0063315

DOE/RL-2004-61
Revision 0

Removal Action Work Plan (RAWP) for the 232-Z Contaminated Waste Recovery Facility

Date Published
November 2004

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

United States
Department of Energy
P.O. Box 550
Richland, Washington 99352

Reviewing
Official / ADC: Gary R. Holcomb

Date: 11/16/04

A. Aardal 11-29-2004
Release Approval Date

Approved for Public Release;
Further Dissemination Unlimited

DOE/RL-2004-61
Revision 0

Removal Action Work Plan (RAWP) for the 232-Z Contaminated Waste Recovery Facility

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

United States Department of Energy
P.O. Box 550
Richland, Washington 99352

Approved for Public Release;
Further Dissemination Unlimited

Date Received for Clearance Process (MM/YY/DD)
11-29-04

INFORMATION CLEARANCE FORM

A. Information Category

- ☐ Abstract
- ☐ Journal Article
- ☐ Summary
- ☐ Internet
- ☐ Visual Aid
- ☐ Software
- ☐ Full Paper
- ☐ Report
- ☒ Other Work Plan

B. Document Number DOE/RL-2004-61, Revision 0

C. Title
Removal Action Work Plan (RAWP) for the 232-Z Contaminated Waste Recovery Facility

D. Internet Address

E. Required Information

1. Is document potentially Classified? ○ No ◉ Yes (MANDATORY)
   C J Simuli
   Manager's Signature Required
   If Yes Gary B. Hulse ◉ No ○ Yes Classified
   ADC Signature Required
2. References in the Information are Applied Technology ◉ No ○ Yes
   Export Controlled Information ◉ No ○ Yes

3. Does Information Contain the Following: (MANDATORY)
   a. New or Novel (Patentable) Subject Matter? ◉ No ○ Yes
      If "Yes", Disclosure No.: _____
   b. Information Received in Confidence, Such as Proprietary and/or Inventions?
      ◉ No ○ Yes If "Yes", Affix Appropriate Legends/Notices.
   c. Copyrights? ◉ No ○ Yes If "Yes", Attach Permission.
   d. Trademarks? ◉ No ○ Yes If "Yes", Identify in Document.
4. Is Information requiring submission to OSTI? ◉ No ○ Yes
5. Release Level? ◉ Public ○ Limited

F. Complete for a Journal Article

1. Title of Journal

G. Complete for a Presentation

1. Title for Conference or Meeting _____
2. Group Sponsoring _____
3. Date of Conference _____ 4. City/State _____
5. Will Information be Published in Proceedings? ○ No ○ Yes 6. Will Material be Handed Out? ○ No ○ Yes

H. Author/Requestor
D. S. Takasumi DS Takasumi
(Print and Sign)

Responsible Manager
C. J. Simiele CJ Simuli
(Print and Sign)

I. Reviewers

	Yes	Print	Signature	Public Y/N (If N, complete J)
General Counsel	☒	E. V. Hiskes		(Y) / N
Office of External Affairs	☐			Y / N
DOE-RL	☒	W. C. Woolery		(Y) / N
Other	☒	M. L. Spracklen		(Y) / N
Other	☒	G. I. Goldberg		(Y) / N

J. If Information Includes Sensitive Information and is not to be released to the Public indicate category below.

- ☐ Applied Technology
- ☐ Personal/Private
- ☐ Proprietary
- ☐ Business-Sensitive
- ☐ Predecisional
- ☐ UCNI
- ☐ Protected CRADA
- ☐ Export Controlled
- ☐ Procurement-Sensitive
- ☐ Patentable
- ☐ Other (Specify) _____

Information Clearance Approval

APPROVED FOR RELEASE
OFFICIAL
DOCUMENT
Date 11-29-2004

K. If Additional Comments, Please Attach Separate Sheet

A-6001-401 (12/00)

ADMINISTRATIVE DOCUMENT PROCESSING AND APPROVAL

DOCUMENT TITLE:	OWNING ORGANIZATION/FACILITY:
Removal Action Work Plan (RAWP) for the 232-Z Contaminated Waste Recovery Facility	DOE-RL
Document Number: DOE/RL-2004-61	Revision/Change Number: 0

