LOCKHEED MARTIN

ORNL/ER-409

**ENVIRONMENTAL
RESTORATION
PROGRAM**

**Final Deactivation Report
on the Radioisotope Production Lab-D,
Building 3031,
at Oak Ridge National Laboratory,
Oak Ridge, Tennessee**

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LOCKHEED MARTIN ENERGY SYSTEMS, INC.
FOR THE UNITED STATES
DEPARTMENT OF ENERGY

UCN-17560 (6-8-95)

ENERGY SYSTEMS

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Oak Ridge, Tennessee**

Date Issued—August 1997

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Prepared for the
U.S. Department of Energy
Office of Environmental Management
under budget and reporting code EW 20

Environmental Management Activities at
OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee 37831
managed by
LOCKHEED MARTIN ENERGY SYSTEMS, INC.
for the
U.S. DEPARTMENT OF ENERGY
under contract DE-AC05-84OR21400

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PREFACE

This is the *Final Deactivation Report on the Radioisotope Production Lab-D, Building 3031, at Oak Ridge National Laboratory, Oak Ridge, Tennessee* (ORNL/ER-409). Although this element of work is not part of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, it was accomplished in accordance with the substantive requirements of the Act. This work was performed under Work Breakdown Structure 1.6.6.2.10.02 (Activity Data Sheet 6504IS, "Isotopes Facilities Deactivation Project"). This document provides the Environmental Management and Enrichment Facilities Program with the final report on the deactivation of Bldg. 3031.

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ABBREVIATIONS

EM-40	Department of Energy Office of Environmental Restoration
EM-60	Department of Energy Office of Nuclear Materials and Facility Stabilization
HEPA	high-efficiency particulate air
MOA	Memorandum of Agreement
ORNL	Oak Ridge National Laboratory
RCRA	Resource Conservation and Recovery Act
S&M	surveillance and maintenance

DEFINITIONS

Deactivation	The process of placing a facility in a safe and stable condition to minimize the long-term cost of a surveillance and maintenance program that is protective of workers, the public, and the environment until decommissioning is completed.
Decommissioning	Refers to the ultimate disposition of a facility. Also substitutes for previously used "D&D."
Decontamination	The removal or reduction of radioactive or hazardous contamination from facilities, equipment, or soils by washing, heating, chemical or electro-chemical action, mechanical cleaning or other techniques to achieve a stated objective or end condition.
End Point	A detailed specification for the final deactivation condition of areas and hardware within a facility and related documentation. An individual milestone towards the deactivation and/or the decommissioning of a facility.
End Point Technical Information	A compilation of documents to support end point conclusions.
Turnover Package	A compilation of project-related documents to be given to a postdeactivation organization.

EXECUTIVE SUMMARY

The purpose of this report is to document the condition of Bldg. 3031 after completion of deactivation activities as outlined by the Department of Energy Office of Nuclear Materials and Facility Stabilization Program (EM-60) guidance documentation. This report outlines the activities conducted to place the facility in a safe and environmentally sound condition for transfer to the Department of Energy Office of Environmental Restoration (EM-40) Program.

This report provides a profile of Bldg. 3031 before and after deactivation activities. Turnover items, such as the Postdeactivation Surveillance & Maintenance Plan, remaining hazardous materials, radiological controls, Safeguards and Security, quality assurance, facility operations, and supporting documentation provided in the Office of Nuclear Materials and Facility Stabilization Program (EM-60) Turnover package, are discussed.

Building 3031 will require access to facilitate required surveillance and maintenance activities to maintain the building safety envelope. Building 3031 was stabilized during deactivation so that when transferred to the EM-40 program, only a minimal surveillance and maintenance effort would be required to maintain the building safety envelope. Other than the minimal surveillance and maintenance activities, the building will be unoccupied and the exterior doors locked to prevent unauthorized access. The building will be entered only to perform the required surveillance and maintenance.

All materials have been removed from the building and the hot cell, and all utility systems, piping, and alarms have been deactivated.

1. INTRODUCTION

1.1 PURPOSE

This report documents the condition of Bldg. 3031 after completion of deactivation activities as outlined by the Department of Energy Office of Nuclear Materials and Facility Stabilization (EM-60) Program guidance documentation. This report outlines the activities conducted to place the facility in a safe and environmentally sound condition for transfer to the Department of Energy Office of Environmental Restoration (EM-40) Program.

This report provides a profile of Bldg. 3031 before and after deactivation activities. Turnover items, such as the Postdeactivation Surveillance & Maintenance Plan, remaining hazardous materials, radiological controls, Safeguards and Security, quality assurance, facility operations, and supporting documentation provided in the Office of Nuclear Materials and Facility Stabilization (EM-60) Program Turnover package, are discussed.

1.2 SCOPE

This report addresses the activities performed during deactivation associated with Bldg. 3031, to place the facility in a safe and environmentally sound condition to await decommissioning, the status of the facility, and the activities required to maintain the facility following deactivation. Attachment 1, "Building 3031 Floor Plan," provides a floor plan of Bldg. 3031 that illustrates the physical boundaries and scope of this Final Deactivation Project Report, the scope of which is limited to Bldg. 3031.

2. BACKGROUND

2.1 FACILITY DESCRIPTION

Building 3031 is a steel-frame structure covered by corrugated aluminum siding. The single-story facility has a floor area of 825 ft². A manipulator-type hot cell is located on the middle of the west wall. Two laboratory-type hoods occupy the northeast corner of the building with one laboratory-type hood occupying the northwest corner of the building. A laboratory-type workbench occupies the center of the facility and is equipped with a sink. The manipulator cell and laboratory hoods constitute the primary means of containment. All high-level work was conducted in the hot cell. The building operates at a slightly negative pressure relative to the outside atmosphere.

The hot cell has 2-ft barytes concrete walls with 4 in. of lead brick shielding on the operating face of the cell wall and an unshielded top cover. The cell is provided with a mineral-oil-filled lead glass window. A stainless-steel operating pan covers the floor and interior walls up to the level of the viewing window. Small steel doors on each side of the cell are used for the insertion and removal of small equipment and containers. A thick steel double door at the back of the cell provides access for larger items if needed.

Extended reach Model-8 manipulators are inserted through holes in the top of the cell. The slave sections of the manipulators are covered with urethane manipulator boots sealed to the inside top surfaces of the cells. An additional plastic boot and wiper seals in the manipulator barrels provide a secondary containment for manipulator penetration.

2.2 FACILITY HISTORY

Building 3031 was constructed in 1950 as part of the Isotopes Program. The building contains facilities that were utilized for storage, purification, processing, and dispensing of a wide variety of radioisotopes. Primarily these isotopes were processed from irradiated targets from the High-Flux Isotope Reactor, the Oak Ridge Research Reactor, and the 86 in. Cyclotron. The hot cell in Bldg. 3031 was utilized for the final separation of gadolinium (^{153}Gd).

3. FACILITY STATUS

3.1 PREDEACTIVATION FACILITY STATUS

Following approximately 40 years of operations and processing, Bldg. 3031 was surplused and many of the process systems were abandoned in place. General housekeeping was not maintained, and the building structural integrity was allowed to lapse.

Attachment 2, "Predeactivation Facility Photographs," contains photographs of the building conditions before deactivation activities.

3.1.1 Hazards Analysis

No predeactivation hazards analysis was performed. Because only process activities involving less than 100 Ci were performed in Bldg. 3031, it was determined that the facility did not warrant a hazard analysis or safety analysis.

3.1.2 Internal Spaces

The general area contained furniture, cabinets, hazardous waste, radioactive waste, and various miscellaneous items used when the facility was in operation. The lead-based paint is chipping and peeling, providing a means of transferring contamination and endangering personnel and the environment.

Predeactivation radioactive contamination levels and radiation levels for the general area are listed in Tables 1 and 2, respectively. Predeactivation hazardous materials and waste located in the general area are listed in Table 3.

3.1.3 Building Structure and External Spaces

The structure and roof of Bldg. 3031 were inspected and found to be in generally good condition, with the exception of water in leakage through various paths.

3.1.4 Process, Utility, and Support Systems

3.1.4.1 Electrical power system

Before deactivation, the electrical power system provided power distribution for the electrical service to Bldg. 3031. Typical electrical loads were lighting, heaters, and exhaust fans. A 480 VAC outlet also existed for use with welders and other equipment requiring this service.

3.1.4.2 Fire protection system

The fire protection system is a dry-pipe fire suppression system for Bldg. 3031 and is available for use. The general area was equipped with sprinkler heads and alarms as required by the local fire code. In addition, fire extinguishers were placed strategically in and around Bldg. 3031. The fire protection system is not believed to be contaminated.

