miles east of Carlsbad, New Mexico. It is the United States (US) Department of Energy (DOE) permanent disposal location for transuranic (TRU) waste that results from the nuclear defense activities of the US. Only three waste forms are allowed for disposal at the WIPP facility. These are designated as homogenous solids, soil and gravel, and debris. In order to be eligible for shipment to the WIPP facility, a waste stream must meet the definition of transuranic waste which means it contains more than 100 nanocuries of alpha-emitting TRU isotopes per gram of waste (3700 Bq/g) with half-lives greater than 20 years (except for high-level waste) [1]. This waste falls into two categories depending on the dose rate at the surface for the waste container. Contact-handled transuranic waste (CH TRU) is TRU waste with a surface dose rate of 200 millirem per hour (mr/hr) or less (2 mSv/hr) and remote-handled transuranic (RH TRU) waste is TRU waste with a surface dose rate of 200 mr/hr (2 mSv/hr) or greater [1]. RH TRU waste that will be shipped to the WIPP facility cannot exceed 1,000 R/hr (10 Sv/hr).

Much of this TRU waste is TRU mixed waste meaning it contains both transuranic elements and chemical constituents considered to be hazardous under one or more federal laws. As of November 1, 2009, the WIPP facility has received over 8,000 shipments consisting of 64,500 cubic meters of TRU waste. Disposal operations began in March 1999.

Because the waste contains constituents that are considered as hazardous waste under the federal Resource Conservation and Recovery Act (RCRA) [2] and the New Mexico Hazardous Waste Act (HWA) [3] a permit is required to operate the WIPP facility as a hazardous waste storage and disposal facility. The federal RCRA standards, which have been incorporated into the New Mexico regulations by reference, have detailed permitting requirements that include either technical standards or environmental performance standards. For example, the regulations specify the technical standards for construction, operation and closure of a landfill.

Implementing these technical standards as specified in the regulations will assure protection of human health and the environment. On the other hand, facilities such as the WIPP facility, which is a mined geologic repository fall into the category of a “miscellaneous unit” and are subject to environmental performance standards [4] in addition to technical standards. In this regard, many of the conditions and requirements in the WIPP facility Permit were negotiated with the regulatory agency. Since the WIPP facility is the only mined geologic repository permitted in New Mexico (and the United States), there was no regulatory precedent available to use in establishing environmental performance requirements. Consequently, after the Permit was issued and as the facility began operating, it became necessary to modify the Permit to align Permit requirements with actual operational practices.

The WIPP facility Permit was issued by New Mexico on October 27, 1999. Since that time, the Permittees who are the DOE and Washington TRU Solutions LLC (WTS), the WIPP project management and operating contractor (MOC), have modified the original Permit for a number of reasons including:

- Clarifying Permit language
- Removing duplicative processes
- Authorize new processes
- Authorize remote-handled waste
- Authorize new containers
- Implement programmatic and organizational changes
- Implement new technologies
- Implement regulatory changes

The last year was somewhat different than previous years in that most of the Permit revision work was aimed at preparing modifications that have yet to be submitted. This is because two of the four modifications involved are related to resolution of compliance issues raised by the NMED and required extensive negotiation and discussion for resolution. The topics covered in the current modifications are:

- Changes to integrate groundwater monitoring under the Permit with scientific work being reported to the Environmental Protection Agency as part of compliance with 40 CFR 191;
- Changes to the Waste Analysis Plan to clarify the liquid prohibition and other topics
- Changes to add flexibility to the training program; and
- Changes to better define the contents of the WIPP Operating Record.

THE PROCESS FOR CHANGING THE WIPP PERMIT

When the US Environmental Protection Agency (EPA) promulgated final rules dealing with permit modifications, they stated: “The Agency believes that permits must be viewed as living documents that can be modified to allow facilities to make technological improvements, comply with new environmental standards, respond to changing waste streams, and generally improve waste management practices” [5]. In the rulemaking, the EPA provided definitive requirements for preparing, submitting and processing permit modifications. They established three levels of modification, referred to as Classes, depending on the amount of public participation needed. Class 1 modifications are simply notifications to the regulatory agency that a change has occurred or is about to occur. Items that fall into this category are spelled out in an Appendix attached to 40 CFR 270 [6]. Class 1 notifications are required to be made within 7 days of implementation. Class 2 modifications require between 90 to 120 days to complete and involve a 60 day public review period and a public meeting to answer questions regarding the modification. Class 3 modifications are similar to Class 2 except that a public hearing may be requested as part of the administrative process. Class 3 modifications may take 12 to 24 months depending on the complexity of the modification.

