

**Independent Assessment of the
Transuranic Waste
All-hazards Planning Basis
at the
Idaho Cleanup Project**

May 2026



**U.S. DEPARTMENT
of ENERGY**

**Office of Enterprise
Assessments**

Table of Contents

| | |
|---|-----|
| Acronyms..... | ii |
| Executive Summary..... | iii |
| 1.0 Introduction..... | 1 |
| 2.0 Methodology..... | 1 |
| 3.0 Results..... | 2 |
| 3.1 Procedures..... | 2 |
| 3.2 All-hazards Surveys..... | 3 |
| 3.3 Emergency Planning Hazards Assessments..... | 4 |
| 4.0 Best Practices..... | 5 |
| 5.0 Findings..... | 5 |
| 6.0 Deficiencies..... | 5 |
| 7.0 Opportunities for Improvement..... | 5 |
| Appendix A: Supplemental Information..... | A-1 |

Acronyms

| | |
|--------|---|
| AHS | All-hazards Survey |
| CRAD | Criteria and Review Approach Document |
| DOE | U.S. Department of Energy |
| DOE-ID | DOE Idaho Operations Office |
| DSA | Documented Safety Analysis |
| EA | Office of Enterprise Assessments |
| EAL | Emergency Action Level |
| EPHA | Emergency Planning Hazards Assessment |
| EPZ | Emergency Planning Zone |
| ICP | Idaho Cleanup Project |
| IEC | Idaho Environmental Coalition, LLC |
| INL | Idaho National Laboratory |
| INTEC | Idaho Nuclear Technology and Engineering Center |
| OFI | Opportunity for Improvement |
| PA | Protective Action |
| RWMC | Radioactive Waste Management Complex |
| TRU | Transuranic |

INDEPENDENT ASSESSMENT OF THE TRANSURANIC WASTE ALL-HAZARDS PLANNING BASIS AT THE IDAHO CLEANUP PROJECT

Executive Summary

The U.S. Department of Energy (DOE) Office of Enterprise Assessments (EA) conducted an independent assessment of the all-hazards planning basis for transuranic (TRU) waste operations at the Idaho Cleanup Project (ICP) from October to November 2025. The assessment evaluated the effectiveness of both the DOE Idaho Operations Office and the Office of Environmental Management's management and operating contractor, Idaho Environmental Coalition, LLC (IEC), in developing and maintaining the all-hazards planning basis for TRU waste operations.

EA identified the following strengths:

- IEC staff have established comprehensive procedures and guidance related to developing, documenting, and maintaining the TRU waste all-hazards planning basis.
- IEC staff have maintained complete all-hazard surveys applicable to TRU waste operations.
- IEC staff have maintained complete and compliant emergency planning hazards assessments (EPHAs) for TRU waste operations.

EA did not identify any weaknesses or areas of concern related to program compliance.

In summary, the all-hazards planning basis for TRU waste operations at the ICP is adequate with current and compliant all-hazards planning basis procedures, all-hazards surveys, and emergency planning hazards assessments. Additionally, TRU facility EPHAs are established using standardized modeling input parameters that can be applied consistently across the site, and the EPHAs provide most of the information needed to support incident analysis by a consequence assessment team.

INDEPENDENT ASSESSMENT OF THE TRANSURANIC WASTE ALL-HAZARDS PLANNING BASIS AT THE IDAHO CLEANUP PROJECT

1.0 INTRODUCTION

The U.S. Department of Energy (DOE) Office of Emergency Management Assessments, within the independent Office of Enterprise Assessments (EA), conducted an assessment of the all-hazards planning basis for transuranic (TRU) waste operations at the Idaho Cleanup Project (ICP). The all-hazards planning basis includes the development and maintenance of all-hazards surveys (AHSs) and emergency planning hazards assessments (EPHAs). EA conducted this assessment as part of a series of assessments of the TRU waste all-hazards planning basis for sites that make shipments to DOE's Waste Isolation Pilot Plant. The assessment was conducted from October to November 2025 in accordance with the *Plan for the Independent Assessment of the TRU Waste All-Hazards Planning Basis at the Idaho Cleanup Project, October – December 2025*.

The DOE Idaho Operations Office (DOE-ID) and the Office of Environmental Management's management and operating contractor, Idaho Environmental Coalition, LLC (IEC), are responsible for developing and maintaining the all-hazards planning basis for TRU waste operations that occur in the Radioactive Waste Management Complex (RWMC) and the Idaho Nuclear Technology and Engineering Center (INTEC), which are part of the ICP. The all-hazards planning basis is used to develop response plans, emergency action levels (EALs), predetermined protective actions (PAs) or PA recommendations, and the emergency planning zone (EPZ). The assessment evaluated the effectiveness of DOE-ID and IEC in developing and maintaining the all-hazards planning basis for operations involving storage, characterization, processing, and preparation for offsite shipment of TRU waste.