DOCUMENT TYPE *(Check Applicable)*

☒ Plan ☐ Report ☐ Study ☐ Description Document ☐ Other

DOCUMENT ACTION ☐ New ☐ Revision ☐ Cancellation

RESPONSIBLE CONTACTS

	Name	Phone Number
Author:	D. S. Takasumi	372-0249
Manager:	C. J. Simiele	373-1519

DOCUMENT CONTROL

Does document contain scientific or technical information intended for public use? ☒ Yes ☐ No

Does document contain controlled-use information? ☐ Yes ☐ No

("Yes" requires information clearance review in accordance with HNF-PRO-184)

DOCUMENT REVISION SUMMARY

NOTE: Provide a brief description or summary of the changes for the document listed.

REVIEWERS

Others

Name *(print)*	Organization

APPROVAL SIGNATURES

Author:	11/16/04	RELEASE / ISSUE
Name: (Print) D. S. Takasumi D S Takasumi	Date	
Responsible Manager:	11/16/04	NOV 29 2004
Name: (Print) C. J. Simiele C J Simiele	Date	DATE: STA: 15 HANFORD RELEASE ID: 20
Other: Interpretive Authority	11/16/04	
Name: (Print) F. A. Ruck III Fred A Ruck III	Date	

Printed in the United States of America

Approvals

DOE/RL-2004-61, *Removal Action Work Plan (RAWP) for the 232-Z Contaminated Waste Recovery Facility*, Revision 0.

Keith Klein
Manager, Richland Operations Office
United States Department of Energy

12/14/04
Date

Rick Bond
Facilities Transition Project Manager
Washington State Department of Ecology

12-17-04
Date

DOE/RL-2004-61
Revision 0

REMOVAL ACTION WORK PLAN (RAWP) for the 232-Z CONTAMINATED WASTE RECOVERY FACILITY

Prepared for Fluor Hanford, Inc.
by Environmental Quality Management, Inc.

November 12, 2004

CONTENTS

APPENDICES

FIGURES

TABLES

ACRONYMS

AJHA	Automated Job Hazard Analysis
ALARA	as low as reasonably achievable
ARARs	applicable or relevant and appropriate requirements
BED	Building Emergency Director
CAM	continuous air monitor
CFR	Code of Federal Regulations
CM	Configuration Management
CWC	Central Waste Complex
CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
dB	decibels
D&D	decontamination and decommissioning
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
dp	differential pressure
Ecology	Washington State Department of Ecology
EE/CA	engineering evaluation/cost analysis
EPA	U.S. Environmental Protection Agency
EP	emergency procedure
ERDF	Environmental Restoration Disposal Facility
FH	Fluor Hanford, Inc.
GERT	General Employee Radiological Training
HAZMAT	Hazardous Material
HASP	Health and Safety Plan
HEPA	high-efficiency particulate air
HGET	Hanford General Employee Training
HPT	Health Physics Technician
IH	Industrial Health Organization
IS	Industrial Safety Organization
JHA	Job Hazard Analysis
LLMW	low-level mixed waste
LLW	low-level waste
MAR	material at risk
MSDS	Material Safety Data Sheet
NDA	nondestructive assay
NS	Nuclear Safety
PA	Protected Area
PCB	polychlorinated biphenyl
PFP	Plutonium Finishing Plant
PHMC	Project Hanford Management Contract
PIC	Person in Charge
POC	Patrol Operations Center
PPE	personal protective equipment

QA	quality assurance
QC	quality control
Radcon	Radiation Protection
RAWP	Removal Action Work Plan
RCRA	*Resource Conservation and Recovery Act of 1976*
RWP	Radiological Work Permit
SAP	Sampling and Analysis Plan
SEA	Special Entrance Authorization
SSHO	Site Safety and Health Officer
SWB	standard waste box
TPA	Tri-Party Agreement
TRU	transuranic
TSCA	*Toxic Substances Control Act of 1976*
TWA	time weighted average
WAC	Washington Administrative Code
WIPP	Waste Isolation Pilot Plant

