OFFICE OF INSPECTOR GENERAL

U.S. Department of Energy

AUDIT REPORT

OAI-L-17-07 September 2017

INTERIM STORAGE OF TRANSURANIC WASTE AT THE DEPARTMENT OF ENERGY

Department of Energy
Washington, DC 20585

September 12, 2017

MEMORANDUM FOR THE DEPUTY ASSISTANT SECRETARY FOR WASTE AND MATERIALS MANAGEMENT

FROM: Michelle Anderson
Deputy Inspector General
for Audits and Inspections
Office of Inspector General

SUBJECT: INFORMATION: Audit Report on "Interim Storage of Transuranic Waste at the Department of Energy"

BACKGROUND

The Department of Energy's National Transuranic (TRU) Program is an integral part of the mission to ensure the environmental cleanup of the nation's nuclear weapons complex. TRU waste includes radioactive waste resulting from national nuclear defense program activities. The National TRU Program integrates TRU waste cleanup goals and activities of independently managed Department sites across the complex. This includes TRU waste inventory characterization, certification, packaging, interim storage, transportation, and final disposal at the Department's Waste Isolation Pilot Plant (WIPP). In 2016, the Department estimated that about 97 percent of anticipated TRU waste was stored, or will be generated at large quantity sites. These sites consist of the Savannah River Site, Hanford Site (Hanford), Oak Ridge National Laboratory (ORNL), Idaho National Laboratory (Idaho), and Los Alamos National Laboratory (Los Alamos).

WIPP is the nation's only repository for the permanent disposal of defense-related TRU waste. In 2014, two unrelated incidents (a fire involving a salt haul truck on February 5th and a radiological release event on February 14th) led to the suspension of WIPP waste emplacement operations until January 4, 2017. As a result of the suspension, WIPP was unable to receive TRU waste shipments. Given the Department's regulatory commitments associated with TRU waste at multiple sites across the complex, we initiated this audit to evaluate the Department's strategy for interim storage of TRU waste until WIPP accepted TRU waste again. WIPP resumed waste emplacement operations on January 4, 2017.

RESULTS OF AUDIT

Our evaluation of the Department's strategy for interim storage of TRU waste at large quantity sites found that the sites were able to meet their individual interim TRU waste storage needs until

WIPP resumed operations. Also, although the Department did not satisfy all of its regulatory commitments related to TRU waste stored at large quantity sites, nothing came to our attention that would indicate that regulatory commitments impacted large quantity sites' plans to store TRU waste on-site until WIPP resumed operations.

Interim Storage Capacity

The Department's guiding strategy for interim storage of TRU waste was to retain the waste at each individual site pending resumption of WIPP operations and, if possible, continue cleanup efforts. The Department's strategy also included evaluating the impact of interim on-site storage and commitments with state regulators at TRU waste sites. These commitments affected the Department's decisions to either maintain TRU waste on-site or move TRU waste to an off-site interim storage location. The TRU waste interim storage strategy, storage capacity analysis results, and regulatory commitment impact for each of the large quantity sites we reviewed are detailed below.

Savannah River Site

Savannah River Site's strategy was to maintain its TRU waste on-site. Based on our storage capacity analysis, which was verified by a Savannah River Site official, no challenges were identified that prevented Savannah River Site from maintaining its TRU waste on-site until WIPP resumed operations. In addition, we did not identify any TRU waste-related regulatory commitments for Savannah River Site within the scope of our audit objective.

Hanford Site

Hanford's strategy was to maintain its TRU waste on-site. Based on a storage capacity analysis performed by a Hanford official, no challenges were identified that prevented Hanford from maintaining its TRU waste on-site until WIPP resumed operations. Regarding regulatory commitments, Hanford renegotiated a Federal Facility Agreement and Consent Order milestone that was endangered by the WIPP shutdown. As a result, we did not identify any TRU waste-related regulatory commitments for Hanford within the scope of our audit objective.

