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MAR 18 2019

MAR 22 2019

Mr. Cornelius Amindyas
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Hazardous Waste Bureau
New Mexico Environment Department
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Subject: Site Treatment Plan for Mixed Waste Annual Update, Fiscal Year 2018, for Sandia National Laboratories, New Mexico

Dear Mr. Amindyas:

Enclosed is the report Site Treatment Plan for Mixed Waste Fiscal Year (FY) 2018 Annual Update, (FY 2018 Update), for Sandia National Laboratories, New Mexico (SNL/NM)

The Federal Facility Compliance Order (FFCO) Part VII Annual Site Treatment Plan Updates requires the submittal of annual updates by March 31 of each year.

The enclosed FY 2018 Update provides updated information for both the Background Volume and the Compliance Plan Volume of the original Site Treatment Plan (STP). The Background Volume section includes inventory changes, treatment progress, technology development progress, funding status, and the Waste Isolation Pilot Plant status in FY 2018. The Compliance Plan Volume section provides the status of all formal changes accomplished in FY 2018. As required by the FFCO, the FY 2018 Update brings the STP current to the end of FY 2018 for SNL/NM; additionally, per FFCO Section XX.D Certification Statements, the appropriate certification is enclosed with this letter.

The DOE/NNSA and NTESS are available to provide additional information as necessary. If you have questions contact David Rast at (505) 845-5349.

Sincerely,

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Leroy G. Duran
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MAR 18 2019

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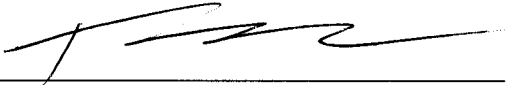
**Site Treatment Plan for Mixed Waste
Fiscal Year 2018 Annual Update**

March 2019

**Sandia National Laboratories / New Mexico
EPA ID No. NM5890110518**

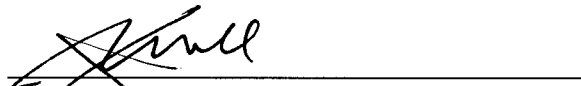
CERTIFICATION STATEMENT

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment for knowing violations.



Terry Cooper, Senior Manager
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Albuquerque, New Mexico
Operator

3/13/19
Date Signed



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3/15/19
Date Signed

Site Treatment Plan for Mixed Waste

Fiscal Year 2018 Annual Update

Sandia National Laboratories / New Mexico

March 2019

Sandia National Laboratories is a multimission laboratory managed and operated by National Technology & Engineering Solutions of Sandia LLC, a wholly owned subsidiary of Honeywell International Inc., for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-NA0003525.

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Acronyms

| | |
|----------------|--|
| BV | Background Volume |
| CFR | Code of Federal Regulations |
| CPV | Compliance Plan Volume |
| DOE | U.S. Department of Energy |
| EPA | U.S. Environmental Protection Agency |
| FFCA | Federal Facilities Compliance Act |
| FFCO | Federal Facility Compliance Order |
| FY | fiscal year |
| LDR | Land Disposal Restriction |
| LWAA | Land Withdrawal Act Amendments of 1996 |
| m ³ | cubic meters |
| MTRU | mixed transuranic |
| NMED | New Mexico Environment Department |
| NNSA | National Nuclear Security Administration |
| NTESS | National Technology & Engineering Solutions of Sandia, LLC |
| No. | Number |
| OSRP | Off-Site Source Recovery Program |
| RCRA | Resource Conservation and Recovery Act |
| SNL/NM | Sandia National Laboratories, New Mexico |
| STP | Site Treatment Plan |
| TCLP | Toxicity characteristic leaching procedure |
| TG | treatability group |
| TRU | transuranic |
| TSCA | Toxic Substances Control Act |
| U.S. | United States |
| U.S.C. | United States Code |
| WIPP | Waste Isolation Pilot Plant |

Executive Summary

The Annual Site Treatment Plan (STP) Update is submitted, as required by the Federal Facility Compliance Order (FFCO), to make both the Background Volume (BV) and the Compliance Plan Volume (CPV) of the STP current to the end of the previous fiscal year (FY) for covered mixed waste in storage at Sandia National Laboratories, New Mexico (SNL/NM).

The FY18 STP Update makes the BV inventory of mixed waste covered by the FFCO current through the end of FY18. Table ES-1 summarizes the BV Update, which presents a status of the treatment progress through FY18 and the current status of treatment technology development.

Table ES-1 Summary of Treatment Progress and Status

| TG and Volume | TG Description | Preferred Treatment Option | Progress or Status |
|--------------------------|--|--|--|
| TG 1 0 m ³ | Inorganic Debris with Explosive Component | Deactivation | There is currently no covered waste in TG 1. |
| TG 2 0 m ³ | Inorganic Debris with a Water Reactive Component | Deactivation | There is currently no covered waste in TG 2. |
| TG 3 0 m ³ | Reactive Metals | Deactivation | There is currently no covered waste in TG 3. |
| TG 4 0 m ³ | Elemental Lead | Macroencapsulation | There is currently no covered waste in TG 4. |
| TG 5 0 m ³ | Aqueous Liquids (Corrosive) | Neutralization followed by Stabilization | There is currently no covered waste in TG 5. |
| TG 6 0 m ³ | Elemental Mercury | Amalgamation | There is currently no covered waste in TG 6. |
| TG 7 0 m ³ | Organic Liquids I | Incineration | There is currently no covered waste in TG 7. |
| TG 8 0 m ³ | Organic Debris with Organic Contaminants | Thermal Desorption | There is currently no covered waste in TG 8. |

See footnotes at end of table.

