Minimization of Risk and Cost Associated with Transuranic Mixed-Waste Characterization - 14143

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ABSTRACT

On March 13, 2013, the New Mexico Environment Department (NMED) approved a Class 2 Hazardous Waste Facility Permit (Permit) modification request (PMR) for the Waste Isolation Pilot Plant (WIPP) facility entitled, "Revise Waste Analysis Plan Waste Characterization Methods." This permit modification served to eliminate redundancy in transuranic (TRU) mixed-waste characterization by removing the requirement for generator/storage sites to routinely characterize their wastes using chemical sampling/analysis, thereby reducing waste characterization complexity, personnel radiation exposure, and cost. Chemical sampling/analysis requirements had historically included the following: (1) headspace-gas sampling/analysis of all waste containers initially, then subsequently changed to only debris waste containers, and (2) solids sampling/analysis of soils/gravel and homogeneous solids waste containers. The generator/storage sites of TRU mixed waste were required to use acceptable knowledge (AK) to identify the Environmental Protection Agency (EPA) hazardous waste numbers (HWNs) applicable to the waste and, subsequently, chemical sampling/analysis for the purpose of "resolving" the assignment of HWNs. The Resource Conservation and Recovery Act (RCRA) regulations do not require the waste generator to resolve the assignment of HWNs using a secondary characterization method. Because the treatment standards associated with the Land Disposal Restrictions do not apply to the waste designated by the Secretary of Energy for disposal at the WIPP facility, HWN assignment does not affect the management and disposal of waste at the WIPP facility. The Permittees only need to be concerned with whether or not the assigned HWNs are allowed by the Permit. In preparing the PMR, the Permittees maintained that the RCRA standards for general waste analysis that are applicable to treatment, storage, and disposal facilities (TSDFs), such as the WIPP facility, were those found in 40 Code of Federal Regulations (CFR), Part 264, Section 264.13 (40 CFR 264.13). The information that had been gained from chemical sampling/analysis activities was not being used to make decisions regarding the storage and disposal of waste at the WIPP facility. Therefore, the Permittees proposed to meet the RCRA standards by requiring the generator/storage sites to use (1) AK to classify TRU mixed waste as hazardous and assign the appropriate EPA HWNs and (2) non-destructive examination (i.e., radiography and/or visual examination (VE)) to verify that the characteristics of the waste were within the parameters necessary to ensure safe storage and disposal of the waste. The NMED evaluated, processed, and approved the Permittees' PMR in accordance with the requirements specified in 40 CFR 270.42(b), which also included a 60-day public comment period. It is currently estimated that approximately $5,000,000 per year in chemical sampling/analysis costs will be avoided by WIPP waste characterization programs with the change in chemical sampling/analysis requirements.

INTRODUCTION

The U.S. Department of Energy (DOE) is responsible for the safe management and disposal of TRU waste produced in defense-related activities. The WIPP facility began accepting defense-related TRU waste on March 26, 1999, becoming the nation's first and only deep geologic repository for the permanent disposal of defense-generated TRU waste. The shipment of TRU mixed waste (TRU waste that is also a RCRA hazardous waste) began the following year.

Because TRU mixed waste is also a hazardous waste, it is subject to regulation under the RCRA and the New Mexico Hazardous Waste Act. The NMED issued the Permit in 1999 to allow the DOE to store and dispose of TRU mixed waste at the WIPP facility in accordance with 40 CFR Part 264 (the standards for owners and operators of hazardous waste TSDFs). The primary purpose of this Permit is to regulate the design, construction, maintenance, operation, and closure of the WIPP facility in a manner that will ensure the protection of human health and the environment from the hazardous components of the waste. The NMED regulates the releases of non-radiological hazardous constituents during the operational phase and for a 30-year post-closure period. The Permit contains a Waste Analysis Plan (WAP) that describes waste characterization activities to be performed at the generator/storage sites prior to shipment of the waste to the WIPP facility. Waste characterization requirements described in the WAP are intended to provide a detailed chemical and physical analysis of a representative sample of the waste in accordance with 40 CFR 264.13. Both contact-handled and remote-handled TRU mixed wastes are permitted for storage and disposal at the WIPP facility. The Permittees for the WIPP facility Permit are the DOE and Nuclear Waste Partnership LLC.

