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Plan

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Facility Shutdown Plan and Deactivation, Decontamination, and Decommissioning Pre-Plan for the OU 7-10 Glovebox Excavator Method Project

Prepared for:
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Idaho Operations Office
Idaho Falls, Idaho

Idaho National Engineering and Environmental Laboratory

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Facility Shutdown Plan and Deactivation, Decontamination, and Decommissioning Pre-Plan for the OU 7-10 Glovebox Excavator Method Project

PLN-343
Revision 1

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Approved

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ABSTRACT

The OU 7-10 Glovebox Excavator Method Project is the project chosen by the U.S. Department of Energy to implement the path forward for demonstrating retrieval, characterization, and interim storage of transuranic waste from Operable Unit 7-10 (which comprises Pit 9) located in the Subsurface Disposal Area within the Radioactive Waste Management Complex at the Idaho National Engineering and Environmental Laboratory. This project was selected for achieving the objectives in the *Record of Decision: Declaration of Pit 9 at the Radioactive Waste Management Complex Subsurface Disposal Area at the Idaho National Engineering Laboratory, Idaho Falls, Idaho,* as modified by the 1995 and 1998 Explanation of Significant Difference documents, by demonstrating retrieval of a portion of the transuranic waste buried in Operable Unit 7-10. Information and experience obtained from execution of the project can be used to support overall activities to remediate other transuranic waste buried within the Subsurface Disposal Area.

The facility shutdown plan and decontamination, deactivation, and decommissioning pre-plan describes the approach that the Idaho National Engineering and Environmental Laboratory will use for shutting down and dispositioning the project facility following completion of the waste retrieval demonstration objectives. The pre-plan builds on the planning that was begun in the *OU 7-10 Glovebox Excavator Method Project Conceptual Design Report for Critical Decision 1* and describes in further detail the activities, methods, and equipment to be used as well as the intermediate and ending conditions to be achieved. The pre-plan also provides preliminary information on the (1) types of waste expected to be generated during decontamination, deactivation, and decommissioning, (2) rough orders of magnitude volume estimates, and (3) anticipated disposal paths.

Revision 1 incorporated the project baseline change to include drum assay and onsite storage in place of transferring waste to the Advanced Mixed Waste Treatment Project. In addition, an alternative shutdown process was documented in Appendix B, Revision 0, of this plan. The alternative process was further evaluated following document issuance. The revised sequence and the corresponding benefits were incorporated in Revision 1.

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CONTENTS

FIGURES

TABLES

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ACRONYMS

AMWTP	Advanced Mixed Waste Treatment Project
ARAR	applicable or relevant and appropriate requirements
BBWI	Bechtel BWXT Idaho, LLC
CAM	constant air monitor
CDR	conceptual design report
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFA	Central Facilities Area
D&D&D	deactivation, decontamination, and decommissioning
DOE	U.S. Department of Energy
DOE-ID	U.S. Department of Energy Idaho Operations Office
DSA	documented safety analysis
DSS	dust-suppression system
EDF	engineering design file
ESD	explanation of significant differences
FFS	Facility Floor Structure
HASP	health and safety plan
HEPA	high-efficiency particulate air
H&V	heating and ventilation
ICDF	Idaho National Engineering and Environmental Laboratory Comprehensive Environmental Response, Compensation and Liability Act Disposal Facility
IDAPA	Idaho Administrative Procedures Act
INEEL	Idaho National Engineering and Environmental Laboratory
IW	industrial waste

LDR	land disposal restriction
LLW	low-level waste
LMAES	Lockheed Martin Advanced Environmental Systems
M&O	management and operating (contractor)
MLLW	mixed low-level waste
MTRU	mixed transuranic waste
NA	not applicable
NCP	National Contingency Plan
NESHAPS	National Emission Standards For Hazardous Air Pollutants
NFPA	National Fire Protection Association
OU	operable unit
PCB	polychlorinated biphenyl
PGS	Packaging Glovebox System
PLC	programmable logic controller
PLN	plan
PPE	personal protective equipment
RAM	radiation area monitor
RCRA	Resource Conservation and Recovery Act
RCS	Retrieval Confinement Structure
RCT	radiological control technician
ROD	record of decision
RWMC	Radioactive Waste Management Complex
SDA	Subsurface Disposal Area
SSC	structures, systems, and components

SWEPP	Stored Waste Examination Pilot Plant
TBC	to be considered
TBD	to be determined
TRU	transuranic
TSDF	treatment, storage, and disposal facility
TSR	technical safety requirement
WAG	waste area group
WES	Weather Enclosure Structure
WMF	Waste Management Facility

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DEFINITIONS

This section provides definitions for certain terms in the context in which they are used in this document. Selection of the terms to be defined was based on the potential for confusion either because of (1) nonstandard use (e.g., terms carried over from previous project documents for consistency although they are not part of the standard deactivation, decontamination, and decommissioning [D&D&D] vernacular), (2) use of terms that may have alternate meanings depending on the reader's background, education, or occupation, and (3) nondescript word use meant to carry a specific meaning within the context of this plan.

Deactivation, decontamination, and decommissioning: Generally refers to the set of activities or phase of the project dealing with the final disposition of the facility; for example, permanently disabling or deenergizing equipment, final decontamination (if necessary), and dismantlement for reuse or disposal.

End-state criteria: The criteria used as the basis for determining successful achievement of project objectives relating to final conditions for the facility, equipment, and associated materials. For example, this includes release criteria established for facility components, equipment, and materials and site-specific thresholds for radiological and hazardous contaminants present in specified site media (e.g., soil and ground water). Independent verification personnel use this criteria when validating the accuracy and completeness of post-D&D&D measurements.

Layup: A period, rather than a process, during which the facility is monitored and maintained in stable and known conditions. Note: This term is comparable to the term "surveillance and maintenance" in the standard D&D&D vernacular.

Operations: (1) A generic term (when not qualified) that is used to refer to activities performed by the Operations organization (e.g., waste retrieval, underburden sampling, and shutdown activities) and (2) the Idaho National Engineering and Environmental Laboratory organization responsible for achieving the overall project objectives (see retrieval operations [below] for a listing of the overall project objectives) by performing (e.g., the waste retrieval, underburden sampling, waste characterization, and packaging).

Pulled: A project-specific term used to describe the action taken by operations personnel to relocate subsurface investigation soil-probe casings from the installed vertical locations so that excavation efforts can continue. Relocation of the probe casings will be within the confines of the retrieval demonstration area (i.e., casings will not be taken out of the confinement boundary).

Post-retrieval: A project-specific term that collectively refers to the shutdown, layup, and D&D&D project phases, or activities included therein.

Retrieval operations: The project phase, or set of activities, that directly supports achievement of all four of the overall project objectives, which are to (1) demonstrate waste zone retrieval (i.e., excavation), (2) provide information on any contaminants of concern present in the underburden (i.e., underburden sampling and analysis), (3) characterize waste zone material for safe and compliant storage (e.g., waste screening, sampling, and analysis; in-process fissile measurements; and drum assay), and (4) package and store waste onsite, pending decision on final disposition. Retrieval operations are complete when all of

the following activities have been completed. These activities do not necessarily run sequentially and may overlap.

1. A minimum 75 yd^3 of waste zone material has been excavated within the retrieval area

2. Retrieved waste zone material has been assayed, determined to be less than 200 FGE per drum, and sent to temporary storage (onsite)

3. Retrieved waste zone material has been sampled

4. Exposed underburden below the retrieval area has been sampled

5. Security has reviewed the last of the glovebox record of handling videotapes and all suspect security items have been dispositioned

6. U.S. Department of Energy has provided a Notification of Completion of Stage II excavation to the Agencies (i.e., U.S. Environmental Protection Agency and the Idaho Department of Environmental Quality) and the Agencies agree that excavation is complete

7. All waste items and outliers have been evaluated to identify the need for returning the material to the pit or processing in the glovebox, and no further need to perform these activities exists.

Shutdown (also safe shutdown): (1) The set of activities (i.e., process) performed to identify and mitigate facility hazards to place said facility in stable and known conditions that are cost-effective to maintain and (2) the state of the facility after shutdown activities have been successfully performed. Note: This term is related to the term "deactivation" in the standard D&D&D vernacular, which implies permanent disabling of equipment. However, as used in this plan, shutdown relative to equipment and systems implies temporary versus permanent disabling or deenergizing (e.g., disconnecting equipment from its source of power by an easily reversible method). Deactivation as a part of D&D&D has a more permanent connotation.

Facility Shutdown Plan and Deactivation, Decontamination, and Decommissioning Pre-Plan for the OU 7-10 Glovebox Excavator Method Project

1. INTRODUCTION

1.1 Background

The *Record of Decision: Declaration of Pit 9 at the Radioactive Waste Management Complex Subsurface Disposal Area at the Idaho National Engineering Laboratory, Idaho Falls, Idaho* (DOE-ID 1993) specifies environmental remediation of transuranic (TRU) waste from Waste Area Group (WAG) 7, Operable Unit (OU) 7-10 (which comprises Pit 9), located in the Subsurface Disposal Area (SDA) within the Radioactive Waste Management Complex (RWMC) at the Idaho National Engineering and Environmental Laboratory (INEEL). The location of the RWMC within the INEEL is shown in Figure 1 and a graphic representation of the SDA showing an expanded view of the OU 7-10 Project area is shown in Figure 2.

The *Waste Area Group 7 Analysis of OU 7-10 Stage II Modifications* (INEEL 2001) identifies a feasible approach to retrieving waste from OU 7-10. The OU 7-10 Glovebox Excavator Method Project was established to accomplish the objectives presented in that report. The overall objectives for the project are as follows:

- Demonstrate waste zone material retrieval
- Provide information on any contaminants of concern present in the underburden
- Characterize waste zone material for safe and compliant storage
- Package and store waste onsite, pending decision on final disposition.

This scope of work was requested by the U.S. Department of Energy Idaho Operations Office (DOE-ID) in support of the *Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory* (DOE-ID 1991), the OU 7-10 Record of Decision (ROD) (DOE-ID 1993), and Appendix A of the *Remedial Design/Remedial Action Scope of Work and Remedial Design Work Plan: Operable Unit OU 7-10 (Pit 9 Interim Action)* (LMITCO 1997).

The activities presented in this document are based on requirements contained in *OU 7-10 Glovebox Excavator Method Technical and Functional Requirements* (INEEL 2002a). The OU 7-10 Technical and Functional Requirements document (INEEL 2002a) establishes the technical baseline for the project and links the requirements presented in the OU 7-10 ROD, the 1995 and 1998 Explanation of Significant Differences (ESDs) documents (DOE-ID 1995; 1998), and Appendix A of the OU 7-10 Project Interim Action Plan (LMITCO 1997).

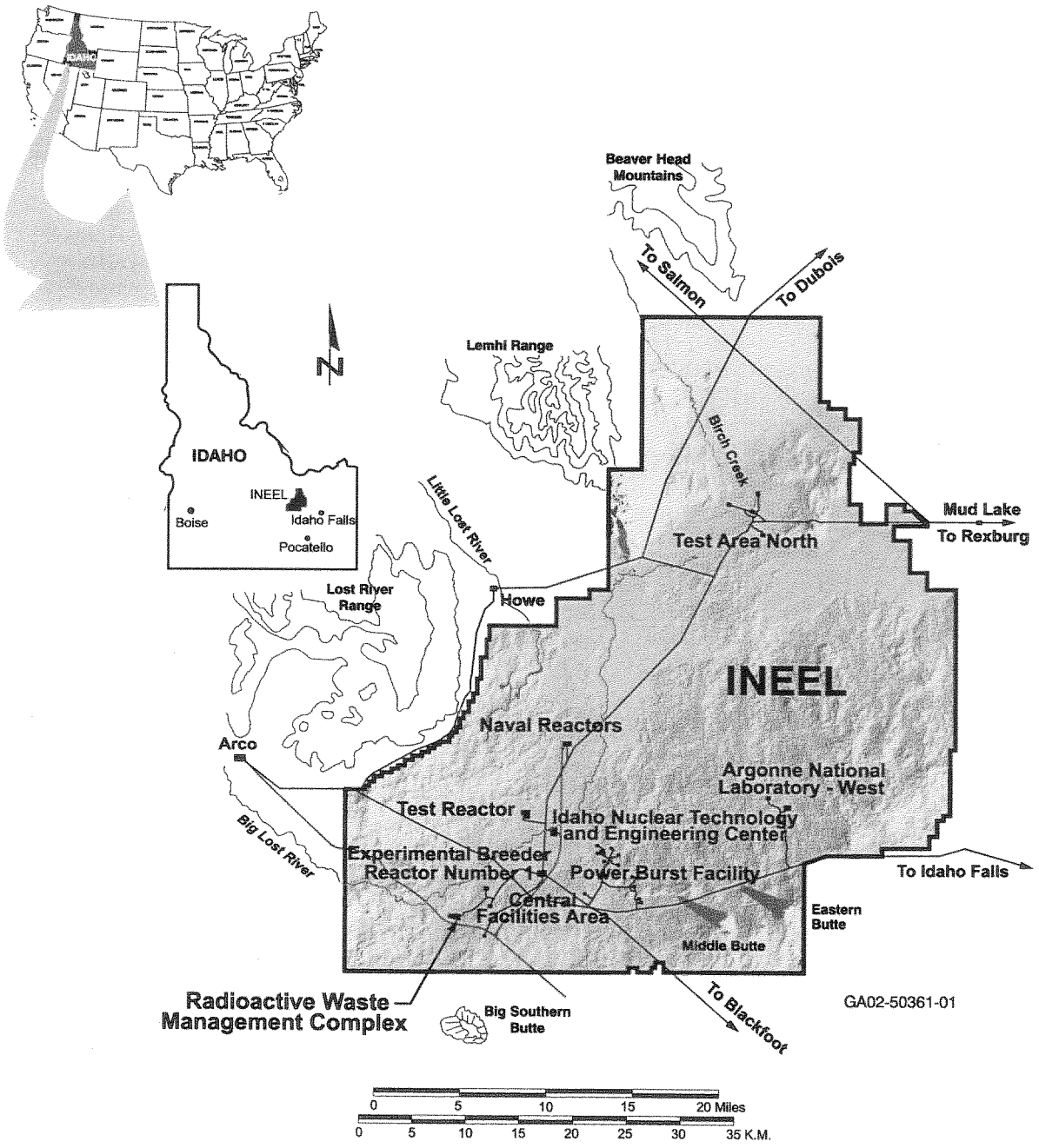

Figure 1. Map of the Idaho National Engineering and Environmental Laboratory showing the location of the Radioactive Waste Management Complex.

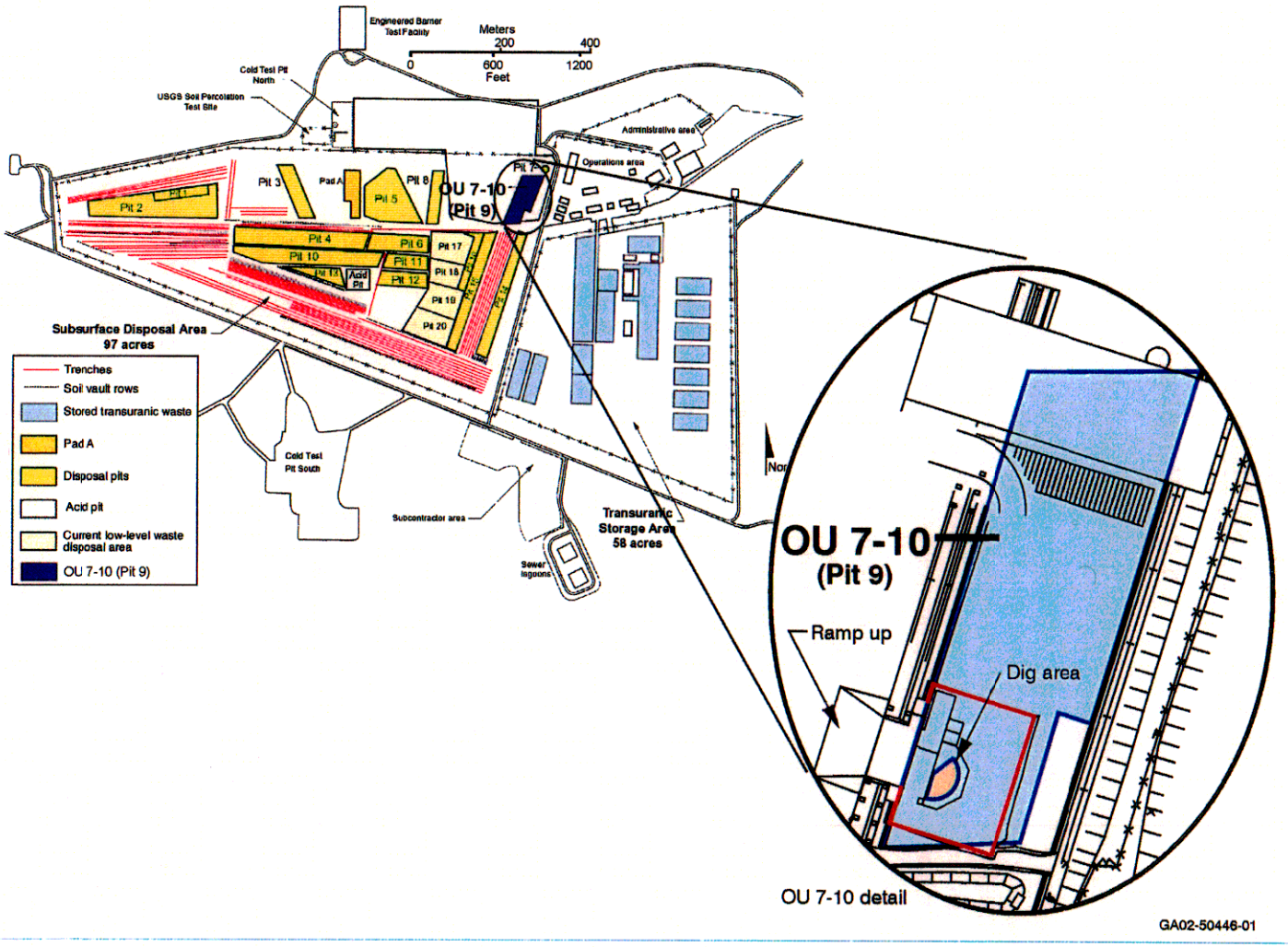

Figure 2. Map of the Subsurface Disposal Area of the Radioactive Waste Management Complex showing the location and an expanded view of OU 7-10 project area.

1.2 Purpose

The purpose of this plan is to satisfy the two primary objectives listed below:

1. This plan will build on and continue the planning that was begun in the *OU 7-10 Glovebox Excavator Method Project Conceptual Design Report for Critical Decision 1* (INEEL 2002b) relative to the post-retrieval life-cycle phases of the project facility. The plan will communicate pertinent information (e.g., plans, feedback about design impacts, and project-related information) to members of the project team as well as to external stakeholders.

2. This plan will support and provide documentation that capital asset life-cycle planning and planning for deactivation, decontamination, and decommissioning (D&D&D) has been performed pursuant to regulatory and U.S. Department of Energy (DOE) requirements.

1.2.1 Objective 1: Planning and Communication

Based on assumptions about initial conditions and proposed ending conditions, this plan describes the following:

- Approach to place project facilities, systems, and materials into stable and known conditions
- Activities necessary to maintain these conditions until final facility disposition
- A conceptual approach for D&D&D.

This plan also predicts equipment and material disposition paths and provides volume estimates for associated waste streams. The process descriptions and information contained in this document will be provided as input to the design team for identification and resolution of design impacts (see Appendix A). The process descriptions, sequencing, and timeline presented herein will provide a basis for interface identification as well as for more detailed cost and schedule estimation by the project team. In addition, this plan will serve as a mechanism to communicate these approaches, process descriptions, assumptions, ending conditions, and other pertinent information to external stakeholders.

1.2.2 Objective 2: Compliance with Regulations and Requirements

As described below, this plan helps to satisfy DOE and regulatory requirements in the following subject areas:

- Planning for the complete life cycle of capital assets during the design phase and describing a proposed decommissioning method and conversion to other use[a]
- Selecting design features and materials to facilitate decontamination and decommissioning[b]

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a. Required by DOE O 430.1A, "Life Cycle Asset Management," and DOE M 435.1-1, "Radioactive Waste Management Manual." These documents are applicable to this project through Attachment G, "List of Applicable Directives (List B)," to the INEEL management and operating contract (Contract No. DE-AC07-99ID13727).

- Describing facility ending conditions (after operations, shutdown, and decommissioning)[c]
- Generating, handling, and disposing of radioactive and hazardous waste.[d]

1.2.2.1 Life-Cycle Planning. This plan, which includes described approaches, processes, methods, and equipment, is evidence of the performance of life-cycle planning for the post-retrieval life-cycle phases during facility design. Section 3.3 of this plan describes the proposed decommissioning approach (i.e., total removal of the project facility via dismantlement).

1.2.2.2 Features and Materials to Facilitate Decontamination and Decommissioning. Appendix A of this plan identifies areas where design features and materials were selected to facilitate D&D&D or reuse of equipment or structures.

1.2.2.3 Facility Ending Conditions. Facility conditions expected to be present at specific points of time in the post-retrieval life-cycle phases of the facility have been forecasted as a basis for the development of this plan. These specific points in time include the following:

- Starting conditions at the beginning of shutdown activities (i.e., ending conditions after waste retrieval and underburden sampling) (see Section 2.3.1)
- Ending conditions after successful completion of shutdown activities (i.e., conditions after the facility is placed into safe, stable, and known conditions for layup) (see Section 3.1.6)
- Ending conditions after the layup period (i.e., starting conditions at the beginning of D&D&D) (see Section 3.2.3)
- Ending conditions after final facility decommissioning (i.e., after facility removal via dismantlement and subsequent OU 7-10 surface restoration activities) (see Section 2.3.2).

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b. Required by 10 CFR 835.1002, "Occupational Radiation Protection," Part 1002, "Facility Design and Modification," which applies to this project through Attachment K, "List of Applicable Laws and Regulations (List A)," to the INEEL management and operating (M&O) contract (Contract No. DE-AC07-99ID13727). Also required by DOE O 420.1, "Facility Safety," and DOE M 435.1-1, "Radioactive Waste Management Manual," which apply to this project through Attachment G, "List of Applicable Directives (List B)," to the INEEL M&O contract.

c. Required by DOE O 430.1A, "Life Cycle Asset Management," which applies to this project through Attachment G, "List of Applicable Directives (List B)," to the INEEL M&O contract (Contract No. DE-AC07-99ID13727).

d. Required by DOE Order 5400.1, "General Environmental Protection Program," and DOE M 435.1-1, "Radioactive Waste Management Manual," which apply to this project through Attachment G, "List of Applicable Directives (List B)," to the INEEL M&O contract (Contract No. DE-AC07-99ID13727). Waste generation, handling, and disposal must also comply with Executive Orders EO12856, "Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements," (58 FR 150) and EO13101, "Greening the Government through Waste Prevention, Recycling, and Federal Acquisition," (63 FR 179) as required by DOE O 435.1 (from Attachment G, "List of Applicable Directives [List B]," to the INEEL management and operating contract).

