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TRANSURANIC WASTE MANAGEMENT AT SANDIA NATIONAL LABORATORIES

The History, Current Status and Path Forward

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Abstract

This paper documents the history of the TRU program at Sandia, previous and current activities associated with TRU material and waste, interfaces with other TRU waste generator sites and the Waste Isolation Pilot Plan (WIPP), and paths forward for TRU material and waste. This document is a snapshot in time of the TRU program and should be updated as necessary, or when significant changes have occurred in the Sandia TRU program or in the TRU regulatory environment. This paper should serve as a roadmap to capture past TRU work so that efforts are not repeated and ground is not lost due to future inactivity and personnel changes.

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1. INTRODUCTION

Sandia National Laboratory (Sandia) is a multidisciplinary national laboratory and a Federally Funded Research and Development Center. Sandia applies advanced science and engineering to detect, repel, defeat, or mitigate national security threats. Sandia's primary mission is nuclear deterrence. Sandia develops technical solutions in homeland security; addresses the highest-priority risks associated with proliferation of weapons of mass destruction and catastrophic incidents; and assures energy supplies and the reliability and resilience of the energy infrastructure (1).

Sandia uses transuranic (TRU) materials in its research and development programs for the U.S. Department of Energy (DOE), and consequently generates TRU waste that qualifies for disposal at the Waste Isolation Pilot Plant (WIPP), located in Carlsbad, NM. In addition to Sandia-generated TRU waste, Sandia has stored legacy TRU material and waste and continues to store newly-generated TRU material and waste on behalf of others prior to shipment for final disposal.

2. BACKGROUND

A number of experiments have been and continue to be performed in support of programs that generate TRU waste. This report defines TRU waste and what is eligible for disposal at the WIPP; describes the past and present TRU program at Sandia; and lists the programmatic requirement documents governing final disposal of TRU waste.

2.1. Definitions

In March 1999, the WIPP, located in Carlsbad, NM, accepted the first shipment of defense TRU waste for emplacement in the geologic repository (2). Two criteria must be met to be considered TRU waste and be eligible for disposal at the WIPP. The first is that it must bear nuclides with an atomic number greater than 92 and meet the definition of TRU waste: Waste containing more than 100 nanoCuries (nCi) of alpha-emitting TRU isotopes per gram of waste, with half-lives greater than 20 years, except for (i) high-level radioactive waste; (ii) waste that the Secretary of Energy has determined—with the concurrence of the Administrator of the National Nuclear Security Administration—does not need the degree of isolation required by the disposal regulations; or (iii) waste that the Nuclear Regulatory Commission (NRC) has approved for disposal on a case-by-case basis in accordance with 10 CFR Part 61 (3).

Second, TRU waste streams must meet the definition of TRU "defense" waste, that is, it must have been generated in whole or in part by one of the atomic energy defense activities listed in *Nuclear Waste Policy Act of 1982* (NWPA) (4).

TRU waste eligible for the WIPP is either contact-handled (CH) or remote-handled (RH). CH TRU waste is defined as transuranic waste with a surface dose rate not greater than 200 millirem per hour (mrem/hr). RH waste is defined as waste with a surface dose rate of 200 mrem/hr or greater (5). These definitions indicate an overlap at 200 mrem/hr for CH and RH dose rate limits.

These dose criteria were set in the *WIPP Land Withdrawal Act* enacted by Congress and amended in the 104th Congress (5). Consequently, the definition is repeated in subsequent regulatory documents. In practice, DOE TRU waste generator sites handle waste containers as RH if the container measures 200 mrem/hr or greater on the surface of the waste container.

2.2. Sandia's TRU Mission History

Sandia conducts defense weapons research and development activities that generate TRU waste. The following sections provide a brief description of such activities, or of TRU waste stored at Sandia on behalf of other entities.