3.1.4.3 Building steam system

The building steam system provided steam for use in heating the general area of Bldg. 3031. Two heat exchangers are located in Bldg. 3031 to provide space heating for personnel. The building steam system is not believed to be contaminated. However, the majority of the steam piping within Bldg. 3031 is lagged with asbestos insulation materials.

3.1.4.4 Potable water system

Before deactivation, the potable water system provided water to the Bldg. 3031 safety shower, hot water heater, and sink. The potable water system is not believed to be contaminated.

3.1.4.5 Hot drain system

Before deactivation, the hot drain system provided a means of discharging liquid process wastes from the hot cells to the liquid low-level waste system. The hot drain system is a gravity drain system to the WC-10 tank in the low level liquid waste system. The hot drain system was determined to be highly contaminated from the process and cleaning activities performed before deactivation.

3.1.4.6 Process drain system

Before deactivation, the process drain system provided a means of removing liquids from the area floor to the Oak Ridge National Laboratory (ORNL) process waste system and treatment facility. The process drain system is a gravity drain system. The process drain system was determined to be contaminated from the process and cleaning activities performed before deactivation.

3.1.4.7 Natural gas system

The natural gas system to Bldg. 3031 was never used. The system has remained isolated from the building since the time of its installation and is not believed to be contaminated.

3.1.4.8 Overhead crane

Before deactivation, an overhead crane was used in Bldg. 3031 to provide a means of moving heavy equipment in and around the hot cell. The overhead crane was determined to be contaminated from the process activities performed before deactivation.

3.1.4.9 Plant air system

Before deactivation, the plant air system provided 110 psig air to Bldg. 3031. The plant air system was regulated and used for process activities and instrumentation throughout the facility. The plant air system is not believed to be contaminated.

3.1.4.10 Hot cell manipulators

Before deactivation, the hot cell manipulators provided a means of remote process operation within the hot cell. The hot cell is equipped with Model 8 manipulators. Before deactivation the hot cell manipulator boots and seals were determined to be in poor condition and a potential method for the spread of contamination from the hot cells.

3.1.4.11 Central ventilation system

Before deactivation, the central ventilation system provided exhaust ventilation services to the hot cell in Bldg. 3031. The central ventilation system for Bldg. 3031 was filtered through high-efficiency particulate air (HEPA) filters before discharge to the 3039 stack. The central ventilation system was determined to be contaminated from the process activities performed before deactivation.

3.1.4.12 Local ventilation system

Before deactivation, the local ventilation system provided exhaust ventilation services to the hoods in Bldg. 3031. The local ventilation system for Bldg. 3031 was filtered through HEPA filters before discharging to the atmosphere. The local ventilation system was determined to be very slightly contaminated from the process activities performed before deactivation.

3.1.5 Radioactive Material, Contamination, and Waste

Table 1 lists the radioactive contamination levels identified on radiation surveys conducted before deactivation.

Table 1. Predeactivation radioactive contamination levels

Identification	Description	Quantity
Hot cell	Alpha smear—transferable contamination	Less than 500 dpm/100cm ²
Hot cell	Beta/gamma smear—transferable contamination	1.0 to 40,000 dpm/100cm ²
Hood #1	Alpha smear—transferable contamination	Less than 500 dpm/100cm ²
Hood #1	Beta/gamma smear—transferable contamination	1988 dpm/100cm ²
Hood #2	Alpha smear—transferable contamination	Less than 500 dpm/100cm ²
Hood #2	Beta/gamma smear—transferable contamination	224 dpm/100cm ²
Hood #3	Alpha smear—transferable contamination	Less than 500 dpm/100cm ²
Hood #3	Beta/gamma smear—transferable contamination	No detectable contamination
General area	Alpha smear—transferable contamination	Less than 500 dpm/100cm ²
General area	Beta/gamma smear—transferable contamination	231 to 2037 dpm/100cm ²

Table 2 lists radiation levels identified on radiation surveys conducted before deactivation.

Table 2. Predeactivation radiation levels

Identification	Description	Quantity
Hot cell	Fixed and transferable radiation levels	36 mRem/h
Hood #1	Fixed and transferable radiation levels	2 mRem/h
Hood #2	Fixed and transferable radiation levels	20,000 dpm
Hood #3	Fixed and transferable radiation levels	20,000 dpm
General area	Fixed and transferable radiation levels	up to 38 mRem/h

3.1.6 Hazardous Materials and Waste

Table 3 lists the hazardous materials and waste identified during facility walkdowns before deactivation.

Table 3. Building 3031 predeactivation hazardous materials and waste

Identification	Description	Quantity
Lead-based paint	Used as wall covering throughout building.	Indeterminate
Asbestos floor tiles	Used as floor covering throughout the building.	~825 ft ²
Asbestos lagging	Used as pipe lagging throughout the building	Indeterminate
PCBs	Electrical devices and transformers	Indeterminate
Lead shielding	Used in hot cell walls and window	Indeterminate
Mineral oil	Used in hot cell window	Indeterminate

3.2 POSTDEACTIVATION FACILITY STATUS

Attachment 3, "Postdeactivation Facility Photographs," contains photographs of the building conditions following deactivation activities.

3.2.1 Deactivation End Point Completion

End point criteria for deactivation activities and end point completion documentation are not applicable for Bldg. 3031. The requirement and guidance for these program elements were not developed before Bldg. 3031 deactivation.

3.2.2 Hazards Analysis

A postdeactivation hazards screening was performed. This hazards screening placed the facility in the "other industrial" category.

3.2.3 Internal Spaces

The miscellaneous items abandoned when the facility was no longer in use have been removed from the general area. No significant combustibles remain in the general area, and the general area of Bldg. 3031 has been decontaminated to remove transferable contamination from access-required spaces. The lead-based paint is chipping and peeling, providing a means of transferring the lead and endangering personnel and the environment.

Postdeactivation radioactive contamination levels and radiation levels for this area are listed in Tables 4 and 5, respectively. Postdeactivation hazardous materials and waste located in this area are listed in Table 6.

3.2.4 Building Structure and External Spaces

The structure and roof of Bldg. 3031 were inspected and found to be in generally good condition, with the exception of some water in leakage through various paths.

3.2.5 Process, Utility, and Support Systems

3.2.5.1 Electrical power system

All electrical services, with the exception of lighting, have been disconnected or de-energized at the main breaker box.

3.2.5.2 Fire protection system

The fire protection system is a dry system and remains available for use if there is a fire in the building.

3.2.5.3 Building steam system

The building steam system has been isolated, drained, and abandoned in place.

3.2.5.4 Potable water system

The potable water system has been isolated, drained, and abandoned in place.

3.2.5.5 Hot drain system

The hot drain system has been abandoned in place. All hot cell drains have been plugged to isolate the hot cells and to prevent the potential spread of contamination. The hot drain system remains highly contaminated from the process and cleaning activities performed before deactivation.

3.2.5.6 Process drain system

The process drain system has been abandoned in place. However, the process drain system remains connected to the ORNL process waste system. The process drain system remains contaminated from the process and cleaning activities performed before deactivation.

3.2.5.7 Natural gas system

The natural gas system has been isolated, vented, and abandoned in place.

3.2.5.8 Overhead crane

The overhead crane has been de-energized and abandoned in place. The overhead crane remains contaminated from the process activities performed before deactivation.

3.2.5.9 Plant air system

The plant air system has been isolated, vented, and abandoned in place.

3.2.5.10 Hot cell manipulators

The hot cell manipulator boots and isolation bags were removed and replaced. New boots were placed on the in-cell portion of the manipulators. The plastic boot and wiper that seals around the manipulator were removed. The manipulator control arms were bagged as an added precaution.

3.2.5.11 Central ventilation system

The central ventilation system remains in operation to provide negative pressure for contamination control for the hot cell. All controls associated with the central ventilation system remain in operation as well. The central ventilation system remains highly contaminated from the process activities performed before deactivation.

3.2.5.12 Local ventilation system

The local ventilation system has been removed from service and shut down. The local ventilation system is slightly contaminated from the process activities performed before deactivation.

3.2.6 Radioactive Material, Contamination, and Waste

Table 4 lists the radioactive contamination levels identified on radiation surveys conducted following deactivation.