2.0 METHODOLOGY

The DOE independent oversight program is described in and governed by DOE Order 227.1A, *Independent Oversight Program*, which EA implements through a comprehensive set of internal protocols, operating practices, assessment guides, and process guides. This report uses the terms "best practices, deficiencies, findings, and opportunities for improvement (OFIs)" as defined in the order.

As identified in the assessment plan, this assessment considered requirements specified in DOE Order 151.1D, *Comprehensive Emergency Management System*. EA also used section 4.2, *All Hazards Planning Basis*, of EA CRAD 33-09, Revision 0, *DOE O 151.1D Emergency Management Program*, and considered the guidance provided in DOE Guide 151.1-1B, *Comprehensive Emergency Management System Guide*.¹

EA examined key documents, such as IEC procedures for developing and maintaining AHSs and EPHAs, the AHSs and EPHAs for facilities where TRU waste is stored and prepared for shipment to the Waste Isolation Pilot Plant, and other relevant programmatic documentation supporting the preparation of the all-hazards planning basis. EA toured 14 RWMC and INTEC TRU waste storage facilities and the RWMC and INTEC emergency control centers and interviewed key personnel responsible for the

¹ DOE Order 151.1E, *Comprehensive Emergency Management System*, was approved on October 28, 2024. At the time of the assessment, DOE Idaho Operations Office had not yet transitioned to the revised order, and DOE Order 151.1D requirements were in effect, which mandated establishment and maintenance of an Emergency Management Hazardous Materials Program.

development of all-hazards planning basis documents. The members of the assessment team, the Quality Review Board, and the management responsible for this assessment are listed in appendix A.

There were no previous EA findings to follow up on during this assessment.

3.0 RESULTS

3.1 Procedures

This portion of the assessment determined whether IEC procedures provide clear and appropriate guidance for developing, documenting, and maintaining AHSs and EPHAs, including identifying roles and responsibilities for review and approval.

The AHSs and EPHAs for ICP TRU waste facilities are developed by IEC, which is responsible for preparing both emergency management and vulnerability assessment analyses. IEC has developed and implemented an adequate set of guidance documents and procedures for developing and maintaining a technically based emergency management program that meets all DOE requirements. The site emergency plan, PLN-2012, *ICP Emergency Plan/RCRA Contingency Plan*, defines the process for AHS/EPHA development and administration, which then flows down into IEC implementing guides/procedures. INL guides GDE-437, *Developing and Maintaining Emergency Management All-Hazards Surveys*, and GDE-438, *Developing and Maintaining Emergency Management Hazards Assessments*, are used to implement the technical and administrative requirements for the development of AHSs, EPHAs, EALs, and predetermined PAs. GDE-437 and GDE-438 are compliant with DOE Order 151.1D and provide guidance for developing, documenting, and maintaining AHSs and EPHAs, including identifying roles and responsibilities for review and approval.

Guide GDE-437 directs that an AHS be developed to identify, record, and screen facility hazards as required by DOE Order 151.1D. GDE-437 provides adequate guidance on identifying and estimating hazardous material release scenarios, both human-caused and those associated with natural phenomena, in terms of type, quantity, and form of radioactive and other hazardous materials. GDE-437 also provides a clear description of the hazardous materials screening process and its application to the hazardous materials in a facility for AHS and EPHA development. The hazardous materials screening process requires the identification of all hazardous materials (e.g., radiological, chemical, explosives, hazardous biological agents and toxins) in a facility for a qualitative assessment based on DOE screening criteria.

Guide GDE-438 directs that an EPHA be developed when at least one hazardous material requiring quantitative analysis is identified through the hazardous materials screening process conducted as part of the AHS as required by DOE Order 151.1D. GDE-438 requires a quantitative analysis of all hazardous materials identified for further analysis in the AHS, provides correct criteria for excluding hazardous materials from further analysis in the EPHA, identifies receptors of interest for consequence projections, and provides source term determination instructions that effectively establish conservative material-at-risk quantities. In addition, GDE-438 appropriately defines conservative and average meteorological conditions and includes PA guides for both radioactive and chemical hazardous materials. Finally, GDE-438 effectively describes the establishment of a spectrum of potential emergency incident scenarios for analysis in the EPHA.

