



# **Assessment of Radioactive Waste Management at the Idaho National Laboratory**

**Interim Report**

**December 2019**

Office of Enterprise Assessments  
U.S. Department of Energy

# **Assessment of Radioactive Waste Management at the Idaho National Laboratory October 21-31, 2019 Interim Report**

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## **Overview**

This assessment is in response to the Deputy Secretary of Energy's July 9, 2019, memorandum directing the Office of Enterprise Assessments (EA) to undertake a U.S. Department of Energy (DOE)-wide assessment of the procedures and practices for packaging and shipping radioactive waste. The assessment activities focused on the waste management performance of the Idaho National Laboratory (INL) management and operating contractor, Battelle Energy Alliance (BEA). Waste management activities include characterizing, packaging, and shipping low-level waste (LLW) and mixed low-level waste (MLLW) for disposal. An assessment of Fluor Idaho's and the DOE Office of Environmental Management's (EM's) transuranic waste management practices was conducted separately. The assessment team, identified in Appendix A, examined a sample of waste generator operations representing about 95% of the total waste (by volume) shipped to four disposal facilities. BEA's diverse control strategy (defense-in-depth) for its waste management processes, from the generator to final packaging, is illustrated in Appendix B.

This report provides the interim results of the assessment of LLW and MLLW management at INL, addressing non-compliances and apparent causes contributing to weaknesses. At the conclusion of the enterprise-wide assessment, a final compilation report will include the results of this summary. The perspective gained by conducting this assessment could change as additional information becomes available from subsequent site assessments. The final compilation report will identify best practices, lessons learned, and cross-cutting recommendations.

DOE Order 227.1A, *Independent Oversight Program*, describes and governs the DOE independent oversight program, which EA implements through a comprehensive set of internal protocols, operating practices, assessment guides, and process guides. DOE Order 227.1A defines the terms best practices, findings, deficiencies, opportunities for improvement, and recommendations. In accordance with DOE Orders 227.1A and 226.1B, *Implementation of Department of Energy Oversight Policy*, it is expected that the site will analyze the deficiencies identified in this summary, and develop and implement corrective actions in accordance with the INL issues management system.

## **Summary**

Overall, BEA's waste management program ensures proper characterization, packaging, and shipping of radioactive waste for disposal, and the DOE Office of Nuclear Energy (NE) Idaho Operations Office (DOE-ID) maintains adequate operational awareness of waste management activities. This assessment found no findings, no interim recommendations, and two opportunities for improvement for consideration by DOE Federal and contractor management. This assessment also identified three BEA deficiencies associated with training, issues management, and maintenance work orders. Although these deficiencies did not result in mishandling of LLW or MLLW, management attention is warranted to reduce the risk of mishandling in the future. One DOE-ID deficiency was also identified in performance of radioactive waste management program oversight. Currently, DOE-ID has approximately 40 identified vacancies across the organization, out of approximately 140 NE-funded positions.

NE did not direct DOE-ID to conduct a self-assessment of waste management activities similar to those conducted by the National Nuclear Security Administration (NNSA) and EM. Although the peer reviews are underway, the peer review at this site had not been completed at the time of this assessment. The results of the peer reviews will be addressed in the final compilation report.

## **Positive Attributes**

### *Waste Characterization*

- Analytical laboratory operators and technicians are experienced and demonstrated thorough knowledge of detection technologies, processes, and equipment operation and properly evaluated data results to ensure accurate waste characterization.
- BEA's suite of measurement capabilities goes beyond gamma spectroscopy, liquid scintillation counting, and alpha-beta smear counting by including mass spectrometry and chemical separations and analysis.

### *Waste Stream Control*

- BEA uses the Integrated Waste Tracking System (IWTS) which provides cradle-to-grave waste tracking, using information derived from the Waste Determination and Disposition Form, to assist organizations in implementing program requirements to ensure proper waste stream management from generation through characterization, packaging, certification, and shipping. IWTS is a Nuclear Quality Assurance (NQA)-1 compliant database hosted by Fluor Idaho for several DOE contractors, including BEA.
- Waste generators demonstrated appropriate knowledge of approved waste streams and controls to prevent the introduction of prohibited articles. Waste generators recognize their role as the first line of defense for proper waste characterization and control. In addition, BEA effectively implements waste material segregation and control at the point of origin and records key information necessary for accurate waste characterization and tracking.
- Waste management activities demonstrated that assigned Waste Management Program – Waste Generator Services (WGS) representatives routinely engage with the generator. WGS personnel performing waste verification and packaging in various facilities demonstrated consistency in their approach and alignment across the organization.

### *Packaging and Shipping*

- Form 435.79, *Container Information and Closure Checklist*, includes torque wrench calibration information to provide evidence of proper calibration.
- All shipping documents signed by a certified shipper are required to go through a peer review of the shipping checklist by another certified shipper as a defense-in-depth action to ensure the completeness and compliance of every shipment that leaves the site.

### *Quality Assurance*

- BEA developed, published, and distributed eight waste management-related lessons learned over the past year.

### *Federal Oversight*

- DOE-ID has well-documented processes for conducting all oversight activity. The results of completed oversight activities are appropriately documented in weekly reports, monthly operational awareness reports, quarterly evaluation reports, and quarterly Performance Evaluation and Measurement Plan reports (evidence of evaluation of contractor performance).

## Findings

The assessment identified no findings.

## Deficiencies

Deficiencies are inadequacies in the implementation of an applicable requirement or standard. Deficiencies that did not meet the criteria for findings are listed below, with the expectation from DOE Order 227.1A for site managers to apply their local issues management processes for resolution.