The Permittees at WIPP facility have submitted over 100 permit modifications in the first ten years of the permit. Most of these have been processed successfully. Several have been withdrawn for subsequent re-submittal or because of a change in operating plans. The modification process has been very successful for the WIPP project in that it has significantly reduced the cost of waste characterization and provided a variety of disposal containers ranging from 55-gallon drums to ten drum overpacks. In addition, RH TRU waste is now being disposed as the result of a permit modification approved in 2006. Figure 1 depicts the number of modifications that have been processed by the NMED since the Permit was issued.

While the regulations provide a basis for preparing and processing permit modifications, the DOE has adopted a greater transparency approach to Class 2 and Class 3 permit changes at WIPP. After a modification is developed and reviewed internally, a draft is provided to key stakeholder groups for review and comment. A stakeholder meeting is scheduled, usually two weeks after the draft modification is provided, in order to answer questions and receive comments. Comments are addressed to the fullest extent possible before the final modification is submitted to the NMED.

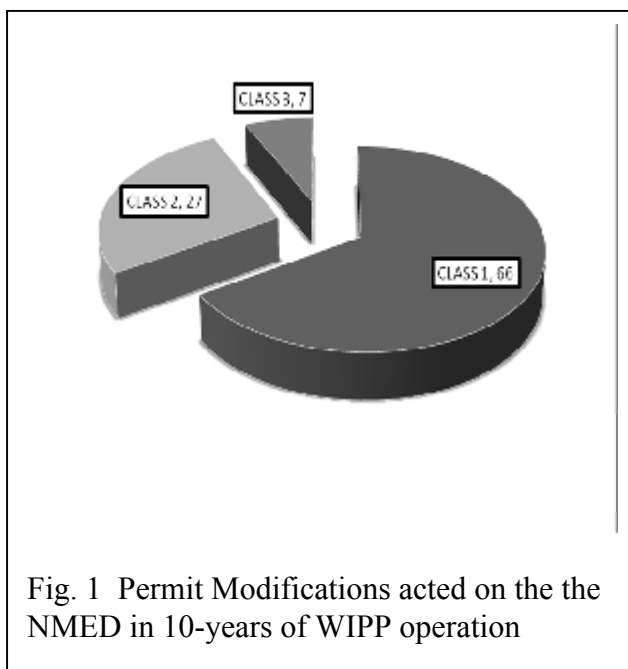


Fig. 1 Permit Modifications acted on the the NMED in 10-years of WIPP operation

In addition, the DOE has reserved a portion of its internet web site home page for Permit Related Documents, including drafts for stakeholder review and modifications submitted for processing

by the NMED. This process of engaging stakeholders early and often has resulted in a less contentious permitting process. For Class 3 modifications, the NMED has successfully implemented a process to negotiate issues prior to the public hearing in order to resolve as many of the issues as possible.

Table I depicts the process used by the DOE at WIPP for Class 2 and Class 3 permit modifications. If the modification is a Class 3, then the process continues with the issuance of a draft Permit incorporating the proposed and additional

Table I Permit Modification Process Used at the WIPP Project

Activity	Duration
Identify need for modification	
Write justification for modification	30-45 days
Prepare draft modification	30-45 days
Review of draft by stakeholders	14 days
Prepare final modification	30-45 days
Submit and conduct public comment period	60 days
Obtain decision from regulatory agency	Up to 60 days

opportunity for the public to comment and request a hearing. If a hearing is held, the Class 3 process could take several years to complete. In the case of two recent Class 3 modifications, one adding disposal units to the WIPP repository and another removing solid waste management units from the list of units needing remediation, the stakeholder interactions led to granting the permit modification without a public hearing.