2.2.1. Severe Accident Scenario TRU Waste

In the late 1970s to mid-1990s, Sandia conducted reactor studies that primarily involved preparation of light water reactor (LWR) and liquid metal fast breeder reactor (LMFBR) experimental assemblies irradiated at Sandia to simulate severe accident scenarios. Following irradiation, post-irradiation examination was conducted in the Hot Cell Facility (HCF) at Technical Area V (TA-V). All of the experiments involved radioactive materials and/or fissile materials. The gloveboxes used to assemble, disassemble, and conduct post-irradiation experiments were decontaminated and the TRU waste generated was packaged in 55-gallon drums at the conclusion of the experiments. Additional TRU waste was generated in 2014-15 when the experimental assemblies were declared TRU waste, and were determined to be eligible for WIPP disposal and consequently were repackaged in compliance with WIPP requirements (6, 7).

2.2.2. Lovelace Respiratory Research Institute TRU Waste

In January 1997 and again in September 2004, Sandia took possession of TRU waste that had been generated and packaged at the Inhalation Toxicology Research Laboratory (ITRI), now known as the Lovelace Respiratory Research Institute (LRRI) located on Kirtland Air Force Base (KAFB). The TRU waste was generated in the late 1960s to mid-1970s, when LRRI was a DOE prime contractor. The research focused on the human health effects associated with inhalation of airborne radioactive fission products and TRU alpha-emitting radionuclides. Sandia agreed to store this waste until a disposal facility became available (8).

2.2.3. Sandia Miscellaneous TRU Waste

Sandia generates small amounts of TRU waste such as calibration sources and standards used in instrumentation or for research and development in threat detection and other programs. When these materials no longer meet the requirements of the project, experiment, or program, and cannot be used by others, they are declared TRU waste (9).

2.2.4. Sandia/LANL Pu-ICE TRU Waste

Sandia and Los Alamos National Laboratory (LANL) conduct a cooperative research effort, the Plutonium Isentropic Compression Experiments (Pu-ICE), performed at the Z pulsed-power generator (Z-machine) located in TA-IV at Sandia. LANL fabricates and ships Pu targets to Sandia where they are assembled into an experimental vessel and Sandia performs the

experiments. The TRU material used is considered LANL material throughout the entire process. The TRU waste generated at the conclusion of the experiment belongs to LANL. However, Sandia stores the experimental vessels until they are shipped back to LANL (10).

2.3. Relationship With WIPP and Other DOE TRU Generators

The WIPP is a DOE facility under the DOE Office of Environmental Management (EM) and the National TRU Program (NTP), and administered by the local Carlsbad Field Office (CBFO) (2). Sites generating TRU waste are divided into two categories, Large Quantity Sites (LQS), such at Idaho National Laboratory (INL) and LANL, and Small Quantity Sites (SQS), such as Sandia and Lawrence Livermore National Laboratory. Some are EM facilities, others are National Nuclear Security Administration (NNSA) facilities. There are also some commercial sites that generated defense TRU waste in the past. Generally, EM is responsible for legacy TRU waste and NNSA is responsible for newly-generated waste at the NNSA laboratories.

The WIPP is the only facility permitted and approved for the disposal of defense-related TRU waste. The requirements for characterizing, certifying, transporting, and disposal of the TRU waste can be found on the WIPP home page (2). The management and operating (M&O) contractor at WIPP supports geologic repository operations as well as provides support to the TRU waste generator sites. Generator site plans and procedures for characterizing, certifying, and transporting TRU waste must be approved by WIPP before implementation. Most LQSs have on-site certification programs, while the SQSs contract with the Central Characterization Program (CCP) (managed by the M&O contractor) to provide certified characterization, certification, and transportation services.

In May 2001, the CBFO, in coordination with DOE Headquarters, established a "WIPP Corporate Board", comprised of DOE site representatives as voting members, and contractors from each site as non-voting members. The Board meets twice a year at different DOE sites to discuss the status of WIPP, shipping schedules, regulatory issues and pending permit modifications, Nuclear Regulatory Commission (NRC) items related to shipping containers, and other issues of importance (11). The LQSs and SQSs present their status and issues. Representatives of the DOE Sandia Field Office (SFO) and Sandia have participated in this meeting since its inception.

WIPP conducts two conference calls each month in which Sandia participates, the RH site conference call and the SQS conference call (12). Each participating site provides status updates on TRU waste operations and other issues or questions. Discussions between participates, including headquarters and CBFO if in attendance, are encouraged.