The original 1999 Permit required the Permittees to use headspace-gas concentrations obtained from all TRU mixed waste containers received at the WIPP facility to calculate emissions of volatile organic compounds (VOCs) from the repository during the operational phase of the WIPP facility. These emissions would be compared to the risk-based concentration limits to ensure that the environmental performance standards were met. In 2006, the Permit was modified to reflect the Section 311 Congressional mandate [1] to demonstrate compliance with the environmental performance standards through room-based VOC monitoring, thereby eliminating the need to obtain VOC headspace-gas concentrations from each container of waste. At that time, the Permit requirements were modified such that headspace-gas sampling/analysis, as well as solidified-waste sampling/analysis, was to be conducted on a statistically-based subpopulation of the waste for the purposes of "resolving" the assignment of HWNs as determined through AK. Chemical sampling/analysis was no longer to be used for making decisions regarding the management, storage, or disposal of waste at the WIPP facility.

In December 2012, the Permittees submitted a Class 2 PMR to the NMED. The PMR proposed "changes to waste sampling and analysis methods" by utilizing solely AK, radiography, and VE to provide the RCRA-required detailed physical and chemical analyses of the waste.

DISCUSSION

Regulatory Background

The regulations in 40 CFR 264.13(b) require a written WAP that specifies parameters for measurement and the waste analysis methods that will be used to determine the parameters. According to the EPA guidance document, Office of Solid Waste and Emergency Response (OSWER) 9938.4-03, "Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Waste," methods are specified that are appropriate for each parameter [2], and only one method is needed for each parameter. One of the waste parameters identified in the Permit is the identification of HWNs. The Permit already required AK to be used for the identification of HWNs for a waste stream, but it also required the use of chemical sampling/analysis to resolve the assignment of HWNs identified using AK. Thus, the Permit required the use of more than one method for determining this parameter: (1) AK and (2) chemical sampling/analysis.

A Permit modification was necessary to eliminate redundancy in waste characterization by removing the requirement for generator/storage sites to routinely characterize their wastes using chemical sampling/analysis, thereby reducing waste characterization complexity, personnel radiation exposure, and cost. Since the information gained from chemical sampling/analysis activities was no longer being used to make decisions regarding the storage and disposal of TRU mixed waste at the WIPP facility and was not required to meet the RCRA regulations, continued and ongoing characterization using chemical sampling/analysis was unwarranted.

The PMR proposed to require the generator/storage sites to characterize their waste using solely the methods of AK, radiography, and VE. The PMR also proposed to remove the activities associated with chemical sampling/analysis from the Permit, specifically the requirements associated with headspace-gas sampling/analysis and homogeneous-solids and soil/gravel waste sampling/analysis. The Permittees proposed to meet these standards by requiring the generator/storage sites to use (1) AK to classify TRU mixed waste as hazardous by assigning the appropriate HWNs and (2) non-destructive examination (i.e., radiography and/or VE) to ensure that the waste is within established parameters (i.e., the waste contains no prohibited items). Radiological waste characterization is not covered by the Permit and was, therefore, not a topic of the PMR.