1.0 SECTION 1 – INTRODUCTION

This document presents the work planning and controls approach for the decontamination and decommissioning (D&D) of the 232-Z Contaminated Waste Recovery Process Facility (232-Z Facility). The 232-Z Facility recovered residual plutonium from process waste through incineration and/or leaching of the scrap material generated from various stages in the plutonium process. The operational history of the facility indicates that failures of equipment, as well as spills, resulted in the release of radionuclide and other contamination to the building and external soils. The facility has not been used for approximately 20 years, and the U.S. Department of Energy (DOE) has determined there is no ongoing need for the building. The M-83 milestones established under the Tri Party Agreement (TPA) direct the DOE to dismantle the 232-Z Facility consistent with the decision from an Engineering Evaluation/Cost Analysis (EE/CA) as documented in an Action Memorandum. The EE/CA for the 232-Z Facility determined that the building should be demolished to slab-on-grade and the debris disposed to the Environmental Restoration Disposal Facility (ERDF) (DOE-RL 2003-29, Section 4.2.1, page 14).

1.1 PURPOSE

This Removal Action Work Plan (RAWP) provides an overview of the removal action (232-Z D&D Project), the methods of operation, and the supporting control functions associated with the facility removal and disposal objectives. It was prepared in accordance with the requirements of the *Hanford Federal Facility Agreement and Consent Order* (TPA) (Ecology et al. 2003) and the U.S. Environmental Protection Agency (EPA)/U.S. Department of Energy *Policy on Decommissioning Department of Energy Facilities under CERCLA* (DOE/EPA 1995). The Washington State Department of Ecology (Ecology) is the lead regulatory agency for this removal action.

This RAWP identifies the regulatory guidelines, applicable DOE orders, and Fluor Hanford, Inc. (FH) operational procedures that direct and control the work activities that will be used for this removal action. It is the intention of this document to provide adequate information and operational direction to allow the preparation of inclusive work instructions for the tasks to be performed. Work instructions will provide the detailed directives that identify the concerns, requirements, responses, and efforts involved in specific project tasks. Preparation and review of the detailed work instructions will be conducted per FH work control processes.

1.2 SCOPE AND OBJECTIVES

The scope of work involved in this removal action includes the major tasks of contamination stabilization and/or decontamination, dismantling facility structures, and disposing of waste products. This RAWP provides an overview of the tasks required and the implementation processes that will be used to perform these activities. The activities include operational plans/work packages, condition analyses, hazard analysis, and schedule and work performance guidance. The RAWP includes references to governing documents that have been prepared under previous work scope to support this project, as well as documents prepared specifically to support the removal activities.

The Engineering Evaluation/Cost Analysis for the 232-Z Facility (DOE-RL 2003) presented three alternative approaches for future facility management and the resultant levels of personnel and environmental protection and operational costs that could be obtained by each approach. Decontamination and stabilization of the facility followed by demolition and disposal at the ERDF, provided the waste meets the ERDF waste acceptance criteria, was selected as the most responsive approach to these concerns. This approach does not anticipate or otherwise limit future land remediation decisions or actions. This selection is documented in the *Action Memorandum for the 232-Z Contaminated Waste Recovery Facility* (Letter 04-AMCP-0486), which provides authorization to proceed with this non-time-critical removal action project.

Decontamination and/or stabilization of facility surfaces will be completed prior to the beginning of the demolition activity. It is possible, however, that additional, minor decontamination could be required before the demolition of the facility has been completed.

During the demolition activities, the waste products generated will be separated into waste streams, which will be stored at appropriate waste storage locations or facilities within or external to the 232-Z Facility until final disposal. The *232-Z Contaminated Waste Recovery Process Facility Waste Management Plan* (HNF-20862) identifies the locations for staging waste generated during this removal action.

The end point for the demolition of the 232-Z Facility, specified in the *Plutonium Finishing Plant End Point Criteria* (NMS-16404) for the D&D Project, is stabilized "slab-on-grade." Milestone M-83-00A of the TPA documents this end point for facilities pending final disposition of the PFP site.

2.0 FACILITY HISTORY AND DESCRIPTION

The 232-Z Facility was designed and built during the late 1950s and early 1960s to house the Contaminated Waste Recovery Process Facility, also known as the Plutonium Finishing Plant (PFP) Incinerator Building. The facility is an element of the PFP Complex, located in the 200 West Area of the Hanford Site. The building is approximately 11.3 m (37 ft) wide and 17.4 m (57 ft) long.