1.2.2.4 Waste Generation, Handling, and Disposition Planning. This plan, in conjunction with the *Waste Management Plan for the OU 7-10 Glovebox Excavator Method Project* (INEEL 2002c), identifies expected waste types and disposition paths for materials resulting from shutdown and D&D&D activities in accordance with DOE and regulatory requirements for waste planning. In addition, this plan provides rough order-of-magnitude waste-volume estimates for these waste streams.

1.3 Applicability

This shutdown plan applies to project facility life-cycle events that follow the completion of retrieval operations (i.e., waste retrieval, sampling, and packaging). These events have been divided into three distinct phases (listed below) in accordance with the process described in the OU 7-10 Project Conceptual Design Report (CDR) (INEEL 2002b). These three phases are:

1. Facility shutdown
2. Facility layup
3. Facility D&D&D.

1.4 Scope

1.4.1 Activities

1.4.1.1 Facility Shutdown Phase. The facility shutdown phase begins after retrieval operations are complete and project management determines that the overall objectives of the demonstration have been achieved. The scope of activities performed during shutdown includes the following:

- Reduction and immobilization of removable surface contamination
- Stabilization of the excavated portion of OU 7-10
- Other actions necessary to place the facility and associated equipment into a safe and cost-efficient condition for the layup phase.

1.4.1.2 Facility Layup Phase. The layup phase immediately follows shutdown of the facility. The duration of this phase will be kept to a minimum by initiating preparations for D&D&D as soon as possible. However, the facility has been designed such that this phase could be safely maintained for up to 1 year. The scope of activities performed within the facility during the layup phase includes surveillances, monitoring, and facility and equipment maintenance. Examples include routine radiological control surveillances to ensure continued confinement and control of radioactive contamination, monitoring for radiation and airborne contamination, monitoring of environmental emissions, and periodic maintenance of active and deactivated equipment. Concurrently, preparations will be underway for the D&D&D phase. These preparations include but are not limited to the following:

- Development of plans, procedures, and other documents necessary for performing the facility D&D&D

- Accomplishment of a readiness review
- Mobilization of personnel and equipment resources
- Reactivation of the facility for D&D&D.

1.4.1.3 Facility Deactivation, Decontamination, and Deactivation Phase. The D&D&D phase for the project will primarily involve deactivation and dismantlement of the project facility with site restoration of the OU 7-10 surface and associated project work areas. In addition, debris treatment, excess equipment disposition, material transportation, and waste disposal will be performed during the D&D&D phase.

1.4.2 Structures

The scope of this plan includes developing shutdown and D&D&D processes, describing conditions, and identifying final dispositions for the following primary project structures:

- **Weather Enclosure Structure** including the insulated fabric membrane, structural steel support frame, personnel and overhead doors, and interior vestibule walls. Installed equipment includes the power distribution system, uninterruptible power supply, lighting, compressed air distribution system, life safety and fire protection systems, the heating and ventilation (H&V) system (e.g., resistance heaters, ductwork, fans, and high-efficiency particulate air [HEPA] filters and housings), and radiological monitoring systems (personnel contamination monitor-2, scalars, and CAMs).
- **Facility Floor Structure** (FFS) including the shoring box, skirt, structural steel frame, decking, and floor plates.
- **Retrieval Confinement Structure** (RCS) including modular wall panels with integral structural supports (including those of the personnel monitoring and access areas), ventilation equipment, lighting, fire protection systems, doors, windows, dust-suppression system (DSS) piping, and glove and bag-out ports.
- **Packaging Glovebox System** (PGS) including structural supports, enclosure panels and windows, ventilation, lighting, work platforms, drum change-out ports and enclosures, fire protection systems, and glove and sample or equipment bag-out ports.
- **Drum bagout enclosure** including structural supports, fabric walls, HEPA filters, HEPA vacuum, lift tables, and drum movers.
- **Exhaust stack,** a 60-ft single-wall base-supported stack including a stack emissions monitor.
- **Fire riser building** including compressor, firewater lines and valves, and alarm system conduit.
- **Field support trailers** including the radiological control field trailer, Waste Management Facility (WMF) -645, -646, -657, and possibly WMF-613.

1.4.3 Equipment

The scope of this plan includes developing shutdown and D&D&D processes, describing conditions, and identifying final dispositions for the following equipment items:

- Process equipment
  - Excavator including end-effectors (e.g., buckets, hydraulic hammer [core sampler]), and RCS interface
  - PGS hoists, transfer carts, and cart drive system motors
- Process support equipment
  - Personal protective equipment (PPE) storage and shower trailer (if used)
  - PGS waste-handling and -sizing tools
  - Skid-mounted electrical load center
  - Portable diesel generator (standby power)
  - Breathing air compressor trailer
  - Plant air compressor
  - Dust suppression equipment (i.e., pumps, spraying and fogging controls) and water storage tanks
  - Closed-circuit television monitoring and video recording equipment
  - Portable storage units (if used)
  - Decontamination trailer (if used)
  - Uninterruptible power supply
- Material handling equipment
  - Forklifts and battery charging equipment
  - Drum handling and weighing equipment
  - Sample cold storage equipment

- Overburden soil boxes and associated handling equipment

- Radiological safety equipment
  - Fissile material monitors
  - Radiation monitoring equipment
  - Airborne contamination (alpha and beta) monitoring equipment
  - Personnel contamination monitoring equipment (e.g., walk-through units and hand-held friskers)
  - Criticality alarm system

- Safety equipment
  - Personal protective equipment
  - Portable eyewash stations.

1.4.4 Materials

The scope of this plan includes describing conditions and identifying final dispositions for the following materials:

- Overburden soil
- Fill material (i.e., pit run gravel) used for access ramp and FFS leveling course
- Geotextile fabric placed on the OU 7-10 surface before project initiation
- Field run electrical cables and conduit
- Temporary concrete support pads.

1.4.5 Site Improvements

The scope of this plan includes addressing any restoration work, if necessary, for the following site improvements (i.e., returning improved areas back to pre-project conditions):

- New access roads (e.g., gravel)
- Outside operations area (e.g., gravel)
- New parking areas (e.g., gravel)

- Storm water drainage modifications (e.g., culverts, pipes, drains, and berms)
- Other earthwork modifications.

1.4.6 Scope Limitations

This plan is not intended to be a Resource Conservation and Recovery Act (RCRA) (42 USC § 6901 et seq.) closure plan, pursuant to 40 CFR 264.112, "Closure Plan; Amendment of Plan"; or a closure plan pursuant to DOE Manual 435.1-1, "Radioactive Waste Management Manual," Chapter IV, Section Q(1), "Disposal Facility Closure Plans." Further, the actions discussed in this plan will not constitute final or interim closure of OU 7-10 or any part thereof. However, activities performed relative to removing project facilities from OU 7-10, restoration of the protective soil cover, and disposition of associated waste will comply with all (1) applicable or relevant and appropriate requirements (ARARs), (2) to-be-considered (TBC) requirements, and (3) applicable DOE orders. This plan is based primarily on design information and assumptions. Changes to address actual facility conditions after construction and operation are anticipated.

1.4.7 Exclusions to the Scope

Items excluded from the scope of this plan include the following:

- Lockheed Martin Advanced Environmental Systems (LMAES) process and retrieval buildings, associated equipment, and appurtenances
- Radioactive Waste management Complex facilities (other than those loaned for project use)
- Outside operations areas and equipment used for storage of project waste.

2. ASSUMPTIONS AND BASIS

2.1 Assumptions

2.1.1 General

2.1.1.1 Funding Restrictions. Planning for the OU 7-10 Glovebox Excavator Method Project through completion of the retrieval activities is based on the preliminary funding profiles. Note that project funding will include D&D&D in Fiscal Year 2004.

2.1.1.2 Environmental Regulation. It is assumed that because this project is a Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (42 USC § 9601 et seq.) remedial action, obtaining environmental permits will not be required. It is assumed that the versions of ARARs that apply to Stage II[e] are those that were in effect in the *Federal Register* when the OU 7-10 ROD (DOE-ID 1993) was signed, except as modified by the 1998 ESD to the OU 7-10 ROD (DOE-ID 1998), which incorporated the Toxic Substances Control Act ARARs (40 CFR 761). In addition, it is assumed that DOE Order 435.1, "Radioactive Waste Management,"(which cancels DOE Order 5820.2A) applies in lieu of DOE Order 5820.2A, "Radioactive Waste Management." Further, it is assumed that the shipment of waste off-Site will comply with all applicable administrative and substantive requirements. Changes will only be incorporated as agreed with DOE based on evaluation of scope, schedule, and cost impacts through a formal change control process.

2.1.1.3 **Current Idaho National Engineering and Environmental Laboratory Procedures.** For planning purposes, it is assumed that the project (including post-retrieval project phases) will be performed using current INEEL procedures in effect at the time of the project conceptual design (January 2002).

2.1.1.4 Requirements. It is assumed that agency (i.e., U.S. Environmental Protection Agency and the Idaho Department of Environmental Quality) reviews do not result in changes to established project objectives or technical and functional requirements.

2.1.1.5 **Project Objectives.** It is assumed that agencies will accept that the project objectives described in the WAG 7 Analysis of OU 7-10 Stage II Modifications (INEEL 2001), Section 3.3, "Stage II Objectives and Requirements," meet the 1998 ESD (DOE-ID 1998) objectives relative to Stage II.

2.1.1.6 Hazard Category. It is assumed that the facility will likely remain Hazard Category II throughout the project. The facility hazard category may be reduced as the hazardous and radiological releasable inventories are reduced through mitigation and decontamination actions.

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e. Stage II refers to the precursor project that implemented the contingency approach to the OU 7-10 Record of Decision (DOE-ID 1993).

2.1.1.7 Risk Items. It is assumed that management and mitigation plans as identified in Plan (PLN) 1024, "Risk Management Plan for the OU 7-10 Glovebox Excavator Method Project," will be appropriate for identified risk items.

2.1.1.8 Post-Retrieval Maintenance. It is assumed that the Weather Enclosure Structure (WES), RCS, and PGS will remain in place until disposition as implemented by D&D&D and that these structures can be decontaminated to allow safe shutdown. It is assumed that the WES will remain uncontaminated and will not require decontamination.

2.1.1.9 Fissile Material. It is assumed that accountability of fissile material will not be an issue during post-retrieval life-cycle phases.

2.1.2 Scope and Schedule Assumptions

2.1.2.1 Critical Lifts. It is assumed that no critical lifts will be required.

2.1.2.2 Idaho National Engineering and Environmental Laboratory Equipment Availability. It is assumed that all equipment to be used will be available when needed and will not require upgrading, modification, or repair.

2.1.2.3 Project Equipment Availability. It is assumed that project equipment, including the excavator, breathing air compressor trailer, plant air compressor, standby diesel generator, skid-mounted load center, and temporary power cables will be available for use during the shutdown, layup, and D&D&D phases. It is assumed that additional necessary equipment, tools, and PPE will be available as needed to support the schedule.

2.1.2.4 Idaho National Engineering and Environmental Laboratory Equipment Conditions. It is assumed that the equipment will be in good operating condition and no allowance will be made for equipment operating in severe conditions or beyond periodic maintenance services.

2.1.2.5 Idaho National Engineering and Environmental Laboratory and Project Equipment Cleaning. It is assumed that INEEL or project equipment outside the confinement structure will not require decontamination (other than a wipe down), cleaning, or replacement.

2.1.2.6 Utilities. It is assumed that all utilities will have the required capacities available and can be secured at the locations indicated on the conceptual drawings.

2.1.2.7 Storage Containers. It is assumed that the four existing government-owned Connex trailers will be available to use for storage during the post-retrieval life-cycle phases and that they can be used at no additional cost to the project. In addition, it is assumed that these trailers will require only connection to electrical service and fire detection systems to make them suitable for freeze protection and that no modifications or additions to the interior of the trailers will be required.

2.1.2.8 Non-Idaho National Engineering and Environmental Laboratory Equipment. It is assumed that subcontractor leased equipment will not require decontamination (other than a wipe down) or replacement. It is assumed that all non-INEEL equipment will be free released at the end of use.

2.1.2.9 Lockheed Martin Advanced Environmental Systems. It is assumed the on-going LMAES litigation or Site activities will have no adverse effect on the post-retrieval life-cycle phases of the project.

2.1.2.10 Existing Trailers. It is assumed that three existing trailers (WMF-657, -645, -646) will be available for use during operations (including post-retrieval operations) and that the current configuration and condition of the trailers will serve the intended functions without repair or alteration. No additional funding will be estimated for such modifications.

2.1.2.11 Office Space. It is assumed that this project will supply additional office space beyond the identified existing trailers for 15 people (approximately 139 m^2 [1,500 ft^2]) for 1 year after shutdown. This added space is assumed to be in the form of leased trailers and will be needed to support shutdown, layup, and D&D&D operations.

2.1.2.12 Readiness Review. It is assumed that (1) no schedule impacts from identified rework items outside the project scope will be identified, (2) no additional schedule time will be allowed for repeating all or portions of the D&D&D management self-assessment or readiness review sequence of activities because of failure, and (3) that the D&D&D readiness review will be successful, involving one scheduled cycle.

2.1.2.13 Probe Casing Extraction. Before the start of the waste retrieval demonstration (completed in Stage I), a series of moisture and visual probes and probe casings was placed in the ground in the area targeted for the waste retrieval demonstration to obtain waste data. It is assumed that the probe casings will be pulled out only as necessary to support waste retrieval operations.

Note: After being pulled (see definitions), extracted probes and probe casings will remain in the pit; that is, they will be laid down in the bottom of the excavation area, away from excavation activities, and at no time removed from the confinement area.

2.1.2.14 Availability of Funding. It is assumed that funding necessary to perform the project within the schedule will be available.

2.1.2.15 Completion. It is assumed that the project fieldwork will be complete when (1) all retrieved materials have been stored, (2) facilities have been either cleaned and released for reuse or decontaminated, dismantled, and removed from the project site, and (3) waste materials resulting from D&D&D have been transferred for disposal.

2.1.2.16 Start of Shutdown and Project Completion Timing. It is assumed that facility shutdown operations will begin after (1) completion of retrieval operations and (2) approval has been received from project management to begin the shutdown phase. It is assumed that D&D&D operations will be completed as early as possible but no later than 1 year after the start of shutdown.

Note: Any delays that occur between the completion of waste retrieval and underburden sampling and the start of shutdown operations are assumed to be part of retrieval operations and are not shown as a component of the post-retrieval operations timeline.

2.1.2.17 Field Shift Schedules. It is assumed that a single crew working a total of 4 days per week and 10 hours per day will be sufficient for D&D&D preparation activities performed during the layup

phase. Routine monitoring performed during the layup phase will be performed by Operations and Radiological Controls personnel as needed. Sufficient staffing will be applied during the D&D&D phase to complete the project in a safe and timely manner.

2.1.2.18 Season or Weather Delays. It is assumed that winter dismantlement will be acceptable and that no weather delays will occur.

2.1.2.19 Equipment Failure. It is assumed that no major equipment failure will occur that could impact the schedule critical path. It is assumed that schedule process durations and time estimates will adequately capture the requirements for preventive and minor maintenance.

2.1.2.20 Procured Services. It is assumed that procured services will not cause delays and will be received as planned.

2.1.2.21 Schedule Contingency. For the purpose of this plan only, no schedule contingency (i.e., allowance) will be assumed when developing the timeline for the post-retrieval life-cycle phases. Ordinarily, schedule contingency would be included for items such as potential change orders, field problems, and materials, equipment, and service delays to the project.

2.1.3 Interface Assumptions

2.1.3.1 Idaho National Engineering and Environmental Laboratory Comprehensive Environmental Response, Compensation and Liability Act Disposal Facility Interface. It is assumed that the INEEL CERCLA Disposal Facility (ICDF) will be open and have sufficient availability to treat and dispose of the waste identified in Section 4 of this document for disposition at ICDF. In addition, it is assumed that the only costs to the project for such disposition will be characterization, transportation, and container costs. Once materials are delivered to the ICDF, the project will no longer accrue any costs related to treatment or disposal. This assumption is in agreement with the current ICDF scope and plan of operations.

Note: If the ICDF is not able to accept some or all of the low-level waste (LLW) generated during D&D&D activities (e.g., facility not yet open, available disposal space already allocated, or insufficient staffing to process additional waste), it is assumed that disposal will occur at an off-Site treatment, storage, or disposal facility (TSDF) permitted to receive such waste (e.g., Envirocare in Utah).

2.1.3.2 Advanced Mixed Waste Treatment Project Interface. It is assumed that a portion of the waste materials resulting from the shutdown and D&D&D activities cannot reasonably be decontaminated to below 10 nCi/g for TRU contaminants. Further, it is assumed that the Advanced Mixed Waste Treatment Project (AMWTP) will not accept such materials for processing and disposal.

2.1.3.3 Waste Stream Disposition. It is assumed that disposition paths will be available for waste streams generated during post-retrieval operations, with the exception of TRU waste. All TRU waste will be stored onsite pending disposition.

2.1.4 Radiological and Criticality Assumptions

2.1.4.1 Worker Location and Protection. It is assumed that the worker safety basis will be bounded by the approved final documented safety analysis (when completed), job safety analyses, project health and safety plans (HASPs), a critical safety evaluation, the Fire Hazards Analysis (Gosswiller 2002), and operations procedures.

2.1.4.2 Remote Handling. During facility shutdown, layup, and D&D&D operations, radioactive waste materials will not be present in such quantities that would require remote handling of decontamination and D&D&D waste streams.

2.1.4.3 Criticality. During post-retrieval project phases, fissile materials will not be present in quantities that, if accumulated, would cause the potential for a nuclear criticality to exceed the level of extremely unlikely.

2.1.4.4 Contamination Levels. It is assumed that alpha contamination levels inside the RCS and gloveboxes may exceed 1×10^6 dpm per 100 cm^2 and that adequate PPE will be available to allow personnel entry into these confinement areas.

2.1.4.5 Radiological Conditions. It is assumed that no unexpected radiological conditions will be encountered during shutdown, layup, or D&D&D activities.

2.1.5 Shutdown Assumptions

2.1.5.1 Safe Shutdown. It is assumed that the facility will transition to safe shutdown after operations.

2.1.5.2 Retrieval Operations Completed. It is assumed that retrieval operations will be completed before initiation of this work. It is assumed that any materials from excavation that could not be processed during retrieval operations have been either dispositioned (e.g., disposed of) during retrieval operations or returned to the open excavation before initiation of this work. It is assumed that any materials returned to the open excavation will be placed at least 0.9 m (3 ft) below grade.

2.1.5.3 Post-Retrieval Facility Condition. It is assumed the conditions identified in Section 2.3.1 are valid and reflect the actual condition of the excavation, the facility, and the retrieved waste.

2.1.5.4 Condition of Probes. It is assumed that several of the probes will be pulled out and laid on their sides within the excavation and that all parts of these probes will be at least 0.9 m (3 ft) below grade. Further, it assumed that the remaining probes (those not pulled [see definitions]) will be in the original, installed positions (i.e., vertical) and will require partial removal (i.e., down to 0.9 m [3 ft] below grade) during the facility shutdown or D&D&D phase.

2.1.5.5 Confinement of Contamination. It is assumed that negligible contamination will be spread outside of the confinement area boundary during retrieval operations. This includes contamination spread (1) from personnel entry and exit, (2) through the excavator hydraulic fluid from an accident or from a confinement breach (e.g., loss of a glove), (3) from breach of a bag during drumout operations or

sample bag-out, (4) from H&V system failure, or (5) from an uncontained leak path. Unexpected contamination of equipment and structures has the potential to change the shutdown and D&D&D approaches as well as disposition options for materials.

2.1.5.6 Overburden Disposition. It is assumed that project management approval will be received (with agency concurrence) to backfill the excavated waste zone with a clean, weak (i.e., nonmonolithic) grout in lieu of the overburden material removed from the excavation area as described in the project CDR (INEEL 2002b; Burton 2002). In addition, it is assumed that final disposition paths for the removed overburden material include (1) disposal at the ICDF or the RWMC LLW pit or (2) reuse as OU 7-10 overburden through reinstallation over the grout backfill.

2.1.6 Layup Assumptions

2.1.6.1 Layup. It is assumed that a layup period where the facility is monitored and maintained in a safe shutdown condition will be required while D&D&D preparations are performed (e.g., documents and plans developed, facility characterized, readiness review conducted, work crews mobilized, and certain facility systems reactivated).

2.1.6.2 Maintenance. It is assumed that no equipment modifications or servicing will be required beyond normal planned maintenance and repairs.

2.1.6.3 Layup Duration. It is assumed that the layup period duration will be only as long as necessary to prepare for D&D&D, receive authorization to proceed, and initiate the D&D&D phase. The duration of this period is assumed to be less than 1 year such that the facility design life will not be exceeded.

2.1.7 Deactivation, Decontamination, and Decommissioning Assumptions

2.1.7.1 Ending Conditions. It is assumed that Section 2.3.2 accurately describes the conditions that must be achieved during D&D&D for project closeout.

2.1.7.2 Final Backfill. It is assumed that a final backfill of approved fill material (e.g., protective soil cover layer) to a depth of 0.9 m (3 ft), as measured from the top of the initial backfill (i.e., grout) to finished grade, will be sufficient to provide interim protection of workers, the public, and the environment until such time that more permanent measures are implemented.

2.1.7.3 Cross Contamination of Overburden. It is assumed that no cross contamination of overburden will occur during retrieval operations. This includes the assumption that no subsidence of soil will occur from behind the shoring box at any time such that the overburden behind it becomes contaminated.

2.1.7.4 Transportation Permits. It is assumed that no transportation permits will be required for movement of materials resulting from D&D&D.

2.1.7.5 Dismantlement Site Access and Lay-Down Area. It is assumed that the main LMAES (i.e., north) gate will be used for access during dismantlement, and the area between the LMAES

processing building and OU 7-10 will be available for use as the main lay-down area. It is assumed that an additional lay-down area will be available north of the LMAES fenced area.

2.1.7.6 Sizing. The RCS, all material and equipment inside the RCS, and the PGSs and internal equipment will be assumed contaminated and will be sized and loaded into soft-sided waste bags or approved waste boxes or drums.

2.1.7.7 Mixed Low-Level Waste. The RCS, all material and equipment inside the RCS, and the PGSs and internal equipment (except as otherwise identified in Table 1) will be considered mixed low-level waste (MLLW) and will be transported to the ICDF for disposal or, if ICDF is unavailable, to an off-Site TSDF.