Table ES-1 Summary of Treatment Progress and Status (continued)

| TG and Volume | TG Description | Preferred Treatment Option | Progress or Status |
|---------------------------|---|--|---|
| TG 9 0 m ³ | Inorganic Debris with TCLP Metals | Macroencapsulation | There is currently no covered waste in TG 9. |
| TG 10 0 m ³ | Heterogeneous Debris | Sort followed by Reclassification | There is currently no covered waste in TG 10. |
| TG 11 0 m ³ | Organic Liquids II | Hydrothermal Processing | There is currently no covered waste in TG 11. |
| TG 12 0 m ³ | Organic Debris with TCLP Metals | Macroencapsulation | There is currently no covered waste in TG 12. |
| TG 13 0 m ³ | Oxidizers | Deactivation followed by Stabilization | There is currently no covered waste in TG 13. |
| TG 14 0 m ³ | Aqueous Liquids with Organic Contaminants | Evaporative Oxidation | There is currently no covered waste in TG 14. |
| TG 15 0 m ³ | Soils <50% Debris & Particulates with TCLP Metals | Stabilization | There is currently no covered waste in TG 15. |
| TG 16 0 m ³ | Cyanide Waste | Oxidation | There is currently no covered waste in TG 16. |
| TG 17 0 m ³ | Liquid/Solid with Organic and/or Metal Contaminants | Incineration followed by Stabilization | There is currently no covered waste in TG 17. |
| TG-18 0 m ³ | Particulates with Organic Contaminants | Incineration | There is currently no covered waste in TG 18. |
| TG 19 0 m ³ | Liquids with Metals | Stabilization | There is currently no covered waste in TG 19. |

See footnotes at end of table.

Table ES-1 Summary of Treatment Progress and Status (concluded)

| TG and Volume | TG Description | Preferred Treatment Option | Progress or Status |
|-----------------------------|--|---|--|
| TG 20 0 m ³ | Propellant with TCLP Metals | Deactivation followed by Stabilization | There is currently no covered waste in TG 20. |
| TG 21 0 m ³ | Sealed Sources with TCLP Metals | Off-Site Shipment / Macroencapsulation | There is currently no covered waste in TG 21. |
| TG 22 0 m ³ | Reserved | Not Applicable | Not Applicable |
| TG 23 0 m ³ | Thermal Batteries | Off-Site Shipment / Size Reduction followed by Stabilization | There is currently no covered waste in TG 23. |
| TG 24 0 m ³ | Spark Gap Tubes with TCLP Metals | Off-Site Shipment / Macroencapsulation | There is currently no covered waste in TG 24. |
| TG 25 0 m ³ | Classified Items with TCLP Metals | Sort followed by Reclassification | There is currently no covered waste in TG 25. |
| TG 26 0 m ³ | Debris Items with Reactive Compounds & TCLP Metals | Off-Site Shipment / Deactivation followed by Macroencapsulation | There is currently no covered waste in TG 26. |
| TG 27 0 m ³ | High Mercury Solids & Liquids | Stabilization | There is currently no covered waste in TG 27. |
| MTRU 1.92 m ³ | MTRU | To be determined | 1.92 m ³ of MTRU waste is currently in inventory. |

m³ Cubic meters
 MTRU Mixed transuranic
 TCLP Toxicity Characteristic Leaching Procedure
 TG Treatability group

A funding issues status report affecting the STP-related activities is included in the BV Update. Sufficient funding has been requested and granted to meet FY18 performance objectives for management and disposal of mixed waste. If budget reductions cause impacts to the mixed waste treatment activities, this information will be provided to the New Mexico Environment Department (NMED) as it becomes available.

The U.S. Department of Energy (DOE) /National Nuclear Security Administration (NNSA) and National Technology & Engineering Solutions of Sandia, LLC (NTESS) continue to evaluate options that could be viable alternatives to the preferred treatment options identified in the STP. These options include mixed waste treatment capacity that has become available since the STP was submitted, or that is expected to become available in the near future at off-site commercial or off-site DOE/NNSA facilities.

The STP BV Update also presents the capabilities of the DOE's Waste Isolation Pilot Plant (WIPP) for permanent disposal of transuranic and mixed transuranic (MTRU) waste.

The CPV Update provides the summary and status of changes, proposed or approved revisions and amendments, and additions or deletions of covered waste occurring since the previous Annual STP Update.

Revision Number (No.) 15 to the STP, establishing compliance dates of December 31, 2020 for all treatability groups, was approved by the NMED on October 19, 2016 (Kieling October 2016).