- **Deficiency D-BEA-1:** Contrary to DOE Order 414.1D, *Quality Assurance*, Contractor Requirements Document (CRD), Attachment 2, Section 2, not all personnel who generate waste (i.e., maintenance personnel) receive training for activities affecting compliance with the Nevada National Security Site disposal facility's Waste Acceptance Criteria. There is no required INL laboratory-wide training on radioactive and mixed waste management. BEA relies on generators' knowledge and procedures to maintain waste stream integrity. However, interviews with generators demonstrated various levels of waste management training, ranging from classroom training for laboratory technicians, to no formal training for maintenance technicians. Relying on procedures without commensurate training could result in technicians not understanding the purpose or intent of the procedure requirements and incorrectly executing steps, leading to waste stream compliance challenges.
- **Deficiency D-BEA-2:** Contrary to DOE Order 226.1B, CRD, Attachment 1, 2.b.(3)(a), BEA did not enter two non-conforming conditions associated with the waste stream control into the issues management system (LabWay) in a timely manner. One non-conforming condition involved improper logging of items in waste containers on the inventory form by the generator; the other was temporary placement of a prohibited item in a waste receptacle. Both deficiencies were corrected within a day. Interviews indicated that there is inconsistent direction to use LabWay for minor non-conformance issues. Not entering such non-conformances represents a missed opportunity to track and trend such issues and to support continual improvement of the process. LWP-13840, *Issues Management*, provides guidance for entering issues but does not set an expectation that lower significant items be entered to allow trending. Management subsequently entered these items into LabWay.
- **Deficiency D-BEA-3:** Contrary to DOE Order 414.1D, CRD, Attachment 2, Section 5.a, Work Processes, LWP-6200, *Maintenance Integrated Work Control Process*, does not specifically document management of waste streams from minor maintenance work orders, documented minor maintenance work orders, and troubleshooting work orders. These maintenance activities may include work in radiological areas and may produce radioactive waste. During the onsite assessment, there were no observed examples of mishandled radioactive waste by maintenance personnel.
- **Deficiency D-DOE-ID-1:** Contrary to DOE Manual 435.1-1, *Radioactive Waste Management Manual*, Chapter I, Section 2.F.(10), DOE-ID does not complete and document planned oversight to ensure that waste management program activities are conducted in accordance with the approved radioactive waste management basis and DOE Order 435.1, *Radioactive Waste Management*. Contributing factors include long-term staffing vacancies and unclear roles and responsibilities for waste management oversight. An example of how staffing vacancies impacted completion of oversight activities is the completion of only one out of 10 scheduled assessments. Currently, DOE-ID has approximately 40 identified vacancies across the organization, out of approximately 140 NE-funded positions.

## Other Areas of Weakness

Other areas of weakness represent potential vulnerabilities that warrant site management's consideration but do not rise to the level of a finding or deficiency as defined in DOE Order 227.1A. The site should review these vulnerabilities and take appropriate actions. These weaknesses will be further reviewed against subsequent enterprise-wide site assessments to determine whether the vulnerability is cross-cutting and warrants an enterprise-wide response.

### *Waste Stream Control*

- Lessons learned training on the Y-12 event was provided only to WGS staff, using the EM Headquarters PowerPoint slides during tailgate briefings, and did not include waste generators. BEA relies on generator training and procedures as the first line of defense. However, the generators were not included in the briefing. See OFI-BEA-1.

### *Quality Assurance*

- Although the BEA independent assessor stated that field work observations included generator performance, the last two independent assessment reports completed over the past two years did not address generator waste segregation and control in the checklists or in the objective evidence discussion sections.

### *Federal Oversight*

- DOE-ID document 01.OD.01, *Functions, Responsibilities, and Authorities*, assigns oversight of DOE Manual 435.1-1 activities to two organizations but does not further delineate their responsibilities. See OFI-DOE-ID-1.

## Interim Recommendations

No interim recommendations resulted from this assessment. Interim recommendations are intended to capture the evolving need for possible DOE management attention based on identified conditions from a single or multiple-site assessment. Interim recommendations should be considered suggestions for improving program or management effectiveness.

## Opportunities for Improvement

Opportunities for improvement are suggestions that are offered to assist cognizant managers in improving programs and operations.

- **OFI-BEA-1:** BEA should consider conducting laboratory-wide training on the Y-12 National Security Complex waste management event for all personnel associated with waste management activities.
- **OFI-DOE-ID-1:** DOE-ID should consider revising 01.OD.01, *Functions, Responsibilities, and Authorities*, to clearly distinguish DOE Manual 435.1-1 activities that are assigned to two separate organizations.

## **Appendix A Supplemental Information**

### **Dates of Office of Enterprise Assessments (EA) Onsite Assessment**

October 21-31, 2019

### **Assessment Team**

Jimmy S. Dyke – Lead

Timothy F. Mengers – EA, Waste Characterization and Certification

Andrew S. Worker – NNSA Enterprise Stewardship, Packaging and Shipping

Frank A. Inzirillo – EA, Waste Stream Control and Quality Assurance

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## Appendix B Description of Waste Control Defense-in-Depth as Applied at INL

This figure shows the various engineering and administrative controls implemented throughout the radioactive waste management process to ensure that waste shipped to a disposal site meets all waste acceptance criteria and that no prohibited items are accidentally introduced into waste streams. Defense in depth is intended to reduce the likelihood of a non-compliant waste package by implementing a diverse defensive control strategy, so that if one layer of defense turns out to be inadequate, another layer of defense will prevent a non-compliance. In this figure, the generator is the point of origin of any waste stream. As waste progresses through the process, it can be accumulated and stored at various locations. Along the way, the waste is characterized and verified to be appropriate for the approved waste stream. Once finally packaged, the waste is certified to have met all requirements and is shipped to its final disposal site.