Table 1. Equipment and expected disposition paths following completion of the OU 7-10 Glovebox Excavator Method Project.

Waste Stream Description	Expected Waste Type(s)	Planned Primary Disposition[a]
Air compressors (breathing air trailer and plant air compressor) and receiver tanks	Not applicable (NA) – not a waste	Survey and release for reuse within the U.S. Department of Energy (DOE) complex.
Cameras, monitors and video cassette recorders	NA	Survey and release for reuse within the DOE complex.
Cargo containers	NA	Survey and release for reuse within the DOE complex.
Compressed gas cylinders (full, partially filled, or empty)	NA	Central Facilities Area property control for reuse.
Concrete support pads (miscellaneous)	Industrial waste (IW)	INEEL landfill.
Decontamination trailer (if used)	NA	Survey and release for reuse within the DOE complex.
Drum-handling equipment	NA	Survey and release for reuse within the DOE complex.
Drum-out bag stubs (in Packaging Glovebox System [PGS])	Mixed transuranic waste (MTRU)	Onsite storage.
Drum-out enclosures, including enclosure panels, doors, windows, and support structure (part of PGS)	Low-level waste (LLW)	Idaho National Engineering and Environmental Laboratory Comprehensive Environmental Response, Compensation and Liability Act Disposal Facility (ICDF)
Dust suppression system (internal to Retrieval Confinement Structure [RCS])	LLW	ICDF

Table 1. (continued).

Waste Stream Description	Expected Waste Type(s)	Planned Primary Disposition[a]
Dust-suppression system (piping system outside confinement area boundary)	IW	INEEL landfill.
Dust-suppression system (skid with pumps, tanks, and controls)	NA	Survey and release for reuse within the DOE complex.
Excavator body	NA	Survey and release for reuse within the DOE complex Note: The possibility is high that the costs of decontamination to allow reuse of the excavator will exceed the value of the excavator. This depends on the level of contamination in the facility and the ability of the excavator seals to keep the contamination from entering the hydraulic system. If the excavator is not released for reuse, hazardous components, such as the battery, fuel, oil, and hydraulic system will be removed and disposed of appropriately, and the excavator body will be disposed of at ICDF. The hydraulic fluids, greases, and hydraulic system will be MTRU waste and will be stored onsite
Excavator arm	Mixed LLW (MLLW)	ICDF
Excavator end effectors (including buckets and hydraulic hammer attachment)	LLW	ICDF
Electrical equipment (i.e., breaker boxes and transformers)	NA	Survey and release for reuse within the DOE complex.
Electrical wiring and outlets	IW	INEEL landfill.
Eye wash stations	NA	Survey and release for reuse within the DOE complex.
FFS outside RCS (flooring and decking)	IW	INEEL landfill.
FFS flooring inside RCS (all structural members and skirt)	LLW	ICDF
Fire protection system for Weather Enclosure Structure (WES)	IW	INEEL landfill

Table 1. (continued).

Waste Stream Description	Expected Waste Type(s)	Planned Primary Disposition[a]
Fire protection distribution equipment for RCS and PGS—components outside the confinement area boundaries	IW	INEEL landfill
Fire protection panels and controls for WES and RCS	NA	Survey and release for reuse within the DOE complex
Fire protection system for RCS and PGS—piping and nozzles inside confinement area boundary	LLW	ICDF
Fire protection system skid for PGS	NA	Survey and release for reuse within the DOE complex
Fissile monitor systems (in PGS)	NA	Survey and release for reuse
Forklift battery charging stations	NA	Survey and release for reuse within the DOE complex
Forklifts	NA	Survey and release for reuse within the DOE complex
Generator—standby diesel	NA	Survey and release for reuse
Geotextile fabric cover from pit	LLW	ICDF
Gloves—RCS and PGS	MTRU	Stored onsite
Gravel fill material (access ramp and FFS leveling course)	LLW	ICDF (as cover or fill)
H&V ducting from RCS to HEPA housings	LLW	ICDF
H&V system (motors, controls, and resistance heating units)	NA	Survey and release for reuse within the DOE complex
HEPA filters and housings	MTRU	Stored onsite
HEPA inlet filters and housings	MTRU	Stored onsite
H&V ducting and stack downstream from HEPA filters and fans	LLW	ICDF
Lighting systems for WES, RCS, and PGS	IW	INEEL landfill
H&V ducting in PGS	LLW	ICDF
Monitoring system – criticality (criticality alarm system)	NA	Survey and release for reuse within the DOE complex
Monitoring systems—radiation area monitors, constant air monitors, and personnel contamination monitors	NA	Survey and release for reuse within the DOE complex

Table 1. (continued).

Waste Stream Description	Expected Waste Type(s)	Planned Primary Disposition[a]
Office trailers	NA	Survey and release for reuse within the DOE complex
Overburden soil (in sacks)	LLW	ICDF or RWMC LLW pit (as cover or fill)
Overburden boxes	IW	INEEL landfill
Pallets	NA	Survey and release for reuse within the DOE complex
Personal protective equipment and shower trailer (if used)	NA	ICDF, laundry, or stored onsite
PGS hoists and fissile monitor well	MTRU	Stored onsite
PGS glove ports	MTRU	Stored onsite
PGS skins or shells	LLW	ICDF
PGS support structures (external to confinement area boundary)	LLW (because of association with attachment to PGS skin)	ICDF
PGS windows	LLW	ICDF
PGS working platforms	IW	INEEL landfill
Probes—cut off portions	LLW	ICDF
RCS—skin, support structure, doors and windows	LLW	ICDF
Shoring box	LLW	ICDF
Small tools and miscellaneous items (bagged out of RCS or the PGS)	MTRU	Stored onsite
Skid-mounted electrical load center	NA	Survey and release for reuse
Storage cabinets (including cold sample storage and storage shelving)	NA	Survey and release for reuse within the DOE complex
Transformers and panels	NA	Survey and release for reuse
Vacuums (in PGS)	MTRU	Stored onsite
Waste transfer conveyance system components and subsystems (structure, carts, rails, and drive systems)	LLW	ICDF

Table 1. (continued).

Waste Stream Description	Expected Waste Type(s)	Planned Primary Disposition[a]
Weigh scales	NA	Survey and release for reuse within the DOE complex
WES skin or shell (including personnel and overhead doors)	NA	Survey and release for reuse within the DOE complex
WES support structure	NA	Survey and release for reuse within the DOE complex
WES vestibule (walls and roof)	IW	INEEL landfill

a. Expected disposition path for the majority of the identified equipment and material, subject to applicable waste acceptance criteria.

2.1.7.8 Steel Deck and Weather Enclosure Structure. It is assumed that radiological surveys in preparation for the release of the WES and portions of the FFS steel decking material located outside of the RCS boundary will detect no contamination from project operations. If radiological releases occur during operations, then the approach must be altered. Dismantlement of these structures will be performed in such a manner that the resultant materials can be transported to the storage area at Central Facilities Area (CFA) for potential reuse at the INEEL.

2.1.7.9 Equipment and Material Salvaging. It is assumed that no salvaging of equipment and materials will occur except as identified in Table 1.

2.2 Requirements

This section identifies requirement source documents that apply to the post-retrieval life-cycle phases of the project. Section 2.2.1 identifies those requirement sources that will have broad applicability to all post-retrieval phases. Section 2.2.2 identifies requirement sources and select requirements that will apply to the individual phases (i.e., shutdown, layup, and D&D&D).

2.2.1 Governing and General Requirements

Requirement documents referenced in this section apply to all post-retrieval phases of the project.

2.2.1.1 Contractual Requirements. Post-retrieval project activities will be performed in accordance with the requirements identified in Contract No. DE-AC07-99ID13727 (CF&AO-M&O-02-029). These will include the requirements contained in applicable laws, regulations, and DOE directives as defined by Lists A and B to the contract (i.e., the versions in effect at the start of shutdown). The requirements contained in the listed source documents are included herein by reference only. If, on review, the INEEL management control procedures (i.e., companywide procedures that define how the INEEL and the project will comply with these requirements) are deemed inadequate for completing the scope of post-retrieval activities, INEEL-recognized subject matter experts will be contacted to provide interpretations of the contractual requirements and to obtain guidance on modifying or creating new procedures.

2.2.1.2 *Record of Decision Applicable or Relevant and Appropriate Requirements.*

Table 2 identifies the OU 7-10 ROD ARARs that apply to the post-retrieval phases of the project.

Table 2. Applicable or relevant and appropriate requirements.

Source[a]	Comments and Applicability
State of Idaho, Idaho Administrative Procedures Act (IDAPA), IDAPA 58.01.01.650, "Rules and Standards for Air Pollution Control," and IDAPA 58.01.01.651, "Rules for Control of Fugitive Dust."	Applies to the shutdown and D&D&D phases when dust could be generated.
IDAPA 58.01.05.004 (40 CFR 260.20 and 260.22), "Hazardous Waste Management (HWM) System."	Applies to secondary waste and D&D&D debris created during cleaning and D&D&D activities.
IDAPA 58.01.05.005 (40 CFR 261 Subpart C, "Characteristic Hazardous Waste," 261.20 to 261.24), "Identification and Listing of Hazardous Waste."	Applies to secondary waste and D&D&D debris created during cleaning and D&D&D activities.
IDAPA 58.01.05.011 (40 CFR 268.41 to 268.43), "Land Disposal Restriction (LDR) Treatment Standards."	Current LDRs may apply to waste (D&D&D or secondary waste) that is generated during cleaning and D&D&D activities if it is sent to the ICDF for disposal.
40 CFR 260, "Hazardous Waste Management System: General."	Applies to secondary waste and D&D&D debris created during cleaning and D&D&D activities.
40 CFR 261, "Identification and Listing of Hazardous Waste."	Applies to secondary waste and D&D&D debris created during cleaning and D&D&D activities.
40 CFR 264, "Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Activities."	Applies to secondary waste and D&D&D debris created during cleaning and D&D&D activities.
40 CFR 268, "Land Disposal Restrictions."	Current LDRs may apply to waste (D&D&D or secondary waste) that is generated during cleaning and D&D&D activities if it is sent to the ICDF for disposal.
40 CFR 61, "National Emission Standards for Hazardous Pollutants."	Applies to stack emissions during the shutdown, layup, and D&D&D project phases.
40 CFR 761, "Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions."	Applies to secondary waste and D&D&D debris created during cleaning and D&D&D activities if PCBs are present.

a. The IDAPA numbering scheme has been changed since the applicable or relevant and appropriate requirements were first identified in the OU 7-10 Record of Decision (DOE-ID 1993). The rules and standards section numbers contained in this table reflect the new scheme (i.e., the move from Section 16 to Section 58).

2.2.1.3 Record of Decision To-Be-Considered Guidance. Table 3 identifies the OU 7-10 ROD TBC guidance requirements that directly apply to the post-retrieval operation phases of the project.

2.2.1.4 Other General Requirements. Table 4 identifies selected requirement sources that apply to the post-retrieval operation phases of the project. Identified versions are those that were in effect at the time this plan was generated. Performance of activities during the post-retrieval phase will be in accordance with INEEL procedures that implement regulatory and DOE requirements in effect at that time.

Table 3. To-be-considered guidance requirements.

Source	Comments and Applicability
40 CFR 300, "National Oil and Hazardous Substances Pollution Contingency Plan."	To be determined (TBD)[a]
"A Guide to Delisting of RCRA Waste for Superfund Remedial Responses" (EPA 1990).	Not applicable
Focus on Closure Requirements (EPA 1989a).	TBD[a]
Superfund LDR Guide #1, Overview of RCRA Land Disposal Restrictions (LDRs) (EPA 1989b).	TBD[a]
Toxic Air Pollutants Policy, State of Idaho, *New Source Review Policy for Toxic Air Pollutants.*	Applies to stack emissions during the shutdown, layup, and deactivation, decontamination, and decommissioning project phases.
DOE O 5400.5, "Radiation Protection of the Public and the Environment."	Applies through List B (see Attachment G) of the Idaho National Engineering and Environmental Laboratory management and operating contract to the control of radiological and hazardous contaminants within project facilities.
DOE O 5820.2A, "Radioactive Waste Management."	Cancelled (July 1999) by DOE O 435.1, "Radioactive Waste Management"; and by DOE M 435.1-1, "Radioactive Waste Management Manual."

a. To be resolved by an engineering design file on record of decision applicable or relevant and appropriate requirements being prepared by project environmental personnel.

Table 4. Other general requirements that apply to the post-retrieval operation phases.

Source	Comments and Applicability
10 CFR 71, 2002, "Packaging and Transportation of Radioactive Materials."	Applicable, on List A (Attachment K) of the Idaho National Engineering and Environmental Laboratory (INEEL) management and operating (M&O) contract.
10 CFR 820, 2002, "Procedural Rules for DOE Nuclear Activities," Appendix A, "General Statement of Enforcement Policy."	Applicable, on List A (Attachment K) of the INEEL M&O contract. Price Anderson Amendment Act regulations (10 CFR 820).
10 CFR 830, 2002, "Nuclear Safety Management," Subpart A, "Quality Assurance Requirements."	For example, applicable to data quality objectives, end-state verification, and recordkeeping for deactivation, decontamination, and decommissioning (D&D&D).
10 CFR 830, 2002, "Nuclear Safety Management," Subpart B, "Safety Basis Requirements."	Applicable, on List A (Attachment K) of the INEEL M&O contract.
10 CFR 835, 2002, "Occupational Radiation Protection."	Applicable, on List A (Attachment K) of the INEEL M&O contract.
29 CFR 1910, 2002, "Occupational Safety and Health Standards."	Applicable, on List A (Attachment K) of the INEEL M&O contract.
29 CFR 1926, 2002, "Safety and Health Regulations for Construction."	Applicable, on List A (Attachment K) of the INEEL M&O contract.
40 CFR 112, 2002, "Oil Pollution Prevention, Code of Federal Regulations."	Not applicable. Project is storing less than regulatory limits (i.e., 1,320-gal aboveground total and no single container contains more than 660 gal).
"Comprehensive Environmental Response, Compensation and Liability Act of 1980" *(CERCLA/Superfund)* (42 USC § 9601 et seq.)	The OU 7-10 Glovebox Excavator Method Project is a CERCLA project.
49 CFR 173, 2002, "Shippers—General Requirements for Shipments and Packagings."	Applicable, on List A (Attachment K) of the INEEL M&O contract.
Companywide *Manual 14A - Safety and Health – Occupational Safety and Fire Protection* and *Manual 14B - Safety and Health Occupational Medical and Industrial Hygiene,* 2002.	Applicable to all fieldwork at INEEL.
DOE O 420.1, 2000, "Facility Safety," Change 3, November 22, 2000, U.S. Department of Energy.	Applicable, on List B (Attachment G) of the INEEL M&O contract.
DOE O 460.1A, 1996, "Packaging and Transportation Safety," October 2, 1996, U.S. Department of Energy.	Applicable, on List B (Attachment G) of the INEEL M&O contract.

Table 4. (continued).

Source	Comments and Applicability
DOE O 5400.1, 1990, "General Environmental Protection Program," Change 1, June 29, 1990, U.S. Department of Energy (Note: Specific paragraphs cancelled by DOE O 231.1, "Environmental, Safety, and Health Reporting," Change 2, November 11, 1996.	Applicable, on List B (Attachment G) of the INEEL M&O contract.
DOE-HDBK-1132-99, 2001, *Implementation Guide for Use in Developing Documented Safety Analysis to Meet Subpart B of 10 CFR 830,* U.S. Department of Energy.	Applicable to safety analysis evolutions performed during the post-retrieval life-cycle phases.
DOE-ID N 430.1A, 1998, *Life Cycle Asset Management: ID Expectations*, U.S. Department of Energy Idaho Operations Office, Idaho Falls, Idaho.	Applicable, on List B of the INEEL M&O contract.
DOE-ID O 420.D, 2000, *Requirements and Guidance for Safety Analysis*, U.S. Department of Energy Idaho Operations Office, Idaho Falls, Idaho.	Would apply to safety analyses requiring U.S. Department of Energy approval or documented safety analysis revisions that are executed during the layup or D&D&D phases of the project.
DOE-ID O 440.C, 2000, *Hoisting and Rigging Program,* U.S. Department of Energy Idaho Operations Office, Idaho Falls, Idaho.	Applicable to project hoisting or rigging that occurs during the post-retrieval life-cycle phases.
DOE-ID, 1991, *Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory,* Administrative Record No. 1088-06-29-120, U.S. Department of Energy Idaho Operations Office; U.S. Environmental Protection Agency, Region 10; and Idaho Department of Health and Welfare.	Applicable, defines CERCLA process for INEEL past waste sites including OU 7-10.
DOE-ID, 1993, *Record of Decision: Declaration of Pit 9 at the Radioactive Waste Management Complex Subsurface Disposal Area at the Idaho National Engineering Laboratory, Idaho Falls, Idaho,* Administrative Record No. 5569, U.S. Department of Energy Idaho Operations Office; U.S. Environmental Protection Agency, Region 10; and the Idaho Department of Health and Welfare.	Applicable, this is the Record of Decision (ROD) for OU 7-10.[a]

Table 4. (continued).

Source	Comments and Applicability
DOE-ID, 1995, *Explanation of Significant Differences for the Pit 9 Interim Action Record of Decision at the Radioactive Waste Management Complex at the Idaho National Engineering Laboratory*, U.S. Department of Energy Idaho Operations Office; U.S. Environmental Protection Agency, Region 10; and the Idaho Department of Health and Welfare.	Applies through the OU 7-10 ROD.[a]
DOE-ID, 1998, *Explanation of Significant Differences for the Pit 9 Interim Action Record of Decision at the Radioactive Waste Management Complex at the Idaho National Engineering and Environmental Laboratory*, Administrative Record No. 10537, U.S. Department of Energy, Idaho Field Office; U.S. Environmental Protection Agency, Region 10; and the Idaho Department of Health and Welfare.	Applies through the OU 7-10 ROD.[a]
DOE-ID, 2001a, *Architectural Engineering Standards*, Rev. 28, U.S. Department of Energy Idaho Operations Office, Idaho Falls, Idaho.	Would apply to any temporary structures built during D&D&D.
PRD-183, 2000, *Manual 15A - INEEL Radiological Control Manual*, Rev. 6, July 6, 2000.	Applicable radiological control activities and also to all work performed in radiological areas at the INEEL.
DOE, 2002, *Agreement to Resolve Disputes, the State of Idaho, United States Environmental Protection Agency, United States Department of Energy*, U.S. Department of Energy, State of Idaho, U.S. Environmental Protection Agency.	Amends enforceable milestones as previously identified in the Federal Facility Agreement and Consent Order, the OU 7-10 ROD,[a] and the OU 7-10 Remedial Design and Remedial Action Scope of Work.[b]

a. DOE-ID, 1993, *Record of Decision: Declaration of Pit 9 at the Radioactive Waste Management Complex Subsurface Disposal Area at the Idaho National Engineering Laboratory, Idaho Falls, Idaho.*
b. LMITCO, 1997, *Remedial Design/Remedial Action Scope of Work and Remedial Design Work Plan: Operable Unit OU 7-10 (Pit 9 Project Interim Action).*

2.2.2 Phase-Specific Requirements

The requirements contained in the following subsections are specific to the life-cycle phase of the facility. Technical and functional requirements are from Revision 3 of the Technical and Functional Requirements document (INEEL 2002a).

2.2.2.1 Shutdown Requirements. This section identifies the requirements that are specific to the shutdown phase of the post-retrieval period (see Table 5).

Table 5. Shutdown requirements specific to the post-retrieval period of the project.

Source[a]	Requirement Text	Comments and Applicability
TFR-2527, *OU 7-10 Glovebox Excavator Method Project Technical and Functional Requirements*, Section 3.1.2.5-1	The project shall be capable of storing overburden removed from OU 7-10 for future disposition. • Basis: WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 4.3.1, Modification Description. Disposition of overburden soil is not yet finalized and several disposition paths exist. Final disposition will be based on existing overburden characterization data and on the results of an economic analysis. A storage capability is necessary since overburden soil removed to a mutually agreed upon depth may be returned to the excavation for reuse as overburden. Interstitial soil is handled as part of waste zone material.	Requirement continues into post-retrieval phases until final overburden disposition. Overburden may be disposed of earlier however, for example, during retrieval operations.
TFR-2527, *OU 7-10 Glovebox Excavator Method Project Technical and Functional Requirements*, Section 3.1.2.5-2	The project shall be capable of storing overburden in a manner that prevents contamination from other materials. • Basis: From a waste management perspective, all existing data (Lockheed Martin Advanced Environmental Systems [LMAES] sample data) and process knowledge information (e.g., original borrow source and method of emplacement) on the overburden soils leads to the conclusion that the overburden soils are appropriately managed as low-level waste. The low-level waste designation is only appropriate as long as overburden retrieval and handling prevents contamination from the waste and other materials.	Requirement continues into post-retrieval phases if not disposed of during retrieval operations.
TFR-2527, *OU 7-10 Glovebox Excavator Method Project Technical and Functional Requirements*, Section 3.1.2.5-3	The project shall be capable of storing overburden in a manner that prevents contamination of other materials or the environment. • Basis: The overburden contains trace levels of contamination based on Lockheed Martin Advanced Environmental Systems (LMAES) sampling in 1995. The contamination limits are defined in Table 2-2 of *Manual 15A – INEEL Radiological Control.* Requirements for confinement during handling and storage are defined in Chapter 3 of the same manual.	Requirement continues into post-retrieval phases if not disposed of during retrieval operations.
TFR-2527, *OU 7-10 Glovebox Excavator Method Project Technical and Functional Requirements*, Section 3.1.2.5-4	The project shall be capable of storing retrieved waste zone material for future disposition. • Basis: The WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001.	Requirement continues through post-retrieval phase and beyond.

Table 5. (continued).