Guides GDE-437 and GDE-438 have adequate maintenance provisions and appropriately require facility management and suitable technical expert involvement in developing, reviewing, and approving AHSs and EPHAs. Specifically, the guides appropriately require a technical peer review and then approval of AHSs and EPHAs by the emergency management department and affected facility managers, including

nuclear facility managers, prior to being submitted to DOE-ID for review and approval. Additionally, the guides have adequate maintenance provisions that require AHSs and EPHAs to be reviewed after any update to the facility's safety basis documents, updated prior to significant changes to the facility/site operations or to hazardous material inventories, or reviewed at a minimum of every three years as required by DOE Order 151.1D. IEC has formalized the process documenting how facilities notify emergency management personnel of significant changes in facility hazardous inventories and defined a process for documenting how the reported changes are dispositioned by emergency management personnel. Procedure MCP-2412, *Reporting Changes of Hazards to Emergency Management*, identifies methods that facilities may use to report hazardous material inventory changes that could impact AHS and EPHA calculations and possibly require documents to be revised. Submitted changes are evaluated and the actions taken are documented as required by procedure MCP-2413, *Documenting Receipt and Disposition of Communications to Emergency Management Regarding Hazards*.

Procedures Conclusions

IEC has prepared guides and procedures that are compliant with DOE Order 151.1D and provide complete and clear guidance for developing, documenting, and maintaining AHSs and EPHAs.

3.2 All-hazards Surveys

This portion of the assessment determined whether the IEC AHSs identify all the hazards applicable to TRU waste operations and establish the appropriate input for the all-hazards planning basis of the emergency management program.

The two applicable AHSs reviewed for this assessment (EHS-20, *Emergency All-Hazards Survey for Idaho Nuclear Technology and Engineering Center*, and EHS-30, *Emergency Management All-Hazards Survey for Radioactive Waste Management Complex*) were prepared by IEC and approved by DOE-ID. The AHSs are compliant with DOE Order 151.1D and GDE-437, accurately describe TRU waste operations, and identify all hazards applicable to operations at the RWMC and INTEC, including chemical and radiological hazards. In addition, the AHSs effectively identify and document the generic types (natural, technical, and human-caused) of serious emergency incidents or conditions to which the RWMC and INTEC could be exposed and identify the applicable core program planning and preparedness requirements that constitute the basis for the IEC emergency management program. The hazardous materials and emergency conditions identified in the AHSs are consistent with the documented safety analyses (DSAs) for RWMC and INTEC operations. The results of the AHSs are comprehensive, informative, technically sound, and consistent with DOE guidance.

Both reviewed AHSs include screening of hazardous materials to identify those requiring quantitative analysis in an EPHA. The screening criteria meets DOE Order 151.1D and procedural exclusion requirements as described in GDE-437. The AHSs appropriately screened chemical and radiological hazards within the RWMC and INTEC and identified chemical and radiological hazards that require further analysis in an EPHA. Radioactive material was identified as requiring further analysis when 1) identified in safety basis documents as a credible criticality scenario, 2) non-exempt radioactive materials were located in facilities designated as HC-3 or higher, or 3) when the maximum anticipated inventory, represented as a plutonium-239 equivalent, exceeded DOE-STD-1027-92, *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports*, category 3 threshold quantities.

All-hazards Surveys Conclusions

IEC has effectively prepared, and DOE-ID has approved AHSs for TRU waste operations at the RWMC and INTEC that are complete and accurate. The AHSs identify all applicable hazards, establish the planning basis for the emergency management program, and comply with DOE Order 151.1D requirements.

3.3 Emergency Planning Hazards Assessments

This portion of the assessment determined whether the IEC EPHAs define the provisions of the emergency management hazardous materials program and provide the basis for establishing a graded approach that meets the requirements in DOE Order 151.1D, attachment 4, section 2, and evaluated the utility of the EPHA for conducting consequence assessments during a response.

The two applicable EPHAs reviewed for this assessment (EHA-20, *Emergency Planning Hazards Assessment for the Idaho Nuclear Technology and Engineering Center*, and EHA-30, *Emergency Planning Hazards Assessment for the Radioactive Waste Management Complex*) were prepared by IEC and approved by DOE-ID. The EPHAs implement the guidance in GDE-438 and are compliant with DOE Order 151.1D and procedural requirements for IEC facilities where TRU waste is processed, stored, and packaged for shipping. The EPHAs used a comprehensive, systematic process to identify and analyze hazards associated with TRU waste operations. The EPHAs contain a quantitative analysis of all hazardous materials identified for further analysis in the AHSs, and the assumptions made in the EPHAs are consistent with operational activities and the DSA. The facility and process descriptions in the EPHAs are consistent with the AHSs and DSA. Likewise, the EPHAs contain a compilation of hazardous material maximum quantities associated with TRU waste operations at the RWMC and INTEC. For each incident scenario, consequence assessment results and a corresponding incident classification are provided.