Oak Ridge National Laboratory

ORNL's strategy was to maintain its TRU waste on-site at the Oak Ridge Reservation. Initially, a lack of sufficient interim storage space at the Transuranic Waste Processing Center interrupted remote-handled TRU operations. However, the Department was able to address the issue by moving remote-handled TRU waste from the Transuranic Waste Processing Center to ORNL TRU waste storage facilities. This action required the Department to acquire new storage casks to encase the remote-handled TRU waste canisters in order to meet ORNL's TRU waste storage facilities requirements. Additionally, the Department reduced its TRU waste inventory by completing off-site disposal of the portion of the inventory that was re-characterized as low-level waste and mixed low-level waste. As a result of these actions, ORNL had the capacity to

accommodate its TRU waste interim storage needs on-site until WIPP resumed operations. We did not identify any TRU waste-related regulatory commitments for ORNL within the scope of our audit objective.

Idaho National Laboratory

Idaho's strategy was to ship some TRU waste off-site and store the rest on-site. In order to honor the regulatory commitment to ship out of state any TRU waste brought into the State of Idaho for treatment within 1 year of receipt, as required by the Settlement Agreement with the State of Idaho and the Idaho Site Treatment Plan, Idaho sent three shipments of TRU waste it had processed for Los Alamos to Waste Control Specialists LLC in Andrews, Texas. Idaho made space for the rest of its TRU waste on-site by reconfiguring its existing storage space, reducing TRU waste volume through compaction, and completing off-site disposal of the portion of the inventory that was classified as low-level waste and mixed low-level waste. Thus, according to a storage capacity analysis prepared by an Idaho official, Idaho had the capacity to accommodate its TRU waste interim storage needs on-site until WIPP resumed operations.

However, Idaho was not able to meet all of its regulatory commitments. Specifically, Idaho was not able to fulfill the Settlement Agreement requirement to ship a running average of no fewer than 2,000 cubic meters of TRU waste out of the state annually from 2014 through 2016. Also, the Settlement Agreement commitment to ship all TRU waste out of the state before the end of December 2018 is at risk. While these commitments were not met to date, there was not a defined impact to the Department. According to a letter from the State of Idaho, this is because the remedy for not meeting the milestones – suspension of Department spent fuel shipments to Idaho – had already been imposed for a previously missed commitment.

Los Alamos National Laboratory

Los Alamos's strategy was to ship some TRU waste off-site and store the rest on-site. Los Alamos's legacy TRU waste priority was to move high risk TRU waste off-site. Shipping the waste off-site allowed Los Alamos to address the risk of wildfires in close proximity to TRU waste stored above-ground at Area G, and to fulfill a Framework Agreement commitment with the New Mexico Environment Department to remove the waste by June 2014. When TRU waste shipments to WIPP were suspended in February 2014, the Department determined that interim storage at Waste Control Specialists LLC in Texas was the best available option to honor its commitment to the New Mexico Environment Department. Los Alamos sent 39 shipments of TRU waste to Waste Control Specialists LLC. However, additional planned shipments were suspended due to safety concerns. Therefore, Los Alamos placed the remaining high risk TRU waste into a safe configuration at Area G, but was not able to meet the Framework Agreement commitment. There was no defined impact to the Department from missing this milestone because the Framework Agreement was non-binding.

Based on the Department's analyses, we did not identify any on-site storage capacity challenges at Los Alamos for legacy TRU waste until WIPP resumed operations. However, Los Alamos faces significant on-site storage capacity challenges for its newly generated TRU waste (i.e., waste generated on or after October 1, 1998). This situation occurred primarily because Area G was put into warm standby mode (i.e., the site is required to maintain all above-ground

radioactive materials in a safe configuration and suspend non-essential activities), which reduced the staging capacity for newly generated TRU waste. Los Alamos plans to identify or develop sufficient staging capacity to allow for unrestricted programmatic nuclear operations. While Los Alamos acknowledges there are multiple uncertainties that could potentially impact its ability to provide adequate TRU waste storage to support the Department's programmatic needs, these challenges are already being addressed through implementation of Los Alamos's *2016 Enduring Mission Waste Management Plan*.

PATH FORWARD

Because we found that large quantity sites were able to meet their individual interim TRU waste storage needs until WIPP resumed operations and there was no impact to the Department regarding regulatory commitments, we are not making any formal recommendations.