Source[a]	Requirement Text	Comments and Applicability
TFR-2527, *OU 7-10 Glovebox Excavator Method Project Technical and Functional Requirements*, Section 3.2.2-3	The project shall protect against human exposure to radiation, airborne radionuclides, and hazardous chemicals during the project operations. • Basis: To be protective, exposure limits must be less than or equal to ACGIH threshold limit values, OSHA permissible exposure levels, or NIOSH recommended exposure levels, whichever is less. DOE O 440.1A, "Worker Protection Management for DOE Federal and Contractor Employees," and 10 CFR 835, "Occupational Radiation Protection."	Deemed applicable to post-retrieval phase operations as well as to waste retrieval, sampling, and packaging operations.
TFR-2527, *OU 7-10 Glovebox Excavator Method Project Technical and Functional Requirements*, Section 3.2.6-4	The project shall maintain temperatures that allow normal equipment operation inside the confinement. • Basis: Temperature in the facility must not fall below a point at which the equipment will not be able to be operated. All equipment will operate satisfactorily if the comfort zone temperatures required by Section 1550 of the DOE-ID *Architectural Engineering Standards* are met.	The Weather Enclosure Structure (WES) radiation monitoring equipment has minimum temperature requirements for proper functioning.
TFR-2527, *OU 7-10 Glovebox Excavator Method Project Technical and Functional Requirements*, Section 3.2.7-1	The project shall control releases of hazardous and radioactive effluents to the environment within the limits referenced in DOE O 5400.5, "Radiation Protection of the Public and the Environment," and the National Contingency Plan (NCP).[b] • Basis: The primary long-term objective is to provide for long-term protection of human health and the environment; it is also important to provide for the short-term safety and health of the environment, community, and workers. This is to include the short-term risk assessment as per the NCP.	Applies to the continued control of radioactive and hazardous contaminants within the project facility and to radiological and hazardous waste generated during the shutdown period.
TFR-2527, *OU 7-10 Glovebox Excavator Method Project Technical and Functional Requirements*, Section 3.2.7-2	The project shall maintain releases of radioactive materials to the environment and community within acceptable limits as defined by 40 CFR 61, "National Emission Standards For Hazardous Air Pollutants (NESHAPS)," Subpart H, "National Emission Standards for Emissions of Radionuclides Other Than Radon from DOE Facilities." • Basis: Provides for protection of human health and the environment.	Applies to stack emissions during the shutdown period (i.e., heating and ventilation [H&V] system will remain operational until sometime during D&D&D).

Table 5. (continued).

Source[a]	Requirement Text	Comments and Applicability
TFR-2527, *OU 7-10 Glovebox Excavator Method Project Technical and Functional Requirements*, Section 3.3.5-2	The project shall monitor for emissions of radioactive contaminants to the environment. • Basis: In accordance with the project ARAR, 40 CFR 61.92 and 93, Subpart H, "National Emission Standards for Emissions of Radionuclides Other Than Radon from DOE Facilities."	Because the H&V system will remain in operation during shutdown, the stack monitoring system will likely be necessary unless an air emissions evaluation for this period indicates otherwise.
TFR-2527, *OU 7-10 Glovebox Excavator Method Project Technical and Functional Requirements*, Section 3.3.7-1	The project shall be designed, constructed, operated, and maintained in a manner that prevents fires and explosions. • Basis: DOE O 420.1, "Facility Safety"; and NFPA 801-1998, *Standard for Fire Protection for Facilities Handling Radioactive Materials*. The design must consider the operational aspects of the facility and their associated fire hazards and incorporate proper controls through sound design practice to minimize the potential for fire occurrences.	Requirement is applicable through shutdown and layup until the facility is dismantled.
TFR-2527, *OU 7-10 Glovebox Excavator Method Project Technical and Functional Requirements*, Section 3.5.5-3	The project shall select, as practical, design and procedure options that minimize production of secondary waste in the retrieval, handling, and storage of soils and waste. • Basis: The INEEL environmental policy requires waste minimization and is documented in program Description Document 1012,.Rev. 7: "Integrate all efforts into project planning, design, and construction to minimize toxicity and volume of waste generated, conserve natural resources and energy, and minimize environmental impacts." In addition, DOE Order 5400.1, "General Environmental Protection Program," and DOE Order 435.1, "Radioactive Waste Management," require waste minimization efforts.	Should apply to shutdown and D&D&D phases as well.
TFR-2527, *OU 7-10 Glovebox Excavator Method Project Technical and Functional Requirements*, Section 3.5.6-1	The project shall stabilize the excavation site after waste zone material retrieval by backfilling the excavation. • Basis: The backfill prevents airborne spread of contamination, isolates the waste source term, and removes the physical dangers of an excavated hole in the ground. It is necessary to backfill the excavation in order to place the facility in safe shutdown.	This activity is planned to occur during facility shutdown.

Table 5. (continued).

Source[a]	Requirement Text	Comments and Applicability
TFR-2527, *OU 7-10 Glovebox Excavator Method Project Technical and Functional Requirements*, Section 3.5.6-2	The project shall place the project facilities in stable and known conditions for safe shutdown following completion of waste zone material retrieval and underburden sampling operations. • Basis: DOE Order 530.1A, "Life Cycle Asset Management," requires this to occur at shutdown before completion of mission activities. Facility conditions and system states after shutdown activities have occurred will (1) be protective of worker health and safety, the public, and the environment and (2) provide for cost-efficient activities during the layup (i.e., surveillance and maintenance period).	

a. All references to the *OU 7-10 Glovebox Excavator Method Project Technical and Functional Requirements* are to TFR-2527, Revision 3, published in September 2002.
b. "National Oil and Hazardous Substances Pollution Contingency Plan" (40 CFR 300).

2.2.2.2 Layup Requirements. Table 6 identifies the requirements that are specific to the layup phase of post-retrieval operations.

Table 6. Layup requirements of post-retrieval operations (i.e., surveillance and maintenance).

Source[a]	Requirement Text	Comments and Applicability
TFR-2527, *OU 7-10 Glovebox Excavator Method Project Technical and Functional Requirements*, Section 3.1.3-2	The project shall use the services that are available from RWMC and INEEL. • Basis: "Services" refers to RWMC and INEEL capabilities such as the Idaho Nuclear Technology and Engineering Center Analytical Lab, RWMC Stored Waste Examination Pilot Plant, RWMC storage buildings, and INEEL transportation.	Such services should be considered when determining who performs surveillance and maintenance during the layup phase.
TFR-2527, *OU 7-10 Glovebox Excavator Method Project Technical and Functional Requirements*, Section 3.2.2-3	The project shall protect against human exposure to radiation, airborne radionuclides, and hazardous chemicals during the project operations. • Basis: To be protective, exposure limits must be less than or equal to ACGIH threshold limit values, OSHA permissible exposure levels, or NIOSH recommended exposure levels, whichever is less. DOE O 440.1A, "Worker Protection Management for DOE Federal and Contractor Employees," and 10 CFR 835, "Occupational Radiation Protection."	Deemed applicable to post-retrieval phase operations as well as to waste retrieval, sampling, and packaging operations.

Table 6. (continued).

Source[a]	Requirement Text	Comments and Applicability
TFR-2527, *OU 7-10 Glovebox Excavator Method Project Technical and Functional Requirements*, Section 3.2.6-4	The project shall maintain temperatures that allow normal equipment operation inside the confinement. • Basis: Temperature in the facility must not fall below a point at which the equipment will not be able to be operated. All equipment will operate satisfactorily if the comfort zone temperatures required by Section 1550 of the DOE-ID *Architectural Engineering Standards* are met.	The WES radiation monitoring equipment has minimum temperature requirements for proper functioning.
TFR-2527, *OU 7-10 Glovebox Excavator Method Project Technical and Functional Requirements*, Section 3.2.7-1	The project shall control releases of hazardous and radioactive effluents to the environment within the limits referenced in DOE O 5400.5, "Radiation Protection of the Public and the Environment; and the National Contingency Plan (NCP)." • Basis: The primary long-term objective is to provide for long-term protection of human health and the environment; it is also important to provide for the short-term safety and health of the environment, community, and workers. This is to include the short-term risk assessment as per the NCP.	Applies to the continued control of residual radioactive and hazardous contaminants within the project facility and to any radiological or hazardous waste generated during the layup period.
TFR-2527, *OU 7-10 Glovebox Excavator Method Project Technical and Functional Requirements*, Section 3.2.7-2	The project shall maintain releases of radioactive materials to the environment and community within acceptable limits as defined by 40 CFR 61, "National Emission Standards For Hazardous Air Pollutants (NESHAPS)," Subpart H, "National Emission Standards for Emissions of Radionuclides Other Than Radon from DOE Facilities." • Basis: Provides for protection of human health and the environment.	Applies to stack emissions during the layup period (i.e., heating and ventilation system [H&V] remains operational until sometime during D&D&D). An air emissions evaluation for this period may indicate that stack monitoring is no longer necessary.
TFR-2527, *OU 7-10 Glovebox Excavator Method Project Technical and Functional Requirements*, Section 3.3.5-2	The project shall monitor for emissions of radioactive contaminants to the environment. • Basis: In accordance with the project ARAR, 40 CFR 61.92 and 93, Subpart H, "National Emission Standards for Emissions of Radionuclides Other Than Radon from DOE Facilities."	Because the H&V system will remain in operation during layup, the stack monitoring system will likely be necessary unless an air emission evaluation for this period indicates otherwise.

Table 6. (continued).

Source[a]	Requirement Text	Comments and Applicability
TFR-2527, *OU 7-10 Glovebox Excavator Method Project Technical and Functional Requirements,* Section 3.3.7-1	The project shall be designed, constructed, operated, and maintained in a manner that prevents fires and explosions. • Basis: DOE O 420.1, "Facility Safety"; and NFPA 801-1998, *Standard for Fire Protection for Facilities Handling Radioactive Materials*. The design must consider the operational aspects of the facility and their associated fire hazards and incorporate proper controls through sound design practice to minimize the potential for fire occurrences.	This requirement is applicable through layup until the facility is dismantled.
TFR-2527, *OU 7-10 Glovebox Excavator Method Project Technical and Functional Requirements,* Section 3.5.6-3	The project shall maintain the project facilities in stable and known conditions during the layup period (after shutdown) until D&D&D. • Basis: A short layup period after shutdown is anticipated during which plans are anticipated and resources and processes are put in place to execute the D&D&D.	This requirement is applicable through layup until the facility is dismantled.

a. All references to the *OU 7-10 Glovebox Excavator Method Project Technical and Functional Requirements* are to TFR-2527, Revision 3, published in September 2002.

2.2.2.3 Deactivation, Decontamination, and Decommissioning Requirements. Table 7 identifies the requirements that are specific to the D&D&D phase of post-retrieval operations.

Table 7. Post-retrieval operations deactivation, decontamination, and decommissioning requirements.

Source[a]	Requirement Text	Comments and Applicability
40 CFR 761, "Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions"	Various: • 40 CFR 761 Sections 761.40 through 761.45, "Marking of PCBs and PCB Items" • Section 761.60, "Disposal Requirements" • Section 761.65, "Storage for Disposal" • Section 761.79, "Decontamination Standards and Procedures."	Applicable to equipment and materials that become contaminated with PCBs from the waste.

Table 7. (continued).

Source[a]	Requirement Text	Comments and Applicability
TFR-2527, *OU 7-10 Glovebox Excavator Method Project Technical and Functional Requirements*, Section 3.1.3-2	The project shall use the services that are available from RWMC and INEEL. • Basis: "Services" refers to RWMC and INEEL capabilities such as the Idaho Nuclear Technology and Engineering Center Analytical Lab, RWMC Stored Waste Examination Pilot Plant, RWMC storage buildings, and INEEL transportation.	Such services should be considered when determining who performs the D&D&D and material disposition activities.
TFR-2527, *OU 7-10 Glovebox Excavator Method Project Technical and Functional Requirements*, Section 3.2.7-1	The project shall control releases of hazardous and radioactive effluents to the environment within the limits referenced in DOE 5400.5, "Radiation Protection of the Public and the Environment," and the National Contingency Plan (NCP). • Basis: The primary long-term objective is to provide for long-term protection of human health and the environment; it is also important to provide for the short-term safety and health of the environment, community, and workers. This is to include the short-term risk assessment as per the NCP.	These requirements will apply to the control of residual radioactive and hazardous contaminants within the facility and to any radiological and hazardous waste and debris generated as a result of D&D&D.
TFR-2527, *OU 7-10 Glovebox Excavator Method Project Technical and Functional Requirements*, Section 3.2.7-2	The project shall maintain releases of radioactive materials to the environment and community within acceptable limits as defined by 40 CFR 61, "National Emission Standards For Hazardous Air Pollutants (NESHAPS)," Subpart H, "National Emission Standards for Emissions of Radionuclides Other Than Radon from DOE Facilities." • Basis: Provides for protection of human health and the environment.	Applies to any stack emissions during D&D&D if the H&V system is used during final decontamination or portions of dismantlement. An air emissions evaluation for this period may indicate that stack monitoring is no longer necessary.
TFR-2527, *OU 7-10 Glovebox Excavator Method Project Technical and Functional Requirements*, Section 3.5.5-3	The project shall select, as practical, design and procedure options that minimize production of secondary waste in the retrieval, handling, and storage of soils and waste. • Basis: The INEEL environmental policy requires waste minimization and is documented in program Description Document 1012,.Rev. 7: "Integrate all efforts into project planning, design, and construction to minimize toxicity and volume of waste generated, conserve natural resources and energy, and minimize environmental impacts." In addition, DOE Order 5400.1, "General Environmental Protection Program," and DOE Order 435.1, "Radioactive Waste Management," require waste minimization efforts.	Should apply to shutdown and D&D&D phases as well.

Table 7. (continued).

Source[a]	Requirement Text	Comments and Applicability
TFR-2527, *OU 7-10 Glovebox Excavator Method Project Technical and Functional Requirements*, Section 3.5.6-4	The project shall perform D&D&D of project facilities, systems, and components that are determined as nonessential to or obstructing OU 7-10 or WAG 7 missions. • Basis: Work Package Plan for OU 7-10 Glovebox Excavator Method Project – Safe Shutdown and D&D&D, Work Breakdown Structure (WBS) C.1.01.07.04.04.05, includes the assumption that D&D&D will occur as part of the project in fiscal year (FY) 2005.	Some facilities, systems, and components may be reusable in Stage III.

a. All references to the *OU 7-10 Glovebox Excavator Method Project Technical and Functional Requirements* are to TFR-2527, Revision 3, published in September 2002.

2.2.2.4 Material Disposition Requirements. Table 8 identifies the requirements that are specific to the final disposition (e.g., disposal) of equipment and materials resulting from D&D&D of project facilities.

Table 8. Material disposal and disposition requirements.

Source	Requirement Text	Comments and Applicability
Idaho National Engineering and Environmental Laboratory Reusable Property, Recyclable Materials, and Waste Acceptance Criteria (RRWAC) (DOE-ID 2001b)	Section 4.1, "Reusable Personal Property" Section 4.2, "Recyclable Materials" Section 4.3, "Industrial Waste" Section 4.4, "Hazardous Waste" Section 4.5, "Low-Level Waste" Section 4.6, "Mixed Low-Level Waste" Section 4.8, "Transuranic Waste" Section 4.9, "Mixed Transuranic Waste"	May apply if overburden or low-level waste from decontamination or dismantlement is sent to the RWMC for disposal.
ICDF waste acceptance criteria	To be determined.	Applies to low-level and mixed low-level secondary waste and debris sent to the ICDF for treatment or disposal.
"Release of Surplus and Scrap Materials"[a]	"Also, I am suspending the unrestricted release for recycling of scrap metals from radiation areas within DOE facilities. This suspension will remain in effect until improvements in our release criteria and information management have been developed and implemented . . ." "Henceforth, the Department will not allow the release of scrap metals for recycling if contamination from DOE operations is detected using appropriate, commercially available monitoring equipment and approved procedures."	Applies to metals that contain, or are suspected to contain radioactive contamination from DOE operations including the OU 7-10 Glovebox Excavator Method Project.
"DOE Concurrence Requested - BBWI approach to Disposition of Scrap Metal"[b]	"DOE agrees with the BBWI recommendation to dispose of scrap metal subject to the moratorium in the Central Facilities Area landfill, so long as it meets the landfill's waste acceptance criteria."	Applies to metals that contain, or suspected to contain, radioactive contamination from DOE operations including the OU 7-10 Glovebox Excavator Method Project.

a. Bill Richardson, Secretary of Energy, Memorandum to the Heads of Departmental Units, U.S. Department of Energy, July 13, 2000, "Release of Surplus and Scrap Materials."
b. W. H. Leake, U.S. Department of Energy Idaho Operations Office Memorandum to F. L. Webber, Idaho National Engineering and Environmental Laboratory, March 20, 2002, "DOE Concurrence Requested – BBWI Approach to Disposition of Scrap Metal."

2.3 Starting and Ending Conditions of Pit, Facility, and Area

2.3.1 Starting Conditions after Waste Retrieval and Packaging Operations

The facility shutdown phase will begin when retrieval operations have been completed and project management determines that the overall project objectives have been met. Operations personnel will remain responsible for activities through the shutdown phase and possibly the layup phase. Conditions expected in the retrieval area, the facility, and the waste retrieved from the pit are listed below.

2.3.1.1 Retrieval Area (Open Pit) Conditions

- An open pit will exist inside the RCS confinement area
- Side walls of waste will be exposed in the open pit and subjected to the natural angle of repose
- No subsidence will exist behind the pit shoring box
- Several probes have been pulled (see definitions) and positioned on their sides in the pit, completely (i.e., at least 0.9 m [3 ft]) below grade
- Several probes remain vertical in the pit (at the installed height) with the probe pulling caps that were installed before waste excavation and retrieval began.

2.3.1.2 Facility Conditions

- Waste spilled on the RCS floor that the excavator could reach has been returned to the pit
- Some waste remains on the RCS floor
- The PGS gloveboxes have been cleaned of pit debris (i.e., swept and vacuumed but not yet decontaminated)
- The levels of radiological contamination within the facility range between clean and higher than 1×10^6 dpm/100 cm^2, as shown in Figure 3
- The H&V system is operating within set point parameters established for waste excavation operations
- The standby generator is operational
- Lights are operational and switched on
- The RCS and PGS fire detection and suppression systems are operational
- Radiological monitors are operational and switched on

- Other equipment has been de-energized, but is capable of restart.

2.3.1.3 Waste Conditions

- All waste from retrieval operations has been placed into approved storage, returned to the excavation area, or other approved disposition

- Overburden soil removed from the excavation area during retrieval operations may have been transferred to the ICDF or the RWMC LLW pit for disposal or beneficial use, or, if not yet dispositioned, remains outside the WES in sacks.

2.3.2 Ending Conditions after the Deactivation, Decontamination, and Decommissioning Phase

To properly define the D&D&D scope of activities and process necessary to achieve the desired facility disposition (i.e., facility dismantlement and removal followed by restoration of soil surface conditions to near pre-project conditions), the actual facility conditions (i.e., the starting point) as well as the ending conditions must be known and clearly defined, respectively. Starting conditions for the D&D&D life-cycle phase are described in Section 3.1.6. The proposed ending conditions for the excavated portion of OU 7-10, surrounding areas used by the project, project facility and equipment, and waste and debris generated by D&D&D are described in the Sections 2.3.2.1 to 2.3.2.3. This information will be used later during the development of the final D&D&D plan to help determine the extent of end-state criteria that must be defined, negotiated, and documented. End-state criteria for OU 7-10, discussed herein only in general terms, are assumed to be known and equivalent to the conditions existing before the start of the OU 7-10 Glovebox Excavator Method Project, with two notable exceptions. First, the final condition of the subsurface investigation probes will be different from pre-project conditions and second, a grout zone will have replaced the retrieved waste. Waste and waste containers will be stored adjacent to the pit.

2.3.2.1 Retrieval Area Conditions. The proposed ending conditions for the excavated portion of OU 7-10 and surrounding areas used by the project are described below:

- Initial backfill of the excavated portion of OU 7-10 will be complete. That is, clean grout will be added to a level 15 cm (6 in.) above the bottom of the shoring box (or 0.9 m [3 ft] below the top of the surrounding overburden). The grout material will be as described in Section 3.1.2.2.4. Subsurface investigation probes that were pulled during waste retrieval operations will be lying on their sides near the bottom of the backfilled excavation with all portions thereof at least 0.9 m (3 ft) below final grade. These probes will be empty, closed at both ends, and will have the probe handling cap installed. The subsurface investigation probes that were not removed during waste retrieval operations will be in a vertical position with their tops cut off at the grout level. These probes will not be capped at the top but will be closed at the bottom. They will be backfilled to within 15 cm (6 in.) of the top with sand, soil, clay (e.g., bentonite), or gravel. The final 15 cm (6 in.) of each probe will contain a bentonite plug to prevent future water intrusion.

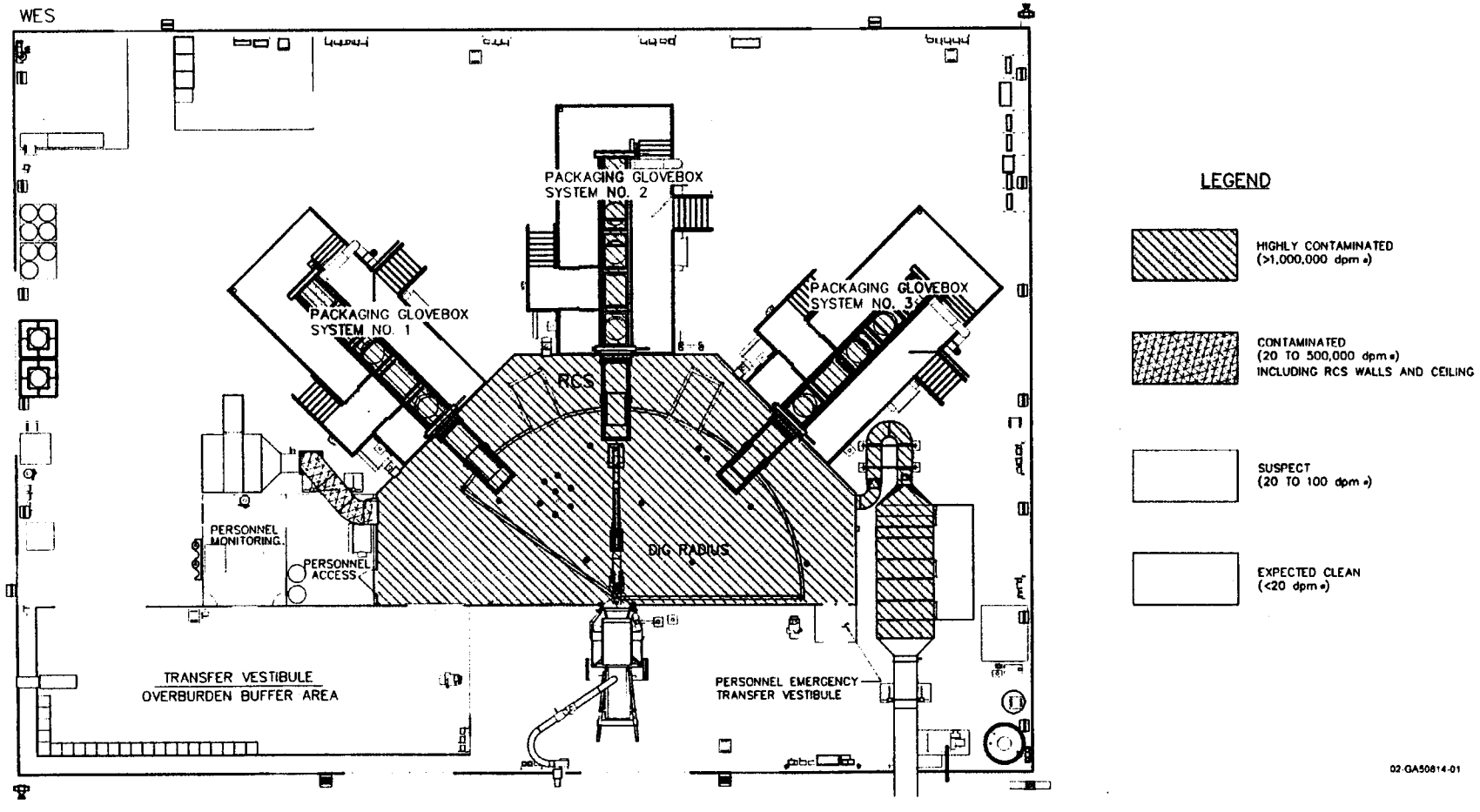

Figure 3. Anticipated facility contamination levels at start of shutdown phase.