2.4. Requirement Documents

The WIPP is approved by the U.S. Environmental Protection Agency (EPA) and permitted by the New Mexico Environment Department (NMED) for the disposal of TRU defense-related waste (2). As such, several state and federal regulatory documents describe requirements for characterization, certification, acceptance, transportation, and disposal of waste for the WIPP. The main requirements documents are listed in the following subsections with a brief description of each. These documents can be found either on the WIPP Home Page, under "Documents"; or, in the case of some transportation documents, at http://www.wipp.energy.gov/NTPXPort. The

transportation documents are not for public viewing on the website due the sensitivity of transportation schedules.

2.4.1. TRU Waste Acceptance Criteria for the Waste Isolation Pilot Plant

The *TRU Waste Acceptance Criteria for the Waste Isolation Pilot Plant* (WIPP WAC) (13), summarizes waste acceptance criteria for CH and RH TRU waste applicable to characterization, certification, transportation, storage, and disposal. It includes the criteria related to the physical, chemical, and radiological characterization of the waste and those properties applicable to the payload containers.

2.4.2. WIPP Hazardous Waste Facility Permit and Waste Analysis Plan

The *WIPP Hazardous Waste Facility Permit* (WIPP HWFP) *Waste Analysis Plan* (WAP) (14) authorizes the DOE to manage, store, and dispose of CH and RH TRU mixed waste at the WIPP. Mixed TRU waste is defined as containing both TRU radionuclides and chemical hazardous components. Chapter B of the WAP contains test methods, waste sampling, and analysis details for complying with the HWFP, and includes screening and verification processes for shipment. The WAP also includes a description of the quality assurance/quality control (QA/QC) requirements.

2.4.3. U.S. Environmental Protection Agency Compliance Certification for WIPP

The EPA initially certified WIPP's compliance with disposal regulations in May 1998 (15). The EPA compliance certificate documents compliance of the geologic, hydrologic, physical, chemical, engineered, and environmental characteristics of the repository. WIPP is recertified every 5 years.

2.4.4. Quality Assurance Program Document

The Carlsbad Field Office (CBFO) *Quality Assurance Program Document* (QAPD) (16) lists and discusses the QA program quality requirements for work sponsored by the CBFO. It uses a graded approach for implementation of the applicable requirements for activity management and control.

2.4.5. Remote-Handled TRU Waste Characterization Program Implementation Plan

The *Remote-Handled TRU Waste Characterization Program Implementation Plan* (17) identifies the characterization requirements and approved methods to meet the requirements of 40 CFR ⁄ 194.24, the EPA's Compliance Certification decision, and the WIPP Land Withdrawal Act (LWA). This document does not include the requirements in the WIPP HWFP, the transportation requirements, or WIPP operations and safety requirements.

2.4.6. Contact-Handled Transuranic Waste Authorized Methods of Payload Control (CH-TRAMPAC) and Remote-Handled Transuranic Waste Authorized Methods of Payload Control (RH-TRAMPAC)

The CH-TRAMPAC (18) and RH-TRAMPAC (19) define the applicable requirements for a payload to be transported to the WIPP or another facility in a TRUPACT-II, HalfPACT, TRUPACT-III, CNS 10-160B cask, or RH-TRU 72-B cask. It documents the acceptable methods to demonstrate compliance, and lists the QA program that applies to those methods.

2.5. TRU MATERIAL AND WASTE

Sandia's TRU program manages both TRU material and waste, and includes CH and RH waste. Only TRU waste can be disposed of at the WIPP, therefore the TRU material must be declared waste before final shipment to the WIPP. The requirements for CH and RH are similar, with some differences in the characterization methods used and shipment options.

2.5.1. Sandia Contact-Handled TRU

As described above, CH TRU waste has a contact dose rate of less than 200 mrem/hr. At Sandia, the CH TRU waste is managed by Department 4736, Waste Management/Pollution Prevention, at TA-III.