The 232-Z Facility is divided into functional areas, including the Process Room, Chemical Mix Room, Scrubber Cell, and the Storage, Change, Ventilation Supply, and Electrical Rooms.

From 1961 until 1973, the facility was used to recover plutonium through incineration of plutonium-contaminated combustible scrap materials and leaching of non-combustible materials. Electric elements maintained the temperature in the combustion chamber at a level (700 to 800°C) to ensure incineration of the feed materials; plutonium was then recovered from the ash. The DOE closed the 232-Z Facility in 1973. From shutdown of the incinerator until 1983, the facility was used for waste segregation activities. The facility was placed in retired inactive status in 1984. A deactivation activity initiated in 1984 resulted in the removal of three large gloveboxes.

The 232-Z Facility was designed to ensure confinement of radioactive materials; ventilation and filters have been maintained at the facility for contamination control since shutdown. During operations, off-gases produced from combustion were routed through a series of unit operations designed to remove particulates before exiting the building through underground ductwork. Air emissions originally were routed through the exhaust stack in the 291-Z Facility. In 1990, the DOE installed a new, independent ventilation system for the 232-Z Facility.

Various activities have been performed to support deactivation of the facility, beginning with the removal of the wall-mounted combustible gas analyzer. Additional activities have included cleanout and removal of gloveboxes ((partially completed), removal of acid digestion process equipment, installation of blanks in hoods, relocation of continuous air monitors (CAMs), and wiring modifications.

An inspection of the 232-Z for seismic resistance of the facility indicated that potential on-site consequences from an earthquake would exceed risk-acceptance guidelines, as described in the Plutonium Finishing Plant Final Safety Analysis Report (HNF-SD-CP-SAR-021, Section 5.2.3.1.1, page 5-45). In 1993, approximately 600 grams of residual plutonium were removed. Contamination still resides in remaining facility process equipment and the ventilation system.

Since 1994, the 232-Z Facility has been in a safe and stable surveillance and maintenance mode with controlled access and a negative pressure.

The building currently houses the major components of the incinerator; all of the equipment and chemicals related to the leach process have been removed. Remaining enclosures include the following:

- Scrubber cell
- Filter boxes 1 and 2
- One multi-section glovebox (sometimes referred to as the incinerator) made up of three sections. These sections are identified as follows:
  - Feed glovebox
  - Incinerator glovebox
  - Ash canning glovebox.

The process equipment within the incinerator glovebox and the cell that housed the off-gas scrubber are inactive, and have been isolated and partially removed. The building ventilation supply and exhaust systems, including the HEPA filtration systems, are in operation, although sections of the exhaust ventilation system piping, connecting hoods, and gloveboxes have been isolated and removed. Safety systems, such as the fire detection and alarm system, CAMs on the HEPA filtered exhaust (with audible and visible alarms), and instruments for measuring differential pressure between ventilation zones are operable. Although the fire detection system remains in operation, the fire suppression system has been deactivated. Building surveillance is provided at least once every 12 hours for detection of abnormalities.

The 232-Z Facility has undergone bulk plutonium removal from the gloveboxes, hoods, and associated ventilation exhaust piping in preparation for ongoing deactivation activities. All remaining above-grade ventilation ducting and the main process enclosures (e.g., the incinerator glovebox and scrubber cell) have undergone non-destructive analysis (NDA).

3.0 REMOVAL ACTION DESCRIPTION

This section provides a description of the planned removal action, summarizes the hazards that have been identified for this removal action, and defines the engineering design basis for necessary preventive and mitigation commitments. The work processes that will be used to demolish the 232-Z Facility will be described in the 232-Z Contaminated Waste Recovery Process Facility Demolition Plan (HNF-20890, Sections 3.0, 4.0, and 5.0), which will be completed prior to the initiation of building demolition activities.

The initial 232-Z Facility deactivation work activities focus on early removal of fissile material, followed by building cleanup and dismantlement efforts. The early elimination of hazardous materials and conditions reduce the precautionary measures and the safeguards needed to protect personnel and the environment during the follow-on demolition work, and will permit the use of standard demolition practices (e.g., heavy equipment).