- Final backfill of the excavated portion of OU 7-10 will be complete. This layer will comprise approved soil fill material that is approximately 0.9 m (3 ft) thick. The surface of the excavation area will be contoured to pre-project conditions and reseeded with native grasses (hydro-seed application). No radioactive contamination above background will be detectable.

- The shoring box will be dismantled and removed from the excavation area. The void created by the shoring box removal will be backfilled with clean soil fill material.

- Gravel from the FFS leveling course, access ramps, and temporary road on the OU 7-10 surface will be removed and the area underneath recontoured and reseeded with native grasses (hydro-seed application).

- The geotextile membrane under the FFS leveling course will be removed and the area underneath recontoured (as needed) and reseeded with native grasses (hydro-seed application).

2.3.2.2 Facility and Equipment Conditions. The following facilities will be totally removed for final disposition (e.g., reuse or disposal):

- The RCS, including inlet and exhaust ventilation system components, will be decontaminated to the extent necessary (with residual removable contamination immobilized), the structure will be dismantled, and the materials removed from the project area. Reusable equipment (e.g., video cameras and lights) will be cleaned and removed in a manner that allows reuse at the INEEL. Other materials will be processed as waste.

- The PGS, including inlet ventilation system components, will be decontaminated to the extent necessary (with residual removable contamination immobilized), the structure will be dismantled, and the materials removed from the project area. Reusable equipment (e.g., video cameras and fissile material monitors) will be cleaned and removed in a manner to allow reuse at the INEEL. Other materials will be processed as waste. There is a potential use for the PGSs during Stage III. This will be determined before the D&D&D phase.

- The FFS will be decontaminated (where necessary), the residual removable contamination immobilized, the structure dismantled, and the materials removed from the project area. Steel decking will be dismantled in a manner to allow reuse at the INEEL. Other materials will be processed as waste.

- The WES, including the exhaust ventilation components and stack, will be dismantled and removed from the project area. Select equipment (e.g., water storage tanks, electrical panels, and resistance heating units), the fabric skin, and support structure will be removed in a manner that allows reuse at the INEEL. Other materials will be processed as waste.

- The breathing air trailer will be deactivated, disconnected, and sent to CFA for reuse at the INEEL.

- The plant air cabinet will be deactivated, removed from the rail footing structure, and sent to CFA for reuse at the INEEL.

- The Radiological Control field trailer will be disconnected from any utilities for reuse at the INEEL.

- Forklifts and drum-handling equipment will be decontaminated and sent to CFA for reuse at the INEEL.

- The portable standby generator will be disconnected, removed from the project area, and sent to CFA for reuse at the INEEL.

- The skid-mounted load center will be disconnected, removed from the project area, and sent to CFA for reuse at the INEEL. Electrical feeder cables will be disconnected and removed from the project area. Reusable components will be sent to CFA for reuse at the INEEL. Other materials will be processed as waste.

- The fire riser structure will remain for potential use during Stage III. Fire water supply lines (and concrete support pads) leading from the fire riser structure to the WES will be dismantled, and removed from the project area. Reusable components will be sent to CFA for reuse at the INEEL. Other materials will be processed as waste.

- The field support trailers (WMF-657, -645, -646, and, if used, WMF-613) will be vacant and returned to the landlord for reallocation at the INEEL.

- Any fencing materials will be removed, surveyed, and sent to CFA for reuse at the INEEL.

2.3.2.3 Waste Conditions. Disposition of secondary waste and debris resulting from D&D&D activities are listed below:

- Transuranic and mixed TRU (MTRU) waste will be packaged in approved containers and stored onsite. Section 5 contains waste volume estimates for this category.

- Low-level waste and MLLW will be packaged in approved containers and transferred to ICDF for treatment and disposal. If ICDF is not available to receive this waste, the MLLW will be packaged and sent to disposal at an off-Site TSDF (e.g., Envirocare) and the LLW will be disposed of in the RWMC LLW landfill.

- Industrial waste will be transferred to the INEEL landfill located at CFA.

3. SEQUENCE AND DESCRIPTION OF POST-RETRIEVAL OPERATIONS

At the conclusion of waste retrieval and underburden sampling operations, the OU 7-10 Glovebox Excavator Method Project will perform shutdown activities to place the excavation and facility into safe, known, and stable conditions where it will remain in layup until D&D&D operations begin. While it is assumed that D&D&D of the facility will begin as soon as practicable, the facility, as designed, can safely accommodate up to a 1-year delay.

Decontamination activities during facility shutdown and D&D&D are contingent on contamination levels inside the facility after retrieval operations are complete and on desired disposition paths for waste materials resulting from D&D&D activities. Anticipated ranges for TRU contamination levels after retrieval operations are shown in Figure 3. Expected waste types and disposition paths for equipment and materials from D&D&D are identified in Table 1. If contamination levels are significantly higher or lower than these anticipated ranges, other approaches and disposition paths may need to be investigated and implemented to provide more appropriate and cost-effective completion of this work.

The OU 7-10 demonstration project is a CERCLA activity, which makes the ICDF the preferred path for treatment and disposal of secondary waste streams and D&D&D debris. The primary ICDF waste acceptance criteria requirements of concern to this project are (1) that the materials have less than 10 nCi/g of TRU contamination and (2) that there are no visible stains from RCRA-regulated materials. Contaminated materials and equipment will be decontaminated only to the extent necessary to protect workers and to meet the ICDF waste acceptance criteria. A fixant then will be sprayed to prevent contamination spread during facility layup, facility D&D&D, material transport, and disposition. Thorough decontamination of all materials will not be necessary. Strippable paint will be used as the fixant to immobilize residual removable contamination and to provide flexibility for D&D&D operations. That is, the dried strippable paint may be removed, if needed, as a means of decontamination during the final facility decontamination. In addition, it may be left in place as a fixant to reduce the risk of radiological uptakes during dismantlement.

3.1 Facility Shutdown Process

Closing the facility down following the completion of retrieval operations consists of four main functions:

1. Overall housekeeping and cleanup
2. Backfilling the open excavation
3. Decontaminating the PGS, RCS, and equipment inside the confinement areas and immobilizing residual removable contamination on surfaces inside the confinement areas
4. Securing the equipment outside the confinement areas (in the WES).

These four activities are shown in Figure 4 and discussed in detail in the following sections.

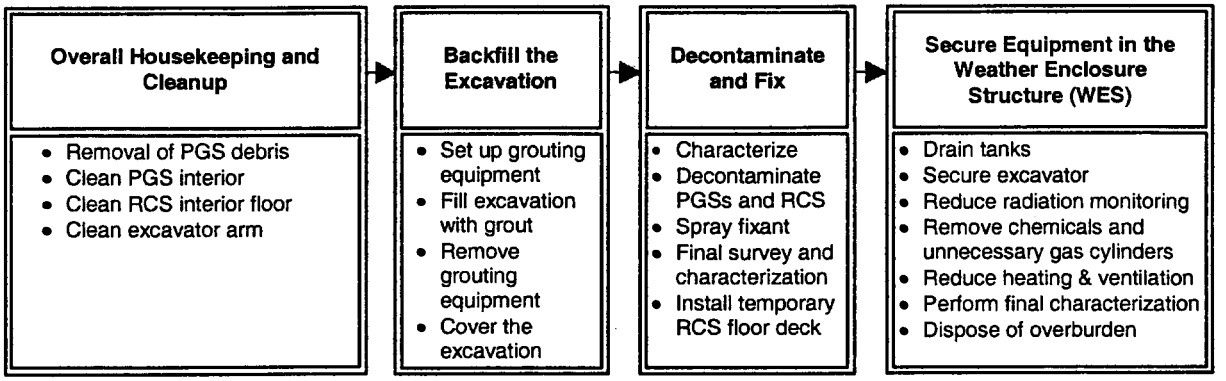

Figure 4. Summary of four main functions of the OU 7-10 Glovebox Excavation Method Project facility shutdown process.

3.1.1 Initial Decontamination of Retrieval Confinement Structure, Packaging Glovebox System, and Equipment and Overall Housekeeping

The first activity in the shutdown process is the initial decontamination of the confinement areas (see Figure 5).

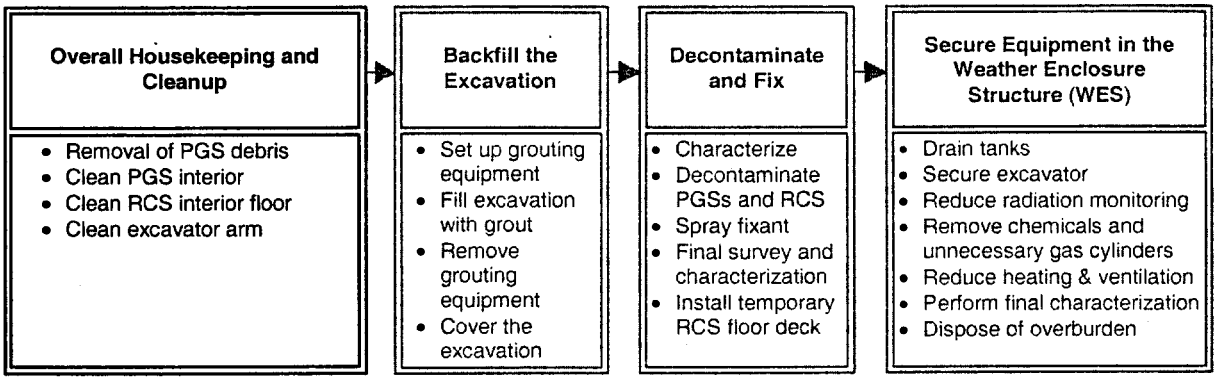

Figure 5. Housecleaning and cleanup of the Packaging Glovebox Systems and the Retrieval Confinement Structure.

3.1.1.1 Approach. The confinement and internal equipment will be decontaminated only to the level necessary to protect workers during subsequent activities and to reduce the volume of TRU waste resulting from D&D&D of the facility. An initial survey of the interior surfaces of the PGS and RCS will be performed to establish initial conditions and determine PPE requirements. Results from smears will be used to determine what surfaces must be decontaminated to reach an overall concentration of less than or equal to 10 nCi/g TRU radionuclides. This gross decontamination will reduce the inhalation hazards and prevent workers from resuspending contaminated dust during shutdown operations.

Anticipated ranges for contamination levels are shown in Figure 3. Areas that are expected to be highly contaminated (higher than 1×10^6 dpm per 100 cm^2 of alpha contamination) include the H&V ducting and filters, the floor (where waste materials may have been spilled), and the gloveboxes (where materials are handled within closed areas). Areas expected to be contaminated in the range of 20 to 5×10^5 dpm per 100 cm^2 of alpha include the remaining surfaces inside the RCS. Areas around the

drumout ports of the gloveboxes are intended to be kept clean, but because of the nature of the operation, will be considered suspect. It is anticipated that contamination levels of these areas (i.e., within the drum loadout enclosures) will be 20 to 100 dpm per 100 cm^2 of alpha contamination.

3.1.1.2 Process Description

3.1.1.2.1 Initial Facility Survey and Characterization—As mentioned above, an initial characterization of the facility will be performed. This effort will start with the interior surfaces of the PGS gloveboxes and drum loadout enclosures and then the interior of the RCS. Process knowledge of contamination events (or lack thereof) should be sufficient for areas within the WES and transfer vestibule. Characterization will include determination of radiological contamination levels as well as radionuclide speciation (needed for safety analysis and waste inventory planning). The primary purposes of this initial characterization are to (1) establish initial conditions of the facility, (2) identify which materials will require decontamination to achieve the desired disposal path, and (3) determine appropriate PPE levels and stay times commensurate with facility conditions.

Radiological Control personnel will first determine the levels of airborne contamination within the confinement areas using remote means. Additionally, smears may be taken of the interior surfaces through available gloveports and the smears bagged out through sample ports for counting. When appropriate PPE has been determined, sampling personnel will enter the confinement areas with support from the radiological control technician (RCT) to collect the necessary samples. In addition, limited sampling for hazardous contaminants (e.g., for polychlorinated biphenyl), if required, may be performed at this time to support detailed planning for the D&D&D and waste disposal.

3.1.1.2.2 Packaging Glovebox System—All small, removable tools will be bagged out of the PGS gloveboxes and disposed of as MTRU waste. The PGS transfer carts will be cleaned of loose waste and dirt and then driven or pushed out of the gloveboxes and into the RCS for subsequent removal during decontamination activities. The gloveboxes then will be cleaned with a vacuum, including gloves, hoists, carts, and cart-drive systems. Wiping of difficult-to-reach areas with long-reach tools may be required. All gloves not needed for the remaining process will be removed and the ports sealed with covers or plugs.

3.1.1.2.3 Initial Decontamination of the Retrieval Confinement Structure—Contamination levels inside the RCS after retrieval operations may exceed 1×10^6 dpm per 100 cm^2. To reduce the exposed waste as a continual source of airborne contamination, the excavation will be kept in a dampened state using the dust-suppression water spray system. Personnel will enter the facility wearing appropriate PPE, decontaminating the floor as they enter. Decontamination of the floor is expected to be accomplished using a vacuum and wet wipes, by removing only gross surface contamination. Any loose pit materials inside the RCS will be wetted to reduce dust and then returned to the pit. Strippable paint may be used on the floor to decrease contamination levels if acceptable radiological conditions are exceeded.

Once the floor has been cleaned, surfaces that would release contamination if brushed by personnel working in the facility (e.g., handrail around the pit, walls within 2.5 m [6.5 ft] of the floor, and personnel access doors will be decontaminated with water and wipes. The PGS transfer carts will be removed from the rails and drive systems with the aid of the excavator for lifting. Then they will be wrapped in plastic,

and placed in the south corner of the RCS between PGS-3 and the personnel emergency transfer vestibule (i.e., in a location that will not block the emergency egress route). Gross contamination will be removed from windows and bag-out ports using water, glass cleaner, and wipes. Gloves in the RCS wall will be removed and the ports sealed with covers or plugs. The internal face of the shoring box will be cleaned of loose dirt and waste using wet wipes on mop handles. The shoring box will be subsequently sprayed with strippable paint to affix any remaining contamination. At this time, the upper sections of any vertical probes (i.e., from the top to at least 0.9 m [3 ft] below grade) also will be coated with a fixant, possibly strippable paint. Long-reach spray wands will be necessary to coat all sides of these probes. The removable sections of hand railing will have to be in place or other forms of fall protection used during entries into the RCS to protect workers from falling into the excavated area.

3.1.1.2.4 Excavator—The attached excavator end-effector will be placed on blotter paper that has been placed on the floor between the pit and the personnel access door. The arm should be extended in a position to allow for decontamination of the arm and attached end-effector without the use of a ladder. Grease and sludge will be scraped off of the excavator and disposed of as a mixed waste (carryover of waste codes from the pit waste, not necessarily from the grease). If fixants are needed, visible grease stains and dirt will be removed first using a nonhazardous industrial detergent, then strippable paint will be sprayed on the surface. The excavator arm is then covered with plastic in such a way as to still allow arm movement. The arm then will be retracted and the end-effector placed on another piece of blotter paper near the pivot point.

3.1.1.2.5 Tools and Equipment—Smaller loose items and tools inside the RCS and PGS will be bagged out or drummed out either through the PGS or through the RCS personnel access door and disposed of as MTRU waste. Larger objects (e.g., excavator tools) will be decontaminated as needed to remove a significant amount of loose material and then bagged to cover remaining contamination.

3.1.1.2.6 Areas Not Decontaminated—Although actual radiological conditions must be determined at the time, it is anticipated that the remaining areas of the facility (e.g., the ceiling and upper walls of the RCS), will not require decontamination to achieve the desired waste disposition path.

3.1.1.3 Required Tools, Equipment, and Other Materials. Tools, equipment, and other materials required for initial decontamination activities are listed below:

- Radiological instruments
- Radiological and industrial PPEs, including fall protection lanyards
- Decontamination wipes
- Mops with decontamination wipes
- Water applicators (e.g., low-pressure garden sprayers)
- Plastic sheeting and tape for sealing penetrations and wrapping equipment
- Plastic bags (various sizes)

- Fixant and strippable paint, spray equipment, and trained spray technicians
- Blotter paper
- Degreaser (nonhazardous industrial detergent)
- Scrapers.

3.1.2 Backfilling of Excavation

After the initial decontamination of the confinement areas is completed, the open pit will be backfilled, as outlined in Figure 6.

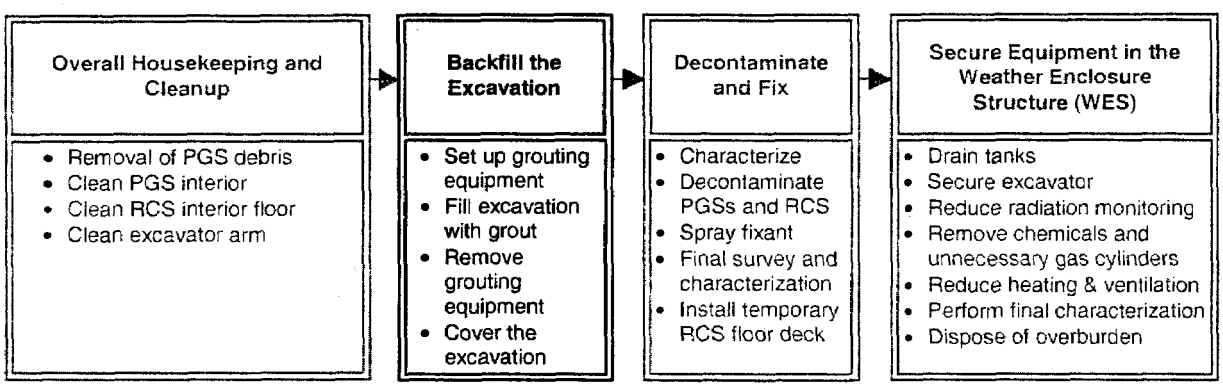

Figure 6. Backfilling the excavation in the OU 7-10 Glovebox Excavation Method Project facility shutdown process.

3.1.2.1 Approach. The excavated portion of the pit will be filled with a grout mixture that will be pumped into the open pit. This activity will leave approximately 1.5 m (5 ft) of the shoring box exposed and approximately 0.9 m (3 ft) of the upper excavation (i.e., overburden layer) to be filled later with soil fill material. This second backfill, when completed during D&D&D of the facility, will bring the excavation area back to final grade (i.e., the level of the surrounding OU 7-10 surface).

When the exposed waste has been covered and stabilized with grout, it is expected that personnel will be able to enter the confinement area with reduced fall protection equipment requirements. This will improve personnel mobility and efficiency. In addition, because the major sources of contamination have been cleaned or isolated (the PGS gloveboxes and exposed waste in the pit, respectively), contamination levels inside the RCS are expected to remain nearly stable after the grouting operation. However, radiological conditions will continue to be monitored.

3.1.2.2 Process Description

3.1.2.2.1 Grouting Equipment Setup—A grout hose will be connected in the WES between the pipe penetrations in the walls of the WES and RCS. A grout pumping truck will deliver the grout and the connection will be made between the truck and the WES pipe penetration. Workers will enter the RCS, wearing appropriate PPE, and connect the inner hose to the RCS pipe penetration, and then take the hose to

the pit. The hose will be sleeved to reduce contamination on the hose surface, which decreases contamination spread when the hose is removed. The hose will be placed near the bottom of the pit to prevent disruption of the waste and contamination during the operation. Radiological air monitoring will verify safe conditions for the operators. After the hose inside the RCS has been connected, the open hose will be a potential contamination path. For this reason, the hose will remain capped until ready for use.

3.1.2.2.2 Filling the Pit—The excavator will move the hose around the probes that remain in the pit from the Stage I investigation. The excavator will raise the hose from the pit as it fills, being careful not to let the grout fall more than a few inches to prevent stirring up large quantities of airborne contamination. The grout will continue to fill the excavation until it reaches a level approximately 15 cm (6 in.) above the bottom edge of the shoring box.

3.1.2.2.3 Grouting Equipment Removal—Once the grout addition operation is completed, operators will disconnect the hose connecting the grout truck to the WES and reinstall the cap. Then the hose inside the WES will be disconnected, placed in a bag, and stored in the WES. The hose in the RCS will be disconnected last. The sleeve on the hose will be removed carefully and the sleeve and hose will be placed in a bag and stored inside the RCS until the D&D&D phase. The caps on the pipe penetrations that were removed during hose installation will be reinstalled and sealed with silicone or tape as each hose is disconnected. Personnel should work from the outside in when removing the hose and resealing the wall penetrations to prevent potential contamination spread outside the RCS via the hose.

3.1.2.2.4 Covering the Pit—The grout does not form a monolith when cured, but has properties similar to gravel or sand. When cured, the material will be more permeable than soil and the pit should experience less subsidence. After the grout is cured, personnel will access the pit surface to place a sheet of plastic over the pit to prevent contamination of the grout surface and probe tops during the remaining operations.

3.1.2.3 Required Tools, Equipment, and Other Materials. Tools, equipment, and other materials required for pit backfilling activities are listed below:

- Radiological instruments
- Radiological and industrial PPEs, including fall protection lanyards
- Silicone or tape for resealing pipe penetration caps
- Grout truck
- Grout hoses for outside WES, inside the WES, and inside the RCS
- Plastic sheeting and tape
- Wrenches
- Large bags for hoses.

3.1.3 Decontaminate and Spray Fixant on Interior Surfaces of the Retrieval Confinement Structure and Packaging Glovebox System

After the open excavation is backfilled, the facility and equipment will be characterized again to determine radiological contamination levels. The areas will be decontaminated to levels of approximately 1,000,000 dpm/100 cm^2. Then fixant will be sprayed on the interior of the confinement structures to immobilize residual removable contamination (see Figure 7).