2.5.1.1. CH General Requirements

The WIPP WAC (13) summarizes the requirements for CH TRU waste to be accepted for disposal at the WIPP, and the WIPP HWFP/WAP (14) describes the characterization requirements to determine if the waste is hazardous. In general, CH TRU waste must meet specific criteria for:

- Container properties—weight limits, assembly configurations, filter vents
- Radiological properties—composition, fissile gram equivalent (FGE), plutonium equivalent Curies (PE-Ci), dose rate, decay heat
- Physical properties—no prohibited items such as explosives, reactives, flammables, liquids, aerosol cans, or sealed containers greater than 4 liters
- Chemical properties—hazardous constituents, chemical compatibility, headspace gas concentrations, prohibited materials
- Data package contents—characterization, certification, and shipping data

The WIPP WAC also includes specific quality assurance (QA) requirements for characterization, certification, and transportation.

Sandia, as an SQS, does not have a WIPP-certified program and in the past was required to characterize Sandia's CH TRU waste to meet Department of Transportation (DOT) requirements and INL waste acceptance criteria. Waste was transported to INL in TRUPACT-IIs, and INL performed the final WIPP certification before shipment to the WIPP. Future characterization and certification for Sandia's CH TRU waste will likely follow this same program.

2.5.1.2. CH Material History

As discussed above, Sandia has generated and continues to generate CH TRU (< 200 mrem/hr on contact) waste. Sandia did not generate LRRI CH TRU waste, but stored it until it was characterized and shipped to WIPP. Currently, Sandia temporarily stores the expended Pu-ICE experimental vessels until they are shipped to LANL for final characterization, certification, and shipment to WIPP. Each category is discussed in more detail below.

- Sandia CH TRU waste—TRU waste is generated in small quantities during research and development activities, predominantly debris from destructive and nondestructive experiments, examinations, decontamination and repackaging activities, and sealed radioactive sources used in equipment calibration, qualification and quality control. The waste may include cellulosics, plastic, rubber, glass, other inorganic materials, and metals. In some cases, liquid radioactive sources have been neutralized and solidified. Major transuranic radionuclides are plutonium and americium, and major non-transuranic radionuclides are cesium and strontium (6, 9).

- LRRI CH TRU waste—LRRI was a DOE prime contractor when it generated this TRU waste. The mission of LRRI was to develop experimental data to improve understanding of the short- and long-term biological consequences of inhaling radioactive materials associated with various energy technologies and nuclear weapons research and development. Since the waste was generated from weapons research, it qualified for WIPP disposal as defense TRU waste. Most of the TRU waste was generated in the 1960s and early 1970s, with a few drums generated in 2003 when LRRI was cleaning out gloveboxes and storage areas. The mixed waste stream included metals, cellulosics, rubber, plastics, organic matrices, and inorganic materials; plutonium, curium, uranium, and americium were the major radionuclides of interest. All of this waste has been shipped off-site and disposed of at the WIPP (8).

- Pu-ICE TRU—The Pu-ICE waste stream consists of Pu-ICE post-shot containment vessels generated from Z machine experiments requested by LANL and conducted by Sandia. The containment vessels are made of machined components, primarily ferrous and non-ferrous metals (99%) with minor amounts of plastics, aluminum, inorganic and organic materials. LANL fabricates the Pu targets and Sandia performs the experiments and stores the resulting waste in WIPP-compliant containers (55-gallon drums or standard waste boxes (SWBs) until shipment back to LANL. LANL maintains ownership of the Pu and other material in the waste, and is responsible for characterization, certification, and shipment to the WIPP (9, 10).

2.5.1.3. CH Packaging and Transportation Configurations

CH TRU waste can be packaged in 30-, 55-, 85-, or 100-gallon drums, pipe over-packs, or SWBs. Specific requirements for each packaging configuration and filter requirements are documented in the WIPP WAC (13). For example, drums must be DOT Type 7A and SWBs must be purchased from a specific vendor. Currently, Sandia uses 55-gallon drums and SWBs for CH waste.

CH TRU waste can be shipped in three different approved Type B containers: TRUPACT-II, HalfPACT, or TRUPACT-III (18). The TRUPACT-III is usually for large items and Sandia has not used this shipping container to date.