Table 4. Postdeactivation radioactive contamination levels

Identification	Description	Quantity
Hot cell	Alpha smear—transferable contamination	Less than 500 dpm/100cm ²
Hot cell	Beta/gamma smear—transferable contamination	1.0 to 100000 dpm/100cm ²
Hood #1	Alpha smear—transferable contamination	Less than 500 dpm/100cm ²
Hood #1	Beta/gamma smear—transferable contamination	No detectable contamination
Hood #2	Alpha smear—transferable contamination	Less than 500 dpm/100cm ²
Hood #2	Beta/gamma smear—transferable contamination	No detectable contamination
Hood #3	Alpha smear—transferable contamination	Less than 500 dpm/100cm ²
Hood #3	Beta/gamma smear—transferable contamination	No detectable contamination
General area	Alpha smear—transferable contamination	Less than 500 dpm/100cm ²
General area	Beta/gamma smear—transferable contamination	350 to 1057 dpm/100cm ²

Table 5 lists radiation levels identified on radiation surveys conducted before deactivation.

Table 5. Postdeactivation radiation levels

Identification	Description	Quantity
Hot cell	Fixed and transferable radiation levels	30 mRem/h
Hood #1	Fixed and transferable radiation levels	0.7 mRem/h
Hood #2	Fixed and transferable radiation levels	0.4 mRem/h
Hood #3	Fixed and transferable radiation levels	Less than 0.1 mRem/h
General area	Fixed and transferable radiation levels	0.1 mRem/h

3.2.7 Hazardous Materials and Waste

Table 6 lists the hazardous materials and waste identified during facility walkdowns following deactivation.

Table 6. Building 3031 postdeactivation hazardous materials and waste

Identification	Description	Quantity
Lead-based paint	Used as wall covering throughout building.	Indeterminate
Asbestos floor tiles	Used as floor covering throughout the building.	~825 ft ²
Asbestos lagging	Used as pipe lagging throughout the building	Indeterminate
PCBs	Electrical devices and transformers	Indeterminate
Lead shielding	Used in hot cell walls and window	Indeterminate
Mineral oil	Used in hot cell window	Indeterminate

4. BUILDING 3031 DEACTIVATION ACTIVITIES

The following section addresses the major activities performed during the deactivation of Bldg. 3031. The objectives of the deactivation process were to place the facility in a passively safe

and environmentally stable configuration that can be efficiently and cost effectively maintained for an indefinite period of time. The major deactivation issues with regard to Bldg. 3031 are discussed in this chapter.

4.1 INTERNAL SPACES: ACCESS REQUIRED

4.1.1 General Areas

All storage cabinets, desks, file cabinets, and miscellaneous office materials were removed from the building. Some were green-tagged for reuse. The remaining items were disposed of. The asbestos floor tiles were not removed and are not intended to be removed until facility decontamination and decommissioning.

Lead-based paint exists throughout the building as wall covering. The areas that were peeling and flaking have been repaired; the remainder of the paint will remain as is. Paint condition is an inspection item in the surveillance and maintenance plan for Bldg. 3031.

4.2 INTERNAL SPACES: NO ACCESS REQUIRED

4.2.1 3031 Hot Cell

The following deactivation activities were performed in the hot cell:

- The hot cell manipulator boots and isolation bags were removed and replaced. New boots were placed on the in-cell portion of the manipulators. The plastic boot and wiper that seals around the manipulator were removed.
- The hot cell was wiped down to reduce airborne contamination.
- All hot cell service lines were identified, labeled, and plugged.
- All in-cell filters were removed.
- All hot cell drains were plugged.
- Access to the hot cell was secured.

4.3 EXTERNAL SPACES

4.3.1 Building 3031 Structure

The exterior of Bldg. 3031 was inspected and found to be in generally good structural condition. The building exterior has been sealed to eliminate air and water in leakage and to provide an effective containment for the building.

4.3.2 Building 3031 Roof

The roof of Bldg. 3031 was repaired/inspected and found to be in generally good structural condition.

4.4 OPERATIONAL SYSTEMS

4.4.1 Electrical Power System

All electrical services that were not essential to the basic surveillance and maintenance operations were disconnected at the main breaker box.

4.4.2 Fire Protection System

The fire protection is a dry pipe delivery system available for use if there is a fire in the building.

4.4.3 Hot Drain System

The hot drains from the hot cells were plugged with Plexiglas plugs to isolate the hot cells and prevent the spread of contamination. No decontamination of the hot drain system has been performed.

4.4.4 Process Drain System

The process floor drains remain in operation to direct any roof in leakage to the ORNL process waste system and prevent any uncontrolled contamination from leaving the building. No decontamination of the process drain system has been performed.

4.4.5 Central Ventilation System

The central ventilation system remains in operation to provide negative pressure for contamination control for the hot cell. All controls associated with the central ventilation system remain in operation as well. No decontamination of the central ventilation system has been performed.

4.4.6 Local Ventilation System

The local ventilation system has been removed from service and shut down in place. No decontamination of the local ventilation system has been performed.

4.5 "MOTHBALLED" SYSTEMS

No "mothballed" systems are associated with Bldg. 3031.

4.6 ABANDONED SYSTEMS

4.6.1 Building Steam System

The building steam system supply was drained and valved off.

4.6.2 Potable Water System

Potable water has been isolated from Bldg. 3031 by capping the incoming line.

4.6.3 Hot Cell Manipulators

The hot cell manipulator boots and isolation bags were removed and replaced. New boots were placed on the in-cell portion of the manipulators. The plastic boot and wiper that seals around the manipulator were removed. Decontamination was performed, as required, during manipulator boot replacement.

4.6.4 Natural Gas System

Natural gas was vented and valved off.

4.6.5 Overhead Crane

The overhead crane was de-energized and abandoned in place. Minor decontamination was performed on the overhead crane to minimize the potential spread of contamination.

4.6.6 Plant Air System

The plant air system has been depressurized and valved off.

5. TRANSITION ACTIVITIES

Building 3031 will be officially transferred from the EM-60 program to the EM-40 program by a Memorandum of Agreement (MOA). The building will be accepted "as is" by EM-40 at the time of transfer.

5.1 MEMORANDUM OF AGREEMENT

The MOA documents the requirements agreed upon between Office of Environmental Restoration (EM-40) and Office of Facility Transition and Management. The signed MOA indicates acceptance by EM-40 that the criteria outlined in the MOA have been completed satisfactorily, with the exception of post-transition punchlist items, and that the level of deactivation of the facility is acceptable for transition to the EM-40 program. Post-transition punchlist items will be finished after deactivation is complete. The details of how the punchlist items will be completed and documented will be addressed in the MOA.

5.2 POST-TRANSITION ACTIVITIES

No post-transition punchlist items have been identified for Bldg. 3031. All deactivation activities have been completed before transfer to EM-40.

6. POSTDEACTIVATION SURVEILLANCE AND MAINTENANCE

The "Postdeactivation S&M Plan for Building 3031" covers surveillance and maintenance (S&M) activities associated with the interior spaces, operational and mothballed systems, and external areas related to Bldg. 3031.

The specific objectives of the S&M program for Bldg. 3031 are as follows:

1. ensure adequate containment of contamination;
2. provide physical safety and security control;
3. maintain the facility in a manner that will minimize potential hazards to the public; and
4. provide a mechanism for the identification and compliance with applicable environmental, safety, and health requirements.

The "Postdeactivation S&M Plan for Building 3031" details the specific S&M items to be performed and estimates the annual cost of performance. The S&M cost estimates are based on previous operational costs associated with similar S&M activities at ORNL.

The S&M activities associated with Bldg. 3031 include the following types of activities:

- walkdowns and inspections for structural integrity, safety, radioactive contamination, and hazardous material conditions;
- general housekeeping of the interior and exterior of the building as needed; and
- maintenance activities required to maintain the security and safety envelope of the facility.

7. ABNORMAL ACTIVITIES/CONDITIONS

No abnormal activities/conditions have been identified for Bldg. 3031.

8. TURNOVER PACKAGE DOCUMENTATION

8.1 ADMINISTRATIVE TURNOVER PACKAGE

Administrative turnover consists of a collection of administrative documents. This includes procedures, agreements, and other documents not directly related to the physical facility. The level of detail depends on the conditions, requirements, and agreements specific to the facility.

Attachment 4, "Administrative Turnover Package Checklist," reflects the documents required for this facility with respect to administrative turnover. The following sections detail the contents of the applicable sections required for Bldg. 3031.

8.1.1 Final Deactivation Project Report

A management summary of the facility deactivation completion, general status, and conditions, demonstrating conformance with the U.S. Department of Energy's specification of the overall end point. It identifies management actions needed that are not routine and describes unresolved issues.