1.0 Introduction

1.1 Background

The U.S. Department of Energy (DOE) prepared Site Treatment Plans (STPs) as required by Section 3021 (b) of the Resource Conservation and Recovery Act (RCRA) (RCRA 1976) and amended by the Federal Facilities Compliance Act (FFCA) (FFCA 1992) describing the development of treatment capacities and technologies for treating mixed waste. STPs are required for DOE facilities that generate or store mixed waste, defined in the FFCA as waste containing both a hazardous waste subject to the RCRA and a source, special nuclear, or by-product material subject to the Atomic Energy Act of 1954 (AEA 1954). The final STP was attached to a Federal Facility Compliance Order (FFCO) issued jointly to the DOE and Sandia Corporation (now National Technology & Engineering Solutions of Sandia, LLC [NTESS]) by the New Mexico Environment Department (NMED) on October 4, 1995 (NMED October 1995).

The FFCA of October 6, 1992 established a waiver of sovereign immunity for federal facilities storing mixed waste in compliance with all RCRA requirements except for those of RCRA Section 3004(j). Section 3004(j) of the RCRA allows one year for storage of waste for purposes of treatment to meet the RCRA Land Disposal Restrictions (LDR). Although the sovereign immunity waiver took effect with the signing of the FFCA (i.e., October 6, 1992), the FFCA allowed federal facilities three years of grace to come under a state or U.S. Environmental Protection Agency (EPA) Compliance Order. The waiver allowed federal facilities to be subject to fines and penalties for mixed waste that is non-compliant with RCRA 3004(j) unless the waste is covered under a state-approved plan. The NMED approved the Sandia National Laboratories, New Mexico (SNL/NM) STP with modification and attached it to a Compliance Order (the FFCO). The FFCO issued to the DOE and NTESS defines *covered waste* as,

. . . all mixed waste at SNL/NM, regardless of time generated, which is being stored in violation of the land disposal requirements of Section 3004(j) of RCRA, including mixed waste that is newly discovered, identified, generated, or received from off-site; mixed waste that is generated through environmental restoration and decontamination and decommissioning activities; and legacy material that has been evaluated and determined to be mixed waste.

The DOE/National Nuclear Security Administration (NNSA) and NTESS have worked in compliance with the FFCO and met all required STP compliance activities and dates. On June 16, 2016, the DOE/NNSA and NTESS requested a revision to the STP to modify compliance dates and update the options for management of covered mixed transuranic (MTRU) wastes. On October 19, 2016, NMED approved proposed Revision No. 15 to the STP, updating MTRU management options and establishing compliance dates of December 31, 2020.

1.2 Annual Update

The Annual STP Update is submitted to make both the Background Volume (BV) and the Compliance Plan Volume (CPV) current to the end of the previous federal fiscal year (FY).

The BV addresses:

- 1) The inventory of covered waste in storage and projections of the inventory of covered waste expected to be placed into storage for the next five fiscal years;
- 2) Progress reports on treatment and treatment technology development;
- 3) A report on the funding of STP-related activities;
- 4) The status of any treatment variances being applied for; and
- 5) Plans for treatment of mixed transuranic waste at the DOE Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico.

The CPV describes:

- 1) Any revisions or amendments requested or granted in that fiscal year that change the compliance dates,
- 2) Additions or deletions of waste, treatability groups (TGs), or treatment technologies, or
- 3) Any other changes to the schedules of the STP.

Updates to the BV are presented in Section 2.0. Updates to the CPV are presented in Section 3.0 of this report.

2.0 Background Volume Update

The FY18 Update to the STP BV provides information about changes to the inventory of covered waste at SNL/NM and reports on progress or changes in the plan for mixed waste treatment that occurred in FY18.

2.1 Inventory Report

The FY18 Update to the STP BV describes the changes to the inventory of covered waste in storage at SNL/NM and makes the inventory information current to the end of FY18. The FY18 Inventory Update Summary Table (Table 2-1) presents a detailed inventory indicating the increase or decrease in volume to each TG. During FY18, 0.004 cubic meters of waste was added to the MTRU TG. No other covered waste was located at SNL/NM during FY18; therefore, the current inventory in every TG other than MTRU is 0 cubic meters.

Table 2-1 FY18 Inventory Update Summary

| Treatability Groups (TG) and Preferred Treatment Options | Reported Covered Waste Volume (m ³) in Storage (End FY16) | FY18 Changes (m ³) | Comments | Estimate of Covered Waste Volume (m ³) in Storage (End FY18) | Five-Year Projection for Volume of Covered Waste FY19-FY23 (m ³) |
|---|---|--------------------------------|----------|--|--|
| TG 1 Inorganic Debris with Explosive Component Deactivation | 0 | Increases: 0 | | 0 | <1 |
| | | Decreases: 0 | | | |
| TG 2 Inorganic Debris with a Water Reactive Constituent Deactivation | 0 | Increases: 0 | | 0 | <1 |
| | | Decreases: 0 | | | |
| TG 3 Reactive Metals Deactivation | 0 | Increases: 0 | | 0 | <1 |
| | | Decreases: 0 | | | |
| TG 4 Elemental Lead Macro-encapsulation | 0 | Increases: 0 | | 0 | <1 |
| | | Decreases: 0 | | | |

See footnotes at end of table.