2.5.1.4. CH Material Disposed

As described in Section 2.5.1.1, Sandia does not have a WIPP-certified program for characterizing and certifying its TRU waste. Therefore, Sandia has packaged and shipped CH waste to INL where it was certified and shipped to WIPP for final disposal. The state of Idaho required that INL certify the waste in six months and ship to WIPP within an additional six months. At this time, all Sandia waste that was shipped to INL has been emplaced in the WIPP. The following information is for recent CH TRU waste that has been shipped off-site to WIPP (20):

- December 2010, shipped eleven 55-gallon drums, included ITRI/LRRI and Sandia hot cell debris waste
- March 2011, shipped five 55-gallon drums, included Sandia sources and ITRI/LRRI waste

Sandia also stores expended Pu-ICE shots prior to being shipped to LANL for final certification and disposal at WIPP. The following Pu-ICE waste has been shipped to LANL (19).

- December 2010, shipped three 55-gallon drums, Pu-ICE waste
- July 2013, shipped six 55-gallon drums and two SWBs, Pu-ICE waste

2.5.1.5. CH Material Onsite

Sandia continues to generate small quantities of CH TRU waste which is managed by Department 4736, Waste Management/Pollution Prevention. The containers are stored in the Manzano bunkers or at TA-III at the Radioactive and Mixed Waste Management Facility (RMWMF). The CH TRU data is located on the Sandia RadTrack (9) database. Data is also documented in two WIPP inventories, the Annual Transuranic Waste Inventory Report (21) and the Container Specific Inventory Report (22). See Sections 3.1 and 3.2 for more specific information about the WIPP inventories. The Sandia CH TRU waste is currently packaged in cans, bags, boxes, pails, and/or drums and will require repackaging and WIPP characterization and final certification.

2.5.2. Sandia Remote-Handled TRU

As described above, RH TRU waste has a contact dose rate at or greater than 200 mrem/hr on contact. At Sandia, the RH TRU waste is managed by Department 4736, Waste Management/Pollution Prevention, at TA-III (for legacy) and the Non-Reactor Nuclear Facilities Department (01387) at TA-V (for newly generated).

2.5.2.1. RH General Requirements

The WIPP WAC (13) summarizes the requirements for RH TRU waste to be accepted for disposal at the WIPP, and the WIPP HWFP/WAP (14) and the waste characterization requirements to determine if the waste is hazardous. In general, RH TRU waste must meet specific criteria for:

- Container properties—weight limits, assembly configurations, filter vents

- Radiological properties—composition, fissile gram equivalent (FGE), Plutonium Equivalent Curies (PE-Ci), dose rate, decay heat
- Physical Properties—no prohibited items such as explosives, reactives, flammables, liquids, aerosol cans, or sealed containers greater than 4 liters
- Chemical properties—hazardous constituents, chemical compatibility, headspace gas concentrations, prohibited materials
- Data package contents—characterization, certification, and shipping data

The WIPP WAC also includes specific Quality Assurance Requirements for characterization, certification, and transportation.

NOTE: The current WIPP Documented Safety Analysis (DSA) (23) and Technical Safety Requirements (24) do not authorize WIPP to process and dispose of RH-TRU waste. Therefore, until the DSA is updated and approved to address RH-TRU, WIPP is not accepting any RH-TRU waste for disposal.

2.5.2.2. RH Material History

Eight projects were conducted in the 1970s and 1980s in the original Hot Cell Facility (HCF) at TA-V that generated TRU waste. They were part of the Severe Accident Research Program. These studies involved the preparation of reactor experimental assemblies that were irradiated in Sandia reactors to simulate a variety of accident scenarios, followed by post-irradiation examination and evaluation. The TRU waste generated from this program included debris waste generated during post-irradiation examination processes and the post-irradiation experimental vessels. The initial debris waste in this waste stream consisted of organic and inorganic debris including metal hardware, glass vials, lab ware, glove box gloves, tubing, plastic bottles, personnel protective equipment, and various cellulosic materials. This material was repackaged, characterized, certified, and shipped to the WIPP. The secondary debris waste material included the actual spent experimental vessels, pins and pieces from preparation of the experiments, and waste generated from the clean-up and decontamination of the Auxiliary Hot Cell Facility (AHCF) in Building 6597 after repackaging. It consists of aluminum, ferrous and non-ferrous materials, glass windows, connectors, and fuel pieces (7).