8.1.2 Regulatory Compliance Documentation

Regulatory compliance documentation discusses the status/compliance of all regulatory commitments, including the status of compliance with applicable regulations promulgated pursuant to statutes—such as Occupational Safety and Health Administration; Resource Conservation and Recovery Act (RCRA); Comprehensive Environmental Response, Compensation, and Liability Act; and National Environmental Policy Act—and the remediation process in the National Contingency Plan.

8.1.3 Interagency Agreements Documentation

Interagency Agreements documentation covers Interagency Agreements that identify the terms and milestones of agreements pending and entered into by the U.S. Department of Energy with federal, state, and local agencies and the status of compliance. This includes settlement agreements, administrative or consent orders, and compliance plans to settle outstanding notices of violation.

8.1.4 Existing Permit Documentation

Existing permit documentation details the status of existing permits, including National Pollutant Discharge Elimination System, air permits, RCRA, and others associated with the facility.

8.1.5 Corrective Action Documentation

Corrective action documentation describes the status of corrective actions completed and outstanding from previous audits, inspections, and other similar activities (e.g., Tiger Team, Technical Safety Appraisal, Defense Nuclear Facilities Safety Board, regulatory agencies, self assessments, business systems review), including identification of those items that need to be reevaluated and reviewed with respect to the facility's surplus condition.

8.1.6 Deactivation Locks Log and Keys

The deactivation locks log lists all deactivation locks and keys for facility access, isolation of electrical components, chaining of valves, and other situations where physical access is to be controlled that will be turned over to EM-40 at the time of transfer.

8.2 TECHNICAL TURNOVER PACKAGE

Technical turnover consists of a collection of technical documents that describe the facility, its equipment, and the conditions at the completion of all deactivation activities. The level of detail depends on the conditions, requirements, and agreements specific to the facility. Attachment 5, "Technical Turnover Package Checklist," reflects the documents required for this facility with respect to technical turnover. The following sections detail the contents of the applicable sections required for Bldg. 3031.

8.2.1 Updated Facility Drawings (Arrangement, PID, Loop, Etc.)

Facility, room, and cell arrangement drawings - to the extent they exist. However, except in unique circumstances, as-built drawings of the deactivated conditions within the facility are not provided.

Provides current status (including drawings) of the deactivation/safe shutdown (if applicable). The documentation addresses systems, such as the water, sewer, air, electric, gas, process (mechanical and chemical), and fire protection systems.

See Attachment 7, "Building 3031 Drawing List," for a list of drawings.

Table 7. Building 3031 updated drawings

Number	Rev.	Title
D-37907	A	Manipulator cell—service piping and ventilation—sections & details
D-6615	A	Isotope process area—Process Bldg. "C"—heating and exhaust system
E-30097		Storage vault—mechanical and electrical—plans and details—sheet 3
H203369EG-002-D	001	A/C elec. roof plan A/C units isotope area
D-51926	A	Enclosure Bldgs. 3030 and 3031—ventilation
D-51926		Piping, heating and ventilation

8.2.2 "As Left" Photos of Spaces and Major Equipment

"As left" photos of spaces and major equipment include descriptions and photos of spaces for which access is not anticipated during S&M.

8.2.3 Hazardous Material Inventory and Survey

The hazardous material inventory and survey describes the location of *fixed* hazardous materials, wastes, and contamination with characterization information.

8.2.4 Safeguards and Security Documentation

Safeguards and security documentation describes the inventory and safeguards and security provisions for nuclear or other material remaining in the facility for which there is a requirement for accountability or protection from diversion.

8.2.5 Chemical Substance Inventory and Survey

The chemical substance inventory and survey is an inventory of chemical and hazardous substances remaining, if any, and their characterization information.

8.2.6 Radioactive Materials Inventory and Survey

The radioactive materials inventory and survey is an inventory of radioactive and fissile material remaining as contamination with characterization information and includes the final radiological/hazardous materials survey records, final configuration and surveillance and maintenance requirements, available drawings, specifications, procedures, manuals, and unplanned occurrences records applicable to the facility. Data from the radiological survey are listed in Attachment 8, "Building 3031 Radiological Survey Data."

8.2.7 Facility Soil, Surface Water, and Groundwater Condition Report

For soil, surface water, and groundwater conditions at the facility, this report provides all available data, describes those conditions and the nature and extent of contamination therein, and identifies any known assessment requirements.

8.3 S&M TURNOVER PACKAGE

S&M turnover consists of a collection of documents required to support Postdeactivation S&M activities. The level of detail depends on the S&M specific to the facility. Attachment 6, "S&M Turnover Package Checklist," reflects the documents required for this facility with respect to S&M turnover. The following sections detail the contents of the applicable sections required for Bldg. 3031.

8.3.1 Postdeactivation S&M Plan

This document describes the S&M plan for the facility after deactivation is complete, up to the initiation of decommissioning. The S&M activities will be integrated into the decommissioning work and phased out as decommissioning is completed.

8.3.2 Postdeactivation S&M Updated Safety Equipment List

This document describes the safety equipment that will remain in the facility during the postdeactivation S&M period.

8.3.3 Postdeactivation S&M Procedures

Table 8 contains a list of procedures required during the postdeactivation S&M period. These procedures outline the maintenance activities and special surveillances required to ensure that the facility conditions and safety envelope remain consistent until decommissioning can take place.

Table 8. Building 3031 S&M procedures

Number	Procedure title
IP-1418	Manipulator Removal, Repair, and Replacement
IP-1313, Rev. 2	Local and Central Ventilation System HEPA Filter Replacement

9. REFERENCES

<u>Document Number</u>	<u>Document Title</u>
Draft	Facility Deactivation End Points Handbook; Volume 1: Method and Examples.
Draft	Facility Deactivation End Points Handbook; Volume 2: Deactivation Practices.
DOE/EM-0246	Decommissioning Resource Manual. August 1995
ORNL/ER-249/R2	Martin Marietta Environmental Restoration Program; Work Plan for the Isotopes Facilities Deactivation Project at Oak Ridge National Laboratory, August 1995
	Oak Ridge National Laboratory; Local Emergency Manual, Isotope Area, Revision 94-1, January 1994

10. ATTACHMENTS

1. Building 3031 Floor Plan
2. Building 3031 Predeactivation Facility Photographs
3. Building 3031 Postdeactivation Facility Photographs
4. Administrative Turnover Package Checklist
5. Technical Turnover Package Checklist
6. S&M Turnover Package Checklist
7. Building 3031 Drawing List
8. Building 3031 Radiological Survey Data

ATTACHMENT 1
BUILDING 3031
FLOOR PLAN

Building 3031

**ATTACHMENT 2
BUILDING 3031
PREDEACTIVATION FACILITY PHOTOGRAPHS**

Fig. 2-1. Bldg. 3031: predactivation.

Fig. 2-2. Bldg. 3031: predeactivation.

ATTACHMENT 3
BUILDING 3031
POSTDEACTIVATION FACILITY PHOTOGRAPHS

Fig. 3-1. Bldg. 3031: postdeactivation.

Fig. 3-2. Bldg. 3031: postdeactivation.

ATTACHMENT 4
ADMINISTRATIVE TURNOVER
PACKAGE CHECKLIST

Administrative turnover package checklist

Item number	Document	Applicable?
1	Final Deactivation Project Report	Yes
2	Emergency Response Plan	No
3	Safety Documentation (Category III or greater)	No
4	Regulatory Compliance Documentation	No
5	Interagency Agreements Documentation	No
6	Existing Permit Documentation	No
7	Corrective Action Documentation	No
8	Postdeactivation Punchlist	No
9	Deactivation Locks and Keys	Yes

**ATTACHMENT 5
TECHNICAL TURNOVER
PACKAGE CHECKLIST**

Technical turnover package checklist

Item number	Document	Applicable ?
1	End Point Determination Report	No
2	End Points Completion Report	No
3	End Point Technical Information	No
4	Deactivation Work Plans	No
5	Updated Facility Drawings (arrangement, PID, Loop, etc.)	Yes
6	"As Left" Photos of Spaces and Major Equipment	Yes
7	Hazardous Material Inventory and Survey	No
8	Safeguards and Security Documentation	No
9	Chemical Substance Inventory and Survey	No
10	Radioactive Materials Inventory and Survey	No
11	Facility Soil, Surface Water, and Groundwater Condition Report	Yes