PERMIT MODIFICATIONS IN PREPARATION

As previously stated, there are four modifications that are currently in some stage of preparation. One was submitted in January 2010. The others will not likely be submitted until after the permit is renewed in late 2010 or early 2011.

Modification: Liquid Prohibition And Waste Analysis Plan

The most recent submittal addresses the liquid prohibition in the Waste Analysis Plan. The NMED raised issues regarding the manner in which the liquid prohibition was being implemented with regard to inorganic sludges from Los Alamos. Specifically, the NMED asserted that because liquids that dewater from sludges are “pumpable, pourable, or aspirable”, e.g., they are removable; therefore they are prohibited by the Permit even if the overall volume is less than one percent of the payload container. The Permittees developed and submitted a permit modification to clarify language regarding the liquid prohibition, visual examination and non-conformance reporting. The language removes undefined or poorly defined terms such as “residual liquid”, “well-drained”, and “reasonably drained” and ties compliance to liquid that is capable of being observed using approved waste characterization methods such as radiography and visual examination. An overall waste container limit of one percent liquid by volume remains in effect. This will help generators by reducing the frequency of opening a waste container to remove small containers and laboratory glassware such as pipettes that are full or nearly full. This removes the radiological risks associated with sorting through containers of TRU waste looking for small glass tubes and containers. The proposed modification does not change the overall liquid volume limit established for the WIPP facility.

The permit modification also clarifies the use of visual examination, requires the Permittees to review the generator site choice of non-destructive examination method, and clarifies the nonconformance reporting language. These changes do not significantly change the way visual examination is used, they do assure, however, that the choice to use visual examination is appropriate for the waste stream being examined.

This modification was submitted on January 7, 2010, and is currently in the Public Comment Period.

Groundwater Program Modification

The WIPP groundwater program has been in place since initial site investigation in the late 1970s. When the DOE submitted the Permit application for the WIPP facility in 1996, no groundwater monitoring was proposed. Instead, the DOE took advantage of a provision in the regulations to request a waiver based on a demonstration of no-migration from the repository to the nearest water-bearing zone which is the Culebra Member of the Rustler Formation. Even though the DOE submitted a robust demonstration of no-migration, the NMED rejected this approach since it was their policy to require groundwater monitoring in the vicinity of all permitted disposal facilities. As the result, NMED requested the DOE submit a groundwater monitoring program consistent with the requirements of RCRA to be included in the Permit when issued. Under the Permit, this program focuses on chemical analysis of samples which demonstrate that no disposed waste is contaminating the overlying water bearing zones and to assure that no significant changes are occurring in the physical distribution of groundwater. In order to accomplish this, the program has two groundwater monitoring networks: one for groundwater chemistry and local water levels and one for regional water levels. Chemistry is being measured semiannually in seven wells and water levels are measured monthly in over 40 wells. Language in the Permit regarding the groundwater program is ambiguous in places, confusing the roles of the two monitoring networks. In addition, the maps required by the Permit do not necessarily have to be produced in the same manner as similar maps for compliance with EPA regulations, leading to additional confusion. Finally, the background values that were established as the basis for determining if contamination has occurred have never been incorporated into the Permit by the NMED.

The NMED directed the Permittees to develop and submit a Class 2 modification to resolve the ambiguities and confusion and to address other topics discussed by the NMED and the Permittees.

The resulting modification is nearly ready to submit, however, it will likely be held until the permit renewal process is completed in late 2010 or early 2011.

Training Program Improvement

When the Permit was issued, it contained a great deal of information regarding the training program. Much of this information was provided with the application for information. However, when the Permit was issued, the NMED elected to include the detail as part of the Permit. For example, lesson plans are included in the Permit with comprehensive listing of

course content. This detail hinders making timely changes to training to accommodate changes in consensus standards, such as the National Fire Protection Association (NFPA) code. Furthermore, this type of information is required by State and Federal regulations to be on file at the facility and not necessarily in the Permit. By keeping it on file, it is easier to manage and update as overarching standards change. As the result, the Permittees have prepared a permit modification that will update the training program by moving the details to the facility files and by eliminating job descriptions and training for several positions that no longer exist at the facility. This modification was submitted previously; however it was withdrawn at the suggestion of the NMED in order to better explain some of the changes that are proposed. This modification will be tabled until after the renewal process.