2.5.2.3. RH Packaging and Transportation

RH TRU waste can be packaged in Type 7A 55-gallon drums and placed in removable lid canisters [RLC] or the waste can be direct loaded in the RLCs. There are specific requirements for each of these packaging configurations and filter requirements that are documented in the WIPP WAC (13). Currently, Sandia packages the RH TRU waste in two different configurations at the AHCF: in 30-gallon drums, then over-packs the drums into 55-gallon drums; or in shield pots (for small, high-dose items), with each shield pot placed in a 7-gallon pail, then two 7-gallon pails are placed in a 30-gallon drum and then over-packed in a 55-gallon drum. Three drums are placed in a RLC. It is also permitted to direct load a RLC; however, Sandia has not used this packaging configuration.

Shipment of RH TRU in RLCs is permitted in a RH 72-B cask or in a 10-160B cask (20). One RLC is loaded into a RH 72-B cask. Sandia ships in the RH 72-B cask and has not used the 10-160B cask.

RH waste packaged in 30-gallon drums can also be placed in WIPP approved shielded containers and shipped as CH waste in a TRUPACT-II or HalfPACT, provided the resulting surface dose rate is below the 200 mrem/hr limit for CH waste. See Section 2.5.2.5 for more details regarding the use of shielded containers at Sandia.

2.5.2.4. RH Material Disposed

Sandia has characterized, packaged, and shipped RH-TRU waste directly to WIPP. For RH-TRU, Sandia contracted with the CCP to provide certified acceptable knowledge experts, certified visual examination operators, and certified dose-to-curie operators to characterize the RH TRU waste. The following are shipment dates, number of containers, and waste stream for the RH TRU waste that has been shipped to WIPP (19).

- December 2011, shipped 12 55-gallon drums to WIPP, included hot cell debris waste
- May 2012, shipped 10 55-gallon drums to WIPP, included hot cell debris waste

2.5.2.5. RH Material Onsite

Sandia currently has 25 RH TRU 55-gallon waste drums on site, stored in the high- and mid-bay at the AHCF. All of these containers have been repackaged under a WIPP-certified program by certified acceptable knowledge experts, certified visual examination operators, and certified dose-to-curie operators (25). Characterization activities were audited and observed by EPA, NMED, and Carlsbad Technical Assistance Contractor (CTAC) personnel in July 2015 (26). A table-top audit was performed by WIPP/CCP in December 2016 (27) and again in July 2017 (28). In FY17, Sandia purchased 12 WIPP approved shielded containers for their dose-eligible RH TRU waste to facilitate the certification and shipment of this waste as CH to WIPP. Due to the WIPP being unable to accept RH TRU waste at this time and no schedule for updating the DSA to include RH waste has been communicated to generator sites, Sandia is interested in purchasing newly designed but not currently approved shielded containers. When approved, the remaining 13 RH TRU drums will be eligible for disposal at the WIPP as CH waste.

3. CURRENT OPERATIONS

Sandia is a small quantity site generator, continues to generate small quantities of CH TRU waste and has RH TRU waste on site awaiting final certification and shipment to the WIPP. Therefore, it is important to maintain close coordination with other generator sites and the WIPP. As mentioned previously, Sandia participates in the biannual WIPP Corporate Board meeting and in the monthly SQS and RH conference calls, is a member of the RH Working Group, and maintains contact with various individuals at WIPP for questions, transportation issues, or other information.

3.1. Annual Transuranic Waste Inventory Report

Each generator site is required to update the Annual Transuranic Waste Inventory Report (ATWIR) annually (21). Every January, WIPP sends the inventory spreadsheet from the previous year to each generator site along with instructions for updating the spreadsheet. This inventory is based on waste streams, but does include specific container information. The updated information is from Jan 1 through December 31 of the previous year. When the generator site completes the update, it is sent back to WIPP for review. The WIPP POC may find some discrepancies and these are resolved with the generator site. Once all discrepancies are resolved, WIPP sends a validation letter to the SFO for signature, verifying that the data is accurate.