Attachments

cc: Deputy Secretary
Chief of Staff
Administrator, National Nuclear Security Administration
Acting Assistant Secretary for Environmental Management

OBJECTIVE, SCOPE, AND METHODOLOGY

OBJECTIVE

We conducted this audit to evaluate the Department of Energy's strategy for interim storage of Transuranic (TRU) waste until the Waste Isolation Pilot Plant accepted TRU waste again.

SCOPE

The audit was performed between August 2015 and September 2017. We conducted the audit at the Office of Environmental Management in Germantown, Maryland; Savannah River Site in Aiken, South Carolina; Los Alamos National Laboratory in Los Alamos, New Mexico; and Carlsbad Field Office in Carlsbad, New Mexico. We also obtained information from the Idaho National Laboratory in Idaho Falls, Idaho; Oak Ridge National Laboratory in Oak Ridge, Tennessee; and Hanford Site in Richland, Washington. We limited our scope to the interim TRU waste storage strategy for the National TRU Program and large quantity sites after February 5, 2014, and prior to the Waste Isolation Pilot Plant resuming operations. This audit was conducted under Office of Inspector General project number A15SR056.

METHODOLOGY

To accomplish the audit objective we:

- Reviewed relevant guiding strategies promulgated by the Department, Office of Environmental Management, National TRU Program, and large quantity sites;
- Analyzed TRU waste storage capacity through the end of calendar year 2020 for large quantity sites;
- Assessed large quantity site compliance with relevant regulatory commitments;
- Assessed contingency plans for the storage of newly generated TRU waste at Los Alamos National Laboratory;
- Reviewed relevant Office of Inspector General prior reports; and
- Interviewed key Department and contractor personnel.

We conducted this performance audit in accordance with generally accepted Government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe the evidence obtained provides a reasonable basis for our conclusions based on our audit objective. The audit included tests of controls and compliance with laws and regulations to the extent necessary to satisfy the audit objective. We considered the *GPRA Modernization Act of 2010* and concluded that the Department had established performance measures related to the audit area. Because our review was limited, it

would not necessarily have disclosed all internal control deficiencies that may have existed at the time of our audit. We relied on computer-processed data related to TRU waste management. We conducted a limited data reliability assessment by conducting interviews and performing data testing and deemed the data sufficiently reliable for our use.

Management waived an exit conference on August 24, 2017.

PRIOR REPORTS

- Management Alert on *Remediation of Selected Transuranic Waste Drums at Los Alamos National Laboratory – Potential Impact on the Shutdown of the Department's Waste Isolation Plant* (DOE/IG-0922, September 2014). The review identified several major deficiencies in Los Alamos National Laboratory's procedures for the development and approval of waste packaging and remediation techniques that may have contributed to the February 14, 2014, radiological release in the underground repository at the Waste Isolation Pilot Plant. Additionally, the review addressed concerns that not all waste management procedures at Los Alamos National Laboratory were properly vetted through the established procedure revision process nor did they conform to established environmental requirements. The management alert concluded that immediate action was necessary to ensure that these matters were addressed and fully resolved before transuranic waste operations resumed, or, for that matter, before future mixed radioactive hazardous waste operations were initiated. Management concurred with the report's findings and recommendations and stated that the results of our investigation were generally consistent with findings from internal investigations.

- Audit Report on *The Office of Environmental Management's Disposition of Transuranic Waste* (OAS-L-13-09, May 2013). The audit found that while the Office of Environmental Management had made progress in meeting its operational disposal goals, it was not on track to meet its goal to dispose of 90 percent of the Department of Energy's legacy transuranic waste by the end of fiscal year 2015. In particular, the Office of Environmental Management faced a number of challenges in meeting its planned 90 percent waste disposal goal by 2015. Additionally, the report concluded that without further modifications to the repository or existing waste disposal practices, the Waste Isolation Pilot Plant may not have capacity for disposal of remote-handled inventory. The Office of Environmental Management had identified alternative actions to alleviate the challenges facing the transuranic waste disposition program.

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