Table 2-1 FY18 Inventory Update Summary (continued)

| Treatability Groups (TG) and Preferred Treatment Options | Reported Covered Waste Volume (m ³) in Storage (End FY16) | FY18 Changes (m ³) | Comments | Estimate of Covered Waste Volume (m ³) in Storage (End FY18) | Five-Year Projection for Volume of Covered Waste FY19-FY23 (m ³) |
|--|---|--------------------------------|----------|--|--|
| TG 5 Aqueous Liquids (Corrosive) Neutralization followed by Stabilization | 0 | Increases: 0 | | 0 | <1 |
| | | Decreases: 0 | | | |
| TG 6 Elemental Mercury Amalgamation | 0 | Increases: 0 | | 0 | <1 |
| | | Decreases: 0 | | | |
| TG 7 Organic Liquids I Incineration | 0 | Increases: 0 | | 0 | <1 |
| | | Decreases: 0 | | | |
| TG 8 Organic Debris with Organic Contaminants Thermal Desorption | 0 | Increases: 0 | | 0 | <1 |
| | | Decreases: 0 | | | |
| TG 9 Inorganic Debris with TCLP metals Macro-encapsulation | 0 | Increases: 0 | | 0 | <1 |
| | | Decreases: 0 | | | |
| TG 10 Heterogeneous Debris Sort followed by Reclassification | 0 | Increases: 0 | | 0 | <1 |
| | | Decreases: 0 | | | |

See footnotes at end of table.

Table 2-1 FY18 Inventory Update Summary (continued)

| Treatability Groups (TG) and Preferred Treatment Options | Reported Covered Waste Volume (m ³) in Storage (End FY16) | FY18 Changes (m ³) | Comments | Estimate of Covered Waste Volume (m ³) in Storage (End FY18) | Five-Year Projection for Volume of Covered Waste FY19-FY23 (m ³) |
|---|---|--------------------------------|----------|--|--|
| TG 11 Organic Liquids II Hydro-thermal Processing | 0 | Increases: 0 | | 0 | <1 |
| | | Decreases: 0 | | | |
| TG 12 Organic Debris with TCLP metals Macro-encapsulation | 0 | Increases: 0 | | 0 | <1 |
| | | Decreases: 0 | | | |
| TG 13 Oxidizers Deactivation followed by Stabilization | 0 | Increases: 0 | | 0 | <1 |
| | | Decreases: 0 | | | |
| TG 14 Aqueous Liquids with Organic Contaminants Evaporative Oxidation | 0 | Increases: 0 | | 0 | <1 |
| | | Decreases: 0 | | | |
| TG 15 Soils <50% Debris & Particulates with TCLP metals Stabilization | 0 | Increases: 0 | | 0 | <1 |
| | | Decreases: 0 | | | |
| TG 16 Cyanide Waste Oxidation | 0 | Increases: 0 | | 0 | <1 |
| | | Decreases: 0 | | | |

See footnotes at end of table.

Table 2-1 FY18 Inventory Update Summary (continued)

| Treatability Groups (TG) and Preferred Treatment Options | Reported Covered Waste Volume (m ³) in Storage (End FY16) | FY18 Changes (m ³) | Comments | Estimate of Covered Waste Volume (m ³) in Storage (End FY18) | Five-Year Projection for Volume of Covered Waste FY19-FY23 (m ³) |
|---|---|--------------------------------|----------|--|--|
| TG 17 Liquid/Solid with Organic and/or Metal Contaminants Incineration followed by Stabilization | 0 | Increases: 0 | | 0 | <1 |
| | | Decreases: 0 | | | |
| TG 18 Particulates with Organic Contaminants Incineration | 0 | Increases: 0 | | 0 | <1 |
| | | Decreases: 0 | | | |
| TG 19 Liquids with Metals Stabilization | 0 | Increases: 0 | | 0 | <1 |
| | | Decreases: 0 | | | |
| TG 20 Propellant w/ TCLP Metals Deactivation followed by Stabilization | 0 | Increases: 0 | | 0 | <1 |
| | | Decreases: 0 | | | |
| TG 21 Sealed Sources w/ TCLP Metals Off-site Shipment / Macro-encapsulation | 0 | Increases: 0 | | 0 | <1 |
| | | Decreases: 0 | | | |
| TG 22 Reserved | NA | Increases: 0 | | NA | NA |
| | | Decreases: 0 | | | |

See footnotes at end of table.