Changes To The Contents Of The WIPP Operating Record

One of the requirements of RCRA is to maintain an Operating Record. The contents of the Operating Record are listed specifically in 40 CFR 264.73 and include information on waste received for disposal, location of the waste in the facility, results of waste analysis, reports of incidents involving the Contingency Plan, manifests, training records, inspection records, monitoring, testing and analytical data, certifications, and other records specified by permits. The Operating Record is the proof that a facility has remained in compliance with the conditions of their permit and, therefore must be well managed and current. Record retention periods range from three years to the closure of the facility. For the WIPP facility, some of the records packages include the initial and annual generator site audit reports; each audit report may include two to three “banker’s boxes” of documentation, all of which must be retained in the Operating Record. Recent regulatory changes were made in the requirements for retaining documents in the facility Operating Record. With these changes in mind, the Permittees propose to change the Permit to assure compliance with the Operating Record regulations. This will involve focusing the content of the Operating Record to consist of only those items specifically listed in the regulations and moving other records mandated by the Permit into facility files. In addition, current retention periods will change to reflect the NMED’s new codification of the federal regulations. Overall, the change will provide flexibility in how and for what time period records are stored at the facility.

FUTURE CHANGES

There are several further changes that are on the drawing board and will likely not be finalized until the renewed Permit is issued. These are summarized below:

- TRUPACT III—TRUPACT III will soon be available to transport standard large boxes to the WIPP facility for disposal. Both the TRUPACT III and the standard large box will be added to the Permit as acceptable containers for the WIPP facility.
- Panel Closures—the current panel closure involves the construction of a large concrete monolith in the underground. Construction of the monolith under these conditions and using the mixture that the NMED has specified in the Permit will not meet the performance standards in the Permit. Therefore, a change is necessary. The Permittees are currently collecting data to use in proposing a final panel closure design. Concepts

are being evaluated, and when ready, will be submitted to the NMED as a permit modification.

- Alternate Waste Haulage Route—the Permittees will seek to use a different north-south tunnel at the WIPP facility for moving waste from the Waste Shaft to the disposal room. This alternate haulage route will allow the current route to undergo maintenance without restricting waste disposal activities. The proposed route is different than the description in the Permit with regard to both vehicle traffic and ventilation. As the result, a modification will be needed.
- Shielded Containers—the DOE has adopted a shielded container as a means to manage some RH TRU waste as CH TRU waste. This container will require a permit modification in order to address handling at the facility and to indicate how the waste volume will be tallied relative to facility limits.

CONCLUSION

Modifying the WIPP facility Permit to adjust for changes in operations, to improve waste characterization processes, to eliminate confusion, and to accommodate a more flexible implementation has been a tool that the Permittees have used successfully over the last 10 years. The modification process will remain an important aspect of the WIPP program. Although the past year saw little actual modification to the Permit as the staff focused on preparing and submitting the renewal application, the Permittees have not abandoned their commitment to continue to improve the Permit while keeping operations safe and protective of human health and the environment. Several modifications were prepared and are ready to submit when the renewal process is complete. The changes all represent significant improvement in the way the facility operates and can result in reduced cost and reduced risk of missing a compliance target.

REFERENCES

1. Public Law 102-579, The Waste Isolation Pilot Plant Land Withdrawal Act, as amended by Public Law 104-201 (H.R. 3230, 104th Congress)
2. Resource Conservation and Recovery Act (RCRA), 42 U.S.C. s/s 6901 et seq (1976)
3. New Mexico Hazardous Waste Act [HWA; Chapter 74, Article 4 NMSA 1978]
4. 20.4.1.100 New Mexico Administrative Code (NMAC) [incorporating 40 CFR 260.10, “miscellaneous unit”]
5. Environmental Protection Agency, “Hazardous Waste Permit Modifications”, 53 FR 37912, September 28, 1988
6. 20.4.1.900 New Mexico Administrative Code (NMAC) [incorporating 40 CFR 270.42]