The following sections provide an identification of the major work phases of this project, along with the potential uncertainties that might be encountered and their related response actions.

3.1 MOBILIZATION AND SITE PREPARATION

Non-process areas in the 232-Z Facility do not require any specific changes or upgrades other than coordination with the operational element of the PFP work force. Specific laydown areas for demolition equipment and materials, and a CERCLA compliant waste storage area will be identified prior to initiating building demolition.

Although work needs and conveniences have been established for routine D&D activities, specialized capabilities using non-routine chemicals have been identified to conduct the decontamination of equipment and surfaces in specific areas of the facility. The necessary material, equipment, and/or personnel have been obtained to implement these new decontamination methods.

Presently, the anticipated special needs of this project include the following:

- A variety of contamination control structures (greenhouse or glovebox) to provide contamination control.
- A waste package assay station [drums and Standard Waste Boxes (SWBs)] to characterize fissile material contents.
- A decontamination station to support a variety of operational needs.
- Decontamination processes and solutions to reduce the concentrations of radiological constituents on surfaces in the glovebox and scrubber cell.
- An area equipped for waste container packaging.

- Specialized hoisting devices to assist with dismantlement operations. NOTE: All hoisting devices will be consistent with requirements in DOE-RL-92-36, *Hoisting and Rigging Manual* (DOE-RL 1993).

- Radiation monitoring.

Each of these needs involves uncertain or unknown conditions that must be addressed to permit the implementation of facility demolition. Development of special needs is included in the scope and schedule of this RAWP. As the facility is deactivated and demolished, structural features, airflow conditions, background radiation levels, and airborne contamination concentrations are likely to change, and are some of the facility uncertainties that exist at this time. Operational conveniences and traffic patterns periodically could change in accordance with the tasks completed, those tasks to be performed, and changes in security or operational conditions of the remainder of the PFP Complex.

3.2 CHARACTERIZATION FOR WORK IMPLEMENTATION

Characterization of facility systems and conditions will be performed throughout this project to provide information pertinent to personnel and environmental safety and waste shipping and disposal information for the various waste streams that will be generated. This information will be used to identify the required personal protective equipment (PPE) for specific operations, air monitoring, and packaging of waste in accordance with solid waste disposal criteria (ERDF for disposal or Central Waste Complex [CWC] for storage). Because characterization is used to provide insight on unknown, uncertain, and/or suspect conditions, characterization will be performed in conjunction with planned operations, as discussed in the *Sampling and Analysis Plan for the Contaminated Waste Recovery Process Facility, Building 232-Z* (DOE/RL-2004-22).

Analytical samples and survey results will provide information concerning existing conditions within the 232-Z Facility. These samples will identify the presence of toxic substances and/or the depth of contaminant penetration into facility surfaces. Radiological monitoring and radiation surveying will be used to verify facility conditions during all project activities and to ensure the implementation of proper protective measures. Other than the initial samples identified by the sampling and analysis plan (SAP) (Phase 1 samples) no additional analytical samples requiring laboratory analysis to support characterization of building debris are anticipated for the remainder of this removal action. Appendix A provides an overview of the tasks that will be performed to implement the SAP.

Characterization activities will be scheduled to ensure current facility condition information is available at all times. Characterization activities will be scheduled to allow adequate time for analyses and interpretation of the results and are not anticipated to cause project delays. Sampling and analytical efforts will be performed early in the deactivation and demolition process to ensure there is no delay or uncertainty in the identification of radiological or chemical hazards. These analyses will use standard procedures and protocols.

3.3 REMOVAL OR STABILIZATION OF HAZARDOUS MATERIAL INVENTORIES

The removal of plutonium residue from the gloveboxes has reduced the inventory of fissile material in the 232-Z Facility. The facility was estimated to have a remaining inventory (residual nuclear material remaining in process equipment at the start of D&D) that will be in the 100s of grams. This information is based on NDA measurements performed after the initial glovebox equipment removal and cleanout (Westsik 2002); the inventory values will be adjusted to reflect ongoing evaluations conducted to support worker safety and waste designation. Radiological contamination exists throughout the building and has been "fixed" using surface coatings (primarily paint). Only those non-radiological hazardous materials associated with building materials and components will continue to pose threats or present a waste disposal concern during the remainder of the deactivation and demolition of the building. These materials will be similar, if not identical, to those found in other facilities that have been previously demolished at the Hanford site. This prior work (e.g., 100 Areas and the 233-S Building) will provide insight on procedures and personnel protections needed for the 232-Z demolition.