The RCRA regulations and published EPA guidance documents allow the use of AK to characterize hazardous waste. As a basis for the development of the original WAP, the Permittees used the EPA guidance outlined in OSWER 9938.4-03. Although OSWER 9938.4-03 states that "[w]herever feasible, the preferred method to meet the waste analysis requirements is to conduct sampling and laboratory analysis," the document further states in the next paragraph that "generators and TSDFs also can meet waste analysis requirements by applying acceptable knowledge. Acceptable knowledge can be used to meet all or part of the waste analysis requirements" [2]. In addition, the EPA and Nuclear Regulatory Commission (NRC) have jointly issued guidance which encourages the use of AK for radioactive mixed waste due to the inherent health and safety risks associated with its sampling and analysis. The citation specifically states that "[t]he use of waste knowledge by a generator and/or a TSDF to

characterize mixed waste is recommended throughout this document to eliminate unnecessary or redundant waste testing." This guidance is provided in Federal Register (FR) citation 62 FR 62079, "Joint NRC/EPA Guidance on Testing Requirements for Mixed Radioactive and Hazardous Waste" [3]. The following discussion describes how compliance with the waste analysis standards of 40 CFR 264.13 is achieved without the use of chemical sampling/analysis, thereby meeting the intent of the NRC/EPA guidance to minimize risk to workers.

In accordance with 40 CFR 264.13(a)(1), waste analysis must provide all the information that must be known to treat, store, or dispose of the waste in accordance with 40 CFR Parts 264 and 268. The regulations in 40 CFR Part 268, which pertain exclusively to treatment standards and land disposal prohibitions, are not applicable to waste designated by the Secretary of Energy for disposal at the WIPP facility. Typically, a TSDF must develop a WAP to obtain a detailed chemical and physical analysis of the waste to ensure that the treatment standards specified in 40 CFR Part 268 are met prior to land disposal. However, Section 9(a)(1)(H) of the Land Withdrawal Act Amendment (Public Law 104-201) exempted waste designated by the Secretary of Energy for disposal at the WIPP facility from the treatment standards and associated prohibitions [4]. Applicable portions of 40 CFR Part 264 are the standards set forth in the following subparts:

- 40 CFR Part 264, Subpart I, "Use and Management of Containers"
  - 40 CFR 264.172, "Compatibility of waste with containers"
  - 40 CFR 264.176, "Special requirements for ignitable or reactive waste"
  - 40 CFR 264.177, "Special requirements for incompatible wastes"
- 40 CFR Part 264, Subpart X, "Miscellaneous Units"
  - 40 CFR 264.601, "Environmental Performance Standards"

As specified in 40 CFR 264.13(a)(2), the waste analysis may include data developed under 40 CFR Part 261, the standards pertaining to the identification of hazardous waste, and existing published or documented data on the hazardous waste or on hazardous waste generated from similar processes. The regulation in 40 CFR 262.11 assigns the responsibility of determining if waste is hazardous as defined in 40 CFR Part 261 to the waste generator. In making hazardous waste determinations, the generator may use testing (including chemical sampling/analysis) of the waste or "knowledge of the hazard characteristic of the waste in light of the materials or the processes used" in accordance with 40 CFR 262.11(c)(2).

As described in OSWER 9938.4-04, AK consists of "process knowledge" and may also include chemical sampling/analysis data obtained by the waste generator [2]. The PMR did not restrict generator/storage sites from using chemical sampling/analysis as a means for characterizing TRU mixed waste streams. For instance, generator/storage sites may need to conduct chemical sampling/analysis of some waste streams to resolve discrepancies in AK information and complete a hazardous waste determination as required by 40 CFR 262.11. In such cases, the chemical sampling/analysis information and data would be incorporated into the AK record for those waste streams. The March 13, 2013, revision to the Permit added a condition which stated that if the NMED or the Permittees identified a discrepancy regarding the assignment of HWNs not authorized by the Permit, the generator/storage site would be required to perform

additional evaluation and/or characterization of the waste stream, which may include chemical sampling/analysis of the waste [5].

The revised Permit allows the Permittees to use the AK obtained from the generator sites to satisfy 40 CFR 264.13(a)(1) and 264.13(a)(2) in lieu of chemical sampling/analysis. Once EPA HWNs have been applied, there is no regulatory requirement to "resolve" this application as a result of chemical sampling/analysis as was required by the Permit. Furthermore, because the treatment standards and land disposal prohibitions do not apply to the waste designated by the Secretary of Energy for disposal at the WIPP facility, HWN assignment does not affect the management and disposal of waste. The Permittees need only be concerned whether or not the assigned HWNs are allowed by the Permit.