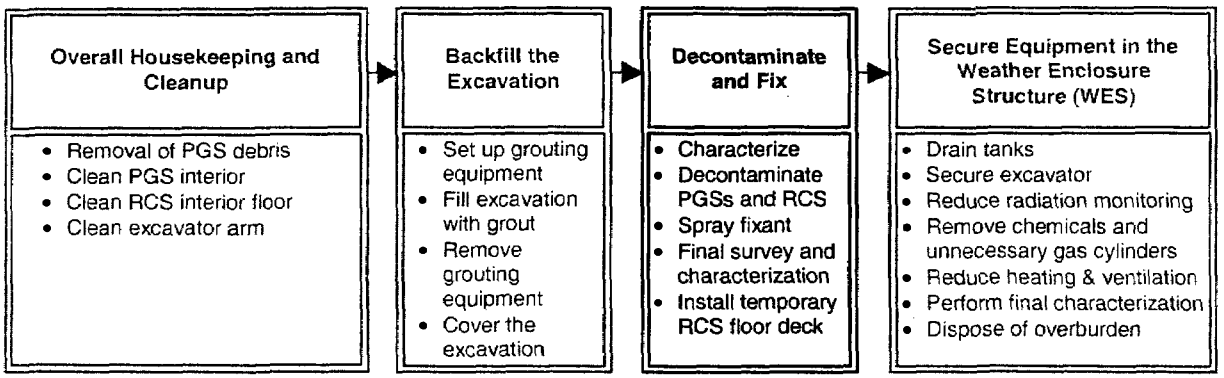

Figure 7. Decontamination and fixant spraying in the OU 7-10 Glovebox Excavation Method Project facility shutdown process.

3.1.3.1 Approach. The gloveboxes will be decontaminated, followed by the RCS. After successful decontamination, strippable paint will be sprayed on all surfaces except windows inside the RCS and PGS to affix any remaining contamination. The facility will be characterized first to provide D&D&D with the necessary radiological data for dispositioning waste. Penetrations for gloves and bag stubs will be sealed with port covers. Windows will be decontaminated to allow use during D&D&D operations.

3.1.3.2 Process Description

3.1.3.2.1 Introducing the BROKK into the Confinement Area—A temporary airlock will be constructed in the WES vestibule to allow a narrow-wheel-base, articulated-boom manlift and BROKK 330 to be brought into the RCS through the existing double doors. Doors leading from the vestibule to the exterior of the WES will be sealed with tape after the equipment is brought into the vestibule. Then the double doors to the RCS will be opened to allow the equipment into the RCS. Following closure of the double doors, the vestibule will be surveyed and released as a clean area. This procedure will be repeated to allow large equipment in the RCS. Airlock materials will remain in place (where possible without space conflicts) through the D&D&D phase. The BROKK will be used to support characterization sampling, radiological control surveys, application of strippable paint, and, if necessary, decontamination activities to be performed inside the RCS. The BROKK will have sufficient vertical and horizontal reach (5.5 m [18 ft] and 6.4 m [21 ft] respectively) to allow access close to ceiling and upper wall areas. However, access to some ceiling and wall areas still will require the use of long-reach tools (i.e., 1.5 to 1.8 m [5 to 6 ft] in length). Reach tools will be designed for the end of the BROKK to allow the BROKK to decontaminate the upper reaches of the RCS.

Note: As a backup to the BROKK, Genie Industries makes a "Z-Boom" with an extended horizontal reach that could assist in doing the job manually. Size of the unit will make maneuvering within the RCS difficult, but there should be sufficient room.

3.1.3.2.2 Removing Transfer Cart Support Structures and Boxes—If necessary to increase the areas accessible by the BROKK or manlift, the transfer cart support structures and the boxes used for staging fire suppressant and absorbent material (used for stabilizing free liquids encountered at the digface) will be removed to allow the manlift to be driven around the back side of the excavation area. Removal will be accomplished by unbolting the items from the RCS floor and using the excavator to place them on the grouted pit surface. Some cutting of structural members will be necessary (e.g., the transfer cart rail support plates will need to be cut because they extend from the RCS back into the gloveboxes).

3.1.3.2.3 Sampling Interior Surfaces of the Retrieval Confinement Structure—Workers will perform radiological and hazardous sampling of the RCS interior for material characterization by using RCT support and the articulated-boom BROKK. Characterization is needed to ensure that appropriate staging, containerization, and marking requirements are followed during D&D&D and that the proper disposition paths are determined.

3.1.3.2.4 Closing Valves and Covering Penetrations, Tools, and Equipment—For systems no longer needed (i.e., DSS and PGS fire system), the valves on the piping will be closed to reduce the possibility of contamination outside of the confinement barrier. If no valves are on the pipes, or the valves are at the equipment instead of near the confinement area wall, the pipes will be cut, surveyed for contamination, and each end will be sealed. The cut location will be positioned as close to the confinement area walls as practicable.

Penetrations for pipes and bag-out ports inside the RCS and PGS will be sealed with covers. Covers may be standard purchased items or plates that are seal-welded over the penetrations. Any tools or equipment that will not be sprayed (i.e., excavator end-effectors, and fire detection and suppression equipment) will be bagged out or taped over. Inlets to and areas around the HEPA filtration system from the RCS will be decontaminated.

3.1.3.2.5 Final Decontamination of the Packaging Glovebox System—The interiors of the PGSs will be decontaminated until surface levels are less than 1,000,000 dps/10 cm^2. This will be accomplished by removing successive layers of strippable coatings, wiping with glass cleaner, and washing with limited garden-type hand sprayers. The H&V will remain operational throughout decontamination.

3.1.3.2.6 Final Decontamination of the Retrieval Confinement Structure—The interior of the RCS will be decontaminated by removing previously applied strippable coatings. This will

be followed by a wash with a Hotsy[f] system. This will spray up to 3 gal/minute at a pressure of 250 psig. The majority of the washing will be done remotely with the BROKK 330. A 5-m (16-ft) extension tool will be required to reach the ceiling and far walls of the RCS. A sealed tarp system will be installed in the excavation to collect the waste water. Water will be recycled if possible, pumped into 55-gal drums, and solidified as LLW. The spray will not affect the ventilation system as long as care is taken while spraying adjacent to the active exhaust duct.

3.1.3.2.7 Spraying Fixant—Radiological Control personnel will take radiological assessment surveys required to characterize the facility for disposition of materials during D&D&D operations. Exposed surfaces (except windows) within the RCS and PGS then will be sprayed with strippable paint, starting with the gloveboxes and finishing at the door exiting the RCS at the transfer vestibule. Care will be taken around the HEPA filters to ensure that paint does not enter into the active ventilation system. Any gloves that are no longer required will be removed and the port will be sealed with a cover or plug.

Note: If airborne contamination levels before or during spraying of strippable paint are high enough that Radiological Control requires it, a localized application of water mist with glycerin will be applied before the paint.

3.1.3.2.8 Final Decontamination and Radiological Surveys of the Retrieval Confinement Structure and the Packaging Glovebox System—After the paint has dried, the facility will be checked to ensure contaminants are adequately fixed and that radiological conditions inside the RCS and PGS are stable and radiological detectors and alarms are adequate. Any final decontamination of the RCS and PGS required to close the facility for layup will be performed at this time. It is expected that conditions will allow the number of radiological detectors and alarms to be reduced at this time.

3.1.3.2.9 Installation of Temporary Steel Truss and Decking in the Retrieval Confinement Structure—After final decontamination and radiological surveys of the RCS have been completed, the steel truss and steel floor plate system will be installed. The BROKK 330 will be placed in the RCS. Floor plate materials will be staged just inside the RCS and placed over the shoring box with the BROKK 330. The steel trusses will be attached to the RCS flooring and the steel plates will be similarly attached to the steel trusses. This steel truss and floor plate system will allow D&D&D operations to move forward more effectively (work on steel truss and floor plating system) rather than working around the waste pit opening.

3.1.3.3 Required Tools, Equipment, and Other Materials. Tools, equipment, and other materials required for the decontamination and fixant application activities are listed below:

- Radiological instruments
- Radiological and industrial PPEs, including fall protection equipment

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f. Hotsy is a line of high-pressure spray systems used extensively for radiological decontamination.

- Temporary airlock enclosure
- Articulated-boom BROKK
- Covers for penetrations (e.g., steel, plastic, and tape)
- Water and glycerin sprayer (if needed)
- Strippable paint, spray equipment, and trained spray technicians.
- Hotsy decontamination system
- Temporary steel decking

3.1.4 Secure Equipment in the Weather Enclosure Structure

After the fixant has been sprayed on the interior of the confinement area structures, the equipment in the WES will be secured (see Figure 8).

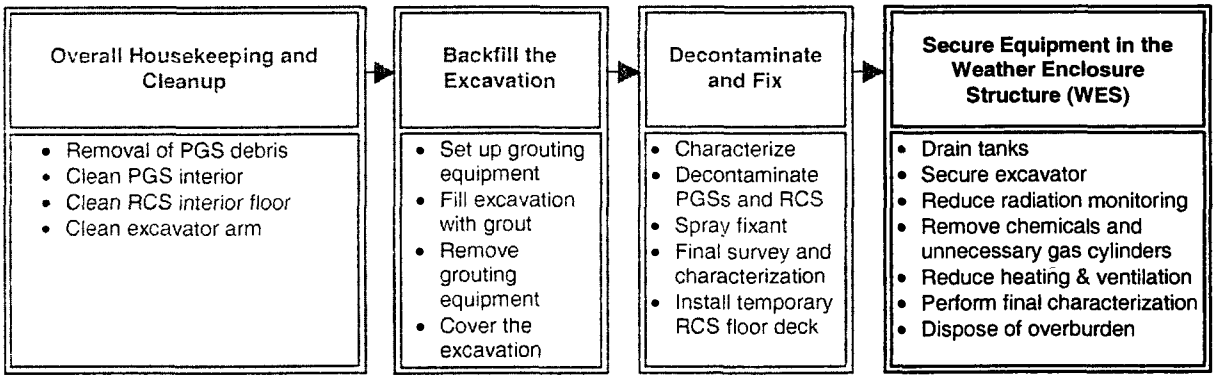

Figure 8. Secure equipment in the OU 7-10 Glovebox Excavation Method Project facility shutdown process.

3.1.4.1 Approach. Equipment in the WES (e.g., water tanks, H&V systems, and monitors) will be placed in a safe condition to enable the facility to remain unused until D&D&D operations begin. The H&V system will be needed during facility layup and possibly during D&D&D operations so will be left operating, but at a reduced airflow and temperature. Radiological conditions will be reassessed and the number of radiological monitors and alarms will be reduced accordingly.

3.1.4.2 Process Description

3.1.4.2.1 Water Tanks—Fire protection systems for the RCS will remain operating. However, with no operations in the gloveboxes, the PGS fire system will not be needed and will be removed from service. Water will be drained or pumped from the DSS and the glovebox fire-mist-system tanks into a water tanker truck. Although no contamination of the water is anticipated, samples will be

taken and analyzed by Radiological Control to ensure the water is clean. The truck will deliver the water to the CFA sewage treatment facility.

3.1.4.2.2 Excavator—The excavator hydraulic fluid is expected to become contaminated through the hydraulic cylinder rods exposed in the excavation area. A sample of the fluid will be taken and analyzed by Radiological Control to determine the actual amount of contamination. If determined necessary by Radiological Control, the hydraulic fluid will be drained, and the hydraulic system flushed to reduce contamination. Absorbents will be added to the drained hydraulic fluid and the mixture will be dispositioned or sent to storage. The system then will be refilled with clean hydraulic fluid.

Because the excavator is expected to be used during dismantlement, fluids will be left in the excavator with the exception of diesel fuel. The diesel fuel will be drained (to reduce fire potential) and surveyed. If it is verified clean, the diesel fuel will be returned to the diesel fuel storage tank located on the diesel generator. The excavator battery will be disconnected.

3.1.4.2.3 Radiological Monitoring Equipment—Most radiological monitors, alarms, and friskers will be left in place and in operational condition for the layup period. Two noteworthy exceptions are the PGS fissile monitors and the criticality alarm system, which may be left in place but will not be left operating. The radiological conditions of the facility will be reassessed and it is expected that the number of radiation and contamination monitors and alarms will be reduced at that time. In addition, all nonessential radiation sources (i.e., controlled) can be removed from instrumentation at this time.

3.1.4.2.4 Chemicals and Compressed Gas Cylinders—Any chemicals used during operations and decontamination will be removed and disposed of or sent to chemical reuse. Gas bottles for the PGS fire system will be surveyed for release and then taken to CFA Property Control as excess. Other gas cylinders supporting radiological equipment will remain in service through the facility layup phase and possibly used to support D&D&D.

3.1.4.2.5 Eye Wash Station—The portable eye wash stations will be needed during D&D&D operations and so may remain in place during the layup period.

3.1.4.2.6 Air Tanks—The breathing air receiver tank will be depressurized to the atmosphere inside the RCS.

3.1.4.2.7 Heating and Ventilation System—The H&V will remain operational. Entry by RCTs to monitor conditions within the WES is anticipated to range from daily to monthly, depending on radiological conditions. The temperature will be maintained at greater than 10°C (50°F) in the cold weather to ensure normal equipment operation.

3.1.4.2.8 Remaining Equipment in the Weather Enclosure Structure—All other equipment in the WES will be left in place but unplugged from power, including cameras, video monitors, scales, the sample cold storage cabinet, PGS power, forklifts, forklift charging station, and DSS controls. The H&V controls will not be de-energized and will remain operational.

3.1.4.2.9 Support Equipment Located Outside the Weather Enclosure Structure—The PPE and shower trailer (if used), leased drum assay trailer (if used), plant air compressor, and the decontamination trailer (if used) will be removed from the area, returned, as appropriate, to the owner, RWMC, or CFA for reuse. The standby power diesel generator and

skid-mounted load center will be kept in service to support the H&V system, radiological monitors, and fire detection and suppression systems. The Radiological Control office trailer, breathing air trailer, and existing field support trailers (WMF-657, -645, -646, and possibly WMF-613) will be left as-is for potential use during layup and D&D&D.

3.1.4.2.10 Final Surveys of the Weather Enclosure Structure—Final surveys of the WES and reviews then will be performed by Industrial Hygiene, Fire Safety, and Radiological Control to ensure the facility is stable.

3.1.4.2.11 Disposition of Overburden—The overburden soil that was removed from the excavation area during the retrieval operation may have been transferred to the ICDF or the RWMC LLW pit immediately after excavation for disposal or beneficial use (as fill material). If not, the overburden will have remained outside the WES stored in sacks. If it has been decided that this soil should not be reused as overburden on OU 7-10, then as part of the shutdown process, these sacks of soil will be taken to the ICDF or RWMC LLW pit for disposal or beneficial use.

3.1.4.3 Required Tools, Equipment, and Other Materials. Tools, equipment, and other materials required for equipment stabilizing activities are listed below:

- Water tanker truck
- Radiological survey instruments
- Transport truck.

3.1.5 Equipment and Facility Requirements During Shutdown Phase

The materials needed for each shutdown operation discussed above are summarized in Tables 9 and 10. Table 9 shows the equipment already in the facility from retrieval operations that must stay operational during the facility shutdown process. Table 10 shows the additional equipment that will be needed to complete the facility shutdown process.

Table 9. Equipment from retrieval operations needed during the shutdown phase.

Equipment	Location	Activity Requiring Equipment	Use
Breathing air system	WES	Initial decontamination of facility.	Supply air to workers entering the RCS to decontaminate and fix contaminants.
H&V system	WES	All shutdown activities.	Personnel comfort and radiological protection.
HEPA vacuum	RCS and PGS	Initial decontamination of RCS and PGS.	Remove contamination from floors, walls, and equipment of RCS and PGS.
RCS and WES fire protection systems	RCS and WES	All shutdown activities.	Provide fire protection of facility and personnel.

Table 9. (continued)

Equipment	Location	Activity Requiring Equipment	Use
Radiological monitors and alarms (except fissile monitors) and criticality alarm system	Weather Enclosure Structure (WES)	All shutdown activities.	Radiological protection.
Uninterruptible power supply	WES	All shutdown activities.	Maintain power to facility safety systems.
Diesel generator	Outside the WES	All shutdown activities.	Maintain power to facility safety systems.
Facility lighting	WES	All shutdown activities.	Visibility during shutdown operations.

Table 10. Additional equipment needed for the shutdown phase.

Equipment	Location Needed	Activity Requiring Equipment	Use
Small hand tools	Retrieval Confinement Structure (RCS)	All shutdown activities.	Connect and disconnect grout tube.
Grout truck	Outside the Weather Enclosure Structure (WES)	Backfilling the pit.	Supply pumpable pit fill material.
Water tanker	Outside WES	Draining Packaging Glovebox System (PGS) firewater and dust-suppression water tanks.	Transport water to Central Facilities Area sewage treatment.
Transport truck (potential use)	Outside WES	Stabilizing equipment in the WES.	Transport overburden to ICDF[a] or Radioactive Waste Management Complex low-level waste pit for disposal or beneficial use.
Radiological decontamination and stabilization materials (e.g., wipes, mops, brooms, bags, tape, plastic sheeting, and silicone).	RCS and PGS	Initial and final decontamination of the RCS and PGS.	Decontamination and stabilization of facility—wiping, spraying, covering.

Table 10. (continued).

Equipment	Location Needed	Activity Requiring Equipment	Use
Radiological survey equipment and materials (e.g., detectors and swipes).	RCS, PGS, and WES	All shutdown activities.	Determining radiological conditions.
Industrial hygiene air sampling and hazardous chemical detection equipment.	RCS, PGS, and WES	All shutdown activities.	Determining industrial hygiene conditions.
Anti-contamination clothing.	RCS and WES	All shutdown activities.	Personnel protection.
Strippable paint and sprayer.	RCS and PGS	Spraying fixant in RCS and PGS interiors.	Fix remaining contamination in RCS and PGS.
Covers for penetrations in the confinement area.	RCS and PGS	Spraying fixant in RCS and PGS interiors.	Covering penetrations to eliminate contamination paths outside confinement area.

ICDF = Idaho National Engineering and Environmental Laboratory Comprehensive Environmental Response, Compensation and Liability Act Disposal Facility

3.1.6 Ending Conditions After Facility Shutdown

A summary of conditions expected after facility shutdown that will be monitored and maintained during the layup period are discussed below:

- **Stage I investigation probes**—The radiological contamination on exposed surfaces of any remaining vertical probes has been immobilized with a fixant, possibly strippable paint. The probes that were pulled during excavation have been laid on the sides of the excavation area and covered completely by grout. All probes are closed on both ends and are empty inside.

- **Pit and shoring box**—The pit has been filled with a weak grout up to 15 cm (6 in.) above the lower edge of the shoring box. This will be approximately 0.9 m (3 ft) below grade and leave approximately 1.5 m (5 ft) of the shoring box exposed. The exposed shoring box has been painted with strippable paint on the top and inside to fix any remaining contamination. A sheet of plastic has been laid over the grout and upright probe casings. The excavation opening in the FFS has been covered with temporary steel decking.

- **Equipment inside the RCS and the PGS**—Waste, grease, and loose dirt have been removed from the larger equipment inside the RCS and PGS and the equipment pieces are wrapped in plastic. Tools and other small items have been bagged out of the RCS and PGS for disposal.

- **Contamination on inside surfaces of RCS and the PGS glovebox skins**—All loose soil and waste has been removed from surfaces of the RCS and PGS. Gloves have been removed and glove ports and sample ports have been covered and sealed. The windows of the RCS and PGS have been decontaminated and left uncovered. The remaining surfaces are covered in strippable paint.

- **Heating and ventilation system**—The H&V system has been left operating. Airflow and negative differential pressure levels will be determined based on actual facility conditions by Radiological Control personnel to ensure continued confinement of radioactive contamination.

- **Fire detection and suppression systems**—The dry-pipe fire detection and suppression system in the RCS is operational, but the RCS deluge, RCS carbon monoxide monitoring, and PGS fire suppression systems have been removed from service.

- **Excavator**—The excavator has been left operable and in place. Grease, loose dirt, and loose waste have been removed from the excavator arm and the arm will be in a resting position with the end-effector resting on the floor. The arm has been coated with strippable paint and wrapped in plastic sheeting. Any hydraulic fluid found from the excavator outside of the RCS has been cleaned, monitored for radiation, and the leaking area covered with clear plastic. The hydraulic system fluid has been sampled and, if determined to be radiologically contaminated, has been drained, flushed, and refilled. The fuel tank has been drained and the battery has been disconnected.

Note: Areas where hydraulic fluid spills have occurred will require frequent radiological monitoring to ensure leaking fluid does not spread contamination.

- **Compressed air tanks**—The breathing air and plant air receiver tanks have been depressurized.

- **Water tanks**—Water has been removed from the DSS and the PGS fire suppression system. The tanks are expected to be free of contamination. The valves at the RCS wall have been shut to close the potential path for contamination to the piping and water tanks.

- **Radiological monitoring**—Constant air monitors (CAMs), radiation area monitors (RAMs,) personnel contamination monitors, and hand friskers remain operational although possibly reduced in number. The glovebox fissile monitors and criticality alarm system have been removed from service.

- **Weather Enclosure Structure equipment**—All other equipment in the WES (e.g., cameras, video monitors, scales, sample refrigerator, PGS power, forklifts, forklift charging station, dust control system, and the PLC control panel) have been left in place but unplugged from power.

- **Overburden soil**—Sacks of overburden continue to be stored outside the WES if a decision has been made to reuse it as overburden on OU 7-10 (above the grouted waste zone). Otherwise, the sacks of overburden soil have been sent to ICDF or RWMC for disposal or beneficial use and none remain at the facility.

- **Portable support equipment**—Most of the portable support equipment trailers remain in-place at the project site to support D&D&D operations. Exceptions include the following (if included in the project scope): the leased assay trailer, the decontamination trailer, the plant air compressor, and the PPE and shower trailer.

3.2 Facility Layup Activities

After shutdown, the facility enters layup status until D&D&D operations begin. Initiation of D&D&D preparations is assumed to be immediate upon reaching the safe shutdown facility condition. During the layup period, the facility will be monitored to ensure radiological confinement is maintained and equipment remains safely stored. Periodic maintenance and inspection of equipment will occur as needed during layup. These tasks may be performed by Operations personnel or, alternatively, by the INEEL Inactive Site organization if the facility transition process has occurred.

The activities that will take place during layup and the equipment that requires monitoring and maintenance during this time are identified in this section.

3.2.1 Equipment and Facility Safety System Monitoring and Maintenance

Most of the equipment used during the retrieval operation will remain in the facility during layup, and either deactivated if not needed during layup or D&D&D, or left operating if needed. Equipment that must be monitored or maintained during facility layup is listed in Table 11. The expected surveillance or maintenance activities, frequency of the activity, and type of worker who will perform the activity for each piece of equipment are given in the table.

Table 11. Equipment requiring monitoring or maintenance during facility layup.