**ATTACHMENT 6
S&M TURNOVER
PACKAGE CHECKLIST**

S&M turnover package checklist

Item number	Document	Applicable?
1	Postdeactivation Surveillance and Maintenance Plan	Yes
2	Postdeactivation Surveillance and Maintenance Updated Effluent Monitoring Plan	No
3	Postdeactivation Surveillance and Maintenance Updated Safety Equipment List	Yes
4	Postdeactivation Surveillance and Maintenance Procedures	Yes
5	Postdeactivation Surveillance and Maintenance Recommendations	No
6	Mothballed Systems Lay-up and Restart Documentation	No

**ATTACHMENT 7
BUILDING 3031
DRAWING LIST**

Building 3031 drawing list

Document number	Revision	Title
A-36615		Plan Manip. Cell
A-36616		Sect. B-B Manip. Cell
C-28458		Interim Low Level Analytical Facility - Floor Plan
C-28459		Interim Low Level Analytical Facility - Section "A-A"
C-28460		Interim Low Level Analytical Facility - Section "B-B"
C3E-020366-A001		Reroof Bldgs. 3030, 3031, 3118 - Site Access Plan and Drawing Index
D-32377		Interim Low Level Analytical Lab. - Floor Plan - Section B-B & C-C
D-32378		Interim Low Level Analytical Lab. - Entrance Plans & Details - Sec. - A-A
D-36280		Manip. Cells Plans, Sects. & Elevs.
D-36320		Manip. Cell for Bldg. 3031 Plans, Elev.
D-37906		Manip. Cell Serv. Piping Plan & Elev.
D-37907	A	Manipulator Cell - Service Piping & Ventilation - Sections & Details
D-37908		Manip. Cell Det. Sht.
D-37921		Manip. Cell Serv. Piping - Plan
D-38003	002	Locations Foundations Plans Dets.
D-38004	002	Horizontal Vertical Sections
D-38005	002	Roof Plan Elevation Dets.
D-38006	001	Loading Doors Steel Panel Dets.
D-38007	001	Port Doors Steel Panel Doors
D-38008	002	Lead Glass Window Steel Panel Dets.
D-38009	001	Bar Anchor For Stainless Steel Liners
D-38219		Concrete Approach Pad Plans Sect. Dets.
D-38428		Manip. Cell Elec. Plans & Elev.
D-43024		Resurfacing at Low Level Facility
D-46696	002	Det. of New Radioactive Waste Drains
D-56569		Foundation Plan Sect. & Dets.
D-56570		Floor Plan and Steel Framing Details Bldgs. 3030 and 3031
D-56571		Wall Sects.
D-56572		Radioactive Waste Drains & Curbs
D-6613		Bldg. C-D-E Equip. Layout
D-6615	A	Isotope Process Area - Process Bldg. "C" - Heating & Exhaust System

Building 3031 drawing list (continued)

Document number	Revision	Title
E-30097		Storage Vault - Mechanical & Electrical - Plans & Details - Sheet 3
H203369EG-002-D	001	A/C Elec. Roof Plan A/C Units Isotope Area
S3D-20369-B006		500 Monorail Plan & Sects.
S3E-020366-B012		Reroof Bldgs. 3030, 3031, 3118 - Roof Plan, Sections & Details
S3E-020366-B013		Reroof Bldgs. 3030, 3031, 3118 - Sections & Details
D-51926	A	Enclosure Bldgs. 3030 and 3031 - Ventilation
D-51926		Piping, Htg. & Vent.

ATTACHMENT 8
BLDG. 3031
RADIOLOGICAL SURVEY DATA

ORNL Radiological Survey Data

Survey Number: 3038-94-0163

3038 Field Office

Date: 11/3/94

Time: 10:20

Surveyor Badge Number: 32721

☐ Routine Survey

RWP Number: 102156

Building: 3031

Specific Location: Three hoods

Description:

Final contamination survey of the three hoods after deconning.

Instruments Used and Calibration Due Date:

CTB-047 2/23/95

General Description of Radiological Conditions:

The maximum smear in hood 1 was 2163 dpm/100cm². Max smear in hood 2 was 11,389 dpm/100cm². This was the only smear that was over 5,000 dpm. Max smear in hood 3 was 574 dpm/100cm². For more details, refer to smear results.

Division or Group Needing the Survey: CT

Person-hours spent on the survey: 0

# of Pages: 4 Completed By: Janet Cox Reviewed by: Slater Date: 11-6-94

Smear Results (dpm/100 cm² unless noted)

Smear Number	α	β	Location	Smear Number	α	β	Location	Smear Number	α	β	Location
1	NC	<200	See map	2	NC	<200	See map	3	NC	350	See map
4	NC	406	See map	5	NC	<200	See map	6	NC	413	See map
7	NC	<200	See map	8	NC	<200	See map	9	NC	<200	See map
10	NC	497	See map	11	NC	217	See map	12	NC	595	See map
13	NC	224	See map	14	NC	<200	See map	15	NC	350	See map
16	NC	2163	See map	17	NC	1484	See map	18	NC	497	See map
19	NC	357	See map	20	NC	4263	See map	21	NC	301	See map
22	NC	336	See map	23	NC	<200	See map	24	NC	<200	See map
25	NC	462	See map	26	NC	<200	See map	27	NC	1344	See map
28	NC	2247	See map	29	NC	11,389	See map	30	NC	4144	See map
31	NC	476	See map	32	NC	539	See map	33	NC	1106	See map
34	NC	1722	See map	35	NC	407	See map	36	NC	371	See map
37	NC	<200	See map	38	NC	<200	See map	39	NC	<200	See map
40	NC	<200	See map	41	NC	<200	See map	42	NC	<200	See map
43	NC	231	See map	44	NC	<200	See map	45	NC	<200	See map
46	NC	497	See map	47	NC	<200	See map	48	NC	<200	See map
49	NC	231	See map	50	NC	574	See map	51	NC	343	See map

ORNL Radiological Survey Data

Survey Number: 3038-94-0163

3038 Field Office

Date: 11/3/94 Time: 1020

State 11-6-94

Give only DM or smear over
 N/A dpm/100 cm² ±
 200 dpm/100 cm² ±

B	B
1	34
2	35
3	350
4	406
5	—
6	413
7	—
8	—
9	—
10	497
11	217
12	595
13	224
14	—
15	350
16	2163
17	1484
18	—
19	—
20	—
21	—
22	—
23	—
24	—
25	—
26	—
27	—
28	—
29	—
30	—
31	—
32	—
33	—

3031
 Hood 1

#	-	Smear Location	Boundary Designations	
			RA - Radiation Area	BA - Radiological Buffer Area
#	-	Large Area Smear	HR - High Radiation Area	CA - Contamination Area
#	-	Contact Dose Rate	VR - Very High Radiation Area	HC - High Contamination Area
#	-	30 cm Dose Rate	AR - Airborne Radioactivity Area	FC - Fixed Contamination Area
#	-	General Area Dose Rate	RM - Radioactive Materials Area	SC - Soil Contamination Area
[SOP]	-	Step-off Pad	UM - Underground Radioactive Materials Area	
AS	-	Air Sample Location		

Default units are in mR/hr and are for open window beta/gamma readings. Letter suffixes with the number indicate specific radiations: B - Beta (mRad/hr), G - Gamma (mR/hr), N - Neutron (mRem/hr). Boundary designations are looking from the designations into the zoned area.

ORNL Radiological Survey Data

Date 11-6-94

Survey Number: 3038-94-0163

3038 Field Office

Date: 11/3/94 Time: 1020

Give only D/M on smears over	
N/A	dpm/100 cm ² e
200	dpm/100 cm ² s
B	B
1	34
2	35
3	36
4	37
5	38
6	39
7	40
8	41
9	42
10	43
11	44
12	45
13	46
14	47
15	48
16	49
17	50
18	497
19	357
20	4263
21	301
22	336
23	<200
24	<200
25	462
26	<200
27	1344
28	2247
29	11,389 *
30	4144
31	476
32	539
33	1106
34	1722

3031
Hood 2

Smear # (29) was
cleaned on 11/7/94
and re-smear'd
1960 dpm/100cm².

Boundary Designations	
(*) - Smear Location	RA - Radiation Area
(*) - Large Area Smear	BA - Radiological Buffer Area
# - Contact Dose Rate	HR - High Radiation Area
# - 30 cm Dose Rate	CA - Contamination Area
# - General Area Dose Rate	VR - Very High Radiation Area
SOP - Step-off Pad	HC - High Contamination Area
AS - Air Sample Location	AR - Airborne Radioactivity Area
	FC - Fixed Contamination Area
	RM - Radioactive Materials Area
	SC - Soil Contamination Area
	UM - Underground Radioactive Materials Area

Default units are in mR/hr and are for open window beta/gamma readings. Letter suffixes with the number indicate specific radiations: B - Beta (mRad/hr), G - Gamma (mR/hr), N - Neutron (mRem/hr). Boundary designations are looking from the designations into the zoned area.