Previously in the Permit, there were two opportunities for HWNs to be assigned to waste streams: (1) during initial waste stream profiling and (2) during subsequent chemical sampling/analysis. To demonstrate the accuracy of assigning HWNs to the NMED, an evaluation was conducted on 251 Waste Stream Profile Forms (WSPFs) that were approved from April 8, 1999, to March 15, 2012. Of the 251 WSPFs that were evaluated, 19 (or 7.6%) had HWNs added due to resolving EPA HWN assignment using chemical sampling/analysis as required by the Permit. All of the added HWNs were authorized by the Permit, and none affected the management, storage, and disposal of the waste at the WIPP facility. Additionally, a WSPF could be revised if EPA HWNs were added to a waste stream due to subsequent chemical sampling/analysis to resolve EPA HWN assignment as specified in the Permit. Ten (10) WSPFs were revised from April 8, 1999, to March 15, 2012. None of these revisions resulted from chemical sampling/analysis to resolve assignment of EPA HWNs. Therefore, the Permittees were able to demonstrate that AK is an accurate method for determining HWNs.

The Permittees also examined projected waste streams listed in the 2012 Annual Transuranic Waste Inventory Report (ATWIR), which was issued in October 2012 [6]. About 60 future waste streams are identified in the ATWIR as either WIPP-bound waste or as potential waste. This inventory represents a final-form volume of about 9,800 cubic meters of TRU waste. Of this total, no HWNs are specified for approximately 6,900 cubic meters. For the most part, this is because the AK record has not yet been compiled for this waste. Because the descriptions of these waste streams indicate they are generated by processes that generated waste already shipped to the WIPP facility, the Permittees had no reason to anticipate that these waste streams would require chemical sampling/analysis in order to complete the characterization process. Based on the descriptions in the ATWIR, future inventories do not significantly vary from experience and the current inventory. Therefore, the conclusions regarding the need for chemical sampling/analysis based on experience is expected to hold for future waste streams.

The regulation in 40 CFR 264.13(b)(1) states, in effect, that the owner or operator of a TSDF must develop and follow a written WAP. This plan, among other things, must specify the parameters for which each hazardous waste or non-hazardous waste, if applicable, will be analyzed and the rationale for the selection of these parameters (i.e., how analysis for these parameters will provide sufficient information on the properties of the waste to comply with paragraph (a) of 40 CFR 264.13). The applicable standards from 40 CFR Part 264, Subparts I

and X, as well as applicable requirements specified in the general Permit provisions [5] are included in Table I, “Summarized RCRA basis for selection of TRU mixed waste parameters.” The identification of waste parameters, rationale for selection, and proposed characterization methods were developed using guidance from OSWER 9938.4-03 [2].

In order to meet the requirements of 40 CFR Part 264, Subparts I and X, the Permittees were required to demonstrate that the chemical constituents associated with HWNs authorized by the Permit were compatible with the waste, waste containers, and disposal system. The HWNs authorized by the Permit were evaluated for chemical compatibility using the most current EPA method available [7] and have been determined to meet the compatibility requirements of the Permit. This compatibility study evaluated chemical compatibility associated with all of the toxicity-characteristic and listed HWNs currently authorized by the Permit. The study was comprehensive in that the only HWNs not evaluated were listed HWNs and toxicity-characteristic HWNs associated with pesticides, fungicides, and herbicides, which are known not to be in the waste destined for disposal at the WIPP facility. In addition to chemical compatibility, waste material parameter weights must be estimated, and it must be determined that no ignitable, reactive, or corrosive wastes (EPA HWNs D001, D002, and D003) are stored or disposed at the WIPP facility. These assurances are provided through the use of AK and radiography and/or VE to verify the absence of prohibited items, not through the use of chemical sampling/analysis.