The ATWIR is sent to the SFO, the manager of the RMWMF, and to the individual who completes the spreadsheet. It is Sandia's responsibility to complete the spreadsheet and resolve any discrepancies. The validation letter is the responsibility of the SFO, with concurrence by the manager of the RMWMF.

3.2. Container Specific Inventory Report

The Container Specific Inventory Report (22) is usually updated in the October/November timeframe. As its name indicates, the data is container specific. The updated data includes information from October 1st through September 30th of the previous FY. The SFO, the manager of the RMWMF, and the individual who completes the spreadsheet are responsible for updating this inventory report.

3.3. WIPP Corporate Board Meetings

The Carlsbad Field Office holds a WIPP Corporate Board Meeting approximately every six months at different locations around the DOE complex. The DOE site representatives are official board members, and the contractors from each TRU waste generator site are participants. The first day of the meeting is for the official board members only with the second day open to all board members and participants. The agenda includes updates from the TRU generator sites and the status of the WIPP with discussions and questions. Breakout sessions are also held at the request of the TRU generator sites where specific issues are discussed on a one-on-one basis with CBFO.

3.4. General Support

The Sandia TRU program is required to respond to questions from NNSA Headquarters, WIPP, or the DOE SFO on a semi-regular basis. Previous requests have included additional inventory requests for waste containing oxidizers/acids/bases and treatments, meeting requests to discuss status, and/or new requirements, alternate storage options, and accountability issues. Sandia responds in a timely manner to these requests.

4. POTENTIAL AND FUTURE TRU WASTE STREAMS FOR SNL

Sandia continues to generate and manage TRU waste. The two inventory reports discussed in Sections 3.1 and 3.2 document TRU waste currently on site and are updated annually. The following sections briefly describe potential TRU waste streams.

4.1. Future CH TRU Waste

The RMWMF will continue to accept small quantities of TRU waste, typically sealed calibration sources, laboratory tools and equipment, and Personal Protection Equipment (PPE) from waste packaging activities. Items may be mixed or non-mixed waste, and will not be repackaged into WIPP-compliant containers until Sandia secures funding for the repackaging activities, obtains concurrence from WIPP that the waste is tentatively acceptable for disposal at the WIPP, and determines a path forward for certification.

4.2. Future D&D (TA V)

The Auxiliary Hot Cell Facility (AHCF) is scheduled for downgrade to a radiological facility in the future and eventually decommissioned and demolished. Before downgrading, the existing filter located inside the hot cell requires replacement and the replaced filter will become TRU (probably RH) waste. Until the WIPP documents that the current RH waste stored at the AHCF will not have to be repackaged, and additional TRU waste generated does not require a nuclear facility, the AHCF should remain a nuclear facility in order to support any potential RH TRU repackaging operations.

4.3. Future Isentropic Research

Sandia and LANL have a joint long-term program for conducting Isentropic Compression Experiments (ICE) involving transuranic materials at Sandia's Z pulsed-power generator (Z-machine). After the experiments are complete, the post-shot experimental vessels are packaged and stored at Sandia as TRU material. LANL retains ownership of these materials and is responsible for the final characterization, certification, and disposal at the WIPP as TRU waste. When Sandia has accumulated several post-shot experimental vessels, Sandia, LANL, and WIPP arrange for shipment to LANL as TRU waste. The TRU material is declared TRU waste at the time of shipment back to LANL.

5. CONCLUSION

Sandia, as a SQS, has a history of generating TRU waste and will continue to do so. Therefore it is important to update this report when requirements change at the WIPP for characterizing, certifying, or disposing of TRU waste or when other changes at Sandia require an update. This report represents a snapshot in time of the history and current status of the TRU program at Sandia.

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2. *About WIPP*, www.WIPP.energy.gov

3. *Licensing Requirements for Land Disposal of Radioactive Waste,* 10 CFR Part 61, Reference 2, Section 2 (18)

4. *Nuclear Waste Policy Act of 1982,* Section 10103 (3) of 42 US Code 10101

5. *The Waste Isolation Pilot Plant Land Withdrawal Act,* as amended by Public Law 104-201, Section 2, (3), (12)

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