Table 2-1 FY18 Inventory Update Summary (concluded)

| Treatability Groups (TG) and Preferred Treatment Options | Reported Covered Waste Volume (m ³) in Storage (End FY16) | FY18 Changes (m ³) | Comments | Estimate of Covered Waste Volume (m ³) in Storage (End FY18) | Five-Year Projection for Volume of Covered Waste FY19-FY23 (m ³) |
|---|---|--------------------------------|-------------------|--|--|
| TG 23 Thermal Batteries | 0 | Increases: 0 | | 0 | <1 |
| Off-site Shipment / Size Reduction followed by Stabilization | | Decreases: 0 | | | |
| TG 24 Spark Gap Tubes w/ TCLP Metals | 0 | Increases: 0 | | 0 | <1 |
| Off-site Shipment / Macro-encapsulation | | Decreases: 0 | | | |
| TG 25 Classified Items w/ TCLP Metals | 0 | Increases: 0 | | 0 | <1 |
| Sort followed by Reclassification | | Decreases: 0 | | | |
| TG 26 Debris Items w/ Reactive Compounds & TCLP Metals | 0 | Increases: 0 | | 0 | <1 |
| Off-site Shipment / Macro-encapsulation | | Decreases: 0 | | | |
| TG 27 High Mercury Solids & Liquids | 0 | Increases: 0 | | 0 | <1 |
| Stabilization | | Decreases: 0 | | | |
| Mixed Transuranic Waste | 1.92 | Increases: 0.004 | New covered waste | 1.924 | <2.1 |
| Treatment or Off-site Disposal | | Decreases: 0 | | | |

FY Fiscal Year
 m³ cubic meters
 MTRU Mixed transuranic
 TCLP Toxicity Characteristic Leaching Procedure
 TG Treatability group

2.1.1 Mixed Waste Inventory Summary

Table 2-1, FY18 Inventory Update Summary, indicates by TG the volume of covered waste reported in the FY17 STP Update and the changes that occurred to that volume to make the reported volume of covered waste current to the end of FY18. The reasons for increases and decreases of reported volume of a TG are briefly noted in the comments column.

The FY18 Inventory Update Summary also contains estimates of the volume of covered waste anticipated in the next five fiscal years, i.e., covered waste to be placed in the inventory under the FFCO in FY19 through FY23. It is anticipated that additional mixed waste may be generated or discovered through low-level radioactive waste sorting activities, decontamination and decommissioning activities, and necessary research activities.

2.1.2 Mixed Transuranic Waste Inventory Summary

There are approximately 1.924 cubic meters (m³) of covered MTRU waste at SNL/NM pending disposition; this volume reflects the full volume of each container holding MTRU waste.

2.2 Progress Report on Treatment and Technology Development

This section reports on the current treatment progress and development of treatment technologies needed by SNL/NM.

2.2.1 Treatment During FY18

On-Site Treatment

No covered waste was treated during FY18.

Off-Site Treatment

No covered waste was shipped off-site for treatment during FY18.

Treatability Studies

No new treatability studies for mixed waste were initiated in FY18.

2.2.2 Current Treatment Technologies

Table 2-2 describes the current treatment options being utilized or developed for mixed waste at SNL/NM. These technologies include the preferred or alternate treatment technologies specified in the STP.

Table 2-2 Current Treatment Technologies

| Preferred Treatment Option | Applicable TG and Description | On-site Treatment | Off-site Treatment |
|--|---|---|---|
| Deactivation | TG 1 (Inorganic Debris with Explosive Component) TG 2 (Inorganic Debris with a Water Reactive Component) TG 3 (Reactive Metals) | The DOE/NNSA and NTESS currently have procedures in place to treat most items within these waste inventories, including aerosol cans and small volumes of water-reactive chemicals, reactive metals, and mock explosives. | Off-site treatment facilities have not been utilized to treat mixed waste using deactivation processes. |
| Macroencapsulation | TG 4 (Elemental Lead) TG 9 (Inorganic Debris with TCLP Metals) TG 12 (Organic Debris with TCLP Metals) TG 25 (Classified Items with TCLP Metals) | Procedures are in place for macroencapsulating wastes on site. | The DOE/NNSA and NTESS may utilize off-site macroencapsulation capabilities at a commercial treatment facility waste that meets the treatment facility's waste acceptance criteria. Off-site treatment facilities are not currently used for macroencapsulation of classified items. |
| Neutralization followed by Stabilization | TG 5 (Aqueous Liquids – Corrosive) | Procedures are in place for treating corrosive liquids on-site. | The DOE/NNSA and NTESS do not currently utilize off-site treatment for corrosive liquids. |
| Amalgamation | TG 6 (Elemental Mercury) | The DOE/NNSA and NTESS typically utilize off-site facilities to treat elemental mercury but have developed procedures for the on-site treatment of small volumes of mercury waste. | The Mercury Export Ban Act (Public Law 110-414) amended the TSCA in 15 United States Code 2605(f) and prohibits Federal agencies from transferring elemental mercury. As long as this prohibition exists, the DOE/NNSA and NTESS will store this waste on-site pending shipment to a designated DOE facility. |
| Thermal Desorption | TG 8 (Organic Debris with Organic Contaminants) | The DOE discontinued the design and development of mobile thermal desorption units based on the availability of alternate treatment technologies. Currently, the DOE/NNSA and NTESS utilize off-site treatment facilities for organic debris with organic contaminants and does not anticipate treating such waste on-site. | The DOE/NNSA and NTESS currently utilize off-site solvent washing capabilities at a commercial treatment facility to treat organic debris with organic contaminants. |

See footnotes at end of table.