ORNL Radiological Survey Data

Slater 11-6-94

Survey Number: 3038-94-0163
3038-64

3038 Field Office

Date: 11/3/94 Time: 1020

Give only D/M on smears over	
<u>N/A</u>	dpm/100 cm ² ±
<u>300</u>	dpm/100 cm ² ±
β	β
1	34
2	35 407
3	36 371
4	37 —
5	38 —
6	39 —
7	40 —
8	41 —
9	42 —
10	43 231
11	44 —
12	45 —
13	46 497
14	47 —
15	48 —
16	49 231
17	50 574
18	51 343
19	52 —
20	53 —
21	54 —
22	55 —
23	56 —
24	57 —
25	58 —
26	59 —
27	60 —
28	61 —
29	62 —
30	63 —
31	64 —
32	65 —
33	66 —

3031

Hood 3

Boundary Designations	
(*) - Smear Location	RA - Radiation Area
(*) - Large Area Smear	BA - Radiological Buffer Area
# - Contact Dose Rate	HR - High Radiation Area
# - 30 cm Dose Rate	CA - Contamination Area
# - General Area Dose Rate	VR - Very High Radiation Area
SOP - Step-off Pad	HC - High Contamination Area
AS - Air Sample Location	FC - Fixed Contamination Area
	RM - Radioactive Materials Area
	SC - Soil Contamination Area
	UM - Underground Radioactive Materials Area

Default units are in mR/hr and are for open window beta/gamma readings. Letter suffixes with the number indicate specific radiations: B - Beta (mRad/hr), G - Gamma (mR/hr), N - Neutron (mRem/hr). Boundary designations are looking from the designations into the zoned area.

ORNL Radiological Survey Data

Deborah Crossno
626079

Survey Number: 3038-96-1882

3038 Field Office

Date: 8-26-96 Time: 0950

Bldg 3031
Top of cell

3038-II +3P

One only DIM on screen over

NC dpm/100 cm² s
200 dpm/100 cm² s

B	B
1	34
2	35
3	36
4	37
5	38
6	39
7	40
8	41
9	42
10	43
11	44
12	45
13	46
14	47
15	48
16	49
17	50
18	51
19	52
20	53
21	54
22	55
23	56
24	57
25	58
26	59
27	60
28	61
29	62
30	63
31	64
32	65
33	66

After the manipulator
boots change the
plastic was removed
from the end of
the manipulators where
they go into the cell.

Average whole
body dose
≈ 1.3 mR/hr 88

Boundary Designations	
① - Smear Location	RA - Radiation Area
② - Large Area Smear	BA - Radiological Buffer Area
③ - Contact Dose Rate	HR - High Radiation Area
④ - 30 cm Dose Rate	CA - Contamination Area
⑤ - General Area Dose Rate	VR - Very High Radiation Area
⑥ - Step-off Pad	HC - High Contamination Area
⑦ - Air Sample Location	FC - Fixed Contamination Area
	RM - Radioactive Materials Area
	SC - Soil Contamination Area
	UM - Underground Radioactive Materials Area

Default units are in mR/hr and are for open window beta/gamma readings. Letter suffixes with the number indicate specific radiations: B - Beta (mRad/hr), G - Gamma (mR/hr), N - Neutron (mRem/hr). Boundary designations are looking from the designations into the zoned area.

#② Probed with portable inst. It was covered with plastic after survey. Page: 2

The top of the cell was posted as a contamination area

ORNL Radiological Survey Data

Survey Number: 3038-96-1886

3038 Field Office

Date: 8/29/96

Time: 9:00

Surveyor Badge Number: 626079

☐ Routine Survey

RWP Number: 3038-96-0043

Building: 3031, 3118

Specific Location: 3031 hot cell and rear cell door in 3118.

Description:

Enter 3031 hot cell via rear cell door in 3118 to detong and remove holder rings. Then pull manipulators and change boots from top of cell in 3031. Then re-enter cell to replace holder rings and tongs, remove waste and do radiological survey.

Instruments Used and Calibration Due Date:

CTB-047 3/1/97

3038-3P 3/26/97

3038-1I 2/11/97

3038-11P 11/19/96

3038-4I 11/25/96

General Description of Radiological Conditions: Previous survey

Maximum loose contamination: 15 mR/hr/100 cm sq beta-gamma inside cell, on top of cell 50,000 dpm/100 cm sq beta-gamma. Maximum fixed contamination: Inside cell 1 R/hr with a average whole body dose of 35.0 mR/hr beta-gamma. On top of cell 80.0 mR/hr beta-gamma. The highest in cell smear from survey performed 8/29/96 was 4.5 mR/hr beta-gamma. The rest of the results are listed below. The post job survey of the room revealed loose contamination on the plastic covering the floor around the cell up to 420 dpm/100 cm sq beta-gamma. The plastic was removed and the whole room surveyed all smears were <200 dpm/100 cm sq beta-gamma and no detectable contamination on the large area masslin smears. It was posted as a fixed contamination area as it was previously except for the top of the cell.

Division or Group Needing the Survey: CT

Person-hours spent on the survey:

6

# of Pages: 8

Completed By: Deborah C. BrownReviewed by: J. M. M. M.

Date: 1-29-97

Smear Results (dpm/100 cm² unless noted)

Smear Number	α	β	Location	Smear Number	α	β	Location	Smear Number	α	β	Location
1	NC	100,000	See map	2	NC	140,000	See map	3	NC	70,000	See map
4	NC	90,000	See map	5	NC	4.5 mR/hr	See map	6	NC	200,000	See map
7	NC	2,884	See map	8	NC	6,300	See map	9	NC	1,533	See map
10	NC	6,482	See map	11	NC	2.8 mR/hr	See map	12	NC	2,681	See map

Description: Manipulator pull.

Sampler Number: M106102 Flow Rate (cfm): 2.5 Date/Time Start: 8/29/96 08:30

Filter Efficiency: 100.0% Date/Time End: 8/29/96 13:30

Date/Time Counted: 9/5/96 8:57 Sample Time (min): 300.0

	Alpha	Beta	
Counter ID	CTA-041	CTB-047	AIR
Counter Efficiency	42.5%	14.4%	SAMPLE
Background Counts	3	50	
Bkgd Count Time (min)	5	5	
Gross Sample Counts	4	17	
Sample Count Time (min)	1	1	
Sample DPM	8.0	48.6	
Air Concentration (uCi/ml)	1.70E-13	1.03E-12	First Count Factor
Min. Det. Conc. (uCi/ml)	2.75E-13	2.08E-12	6.08 N/A

Description: Hot cell entry

Sampler Number: M133701 Flow Rate (cfm): 2.5 Date/Time Start: 8/29/96 08:45

Filter Efficiency: 100.0% Date/Time End: 8/29/96 09:30

Date/Time Counted: 9/5/96 9:00 Sample Time (min): 45.0

	Alpha	Beta	
Counter ID	CTA-041	CTB-047	AIR
Counter Efficiency	42.5%	14.4%	SAMPLE
Background Counts	4	50	
Bkgd Count Time (min)	5	5	
Gross Sample Counts	6	714	
Sample Count Time (min)	1	1	
Sample DPM	12.2	4888.9	
Air Concentration (uCi/ml)	1.73E-12	6.91E-10	First Count Factor
Min. Det. Conc. (uCi/ml)	1.97E-12	1.39E-11	399.57 N/A

ORNL Radiological Survey Data

Deborah Crossne
626079

Survey Number: 3038-96-1886

3038 Field Office

Date: 8-29-96 Time: 0900

3038-3P+1I

CTB-047

Give only DIM on scales over
NC dpm/100 cm² s
200 dpm/100 cm² s

B	B
100k	10
140k	14
70k	36
90k	17
4.5	38
200k	39
2884	40
6300	41
1553	42
6482	43
2.8	44
2681	45
	46
	47
	48
	49
	50
	51
	52
	53
	54
	55
	56
	57
	58
	59
	60
	61
	62
	63
	64
	65
	66

* Read with R50-5
* Counted in beta counter.
The rest were picked with a portable inst.