Because the Permittees are operating a TSDF that accepts waste from off-site facilities, and rely on the information developed by the generators sending the waste, the Permittees are still responsible for obtaining accurate waste analysis information. To accomplish this, the Permittees require the generator/storage site to produce waste information that is consistent with the following requirements in the Permit:

- Generator/storage sites are required to develop a Quality Assurance Project Plan (QAPjP) that mirrors the requirements in the Permit and must provide a list of the procedures that implement the requirements in the QAPjP. The Permittees must approve the QAPjP prior to generator/storage sites performing characterization of waste for shipment to the WIPP facility.
- The Audit and Surveillance Program provides the assurance that the generator/storage site waste characterization program produces information that will allow the Permittees to meet their obligation for accurate waste analysis information.
- Generator/storage sites provide radiography and VE results in batch data reports (BDRs) that must pass through three levels of data review before data are considered complete and released for waste analysis purposes. The three levels of review are (1) data generation level review, (2) independent technical review, and (3) project level review.
- Once a waste stream has been characterized, the Site Project Manager must also submit a WSPF and Characterization Information Summary, which is used as the basis for acceptance of waste characterization information by the Permittees.

TABLE I. Summarized RCRA basis for selection of TRU mixed waste parameters

Regulatory Reference(s)	Waste Parameters	Rationale for Selection	Characterization Methods
• General Permit Provisions	• Liquid waste • Non-radionuclide pyrophoric materials • Hazardous waste not occurring as co-contaminants with TRU mixed wastes • Wastes containing explosives or compressed gases • Waste with polychlorinated biphenyls not authorized under an EPA polychlorinated biphenyl waste disposal authorization • Excluded waste	Prohibited from acceptance at the WIPP facility. Characterization methods needed to establish absence of these prohibited parameters.	AK and Radiography/VE
• General Permit Provisions • 40 CFR 264.176	Waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA HWNs D001, D002, and D003)	Prohibited from acceptance at the WIPP facility. Characterization methods needed to establish absence of these prohibited parameters.	AK and Radiography/VE
• General Permit Provisions • 40 CFR 264.177 • 40 CFR 264.172	• Identification of EPA HWNs • Waste compatibility with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes	All identified EPA HWNs assigned to TRU mixed waste must be allowed by the Permit. EPA HWNs allowed in the Permit are compatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes based on a documented compatibility evaluation.	AK and Radiography/VE
40 CFR 264.601	• Waste material parameter weight estimates • Identification of EPA HWNs, including D001, D002, and D003 • Waste compatibility	Physical and chemical characteristics of the waste are needed for compliance with environmental performance standards as demonstrated by the Performance Demonstration provided in the original Part B Permit Application.	AK and Radiography/VE

The regulations in 40 CFR 264.13(a)(4) and (c) state that off-site TSDFs must inspect and, if necessary, analyze each hazardous waste movement received at the facility to determine whether it matches the identity of the waste specified on the accompanying manifest or shipping paper. These activities are often referred to as “fingerprint analysis” and are aimed at corroborating information about the waste collected by the generators. For the purposes of fingerprint analyses, redundant testing (radiography and/or VE) for waste parameters is appropriate to verify that the waste generated, and received by the Permittees at the WIPP facility, matches the expected characteristics of the waste. It should be noted that OSWER 9938.4-03 clarifies that “[a]cceptable knowledge is not an appropriate substitute for fingerprint or spot check procedures” [2]. Chemical sampling/analysis that had been conducted in accordance with the Permit was never considered fingerprinting. Fingerprint analysis is accomplished through the Waste Confirmation Program [5], which does not involve chemical sampling/analysis and remained unaffected by the March 13, 2013, revision to the Permit.