Table 2-2 Current Treatment Technologies (continued)

| Preferred Treatment Option | Applicable TG and Description | On-site Treatment | Off-site Treatment |
|--|---|--|--|
| Hydrothermal Processing | TG 11 (Organic Liquids II) | The DOE discontinued the development of hydrothermal processing because alternate treatment technologies were available. Currently, the DOE/NNSA and NTESS utilize off-site treatment facilities for organic liquid wastes. | As an alternative to hydrothermal processing, the DOE/NNSA and NTESS are utilizing off-site combustion through a commercial energy recovery boiler. |
| Deactivation followed by Stabilization | TG 13 (Oxidizers) TG 20 (Propellant with TCLP Metals) | Procedures are in place for on-site treatment of oxidizers. The DOE/NNSA and NTESS also developed and implemented on-site treatment procedures for propellant with TCLP metals. | The DOE/NNSA and NTESS have utilized deactivation to treat oxidizers at a commercial treatment facility. The DOE/NNSA and NTESS do not utilize off-site treatment for propellant with TCLP metals. |
| Evaporative Oxidation | TG 14 (Aqueous Liquids with Organic Contaminants) | The DOE/NNSA discontinued the development of evaporative oxidation because alternate treatment technologies were available. Currently, the DOE/NNSA and NTESS utilize off-site treatment facilities for aqueous liquids with organic contaminants. | As an alternative to evaporative oxidation, the DOE/NNSA and NTESS are utilizing off-site combustion through a commercial energy recovery boiler. |
| Stabilization | TG 15 (Soils <50% Debris & Particulates with TCLP Metals) TG 19 (Liquids with Metals) TG 27 (High Mercury Solids & Liquids) | The DOE/NNSA and NTESS currently have procedures in place for the treatment of many wastes with TCLP metals, including soils, particulates, powders, and liquids. NTESS anticipates using off-site facilities for the treatment of high mercury waste. | The DOE/NNSA and NTESS have utilized off-site commercial treatment facilities for stabilization treatment. The Mercury Export Ban Act (Public Law 110-414) amended the TSCA and prohibits Federal agencies from transferring elemental mercury. As long as this prohibition exists, the DOE/NNSA and NTESS will store this waste on-site pending shipment to a designated DOE facility. |
| Oxidation | TG 16 (Cyanide Waste) | The DOE/NNSA and NTESS do not anticipate treating cyanide waste on-site. Currently, the DOE/NNSA and NTESS utilize off-site treatment facilities for such waste. | The DOE/NNSA and NTESS have utilized a commercial treatment facility for the treatment of cyanide waste. |

See footnotes at end of table.

Table 2-2 Current Treatment Technologies (continued)

| Preferred Treatment Option | Applicable TG and Description | On-site Treatment | Off-site Treatment |
|---|---|---|--|
| Incineration followed by Stabilization | TG 17 (Liquid/Solid with Organic and/or Metal Contaminants) | The DOE/NNSA and NTESS currently have procedures in place to treat most liquid/solid and semisolid wastes contaminated with TCLP metals, including soils, charcoals, and oils. Based on the availability of commercial off-site treatment facilities, the DOE/NNSA and NTESS have not developed on-site treatment procedures for liquid/solid or semisolid waste contaminated with organic compounds. | The DOE/NNSA and NTESS have utilized off-site commercial treatment facilities, for treatment of waste requiring thermal treatment (i.e., organic contamination) and for the stabilization of some wastes contaminated with metals. |
| Incineration | TG 18 (Particulates with Organic Contaminants) TG 7 (Organic Liquids I) | On-site incineration capabilities have not been investigated and are not under consideration for development. | The DOE/NNSA and NTESS currently utilize off-site commercial treatment facilities for combustion and solvent washing. |
| Off-site Shipment / Macroencapsulation Pending Disposal | TG 21 (Sealed Sources with TCLP Metals) TG 24 (Spark Gap Tubes with TCLP Metals) TG 26 (Debris Items with Reactive Compounds & TCLP Metals) | The DOE/NNSA and NTESS have developed routine procedures for macroencapsulation as the alternate treatment technology for sealed sources, spark gap tubes, and debris items with TCLP metals. Debris with reactive compounds is macroencapsulated only after treatment for reactivity. | The DOE/NNSA and NTESS have utilized off-site macroencapsulation processes at a commercial treatment facility for spark gap tubes. Additionally, the DOE/NNSA and NTESS are investigating off-site commercial and/or DOE facilities that may be able to accept wastes such as sealed sources and debris items with reactive compounds and TCLP metals for treatment. |
| Size Reduction followed by Stabilization | TG 23 (Thermal Batteries) | The DOE/NNSA and NTESS currently have procedures in place to treat thermal batteries on-site and render them non-reactive. Once the thermal batteries are deactivated, the DOE/NNSA and NTESS can utilize macroencapsulation to treat the thermal batteries on-site for toxicity characteristic metals. | Following on-site deactivation, the DOE/NNSA and NTESS have utilized off-site macroencapsulation processes at a commercial treatment facility to treat thermal batteries. |

See footnotes at end of table.