Equipment	Location	Required Action	Expected Frequency	Personnel
Excavator	Weather Enclosure Structure (WES) and Retrieval Confinement Structure (RCS)	Check for hydraulic fluid leaks and monitor radiation levels at excavator.	Daily or monthly, depending on conditions	Operator, radiological control technician (RCT)
	WES	Check for other fluid leaks.	Monthly	Operator
Confinement	RCS walls	Take smears and air samples inside the WES, and take air samples from inside the RCS.	Weekly	RCT
	PGS glovebox walls	Take smears and air samples at the gloveboxes and drumout port areas. Radiological surveillance.	Weekly	RCT

Table 11. (continued).

Equipment	Location	Required Action	Expected Frequency	Personnel
Forklifts	WES	Check for fluid leaks.	Monthly	Operator
		Preventive maintenance.	Yearly	Maintenance technician
High-efficiency particulate air (HEPA) filters	WES	Check differential pressure.	Daily	Operator
		In-place filter test.	Yearly	HEPA test group
		Perform radiological surveys.	Weekly	RCT
Heating and ventilation system fans	WES	Preventive maintenance.	Equipment dependent	Maintenance technician
Radiological control equipment—constant air monitors and hand monitors	WES	Check operability.	Daily	RCT
Fire detection and suppression systems	WES	Check operability.	Every 6 months	Operator
WES facility—general	WES	General inspections—leaks, lighting, and electrical.	Every 3 months	Operator

3.2.2 Equipment Needs During Layup

Equipment and materials needed for performance of monitoring and maintenance activities during facility layup are listed in Table 12. The operation that requires the equipment or material and the user are also given in the table.

Table 12. Equipment needs during facility layup period.

Equipment	Operation	User
Radiological survey equipment	Daily radiological surveys	Radiological control technician (RCT)
Anticontamination clothing	Weekly radiological surveys and maintenance surveys	RCT and maintenance
Tools	Preventive maintenance actions	Maintenance

3.2.3 Ending Conditions after Layup

The facility is expected to be in the same condition after layup as entering layup. If an unexpected radiological condition or equipment failure occurred, then additional decontamination or equipment maintenance may have been performed. These activities cannot be predicted at this time.

3.3 Deactivation, Decontamination, and Decommissioning Process

The D&D&D process will follow the requirements of the DOE Order 430.1 "Life Cycle Asset Management." The overall approach to deactivating and decommissioning the project facilities is to first remove the gloveboxes and then the RCS. This will be accomplished inside temporary confinement tents and will eliminate the majority of the contaminants in the facility. The WES then will be removed, followed by excavation of the gravel base, and ultimately reseeding of the area. A BROKK 330 tether-controlled or radio remote-controlled robot will be used to demolish the majority of contaminated equipment. The BROKK 330 is a robust, tracked, electric-powered unit capable of cutting through 10-cm (4-in.) pipe, and has approximately 30% more horsepower than the BROKK 250. A BROKK 250 (a smaller version of the same machine but with wheeled travel system) also is planned for use for the demolition of the PGS and WES. The following subsections describe the individual steps required to accomplish this overall strategy.

3.3.1 Selection of Deactivation, Decontamination, and Decommissioning Approach

The Bechtel BWXT Idaho, LLC, (BBWI) project management staff will determine the approach to be used for selection of the organization that will perform the project D&D&D work scope. Currently, the two main choices are (1) onsite Operations D&D&D personnel or (2) off-Site D&D&D subcontractors. This decision will be made before the operational phase of the project.

Using onsite Operations D&D&D personnel will have the advantage that INEEL personnel possess previous INEEL D&D&D experience and understand the Site configuration and procedures. In addition, the INEEL has D&D&D equipment currently available for such projects (i.e., purchased for Site-wide D&D&D operations).

Using off-Site D&D&D subcontractors will incur additional costs because of the additional procurement action necessary to provide a request for proposal against which prospective pre-qualified and qualified D&D&D subcontractors may bid. This will require time from the Engineering and Radiological Control organizations to prepare a scope of work, radiological surveys, and other necessary characterization and project information to provide to the bidders. This also will require additional time to go through the processes for requests for proposal, bid-evaluation, and bid-award. Equipment costs also are presumed to be higher when using subcontractors.

3.3.2 Preparation of Documentation before Start of the Deactivation, Decontamination, and Decommissioning Phase

Before the start of any physical D&D&D work at the project site, specific permits, documents, and plans are required to be in place, in accordance with the PLN-1053, "Deactivation, Decontamination, and

Decommissioning Project Manager's Handbook." The handbook will be referred to for details such as form numbers and implementation of BBWI procedures for documentation, which include the following:

- Abbreviated sampling and analysis plan
- Cultural resource management requirements (from Form 451.01, "Environmental Checklist")
  - National Historic Preservation Act
  - Idaho State Historical Preservation Office
  - Advisory Council on Historic Preservation
- National Environmental Policy Act documentation (42 USC § 4321 et seq.) (Form 451.01)
  - Categorical exclusion
  - Environmental assessment
  - Environmental impact statement
  - Environmental assessment determination
- Project health and safety plan
- Generator treatment plan (i.e., characterization sampling)
- Characterization report and decision analysis report
- Cost and schedule preparation
  - Cost estimate (i.e., budget)
  - Integrated resource-loaded schedule
- Deactivation, decontamination, decommissioning plan
- Safety analysis and hazard classification
- Waste minimization plan
- Generator treatment plan (i.e., D&D&D work)
- Transport plan
- Organizational interface agreements (if required)

- Internal work procedures
- Notifications and requests (e.g., forms)
  - Form 450.19, "Gravel/borrow Request Form"
  - Form 432.56, "Construction Readiness Checklist – Surface Penetration/Excavation"
  - Storm water pollution prevention plan (see the D&D&D Project Manager's Handbook [PLN-1053])
  - Form 580.31, "Property Review Checklist – Tripwire," and Form 580.07, "Excess Property Report"
- Operational readiness reviews and readiness assessments
- Work procedures and work control
- Work permits
  - Radiological work permit
  - Cutting and welding permit
  - Safe work permit
  - Special safe work permit
  - Confined space entry permit
  - Excavation permit
  - Outage request
- Air emissions calculations
- Grouting test report
- U.S. Department of Energy safety evaluation report.

Project characterization will be accomplished during the waste extraction and shutdown operations. The main documents that will be required for start of the D&D&D operations phase are listed below with brief explanations:

- **Safety analysis and hazard classification** can be updated based on the physical condition of the PGS, RCS, and WES at the end of the shutdown phase. Because of the short D&D&D schedule, it is likely the facility will remain Hazard Category II throughout the project.

- **Health and safety plan** will be prepared to include the latest D&D&D technologies and approaches to be used on the project and the latest radiological and chemical constituents determined to be at the project site.

- **Deactivation, decontamination, and decommissioning plan** will be updated to include the latest D&D&D technologies and approaches to be used on the project and the latest radiological and chemical constituents determined to be at the project site.

- **Waste minimization plan** will be updated to include the latest D&D&D technologies and approaches to be used on the project and the latest radiological and chemical constituents determined to be at the project site.

After these main documents have been completed or updated, a readiness review will be required by the facility manager to ensure that the selected D&D&D project team is ready to start the physical work and that all required documentation for work at the INEEL (e.g., plans, permits, requests, and notifications) have been completed and are in place as required by DOE-ID. The type of review (e.g., ORR or readiness review) will be tied to the Hazard Category of the facility.

3.3.3 Mobilization of the Deactivation, Decontamination, and Decommissioning Project Team to the Project Site

The need to mobilize equipment and materials to the jobsite will be necessary for either selected D&D&D project team (onsite operations or off-Site subcontractor). This mobilization is typically done after the proper documentation has been submitted (e.g., HASP and D&D&D plan) as required by the project or facility manager. The typical D&D&D project team will require the following space allocations:

- Trailer for office space
- Trailer for personnel and lunch facilities
- Trailer for clothing changes and showers
- Radiological Control trailer
- Trailer for storage of tools (i.e., hand and power) and materials
- Storage area for equipment
- Lay-down area (waste boxes) for materials
- Storage area for staging and storage of waste.

The office, personnel, lunch, change, and shower trailers will require power, water, and sewer connections that must be supplied by the RMWC facility manager or representative. If existing facilities are to be used by the D&D&D project team (e.g., existing Radiological Control trailer), these facilities

need to be designated as available for use during the execution of the D&D&D phase. This mobilization must be completed and all boundaries of the work site established before the start of any physical work to ensure control of the jobsite by the D&D&D project team.

3.3.4 Reactivating the Facility and Equipment

The D&D&D project team will need to prepare the project facility for the D&D&D activities to be performed effectively. This will include establishing radiological control areas, as necessary, and reactivating many of the project systems and equipment.

3.3.4.1 Approach. The D&D&D project team will perform a walkdown of the facilities and equipment with project engineering and radiological control personnel to ensure familiarization of the physical configuration from the layup phase. The WES, or portions thereof, will be converted to a radiological buffer area that will later contain the temporary confinement enclosures for dismantling the facility confinement structures. Work orders will be prepared to remove lockout and tagout locks and tags from equipment that will be used during the D&D&D phase. In general, all systems and equipment will be reactivated with the exception of the deluge and water misting systems in the RCS (e.g., pit, fire suppression, and digface misting systems) because no need for these systems has been identified.

3.3.4.2 Process Description

3.3.4.2.1 Facility Walkdown and Inspection—The D&D&D project team will conduct a facility walkdown before performing detailed work order planning. This walkdown will familiarize the D&D&D personnel with the facility layout, system layup status, equipment configuration, and allow for the identification of potential hazards or worker concerns.

3.3.4.2.2 Conversion of the Weather Enclosure Structure to a Radiological Buffer Area—In preparation for the facility dismantlement, all or portions of the WES will be converted to a radiological buffer area. Appropriate signs and rope barriers will be erected by RCTs to designate these areas.

3.3.4.2.3 Reactivation of Select Weather Enclosure Structure, Retrieval Confinement Structure, and Packaging Glovebox Systems—Work orders will be prepared as needed to remove locks and tags from selected equipment and systems. Equipment and systems needed during D&D&D will be reactivated or will continue to be maintained in an operational status from layup. The affected systems and associated actions are described below:

- **Heating and ventilating system** will be brought into full operational status (this was left operational but turned down after the shutdown phase).

- **Fire protection systems** (as configured and maintained) will continue in an operational status for the layup period. (Note: the PGS subsystem, CO_2 monitoring system, and RCS deluge system will not be operational.)

- **Excavator** will be brought to full operational status. The following actions will be required:

- Refueling
- Preparation of the excavator arm for work (this was coated with strippable paint and wrapped in plastic during the shutdown phase)
- Attachment of a hydraulic shear end-effector (new) to the excavator.

- **Plant and breathing-air systems** will be restarted (tanks were depressurized during the shutdown phase).
- **Radiological monitors** (e.g., RAMs, personnel contamination monitor-2s, scalars, and CAMs) not already in use will need to be put into operational status as deemed necessary by the Radiological Engineering organization.
- **Weather Enclosure Structure lighting system** will be switched on (this was left in operational condition during layup).
- **Weather Enclosure Structure equipment** will be brought into service as required by the D&D&D project team. These are listed below:
  - Cameras and video monitors will be reactivated to enable remote operations and enhance communications during hands-on operations
  - The sample refrigerator that was used during characterization sampling operations will be reactivated for post-D&D&D end-state condition verification and validation
  - Forklifts and charging stations within the WES will be reactivated during D&D&D operations.
- **Diesel generator** used for backup power in the RCS will be reactivated during D&D&D activities when the availability of electrical power is deemed critical.
- **Other ancillary equipment** will be brought into service as required by the D&D&D project team (although many equipment systems will not be needed).

3.3.5 Packaging Glovebox System Dismantlement Operations

The PGS may be one of the more contaminated systems of the project, with contamination levels similar to the RCS. The PGS has a combination of contaminated and noncontaminated systems, equipment, and materials that will require segregation to achieve waste minimization.

3.3.5.1 Approach. The general approach will be to (1) decontaminate, dismantle and size the PGS equipment, (2) package materials for waste disposal, and (3) transfer waste into the RCS for packaging into waste boxes. Unless reuse is desired for Stage III, D&D&D of the PGS will require a temporary enclosure to be built around a glovebox to ensure no loss of contamination to the WES. The process will be repeated for the three PGS assemblies.

3.3.5.2 Process Description

3.3.5.2.1 Utility Isolation—Typical of the D&D&D of any project, system, or subsystem, all utilities associated with project, system, or subsystem will be locked and tagged-out and physically disconnected. This will be done to ensure the safety of D&D&D personnel while D&D&D operations are being performed (i.e., temporary utilities under direct control of the D&D&D team will be used instead). Affected systems are listed below:

- **Power** for overhead hoist and transfer cart systems
- **Electrical lighting** for the PGS systems (may be left in place until D&D&D of interior equipment has been completed)
- **Fire protection** provided through the PGS fire sprinkler system
- **Heating and ventilation** HEPA filter and flow-through process (may be left in place until D&D&D of interior equipment has been completed).

3.3.5.2.2 Build Temporary Enclosure—The D&D&D team will construct a temporary enclosure around the individual PGS gloveboxes (three each, one at a time), which will minimize the size of the temporary enclosure and ensure that the spread of contamination within the WES is minimized. The typical temporary enclosure will be constructed of a wood frame structure or aluminum with multiple layers of poly sheeting. The poly sheeting will be attached to the interior of the wood frame system allowing the wood or aluminum frame to be reused for the next temporary enclosure. The poly sheeting will be used to facilitate later decontamination efforts (i.e., enable workers to strip off inner layer that should have captured most of the airborne contamination because of the static charge in the poly sheeting).

The temporary enclosure will have inlet filters installed to ensure that air inside the enclosure is filtered and flows from the temporary enclosure through an air mover and into the RCS and maintains negative airflow from the temporary enclosure to the RCS.

The temporary enclosure will have windows to facilitate remote dismantlement.

3.3.5.2.3 Removal of Interior Packaging Glovebox System Equipment—Once the temporary enclosure is in place and has been certified as acceptable, the BROKK 250 will be brought inside the temporary enclosure and D&D&D operations on the PGS can begin. The PGS interior equipment to be removed includes the following:

- Transfer cart system (carts were removed during shutdown operations to facilitate initial decontamination
  - Cart rails
  - Screw drive rod assembly

- Drive motor assembly

- Overhead trolley hoist system.

The drum-loading openings in the PGS floor will remain active to dispose of small size waste generated during the D&D&D process for the PGS interior equipment. The D&D&D personnel will use the existing glove ports to perform disassembly and sizing operations. Additional sizing tools may have to be transferred into the PGS before the start of work. The typical sizing tools will be electrical rotary saws (e.g., band saws) and reciprocating saws.

The overhead trolley hoist system will be used to effect passing of the large equipment from the PGS to the RCS. The BROKK 330 in the RCS will complete this transfer. The screw drive rod assembly and last cart rails will be disconnected and passed into the RCS for sizing and placement in a waste box. The BROKK 330 in the RCS will shear the rods and rails into appropriate lengths and transfer them into a waste box. The motor assemblies will be disconnected and passed into the RCS for sizing and placement into a waste box. The BROKK 330 in the RCS will be used to transfer the sized pieces into a waste box.

The overhead trolley hoist system will be the last item dismantled because it will have been used in conjunction with the BROKK 330 to perform the transfer of equipment from the PGS to the RCS. The assembly will be cut into sections and lowered to the glovebox floor by rope or cable from the previous overhead section. The final section will be the section closest to the RCS where the BROKK 330 inside the RCS may provide assistance in lowering and transferring the final section and then hoist itself into a waste box.

The glovebox drum-loading access ports then will be sealed to ensure containment of contamination within the PGS itself.

3.3.5.2.4 Dismantlement of the Packaging Glovebox System Drum-Loading Enclosure—The PGS drum-loading enclosure will contain temporary HEPA air-handling units with the elephant trunk attached to the enclosure interior. The skirting material will be removed, vacuumed, wet-wiped, and placed in a waste box through a continuous process. Balancing of airflow will be performed to ensure proper airflow and direction throughout the WES, RCS, and PGS.

Personnel will enter the enclosure and vacuum before dismantlement of the skirting material. This should capture most of the loose contamination before dismantlement of skirting, wet wiping, and placement in a waste box. If any known breaches occurred during the drum-loading or change-out process during waste excavation operations, then this process will be handled differently. Fixants or decontamination solutions may be required if the breach was substantial.

The booted seal around the hydraulic drum-lifting assembly will be activated to the raised position to allow vacuuming and wet wiping of the boot itself and adjacent materials. Next, the boot will be removed to assess the interior mechanical assemblies for contamination. Finally, the hydraulic drum assembly will be lowered and sealed to ensure no further contamination.

3.3.5.2.5 Removal of Utilities and Access Platforms—If the exterior glovebox components are completely free of contamination at the conclusion of operations, then they may be

dismantled and removed before the glovebox is enclosed in a tent. If a complete survey cannot be obtained, then the material will be disposed of as LLW.

The utilities that feed the PGS will be isolated if not previously completed (e.g., lighting and H&V) and disconnected from the PGS itself. The utilities then will be dismantled and sized for placement into waste boxes. The utilities to be isolated and disconnected are listed below:

- Power
- Lighting (cleaned and surveyed for potential reuse)
- Fire protection
- Heating and ventilation
- Hydraulics for the drum lifting assembly.

The PGS access platforms should be free of contamination if no drum loading and unloading excursions or PGS glove port ruptures have occurred. These platforms will be disconnected from the PGS structural steel system before dismantlement and sizing for placement into waste boxes. The D&D&D team will place the BROKK 250 into the PGS tent and then use the hydraulic shears to perform sizing and handling operations. The BROKK 250 will provide the power and capability to perform the heavy and higher-risk tasks. Increased efficiencies and productivities will be achieved using this teleremote electrohydraulic demolition equipment.

3.3.5.2.6 Preparing Crane Access Location West of Weather Enclosure Structure—The area west of the WES was initially used for crane access during the construction phase of the FFS, RCS, PGS, and WES. This same location will be used to provide access for the hydraulic crane (i.e., Grove TM9120 [120-ton, truck mounted, hydraulic crane] or equivalent). This location will be used for all crane evolutions during dismantlement. Detailed planning will be required to ensure all crane picks are performed without the potential of side loads or damage by a swinging load.

3.3.5.2.7 Final Sizing of the Packaging Glovebox System—The initial PGS dismantlement operation will be to disconnect the PGS from the RCS wall. A localized containment and HEPA-supplied air-handling unit will be used for this work to further restrict the confinement area to immediate area of work. It is assumed that the 0.64-cm (1/4-in.) rolled collar sheet metal that connects the PGS to the RCS will be a bolt-and-gasket assembly that can be unbolted and a blank slipped in place and refastened. If this is not a bolted connection, the flange will have to be cut using a reciprocating saw and then a blank slipped in place and refastened. The PGS side will have only a plastic covering put in place as a temporary closure.

The BROKK 250 will be used to perform much of the disassembly and sizing operations of the PGS gloveboxes. The main PGS disassembly process will take place within the temporary enclosure and is described below:

- The D&D&D personnel enter the temporary enclosure in appropriate anti-contamination PPE and respiratory protection to partially dismantle the window panels from the frames using hand tools.

Remote dismantlement using the BROKK 250 would not be effective because of the use of high-strength laminated glass in the lower window locations. Manual dismantlement will continue until the window panels are almost free but are still held in place by the frame at a minimum of two points (e.g., one on top and one on bottom). However, dismantlement must be sufficient to ensure that the BROKK 250 is capable of breaking the remaining connections that hold the panels in place.

- Suspend the glovebox load, using the Grove TM9120 crane (or equivalent), while the BROKK 250 is used to shear, remove, and place the support steel in waste boxes. The temporary enclosure roof panel(s) located above the lift point of the PGS will have to be removed and a flexible boot installed to allow the crane wire rope to pass through the boot yet allow the boot to maintain a seal around the cable (i.e., wire rope). This flexible boot system also will have a local HEPA air-handling unit and elephant trunk installed to ensure the capture of any contamination that may escape the H&V system negative pressure drop or flexible boot.
- Lower the glovebox assembly to the WES floor and place it on its side using the Grove TM9120 crane.
- Break the remaining window panel frame connections using the BROKK 250 and place panels into soft-sided bags (some panels will be too large to fit into standard waste boxes).
- Remove the structural steel tubing from the glovebox using the BROKK 250 and shear into sections and place sections in waste boxes.
- Smash the glovebox interior 11-gauge stainless steel sheet metal flat by using the BROKK 250.
- Size the smashed 11-gauge stainless steel sheet metal using the BROKK 250 shears and place in waste boxes.

Note: A potential problem could occur if the 11-gauge stainless steel sheet metal becomes bound up and entangled around the hydraulic shear of the BROKK 250. This would require handwork to fix and creates a potential for personnel injury. Injury will be mitigated by using reach tools and stainless steel or Kenlan-lined gloves.

3.3.5.2.8 Packaging the Packaging Glovebox System into Waste Boxes—The PGS assembly will be placed into various waste boxes depending on the types and levels of contamination. Possible waste types and required segregation of material and waste are listed below:

- Exterior structural steel, LLW
- Interior 11-gauge stainless steel sheet metal, LLW.

If material is surveyed as clean, then it will be disposed of as industrial waste.

Approved waste boxes will be used for these waste packaging operations. Care must be taken to ensure proper sorting and segregation of waste streams in accordance with the approved waste minimization plan.

3.3.5.2.9 Alternative to Packaging Glovebox System Dismantlement—An alternative to the time-consuming dismantlement of the PGS would be to use the PGS as an oversized waste container. Other similar types of waste streams could be placed inside the PGS for disposal. This would require acceptance by the INEEL Waste Generator Services and the disposal facility. Because most of this type of waste is to be LLW, it would seem logical that this oversized waste container could readily be adaptable for disposal in the LLW Disposal Facility.

3.3.5.2.10 Decontamination of Area and Removal of the Temporary Enclosure—The internal layer of poly sheeting will be removed from the ceiling and walls and placed in the waste box. The floors will be vacuumed to remove most loose contamination. The areas then will be wet wiped to remove any additional loose contamination. Radiological Control personnel will perform a radiological survey of the temporary enclosure to ensure a clean configuration. If any radiological contamination is detected, that specific area will be marked for additional decontamination efforts until released by Radiological Control.

The temporary enclosure will be disassembled in reverse order of construction to ensure structural integrity (i.e., walls, trusses, and doorways) for reuse on the next PGS. The process steps identified in Section 3.3.8 will be repeated for the two remaining gloveboxes.

3.3.6 Retrieval Confinement Structure Dismantlement Operations

3.3.6.1 Approach. A temporary enclosure will be built around the RCS to allow the entire structure to be dismantled while maintaining containment of radiological contamination. A BROKK 330 will already be inside the RCS and will be used to dismantle the interior.