Risk reductions

Activities related to chemical sampling/analysis that may pose a risk to workers include the retrieval of randomly-selected containers, sample collection, and packaging of waste samples during operations at the generator/storage sites. Generally, experience has shown that the more waste handling that is required to perform a given characterization activity, the greater the worker radiation doses. Since the WIPP facility opened in 1999, the collective worker dose has increased due to the number of shipments of TRU mixed waste that have been received. Worker doses at the WIPP facility average only 1-2 millirems per year for all monitored workers, and no exposure has been reported for a majority of monitored workers. This is very low in comparison to the applicable permissible regulatory dose limit of 5,000 millirems per year, reflecting, in part, waste characterization activities being performed at the generator/storage sites before shipment to the WIPP facility. At the generator/storage sites where the characterization is performed, worker doses are higher, but they are still well below the regulatory limits [8].

OSWER 9938.4-03, Section 1.5.2, Page 1-14, specifically states that TSDFs may use AK alone in situations where “health and safety risks for personnel would not justify sampling and analysis (e.g., radioactive mixed waste).” The joint NRC/EPA guidance found in 62 FR 62079 reinforces this statement; it specifically “emphasizes the use of knowledge, whenever possible, to determine if a waste is hazardous as a way to avoid unnecessary exposures to radioactivity” [3]. Although chemical sampling/analysis of TRU mixed waste for disposal at the WIPP facility has been historically performed, the process of obtaining samples and performing subsequent analyses poses incremental and increased radiation exposure to the individuals conducting such activities. In addition, these activities require significant expenditure in additional equipment and controls to adequately protect personnel from radiological contamination and exposure. The process of coring to obtain samples of homogeneous solids and soil/gravel waste generates additional waste that must then be disposed. For remote-handled TRU mixed waste, high radiation levels typically require remote-controlled and shielded equipment and facilities just to handle and move containers, much less to intrusively open and sample these

containers. Special equipment and facilities are generally required to transport and analyze collected remote-handled TRU mixed waste samples as well.

As stated previously, the information gained from continued chemical sampling/analysis activities was not being used to make decisions regarding the management, storage, and disposal of TRU mixed waste at the WIPP facility. Therefore, in keeping with the DOE's philosophy of maintaining radiation exposures to workers "As Low As Reasonably Achievable," any exposure due to unnecessary activities cannot be justified.

Cost avoidance

Figure 1, "Stages of chemical sampling/analysis data generation and handling," is a generalized depiction of the steps involved in generating, reviewing/approving, and using data obtained through chemical sampling/analysis. The majority of these steps took place at the generator/storage site level.

Prior to the Permittees' certification of a generator/storage site's characterization program, the site must develop plans and procedures that implement the requirements of the WAP. Currently, there are two WAP characterization programs that conduct waste characterization on behalf of the generator/storage sites, the Central Characterization Project and the Advance Mixed Waste Treatment Project. An initial certification audit must be conducted of the characterization program, and recertification audits must be conducted annually at each site. The audit checklist for the RCRA portion of the certification audits was reduced by approximately 50% with the issuance of the revised Permit in March 2013. Over 25 project and site-specific procedures pertaining to chemical sampling/analysis became obsolete. The cancelling of these documents eliminated manpower associated with maintenance, implementation, and personnel training.

Labor associated with statistical evaluations for individual waste streams was also greatly diminished upon approval of the PMR. Maintenance of random-selection containers lists is no longer required since all waste containers now undergo the same degree of characterization through AK and radiography or VE. The calculation of 90% upper confidence limits, which were once used to "resolve" the assignment of HWNs as part of waste-stream lot evaluations, are no longer relevant to the characterization of TRU mixed waste destined for disposal at the WIPP facility. These activities required the time of one full-time employee for each WAP characterization program.

Only one coring facility, located at the Idaho National Engineering Laboratory, was available to perform homogeneous solids and soil/gravel sampling. Therefore, sampling of packaged homogeneous solids and soil/gravel waste required transportation of containers selected for sampling to and from the coring facility. This resulted in additional transportation-related expenditures. For a given shipment of waste, it is estimated that it would have cost the generator/storage site $5 per mile, and approximately half of that value would have been required for the return trip. The containers selected for sampling were then required to be transported back to the generator/storage site until approved for shipment to the WIPP facility.