Table 2-2 Current Treatment Technologies (concluded)

| Preferred Treatment Option | Applicable TG and Description | On-site Treatment | Off-site Treatment |
|--------------------------------|--|--|--|
| Treatment or Off-Site Disposal | MTRU | <p>On-site treatment capabilities such as macroencapsulation are not considered a preferred path. There is currently no disposal facility that can accept macroencapsulated MTRU waste.</p> <p>The DOE/NNSA and NTESS intend to arrange for certification at SNL before transferring MTRU waste to WIPP for final disposition. Alternatively, the DOE/NNSA and NTESS may use one of the off-site options listed.</p> | <p>As an alternative to certification at SNL, the DOE/NNSA and NTESS may do one or more of the following:</p> <ul style="list-style-type: none"> • Transfer MTRU waste to an off-site certifying facility for final disposition at WIPP. • Utilize the OSRP at LANL, as applicable, for MTRU sources meeting the OSRP waste acceptance criteria. |
| Radionuclide Separation | TG 1 (Inorganic Debris with Explosive Component) | <p>The DOE/NNSA and NTESS currently have procedures in place for radionuclide separation by disassembly of neutron generators, as necessary, to remove the reactive component. The non-reactive mixed waste component is treated using the applicable treatment technologies for inorganic debris or classified items with TCLP metals.</p> | <p>The DOE/NNSA and NTESS have not investigated nor identified off-site treatment facilities to treat neutron generators using radionuclide separation.</p> |

DOE/NNSA US Department of Energy/National Nuclear Security Administration
 LANL Los Alamos National Laboratory
 OSRP Off-Site Source Recovery Program
 MTRU Mixed transuranic
 NTESS National Technology & Engineering Solutions of Sandia, LLC
 TCLP Toxicity Characteristic Leaching Procedure
 TG Treatability Group
 TSCA Toxic Substances Control Act
 WIPP Waste Isolation Pilot Plant

2.2.3 Developing Treatment Technologies

Off-Site Treatment Facilities

The DOE/NNSA and Sandia continue to investigate new treatment technologies available at off-site treatment facilities.

On-Site Treatment Development

The DOE/NNSA and NTESS continue to evaluate the implementation of on-site treatment technologies. The DOE/NNSA and NTESS will request a modification to the RCRA Facility Operating Permit (NMED January 2015 and subsequent modifications), if necessary, to implement additional on-site treatment technologies.

2.3 Funding

Sufficient funding has been secured to support the waste management activities and commitments outlined in the STP. If future budget reductions cause impacts to the mixed waste treatment activities, this information will be provided to the NMED as it becomes available.

2.4 Treatment Variances

The RCRA allows certain case-by case variances of LDR standards. Among these variance options is a “No-Migration Variance Petition” that can be issued if there is appropriate evidence to show that no hazardous constituents will be released from a land disposal unit or permanent repository. Other variances relating to requests for substitution of an alternative treatment technology in place of the LDR-required treatment technology may be sought under the regulations in Title 20, Chapter 4, Part 500 of the New Mexico Administrative Code incorporating the requirements of Title 40 of the Code of Federal Regulations (CFR) Part 268. Existing, planned, and requested treatment variances are described below.

2.4.1 Waste Isolation Pilot Plant No-Migration Variance

There is approximately 1.924 m³ of MTRU waste subject to the FFCO currently stored at SNL/NM. The DOE’s long-term management plan for transuranic (TRU) and MTRU waste continues to be disposal at the WIPP. The WIPP is a waste repository facility near Carlsbad, New Mexico for the disposal of TRU and MTRU waste that was generated by the nation’s defense-related activities.

As a deep geologic repository, the WIPP is significantly different from most hazardous waste disposal sites, which are most commonly shallow landfills. The WIPP is wholly sited in a salt bed 2,100 feet below the land surface. Because salt has the advantageous characteristic of slow plastic deformation, it is predicted that the salt will entomb the waste and seal it from the human environment, making potential release of hazardous constituents a low probability event.

The Land Withdrawal Act Amendments (LWAA) of 1996 (LWA 1996) amended the 1992 Land Withdrawal Act (LWA 1992) to provide that wastes disposed at the WIPP were exempt from the treatment standards and land disposal prohibitions in Section 3004(m) of the RCRA.

On May 18, 1998, EPA published in the Federal Register (63 FR 27354) its final rule certifying that WIPP will comply with the requirements of Subparts B and C of 40 CFR Part 191 and amending the WIPP compliance criteria in 40 CFR Part 194. The final rule became effective June 17, 1998. The first shipment of non-mixed TRU waste was emplaced at WIPP on March 26, 1999. The DOE applied for, and after public hearings, received Hazardous Waste Facility Permit for the WIPP (EPA ID No. NM4890139088) from the NMED for the disposal of hazardous constituents in MTRU waste. That permit became effective on November 26, 1999.

2.4.2 Other Treatment Variance(s)

No treatment variances were requested or granted in FY18. The DOE and NTESS continue to treat mixed wastes in accordance with a variance granted by the NMED on June 3, 2004 (Bearzi June 2004).

2.5 Waste Isolation Pilot Plant Facility Capabilities

The DOE disposes of defense TRU waste, both mixed and radioactive-only, at the WIPP. The facility is a disposal facility without capability of routinely opening waste containers or repackaging waste. This facility is not a generator of TRU waste; therefore, will receive all of the defense TRU waste in shipments from other sites. Described below is the status of the characterization and treatment capabilities at the WIPP facility.