3.3.6.2 Process Description

3.3.6.2.1 Building of Temporary Enclosures and High-Efficiency Particulate Air System for Dismantlement Phase—A large enclosure will be built around the RCS. The enclosure will feature multilayered plastic to aid in final decontamination and removal of the enclosure. A temporary HEPA ventilation unit will be installed (the main ventilation unit will be shut down for dismantlement) to provide continuous off-gas flow and filtration during dismantlement.

3.3.6.2.2 Removal of Interior Retrieval Confinement Structure Equipment (Excavator Arm)—The excavator arm will be decontaminated by wiping down any visible loose dust. The arm will be wrapped with plastic, disconnected from the excavator, and packaged as LLW. The arm will be disconnected from the excavator and removed from the RCS. After the removal of the excavator arm, the CAT 446B excavator will be decontaminated and readied for reuse.

3.3.6.2.3 CAT 446B Excavator Hydraulic Systems—The hydraulic systems will be drained on the CAT 446B excavator. The fluid will be sampled for radioactive contamination and disposed of in accordance with INEEL company procedures.

3.3.6.2.4 CAT 446B Excavator Equipment Decontamination—The CAT 446B excavator will be wiped down. Contaminated grease will be removed using small volumes of detergent solution. This equipment will not be free released, but all surface contamination can be removed.

3.3.6.2.5 CAT 446B Excavator Equipment Readiness—If reuse is a potential for the CAT 446B excavator, it will be reassembled including hydraulics, outriggers, and wheels. The equipment will be released from the job site for radiological use at other on-Site D&D&D jobs. If no further use for the equipment is required, the equipment will be packaged for LLW disposal.

3.3.6.2.6 Removal of Utilities—After utility isolation, the BROKK 330 will demolish the interior equipment (e.g., sprinklers, HEPA, H&V dampers, and deluge components). The waste will be loaded into waste boxes for disposal as LLW.

3.3.6.2.7 Removal of the Main High-Efficiency Particulate Air Unit and Filters— The main HEPA filter bank will be removed and disposed of as TRU or MTRU waste. An additional enclosure may be required around the HEPA enclosure to minimize the spread of contamination. The temporary air movers with HEPA filters must remain operational throughout this step.

3.3.6.2.8 Dismantlement of Retrieval Confinement Structure—A final decontamination of the RCS interior may be required before its dismantlement. Nibblers will be used to cut apart entire roof and wall sections. The contaminated side of the nibbler cutting path will have been taped before operations and will be peeled back just before the cutting activity. This will minimize any release of radionuclides during cutting. The Grove TM9120 crane (or equivalent) would be used with disposable slings and spreader-bar to hold the RCS roof while it is dismantled from the walls, and then lowered onto the temporary steel truss and floor plate system. The walls of the RCS would be similarly rigged, dismantled, and lowered for sizing. Before dismantlement of the RCS roof system, the walls will be stabilized using welded brackets and steel cables anchored to the FFS in combination with fixed-steel angle supports. Some of the lifting points and fixtures can be installed during the RCS construction period. Others will be installed during the D&D&D phase.

3.3.6.2.9 Final Sizing of the Retrieval Confinement Structure Operations—A final decontamination of the RCS interior may be required before its dismantlement. The BROKK 330 then will be used to remove side panels and to dismantle and size the support steel. The entire dismantlement should be accomplished with very few personnel entries into the temporary containment enclosure. The BROKK 330 will perform almost all activities remotely. Personnel entries will only be required to perform maintenance on the BROKK 330 and minor sizing. The BROKK 330 will size the RCS into sections to be placed into waste containers for shipment to the disposal facility. Steel or wood waste containers will likely be used because of the sharp metal edges of the sized RCS.

3.3.6.2.10 Packaging the Retrieval Confinement Structure—During the dismantlement of the RCS and its components, the waste will be sized and packaged into waste containers. The majority of the waste will be classified as LLW. Because of the high density of the steel components, and previous decontamination efforts, no TRU waste is anticipated. Loaded waste containers will be moved out of the temporary containment enclosure as they are filled and staged in a temporary storage location until shipment to the ICDF.

3.3.6.2.11 Final Fixing of Contamination of Retrieval Confinement Structure Flooring—After RCS sizing operations, the remaining RCS flooring will be sprayed with strippable paint and plastic, then plywood will be placed and taped in position to provide additional protection during future operations and assure containment of contamination.

3.3.7 Phase I Dismantlement of the Weather Enclosure Structure Interior Systems and Facility Floor Structure

3.3.7.1 Approach. The WES should be free of contamination at the conclusion of the RCS removal. Any small contaminated spots will be decontaminated and removed. All utilities must be removed before the entire structure is dismantled.

3.3.7.2 Process Description

3.3.7.2.1 Removal of the Interior Equipment Systems—The water and air tanks will be removed and disposed of as clean waste in the CFA landfill. All electrical components, including control panels, distribution panels, and lighting will be removed and disposed of in the CFA landfill. All items removed require radiological control survey.

3.3.7.2.2 Removal of the Exterior Equipment Systems—The exhaust ductwork outside the WES will be wrapped in plastic, dismantled, sized as needed, and placed in approved waste boxes. The stack and fans will be wrapped in plastic, dismantled, and disposed of as indicated in Table 1. After removal, the electric fan motors can likely be reused within the INEEL.

3.3.7.2.3 Removal of the High-Efficiency Particulate Air Supply System—The HEPA supply system should be a clean system upstream of the HEPA filter and can be dismantled for reuse for future projects at the INEEL Site. This disassembly process will be a little slower than normal dismantlement operations because of the additional care required for reuse. An extendable boom fork-truck will be used to assist in this dismantlement.

3.3.7.2.4 Removal of Interior Structures—The transfer vestibule and personnel access structures will be dismantled. Lockers and storage cabinets will be removed.

3.3.7.2.5 Removal of Interior Utility Systems—The firewater and plant air systems will be removed. Various alarms, instrumentation, and camera systems will be removed.

3.3.7.2.6 Radiological Control Final Survey of the Weather Enclosure Structure—Final surveys will be performed by Radiological Control personnel before breaching of the WES or FFS is performed.

3.3.7.2.7 Spot Decontamination (if Necessary)—Any contamination identified will be decontaminated. If the contamination cannot be removed, it will be fixed and the hot spot cut out and disposed of as LLW.

3.3.7.2.8 Phase I Removal of the Interior Facility Floor System—The floor will be dismantled with cutting torches, nibblers, and other mechanical hand tools. The fork-truck also will be required to handle the floor structural members. Materials will be surveyed, sized, and packaged as industrial waste for the CFA landfill.

3.3.8 Removal of Temporary Steel Truss and Floor Plate System

After the partial removal of the FFS around the RCS to provide access to the 2.4-m (8-ft) geotextile membrane and cover steel plates allowing access to clean fill material under the FFS, the temporary steel truss and floor plate system will be removed. Calculations will be performed to determine if tie-downs to the WES are required during FFS dismantlement.

3.3.8.1 Approach. The D&D&D operations will use the BROKK 330 in addition to the CAT 446B excavator arm to remove the temporary steel truss and floor plate system in the reverse order of installation (remove floor plates and then steel trusses). The steel floor plate will be decontaminated and sprayed with strippable paint and placed in oversized fabric bags for an oversized shipment to the ICDF. This will avoid additional cutting time and potential generation of contamination.

3.3.8.2 Process Description

3.3.8.2.1 Temporary Containment Around Shoring Box Area—A temporary containment structure (e.g., wood framing and multiple layers of plastic) is to be constructed around the shoring box area and sealed down to the gravel backfill material and will include its own portable HEPA systems and lighting. This is necessary to assure no loss of contamination during shoring box removal and backfill operations.

3.3.8.2.2 Remove Temporary Steel Floor Plates and Steel Trusses—The temporary steel floor plates and steel trusses will be unscrewed and removed from east to west allowing the BROKK 330 full access during dismantlement operations. The BROKK 330 will handle the placement of steel floor plates and trusses after they are unscrewed by personnel using electrical and hand tools. The steel trusses may have to the further sized to be placed into waste fabric bags on pallets and this could be accomplished using the BROKK 330 and hydraulic shear.

3.3.8.2.3 Remove Waste from Temporary Containment—After the materials are placed into the waste fabric bags for oversize shipment, the bags will be sealed by personnel. These waste fabric bags on pallets then will be transferred to the vestibule airlock using the extendable boom fork-truck. By extending the boom, the fork-truck will never drive onto the contaminated floor area.

3.3.9 Cutting Off Soil Probe Casings

After the initial reactivation of project facility and equipment systems, the initial work task inside the RCS will be to cut off the tops of any vertical soil probe casings at grout level in preparation for dismantlement of the shoring box.

3.3.9.1 Approach. The D&D&D operations will use the BROKK 330 in addition to power cut-off saws to cut off the soil probe casings within the waste excavation. This operation is fairly straightforward and will not require any complex support or special D&D&D techniques to accomplish. Standard radiological controls, including air monitoring and PPE, will be used throughout the process. Once cut, the current plan is to place the tops of the soil probe casings in waste boxes for disposal as LLW or MLLW rather than to bury them in the excavation area.

3.3.9.2 Process Description

3.3.9.2.1 Equipment and Material Introduction into the Confinement Area—The necessary equipment and materials (i.e., BROKK 330 with hydraulic shear, waste box, electric cut-off saws, extra blades, sand fill, and bentonite) will be brought into the RCS through the temporary airlock constructed in the WES vestibule. These items will be needed to comply with the work control documentation.

3.3.9.2.2 Install Means for Pit Access—Personnel access to the waste excavation area grout surface will require installation and securing of ladders (waste pit depth after grouting will be 1.5 m [5 ft] from the RCS steel flooring system).

3.3.9.2.3 Cutting Off Probe Casing Tops—Workers will first unscrew and remove the probe-handling cap (i.e., flexible ball and cable assembly) from the top of a soil probe casing. The BROKK 330 will lift and place the cap in the waste box. The BROKK 330 will then hold the top of the soil probe casing while workers cut it off at grout level using the electric cutoff saw. Then the BROKK 330 will lift the removed section of probe casing and place it in the waste box. This process will be repeated until all vertical soil probe casings have been cut off.

3.3.9.2.4 Backfill and Plug Probe Casings—Workers will then backfill the open probe casings with sand, reserving the last 15 cm (6 in.) of each casing for a bentonite (i.e., clay) plug.

3.3.9.2.5 Securing Equipment—Personnel will secure equipment and materials and then exit the waste excavation area.

3.3.10 Shoring Box Dismantlement Operations

Dismantlement of the shoring box is one of the primary work tasks that must be accomplished before final backfill of the waste excavation area to finished grade. The extent to which undercutting of the shoring box may have allowed contamination to reach the backside of the shoring box, adjacent overburden soils, and the underside of the FFS will not be completely known until the shoring box has been removed. This plan assumes that no undercutting and contamination spread has occurred.

3.3.10.1 Approach. The dismantlement of the shoring box will be one of the more challenging tasks to be accomplished by the D&D&D team and will require the use of a truck-mounted hydraulic crane [i.e., Grove TM9120 [120-ton, truck mounted, hydraulic crane] or equivalent]. The temporary H&V system will be operating to ensure a negative-pressure atmosphere is maintained within the temporary enclosure for confining the contamination. The crane will be set up west of the WES and the main block and tackle will be above the WES with disposable slings and spreader bar inside the temporary enclosure. Detailed planning must be performed to eliminate the potential for side loads or excessive swinging. Initially, the shoring box will be sectioned (i.e., cut with plasma torch) into four major pieces. The crane will hold each piece in turn as it is cut from the remainder of the shoring box, from the protective skirts, and from the supporting floor structure. The section behind each joint will have to be excavated to provide access for cutting operations. The crane then will position each section such that personnel can wrap pieces with plastic before placement into waste fabric bag for oversize shipment to the ICDF. An elephant trunk (i.e., a ventilation trunk line that can be relocated) will be maintained in close proximity to the cutting operation to pull contaminated air through a portable HEPA filter and air mover. After the

shoring box has been dismantled into the four major sections and each has been wrapped and placed into waste fabric bags, the waste fabric bags will be surveyed for shipment to the ICDF.

3.3.10.2 Process Description

3.3.10.2.1 Preparing the Crane Access Location West of the Weather Enclosure Structure—The area west of the WES initially will be used for crane access during the construction phase of the FFS, RCS, PGS, and WES. This same location will be used to provide access for the hydraulic crane (i.e., Grove TM9120 [120-ton, truck mounted, hydraulic crane] or equivalent). This is the same location that was used during the PGS and RCS dismantlement operations.

3.3.10.2.2 Disassembly of Remaining Facility Floor Structure and Geotextile Membrane—The remaining steel structure, floor plating, and floor decking of the FFS will be dismantled using the BROKK 330 and appropriate hand tools to provide access to the geotextile membrane and cover steel plating. The geotextile membrane and cover steel plating will be observed for any visual subsidence. If none is observed, then the removal of the cover steel plating and membrane will continue with radiological surveillance. The membrane will be cut or unbolted from the shoring box. This will eliminate any combustibles from the floor area. If there is visual evidence of subsidence, then a specific plan will be developed to address specific steps necessary to deal with this physical configuration. These cover steel plates and membrane will be placed in waste fabric bags for oversize shipments to a disposal facility or storage area.

3.3.10.2.3 Excavation Behind Shoring Box Joints—The BROKK 330 will be used to excavate behind the four major joints of the shoring box to provide access for the cutting operations. The soil will be placed on plastic for survey and release before replacement after shoring box removal operations are completed.

3.3.10.2.4 Sectioning the Shoring Box—Once the crane is in position and has access to the WES through the flexible boot seal (installed previously), the crane tackle block will be outside the WES and disposable slings and spreader-bar will be attached to the section of shoring box to be sectioned. The crane will take up tension or load on the shoring box and then cutting operations will begin as listed below:

- Fireproof plywood and dunnage will be placed on the waste excavation area grout backfill to provide a stable working platform for personnel and to receive the section of shoring box to be removed. The BROKK 330 will be used to lower materials into the pit and position them in the pit area.

- The shoring box section will have been previously dismantled from its RCS floor structural supports by mechanical drilling and saw cutting or gas-torch cutting of the RCS flooring plate and RCS FFS structural steel.

- The section then will be cut from the shoring box by mechanical drilling and saw cutting or gas torch cutting of the shoring box skin plate and structural steel tubing.

- The section will be positioned to allow it to be wrapped with plastic by personnel before placement into the waste fabric bags.

- The wrapped section of shoring box will then be positioned for placement into the waste fabric bags for disposal.

3.3.11 Final Backfilling of the Waste Excavation Area

3.3.11.1 Approach. After the shoring box has been removed, the remaining waste excavation area will be backfilled using approved soil fill material. This material may be new soil (e.g., obtained from the spreading area) or possibly the same overburden soil that was removed before waste retrieval operations began. Whichever material is selected, the fill material will be brought to the WES in bags and transferred (i.e., augured) into the temporary containment enclosure for remote placement and compaction by the excavator. After backfilling is complete, the fill material will be covered with a minimum of two layers of tarps to prevent contamination of the fill material during subsequent facility dismantlement.

3.3.11.2 Process Description

3.3.11.2.1 Visual Verification of Soil Subsidence—With the shoring box removed, it will be easy to assess if any soil subsidence problems have occurred within the waste excavation area. If soil subsidence has occurred, the affected area(s) can be surveyed and sampled to determine if contamination is present on the exposed overburden soil. If contamination is found, a recovery plan will be developed to manage the specific conditions.

3.3.11.2.2 Complete Backfilling Operations—Bags of approved soil fill material will be transported individually to the WES and placed outside the vestibule. Soil will be loaded into a hopper, mixed with a small amount of water, and transported by auger into the temporary containment enclosure. The damp soil will be dropped into the excavation at the end of the auger. The BROKK 330 will use a pneumatic compactor to spread the soil and achieve an acceptable density. No personnel will be required to enter the temporary containment enclosure for this operation.

3.3.12 Deactivation, Decontamination, and Decommissioning of Equipment

3.3.12.1 Approach. Equipment (e.g., the BROKKs 330 and 250) must be decontaminated on completion of the D&D&D of the facility. The existing tent used to contain the Shoring Box will be used to contain contamination during decontamination of the equipment. The backfill material will be protected with plastic tarps, plywood, and dunnage during the decontamination of the BROKKs.

3.3.12.2 Process Description. The equipment dispositions as discussed below are based on expected residual contamination on identified equipment. However, should the contamination be higher than acceptable levels, additional decontamination or alternate disposition may be required.

3.3.12.2.1 BROKK 330 and 250 Hydraulic Systems—The BROKK 330 and 250 hydraulic systems will be drained and the fluids sampled for radioactive contamination. The fluids will be disposed of in accordance with INEEL company procedures.

3.3.12.2.2 BROKK 330 and 250 Equipment Decontamination—The BROKK 330 and 250 will be decontaminated using a wet wipe-down method. Contaminated grease will be removed using small volumes of detergent solution. This equipment will not be free released but all surface

contamination can be removed. Some contamination will likely remain in the seals but the equipment can still be reused for radiological work at the INEEL.

3.3.12.2.3 BROKK 330 and 250 Equipment Readiness—The BROKK 330 and 250 will be reused on other INEEL D&D&D jobs. They will be packaged for movement to another part of the INEEL Site pending reuse.

3.3.12.2.4 Dismantlement of the Temporary Enclosures—The temporary enclosure tents will be decontaminated. An extra layer of plastic will be included in the temporary enclosure tents during the erection phase. This will allow for quick removal of any interior contamination. After decontamination has been completed, the temporary enclosure tents will be demolished and removed as LLW.

3.3.12.2.5 Dismantlement of the Temporary High-Efficiency Particulate Air System—The temporary HEPA system will be decontaminated and dismantled and prepared for reuse on future INEEL projects.

3.3.13 Final Dismantlement of the Facility Floor Structure and Weather Enclosure Structure

3.3.13.1 Approach. After backfill of the waste pit has been accomplished, the remaining sections of the FFS and WES can be dismantled using the GEHL, JD Processor, and Grove TM9120 crane and other hand tools as required.

3.3.13.1.1 Removal of the Fabric Enclosure System—The fasteners and internal cabling system will be dismantled, allowing removal of the fabric from the WES. The fabric will be divided into a minimum of three sections, folded, and stored for reuse. This activity will be performed only when the wind speed is less than 5 miles per hour.

3.3.13.1.2 Removal of the Weather Enclosure Structure Structural Framing—The structural framing will be unbolted piece-by-piece and disassembled. The steel members will be stored with the fabric at a secure site. Reuse of the building will be sought within the DOE complex system.

3.3.13.1.3 Removal of the Weather Enclosure Structure Final Facility Floor Structure Perimeter—The FFS perimeter will be dismantled with the shearing end effector. Some gas-torch cutting also will be required.

3.3.14 Restoration of the Project Site

3.3.14.1 Approach. After fulfilling the dismantlement requirements of the D&D&D plan, the project area will be returned to its pre-retrieval state.

3.3.14.2 Process Description

3.3.14.2.1 Deactivation, Decontamination, and Decommissioning of Site Utilities—After energy isolation, the site utilities will be removed, including power lines and firewater lines. The

project manager will ensure that the breakers and valves used as isolation points are agreed to with the RWMC facility manager.

3.3.14.2.2 Removal of Ancillary Temporary Facilities—The breathing air, shower, and polychlorinated biphenyls (PCB) storage trailers (if used) will be removed and excessed and all utilities supporting these trailers will be removed.

3.3.14.2.3 Remediation of Graveled Areas—Gravel laid down as part of roads, parking areas, lay-down areas, and the base of the WES will be removed and hauled to the bottom of the SDA for use as base material. The gravel will be spread and compacted on the ramp leading into the SDA and the floor of the SDA to provide improved roadbed.

3.3.14.2.4 Remediation of Grounds—Clean topsoil will be placed over disturbed areas and reseeding will be performed.

3.3.14.2.5 Demobilization—All D&D&D support trailers and equipment will be removed as part of the project site demobilization.

3.3.15 Equipment and Facility Requirements during Deactivation, Decontamination, and Decommissioning Operations

The equipment and facility requirements for the D&D&D team are discussed briefly in the following paragraphs.

Major equipment requirements include the following:

- BROKK 330—recommended to be purchased as part of this project
- CAT 446B—to be purchased as part of this project
- BROKK 250—INEEL Operations D&D&D group-owned equipment
- Grove RT52BC crane—INEEL Operations D&D&D group-owned equipment
- GEHL Forklift—INEEL Operations D&D&D group-owned equipment
- Truck tractor and flatbed trailers—INEEL Operations D&D&D group-owned equipment
- CASE 921C loader—INEEL Operations D&D&D group-owned equipment
- Motor grader—INEEL-owned equipment
- Hydro seeder—INEEL Operations D&D&D group-owned equipment
- Tandem dump truck (12 yd^3)—INEEL Operations D&D&D group-owned equipment

- Twelve-passenger van
- Crew cab 3/4-ton pickup truck.

Power, water, sewer, and other project facilities requirements are identified below:

- One office trailer, 3.7 × 12.2 m (12 × 40 ft) (power)
- One personnel trailer, 3.7 × 12.2 m (12 × 40 ft) (power)
- One change and shower trailer, 3.7 × 12.2 m (12 × 40 ft) (power, water, and sewer)
- Two materials and tool trailers, 3.7 × 12.2 m (12 × 40 ft) (power drop trailer)
  - These trailers will stock standard electrical power tools and hand tools such as the following:
    - Band saws, reciprocating saws, drills, and power chisels
    - Pneumatic impact hammers and wrenches
    - Hand tools, wrenches, hammers, and gas torches
  - These trailers also will stock standard D&D&D materials such as those listed below:
    - Strippable paint, wet-wipe solutions, grease, lubricants, and oils
    - Duct tape, bolts, nails, lumber, poly sheeting, and cotton rags
    - High-efficiency particulate air-handling units, elephant trunk, and HEPA filters
    - Electrical extension chords, ground fault interrupt outlets, lighting, and heating
    - Personal protective equipment: gloves, booties, cloth and Tyvek coveralls, respirators, filters, bubble suits, and air hoses.

3.3.16 Interfaces

Interfaces with INEEL Site facilities and managers and the D&D&D team will be minimal because of the project isolation and location. The main interfaces are listed below:

- Project manager or designated representative will interface with the following:
  - Project operations
  - Facility operations
  - Site property management (e.g., excess property)

- Interface with ICDF about waste disposal
- Stage III Project for equipment reuse.

- Radioactive Waste Management Complex site area director or designated representative will be the interface in the following areas:
  - Site utilities
  - Site restoration
  - Radioactive Waste Management Complex LLW pits (waste interface)
- Site security personnel will be the interface for the following areas:
  - Badging
  - Physical security
  - Physical access to the project site.

3.3.17 End State after the Deactivation, Decontamination, and Decommissioning Phase

The end-state criteria for the D&D&D operations were discussed in Section 2.3.2, which outlines the end state for all facilities, equipment, materials, and site areas associated with this project.