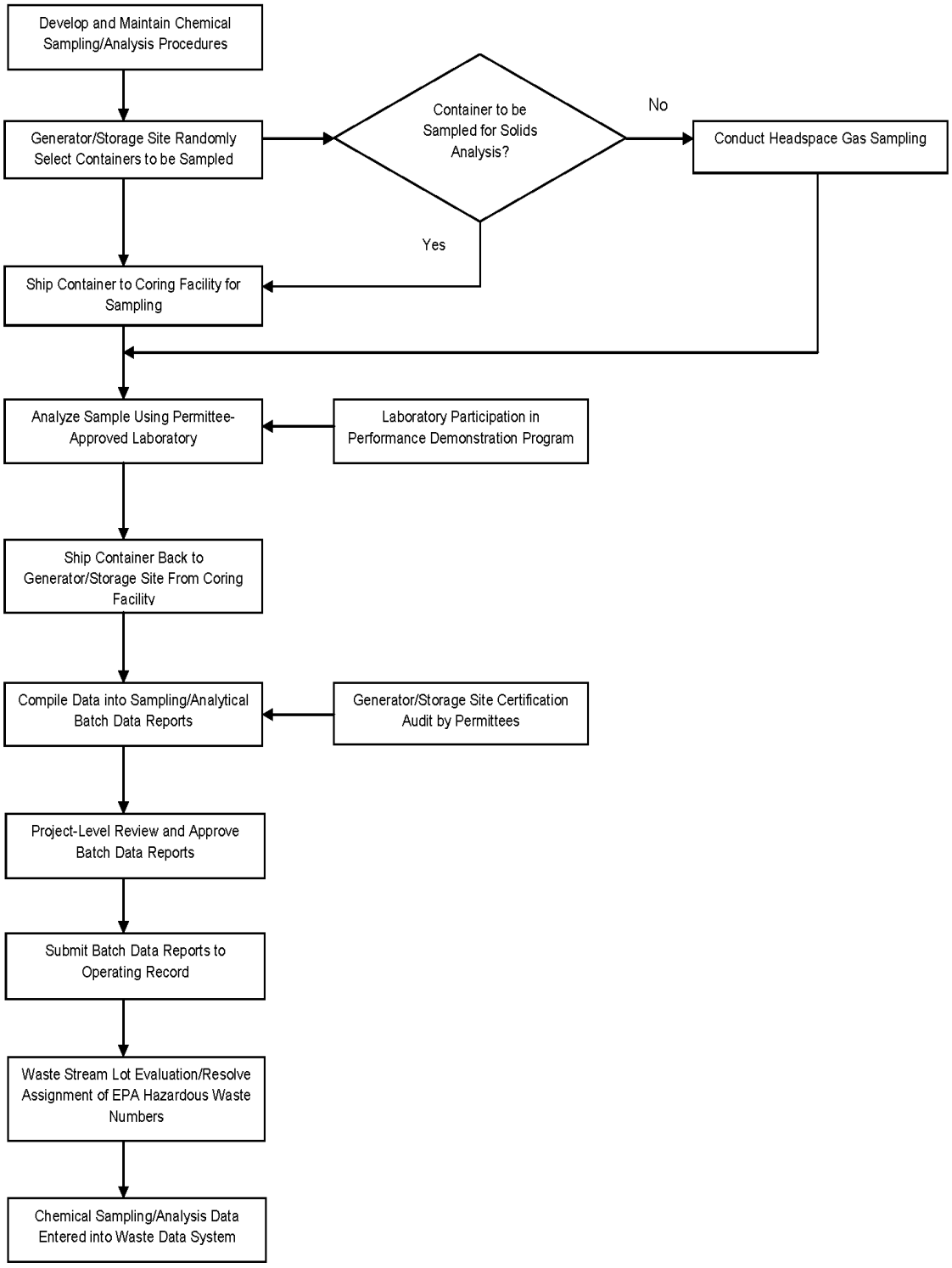

Fig. 1. Stages of chemical sampling/analysis data generation and handling

For example, if a one-way shipment was 2,000 miles, each round-trip shipment of waste containers to be sampled would have cost approximately $15,000. It is difficult to estimate the number of round-trip shipments that would have occurred per year, or how many randomly-selected containers would have been sent for coring at the same time, but it was not uncommon for generator/storage sites to make two to three shipments to the Idaho National Engineering Laboratory coring facility per year.

Other aspects of data generation and handling included the preparation of BDRs by the generator/storage site, the project-level review and approval of the BDRs, and maintenance of the data as part of the RCRA operating record. Table II shows the number of containers sampled and analyzed in 2011 and 2012. Each BDR contained data for up to 20 waste containers and required several days to be generated once the data have been obtained. At the project level, the Site Project Manager was required to perform a validation and verification of the data, which typically took up to one day per batch. Upon approval of the BDRs, characterization data were then entered into the Waste Data System.

It is estimated that $5,468,000 per year in chemical sampling/analysis costs will be avoided by the CCP and the AMWTP combined. The figures presented in Table III represent estimated DOE laboratory contract costs. Additionally, these laboratories were required to participate in DOE's Performance Demonstration Program on an annual basis as part of the DOE's Quality Assurance Program. From Fiscal Year 2007 through 2012, approximately $36,000,000 was incurred to perform chemical sampling/analysis that ultimately had no effect on how TRU mixed waste was managed, stored, or disposed of at the WIPP facility.

CONCLUSIONS