3031 Hot Cell

① - Smear Location	Boundary Designations	
② - Large Area Smear	RA - Radiation Area	BA - Radiological Buffer Area
③ - Contact Dose Rate	HR - High Radiation Area	CA - Contamination Area
④ - 30 cm Dose Rate	VR - Very High Radiation Area	HC - High Contamination Area
⑤ - General Area Dose Rate	AR - Airborne Radioactivity Area	FC - Fixed Contamination Area
⑥ - Step-off Pad	RM - Radioactive Materials Area	SC - Soil Contamination Area
AS - Air Sample Location	UM - Underground Radioactive Materials Area	

Default units are in mR/hr and are for open window beta/gamma readings. Letter suffixes with the number indicate specific radiations: B - Beta (mRad/hr), G - Gamma (mR/hr), N - Neutron (mRem/hr). Boundary designations are looking from the designations into the zoned area.

Average whole body dose $\approx$ 35.0 mR/hr BY

Page: 5

ORNL Radiological Survey Data

Heborah Crossino
626079

Survey Number: 3038-96-1886

3038 Field Office

Date: 8-29-96 Time: 0900

Give only D/M on smear over

_____ dpm/100 cm² a

_____ dpm/100 cm² b

B	B
1	34
2	35
3	36
4	37
5	38
6	39
7	40
8	41
9	42
10	43
11	44
12	45
13	46
14	47
15	48
16	49
17	50
18	51
19	52
20	53
21	54
22	55
23	56
24	57
25	58
26	59
27	60
28	61
29	62
30	63
31	64
32	65
33	66

	Smear Location	Boundary Designations	
		RA - Radiation Area	BA - Radiological Buffer Area
②	- Large Area Smear	HR - High Radiation Area	CA - Contamination Area
#	- Contact Dose Rate	VR - Very High Radiation Area	HC - High Contamination Area
#	- 30 cm Dose Rate	AR - Airborne Radioactivity Area	FC - Fixed Contamination Area
#	- General Area Dose Rate	RM - Radioactive Materials Area	SC - Soil Contamination Area
[SOP]	- Step-off Pad	UM - Underground Radioactive Materials Area	
AS	- Air Sample Location		

Default units are in mR/hr and are for open window beta/gamma readings. Letter suffixes with the number indicate specific radiations: B - Beta (mRad/hr), G - Gamma (mR/hr), N - Neutron (mRem/hr). Boundary designations are looking from the designations into the zoned area.

ORNL Radiological Survey Data

Survey Number: 3038-96-1742

3038 Field Office

Date: 8/15/96

Time: 9:30

Surveyor Badge Number: 626079

☐ Routine Survey

RWP Number: N/A

Building: 3031

Specific Location: Roof

Description:

Bi-annual radiation survey.

Instruments Used and Calibration Due Date:

3038-4i 11/25/96

General Description of Radiological Conditions:

The average whole body dose is ~ 0.46 mR/hr beta-gamma. The highest background reading is 1.3 mR/hr beta-gamma and is on the side of the roof near building 3029. The filter bank is reading about the same as the background.

Division or Group Needing the Survey: CT

Person-hours spent on the survey: 1

# of Pages: 2

Completed By:

Deborah Cressman

Reviewed by:

J. Sluts

Date: 8-20-96

Date: 8-15-96 Time: 0930

3038 Field Office

Survey Number: 3038-96-1743

ORNL Radiological Survey Data

626079

Handwritten signature: *Wm. H. ...*

3031 Roof

↑
N
↓

34	34
35	35
36	36
37	37
38	38
39	39
40	40
41	41
42	42
43	43
44	44
45	45
46	46
47	47
48	48
49	49
50	50
51	51
52	52
53	53
54	54
55	55
56	56
57	57
58	58
59	59
60	60
61	61
62	62
63	63
64	64
65	65
66	66

Give only D/M as dates over
 _____
 _____
 _____

②	Smear Location	RA - Radiation Areas	BA - Radiological Buffer Areas
#	Large Area Smear	HR - High Radiation Areas	CA - Contamination Areas
#	Contact Dose Rate	VR - Very High Radiation Areas	HC - High Contamination Areas
#	30 cm Dose Rate	AR - Airborne Radioactivity Areas	FC - Fixed Contamination Areas
SCF	Strip-off Pad	RM - Radioactive Materials Areas	SC - Soil Contamination Areas
AS	Air Sample Location	UM - Underground Radioactive Materials Areas	

Default units are in mR/hr and are for open window beta/gamma readings. Letter suffixes with the number indicate specific readings: B - Beta (mR/hr), G - Gamma (mR/hr), N - Neutron (mRem/hr). Boundary designations are looking from the designations into the zoned area.

Boundary Designations	Smear Location
Average white body dose ≈ 0.46 mR/hr By	

Default units are in mR/hr and are for open window beta/gamma readings. Letter suffixes with the number indicate specific radiaions: B - Beta (mRad/hr), G - Gamma (mR/hr), N - Neutron (mRem/hr). Boundary designations are looking from the designations into the zoned area.

ORNL Radiological Survey Data

Survey Number: 3038-95-1041		3038 Field Office		Date: 8/31/95		Time: 09:28	
Surveyor Badge Number: 34657		☐ Routine Survey		RWP Number: none			
Building: 3031		Specific Location: Attic					
Description:							
Radiation and Contamination Survey.							
Instruments Used and Calibration Due Date:							
CTA-041 2/20/96		CTB-047 2/20/96		3038-11 1/29/95			
General Description of Radiological Conditions:							
Thirty Defensap Smears were taken in the attic of building 3031 on this date. All smears were found to be <20 dpm/100 cm ² , alpha and <200 dpm/100 cm ² beta-gamma. General area dose ranged from 0.1 mR/hr to 0.5 mR/hr near the old exhaust vents that went to the cell in building 3031.							
Division or Group Needing the Survey: CT				Person-hours spent on the survey: 2			
# of Pages: 2		Completed By: <i>[Signature]</i> 34657		Reviewed by: <i>[Signature]</i>		Date: 9-5-95	
Smear Results (dpm/100 cm² unless noted)							
Smear Number	α	β	Location	Smear Number	α	β	Location
1-30	<20	<200	please see map.				

ORNL Radiological Survey Data

Survey Number: 3038-95-

3038 Field Office

Date: 8/31/95 Time: 0700

CONTAMINATION AND RADIATION SURVEY

BLDG 3031 ATTIC

INSTRUMENTS:

CTA-041

CTB-047

3038-01I

HATCH

SURVEYED BY:

Col. C. H. King 74657
Shawn Bunt 746165

Symbol	Description	Boundary Designations	
		RA - Radiation Area	BA - Radiological Buffer Area
①	Smear Location	HR - High Radiation Area	CA - Contamination Area
②	Large Area Smear	VR - Very High Radiation Area	HC - High Contamination Area
③	Contact Dose Rate	AR - Airborne Radioactivity Area	FC - Fixed Contamination Area
④	30 cm Dose Rate	RM - Radioactive Materials Area	SC - Soil Contamination Area
⑤	General Area Dose Rate	UM - Underground Radioactive Materials Area	
⑥	Step-off Pad		
⑦	Air Sample Location		

Default units are in mR/hr and are for open window beta/gamma readings. Letter suffixes with the number indicate specific radiations: B - Beta (mRad/hr), G - Gamma (mR/hr), N - Neutron (mRem/hr). Boundary designations are looking from the designations into the zoned area.

SMEAR SAMPLE DATA

NAME (HP&S) <i>Spent Cox</i>	PHONE 4-6704	BLDG. NO. (HP&S) 3038	LOCATION (SMEARS TAKEN) 3031 General Area	DATE 11/19/92
SMEARS NUMBERED: From <u>1</u> To <u>40</u>	RESULTS REQUIRED:	DATE COUNTED	COUNTER OPERATOR <i>JSC</i>	
GIVE D/M ONLY ON SMEARS OVER: <u>20</u> d/m α <u>200</u> d/m β	REMARKS: CTA-041 CTB-047			

a	β	LOCATION (*)	a	β	LOCATION (*)	a	β	LOCATION (*)
1	-		34	-	1496	67		
2	-		35	-	760	68		
3	-	368	36	-	-	69		
4	-	-	37	-	-	70		
5	-	-	38	-	6448	71		
6	-	-	39	-	-	72		
7	-	1174	40	-	-	73		
8	-	-	41			74		
9	-	-	42			75		
10	-	888	43			76		
11	-	1000	44			77		
12	-	-	45			78		
13	-	-	46			79		
14	-	-	47			80		
15	-	448	48			81		
16	-	-	49			82		
17	-	-	50			83		
18	-	-	51	<20	<200	84		
19	-	-	52	<20	<200	85		
20	-	-	53	<20	<200	86		
21	-	-	54	<20	<200	87		
22	-	-	55	<20	<200	88		
23	-	-	56	<20	<200	89		
24	-	528	57	<20	<200	90		
25	-	-	58	<20	<200	91		
26	-	-	59	<20	<200	92		
27	-	-	60	<20	<200	93		
28	-	232	61			94		
29	-	992	62			95		
30	-	-	63			96		
31	-	-	64			97		
32	-	-	65			98		
33	-	-	66			99		

UCN-1632 (*) Give only if required

Last Radiation Survey.