The reviewed EPHAs analyze a comprehensive spectrum of incident scenarios based on RWMC and INTEC operations. The EPHAs evaluated scenarios ranging from low consequence and high probability of occurrence to high consequence and low probability of occurrence. The EPHAs identify analyzed scenarios using short descriptive names with: (1) tabulated consequences for each scenario at identified receptor locations, (2) consequences versus distance under worst-case and typical dispersion conditions, and (3) distances at which the protective action criterion (PAC) and thresholds of early lethality are projected to be exceeded at identified receptor locations. The source term for each TRU waste release scenario was appropriately converted to an equivalent isotope to facilitate dispersion modeling calculations. For all scenarios, the source terms were presented as plutonium-239 equivalent based on DSA-determined drum maximum allowable quantity values. Calculations used the appropriate PAC of 1 rem for the radioactive material analyzed, as stated in GDE-438. Consequences were calculated for receptors of interest under two sets of atmospheric conditions: worst-case (F stability, 1.5 meters per second wind speed) and typical (D stability, 3.0 meters per second wind speed). Modeling parameters used in EPHA calculations are documented in the EPHA and are consistent with guidance in GDE-438; however, some modeling parameters (e.g., release duration, deposition velocity, and release radius) are not documented in GDE-438 or the EPHAs. (See **OFI-IEC-1**.)

The results of the reviewed EPHAs are consistent with DOE guidance and are accurate and technically sound. Conservative assumptions are used, and the calculations are accurate based on EA's replication of selected scenarios presented in the EPHAs using the HotSpot dispersion-modeling program. The EPHAs clearly identify hazardous materials that were analyzed, how the results were formulated, and how the results relate to facility operations and configurations in a way that can be replicated and effectively used by Idaho National Laboratory (INL) consequence assessment personnel during an Operational Emergency response, except for some modeling parameters as described in the preceding paragraph.

The EPHAs include the development of EALs, predetermined PAs, and the determination of the size of facility EPZs for the RWMC and INTEC that are compliant with DOE Order 151.1D. The size of the IEC facility EPZ encompasses the projected PA distance for all but the most extreme scenarios and provides a basis for expanding the EPZ, if needed. The facility EPZ distances determined for the RWMC and INTEC do not extend beyond the INL site boundary and are bounded by the consolidated INL site EPZ.

Emergency Planning Hazards Assessments Conclusions

IEC has prepared, and DOE-ID has approved, EPHAs for TRU waste operations at the IEC facilities that are technically accurate; effectively implement the EPHA requirements in DOE Order 151.1D; provide sufficient information to support EALs, PAs, and EPZ development; and provide the majority of information needed for a consequence assessment team to replicate the analysis.

4.0 BEST PRACTICES

No best practices were identified during this assessment.

5.0 FINDINGS

No findings were identified during this assessment.

6.0 DEFICIENCIES

No deficiencies were identified during this assessment.

7.0 OPPORTUNITIES FOR IMPROVEMENT

EA identified the OFI shown below to assist cognizant managers in improving programs and operations. While OFIs may identify potential solutions to findings and deficiencies identified in assessment reports, they may also address other conditions observed during the assessment process. This OFI is offered only as a recommendation for line management consideration; it does not require formal resolution by management through a corrective action process and is not intended to be prescriptive or mandatory. Rather, it is a suggestion that may assist site management in implementing best practices or provide potential solutions to issues identified during the assessment.

OFI-IEC-1: Consider revising GDE-438 and associated EPHAs to include all modeling parameters used in EPHA calculations (e.g., release duration, deposition velocity, and release radius) so that modeling results can be efficiently replicated and used by INL consequence assessment personnel during an Operational Emergency response.

Appendix A Supplemental Information

Dates of Assessment

October 1 to November 7, 2025

Office of Enterprise Assessments (EA) Management

Mark D. Barth, Acting Director, Office of Enterprise Assessments
William F. West, Deputy Director, Office of Enterprise Assessments
Kevin G. Kilp, Director, Office of Environment, Safety and Health Assessments
David A. Young, Deputy Director, Office of Environment, Safety and Health Assessments
Tamara D. Powell, Director, Office of Nuclear Safety and Environmental Assessments
David Olah, Director, Office of Worker Safety and Health Assessments
Terrance J. Jackson, Acting Director, Office of Emergency Management Assessments
Brent L. Jones, Director, Office of Nuclear Engineering and Safety Basis Assessments

Quality Review Board

William F. West, Advisor
Kevin G. Kilp, Chair
John S. Boulden, III
William A. Eckroade
Christopher E. McFearin

EA Assessment Team

Dr. Wade W. Gough, Lead
Robert F. Gee
Jonathan L. Pack