The information that had been gained from the chemical sampling/analysis activities previously required by the Permit was no longer being used to make decisions regarding the storage and disposal of waste at the WIPP facility. Through the Class 2 PMR process, the Permittees proposed to meet the RCRA standards by requiring the generator/storage sites to use AK and radiography and/or VE to characterize their wastes. The NMED evaluated, processed, and approved the Permittees' PMR in accordance with the requirements specified in 40 CFR 270.42(b) and revised the Permit on March 13, 2013. Approximately $5,000,000 per year in chemical sampling/analysis costs will be avoided by WIPP waste characterization programs with the change in chemical sampling/analysis requirements. Additional cost savings and efficiencies will be realized from the elimination or minimization of other activities associated with data package preparation, review, and recordkeeping; procedural maintenance and auditing; and statistical evaluations of data. Worker risks will also be reduced due to the elimination of chemical sampling/analysis activities at the generator/storage sites that may pose incremental and increase radiation exposure to individuals conducting such activities.

Table II. Number of containers with chemical sampling/analysis data

Sample Analysis Year	Generator/Storage Site	Headspace-gas	Solidified-waste
2011	Hanford Site	144	0
	Idaho National Engineering Laboratory	138	0
	Los Alamos National Laboratory	45	10
	Oak Ridge National Laboratory	6	0
	Sandia National Laboratories/New Mexico	11	0
	Savannah River Site	39	10
2012	Argonne National Laboratory - East	17	0
	Idaho National Engineering Laboratory	41	5
	Los Alamos National Laboratory	49	1
	Savannah River Site	256	18
Totals		**746**	**44**

Table III. Estimated cost avoidance associated with chemical sampling/analysis

Annual Cost Avoidance For:	Central Characterization Project	Advance Mixed Waste Treatment Project	Total
Coring Facility	Note (a)	$ 1,000,000.00	$ 1,000,000.00
Analytical Laboratory	Note (a)	$ 3,000,000.00	$ 3,000,000.00
Headspace-Gas Sampling/Analysis	$ 768,000.00	$ 700,000.00	$ 1,468,000.00
Totals	$ 768,000.00	$ 4,700,000.00	$ 5,468,000.00

(a) These costs are covered under the Advance Mixed Waste Treatment Project costs.

REFERENCES

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