ORNL Radiological Survey Data

Survey Number: 3038-96-1863

3038 Field Office

Date: 10-3-96 Time: 2:00

Give only DAM on scales over
 N/A dpm/100 cm² s
 200 dpm/100 cm² s

Column 34667
BUILDING 3031

B	B
1	34
2	35
3	36
4	37
5	38
6	39
7	40
8	41
9	42
10	43
11	44
12	45
13	46
14	47
15	48
16	49
17	50
18	51
19	52
20	53
21	54
22	55
23	56
24	57
25	58
26	59
27	60
28	61
29	62
30	63
31	64
32	65
33	66

Boundary Designations	
① - Smear Location	RA - Radiation Area
② - Large Area Smear	BA - Radiological Buffer Area
# - Contact Dose Rate	HR - High Radiation Area
# - 30 cm Dose Rate	VR - Very High Radiation Area
# - General Area Dose Rate	HC - High Contamination Area
SOP - Step-off Pad	FC - Fixed Contamination Area
AS - Air Sample Location	SC - Soil Contamination Area
	UM - Underground Radioactive Materials Area

Default units are in mR/hr and are for open window beta/gamma readings. Letter suffixes with the number indicate specific radiations: B - Beta (mRad/hr), G - Gamma (mR/hr), N - Neutron (mRem/hr). Boundary designations are looking from the designations into the zoned area.

Average Whole Body Dose Rate $\approx$ 0.25 mRem/hr.

Page: 2

Last contamination
survey.Deborah Cassano
626079

ORNL Radiological Survey Data

Survey Number: 3038-97-0144

3038 Field Office

Date: 2-21-97 Time: 12:15

CTB-047 3038-8P

Give only D/M on scales over
N/A dpm/100 cm² s
300 dpm/100 cm² s

BUILDING 3031

β	β
1	36
2	37
3	38
4	39
5	40
6	41
7	42
8	43
9	44
10	45
11	46
12	47
13	48
14	49
15	50
16	51
17	52
18	53
19	54
20	55
21	56
22	57
23	58
24	59
25	60
26	61
27	62
28	63
29	64
30	65
31	66
32	67
33	68
34	69
35	70

Legend		Boundary Designations	
①	- Smear Location	RA - Radiation Area	BA - Radiological Buffer Area
②-⑧	- Large Area Smear	HR - High Radiation Area	CA - Contamination Area
#	- Contact Dose Rate	VR - Very High Radiation Area	HC - High Contamination Area
#	- 30 cm Dose Rate	AR - Airborne Radioactivity Area	FC - Fixed Contamination Area
#	- General Area Dose Rate	RM - Radioactive Materials Area	SC - Soil Contamination Area
[SOP]	- Step-off Pad	UM - Underground Radioactive Materials Area	
AS	- Air Sample Location		

Default units are in mR/hr and are for open window beta/gamma readings. Letter suffixes with the number indicate specific radiations: B - Beta (mRad/hr), G - Gamma (mR/hr), N - Neutron (mRem/hr). Boundary designations are looking from the designations into the zoned area.

ORNL Radiological Survey Data

Survey Number: 3047-96-0293

3047 Field Office

Date: 04/22/96

Time: 11:28

Surveyor Badge Number: 34657

☐ Routine Survey

RWP Number: 3047-96-0096C

Building: 3031

Specific Location: main operating area.

Description:

A transferable contamination and a fixed contamination survey was conducted on the floor of building 3031. This survey was done after there was a decon effort attempted on the floor.

Instruments Used and Calibration Due Date:

CTA-032 03/11/97

CTB-001 03/11/97

3047-10P 07/02/96

3047-15P 09/02/96

3047-021 07/20/96

General Description of Radiological Conditions:

Transferable contamination up to 9,800 dpm/100 cm² beta-gamma was found. Fixed contamination up to 45 m/hr was detected on the floor in building 3031. Please see map(s) for more detailed information on fixed and transferable contamination.

Division or Group Needing the Survey: CF

Person-hours spent on the survey: 15

# of Pages: 5 Completed By: *[Signature]*Reviewed by: *[Signature]* Date: 5-7-96Smear Results (dpm/100 cm² unless noted)

Smear Number	α	β	Location	Smear Number	α	β	Location	Smear Number	α	β	Location
1			(please see attached map(s))								

RWP + Sign-in sheets
not included with this
copy.

ORNL Radiological Survey Data

Survey Number: 3047-96-0293 3038 Field Office

Date: 4-19-96 Time: 8:1530

TRANSFERABLE CONTAMINATION SURVEY

BUILDING 3031

Give only D/M on smears over
 N/A dpm/100 cm² a
 200 dpm/100 cm² b

B	B
1 <200	24 <200
2	25
3	26
4	27
5 <200	28 <200
6 200	29 210
7 200	40 190
8 210	41 630
9 <200	42 <200
10	43 <200
11 <200	44
12 200	45 <200
13 250	46 350
14 <200	47 <200
15 350	48
16 <200	49
17 800	50 <200
18 <200	51
19 <200	52
20 210	53
21 350	54
22 <200	55
23	56
24	57
25	58
26	59
27	60
28	61
29	62
30	63
31	64
32	65
33 <200	66

#	- Smear Location	Boundary Designations	
#	- Large Area Smear	RA - Radiation Area	BA - Radiological Buffer Area
#	- Contact Dose Rate	HR - High Radiation Area	CA - Contamination Area
#	- 30 cm Dose Rate	VR - Very High Radiation Area	HC - High Contamination Area
#	- General Area Dose Rate	AR - Airborne Radioactivity Area	FC - Fixed Contamination Area
[SOP]	- Step-off Pad	RM - Radioactive Materials Area	SC - Soil Contamination Area
AS	- Air Sample Location	UM - Underground Radioactive Materials Area	

Default units are in mR/hr and are for open window beta/gamma readings. Letter suffixes with the number indicate specific radiations: B - Beta (mRad/hr), G - Gamma (mR/hr), N - Neutron (mRem/hr). Boundary designations are looking from the designations into the zoned area.

Page: _____

* POST DECON EFFORT Under new floor

ORNL Radiological Survey Data

Survey Number: 3047-96-

3038 Field Office

Date: 7-19-96 Time: 1530

FIXED CONTAMINATION SURVEY
BUILDING 3031

Give only DM on screen over

N/A approx 100 cm² •

2CC 6pm 100 cm' 8

β	β
1	34
2	35
3	36
4	37
5	38
6	39
7	40
8	41
9	42
10	43
11	44
12	45
13	46
14	47
15	48
16	49
17	50
18	51
19	52
20	53
21	54
22	55
23	56
24	57
25	58
26	59
27	60
28	61
29	62
30	63
31	64
32	65
33	66

(e) - Smear Location		Boundary Designations	
(H) - (H)	- Large Area Smear	RA - Radiation Area	BA - Radiological Buffer Area
#	- Contact Dose Rate	HR - High Radiation Area	CA - Contamination Area
#	- 30 cm Dose Rate	VR - Very High Radiation Area	HC - High Contamination Area
#	- General Area Dose Rate	AR - Airborne Radioactivity Area	FC - Fixed Contamination Area
SOP	- Step-off Pad	RM - Radioactive Materials Area	SC - Soil Contamination Area
AS	- Air Sample Location	UM - Underground Radioactive Materials Area	

Default units are in mR/hr and are for open window beta/gamma readings. Letter suffixes with the number indicate specific radiations: B - Beta (mRad/hr), G - Gamma (mR/hr), N - Neutron (mRem/hr). Boundary designations are looking from the designations into the zoned area.

Page: _____

* POST DETON EFFORT Under new floor

DISTRIBUTION

1. L. V. Asplund
2. W. D. Brickeen
3. R. A. Brown
4. T. W. Burwinkle
5. K. Constant
- 6-15. R. E. Eversole
17. K. W. Haff
18. S. A. Herron
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