2.5.1 Characterization Capabilities at Waste Isolation Pilot Plant

There are currently no capabilities at WIPP for the characterization of TRU waste for hazardous waste characteristics or constituents.

2.5.2 Mixed Transuranic Waste Treatment Capabilities at Waste Isolation Pilot Plant

No capabilities for treatment of MTRU waste to meet the LDR standards have been developed and none are planned for development at the WIPP facility. Section 9(a)(1)(H) of the LWAA exempts the WIPP from the LDR requirements.

2.5.3 Operational Status of Waste Isolation Pilot Plant

Underground operations at WIPP ceased after a salt haul truck caught fire on February 5, 2014. On February 14, 2014, airborne radionuclides were released due to a breach in a container. Investigations and corrective actions are underway. As of the end of FY18, operations have resumed on a limited basis (NMED January 2016).

3.0 Compliance Plan Volume Update

This submittal of the STP FY18 Update provides information about changes and revisions to the CPV of the SNL/NM STP occurring in FY18. The STP Update to the CPV is divided into sections that address various types of revisions or amendments. Revisions or amendments, or other changes to the STP requested or anticipated to be requested after FY18, are briefly discussed.

3.1 Amendments and Revisions to the Compliance Plan Volume

NMED approved Revision No. 15 on October 19, 2016. This revision established compliance dates of December 31, 2020 for all TGs, updated the STP to include treatment technologies that are now available, and removed activities that have been completed and are no longer applicable. No amendments were submitted to the NMED during FY18.

3.2 Description of Waste Deleted in Accordance with the Requirements in Section V, Covered Matters, or Section IX, Deletion of Waste

No deletion requests were submitted to and/or approved by the NMED during FY18.

3.3 Documentation of New Covered and Newly Discovered Covered Waste in Accordance with the Requirements in Section VIII, Addition of New Covered Waste

During FY18, no new covered waste volume subject to FFCO Section VIII.A was added to the waste inventory of the STP in accordance with FFCO Amendment No. 3.

3.4 Changes to Overall Schedule in the Compliance Plan Volume

Revision No. 15 established compliance dates of December 31, 2020 for all TGs.

3.5 Anticipated Amendments and Revisions

The DOE/NNSA and NTESS do not anticipate submitting any amendments or revisions to the NMED for revision of compliance dates or treatment technologies in FY18.

4.0 References

Atomic Energy Act (AEA) of 1954 (42 U.S.C. §2011 et seq.)

Federal Facility Compliance Act (FFCA) of 1992 (42 U.S.C. §6961)

Resource Conservation and Recovery Act (RCRA) of 1976, as amended (42 U.S.C. §6901 et seq.)

Waste Isolation Pilot Plant Land Withdrawal Amendments Act (LWAA) of 1996 (Public Law 104-201)

Waste Isolation Pilot Plant Land Withdrawal Act (LWA) of 1992 (Public Law 102-579)

Bearzi, J. (New Mexico Environment Department), June 2004. Letter to P. Wagner (U.S. Department of Energy/National Nuclear Security Administration/Sandia Site Office) and L. Shephard (Sandia Corporation) "Approval: Site-Specific Variance from Treatment Standards for Certain Mixed Waste Generated at Sandia National Laboratories/New Mexico, EPA ID# NM5890110518, HWB-SNL-04-006. June 3, 2004.

Kieling, J. (New Mexico Environment Department), October 2016. Letter to D. Rast (U.S. Department of Energy/National Nuclear Security Administration/Sandia Field Office) and J. Jarry (Sandia Corporation) "Approval: Revision Number 15 to the Mixed Waste Site Treatment Plan, Compliance Plan Volume, for Sandia National Laboratories/New Mexico, Environmental Protection Agency Identification Number NM5890110518, HWB-SNL-16-011. October 19, 2016.

New Mexico Environment Department, October 1995. "Federal Facility Compliance Order Pursuant to the New Mexico Hazardous Waste Act and the Resource Conservation and Recovery Act," prepared by the New Mexico Environment Department in the matter of Respondents U.S. Department of Energy and Sandia Corporation, Sandia National Laboratories, Bernalillo County, New Mexico. October 4, 1995, Amended through December 22, 2010.

New Mexico Environment Department, January 2015. "Resource Conservation and Recovery Act Facility Operating Permit, EPA ID No. NM5890110518, to the U.S. Department of Energy/Sandia Corporation, for the Sandia National Laboratories Hazardous and Mixed Waste Treatment and Storage Units and Post-Closure Care of the Corrective Action Management Unit," New Mexico Environment Department Hazardous Waste Bureau, Santa Fe, New Mexico, January 27, 2015, as modified and updated.

New Mexico Environment Department, January 2016. Settlement Agreement and Stipulated Final Order," Resource Projection Division, Hazardous Waste Bureau v. United State Department of Energy, and Nuclear Waste Partnership, LLC, Respondents, RE: Waste Isolation Pilot Plan Eddy County, New Mexico, No. HW-14-21, January 22, 2016.