The initial work scope (decontamination and/or dismantlement) is focused on removing the remaining equipment and debris from the lone remaining glovebox, decontaminating the interior surfaces of the glovebox, and then packaging the glovebox for disposal. If the glovebox can be decontaminated to the extent it can be categorized as low-level waste (LLW) or low-level mixed waste (LLMW), the glovebox box will be disposed at the ERDF. If it remains contaminated with radiological materials requiring a transuranic (TRU) designation, it will be size reduced, packaged in a SWB, and transferred to the CWC for storage.

Following removal of the glovebox, the scrubber cell will undergo decontamination. The equipment within the cell will be size reduced (if needed), packaged, and disposed to the ERDF, or, if TRU, transferred to the CWC for storage. The CWC acceptance criteria will require the waste be packaged into either 55-gal drums or a SWB. Once the equipment has been removed, the scrubber cell will be decontaminated to reduce the radiological concentration of building debris from this part of the facility.

After the glovebox and scrubber cell have undergone deactivation, the 232-Z Facility ventilation system will be deactivated. This step will include the use of greenhouses and/or gloveboxes, equipment removal (including size reduction if TRU), filter and filter housing removal (it is anticipated that this equipment will be TRU contaminated and transferred to the CWC for storage), duct removal, and underground duct characterization. The underground duct carried process exhaust from the 232-Z Facility to the 291-Z Building, until it was replaced with a dedicated stack in 1990. In the 291-Z Building, the 232-Z ductwork interior to the 291-Z building from the interior wall to the connection with the stack ducting will be removed. If required, this ductwork will also be stabilized and size reduced prior to disposal. If the ductwork is not categorized as TRU, it will be packaged for disposal to the ERDF; otherwise, it will be packaged and transferred to the CWC for storage.

The underground ventilation duct (out of service) from the 232-Z to the 291-Z will not be removed as part of this project, but will be characterized and may require a contamination control measure (e.g., fill with foam) based on the results of characterization. The underground duct from the 232-Z Facility to the 291-Z Exhaust Facility will be isolated and stabilized at both the 232-Z and 291-Z Buildings.

The uncertainties associated with the demolition and waste packaging activities include the following:

- Personnel exposure to unexpected toxic substances (low risk).
- Inadvertent generation of high airborne contamination concentrations (moderate risk).
- Unknown structural integrity of the facility and systems that could cause industrial accidents (low risk).
- Depth of contaminant penetration into facility surfaces (scrubber cell only, low risk).
- Common industrial risks associated with working around heavy equipment (low risk).
- Unknown facility conditions (low risk).

Each of the uncertainties known to exist for this removal action will be managed through the use of pre-work surveys, physical/chemical/radiological characterization of the structure and walk through, preventive control measures, analytical data, and in-depth planning (work packages and hazard reviews).

All waste generated will be characterized in accordance with the *Sampling and Analysis Plan* (DOE/RL-2004-22).

Operations involving radiological contaminants will be performed with conservative personnel protection measures commensurate with the hazards anticipated. If monitoring shows the anticipated work environment is other than anticipated, work stoppage will be one of the processes available to ensure adequate personnel protection. During the performance of activities where unknown radiological conditions exist, appropriate measures will be implemented to protect personnel and to reduce the risk of generating airborne contamination.

3.4 BUILDING DEMOLITION

After the major equipment with a significant radionuclide inventory has been removed or stabilized, the project will begin the process of building dismantlement and demolition. The final activity prior to 232-Z Facility demolition will be removal of the off-gas stack and all associated ducting and equipment (fans). This hardware is/was downstream of the 232-Z HEPA filters. If as expected, or as determined by testing, the material is not TRU, it will be disposed to the ERDF.

Preparatory activities will include isolation of the temporary heating, ventilation, and air conditioning, removal of temporary power, minor decontamination, grouting or applying fixative to the floor, and applying fixative to the walls, etc., followed by demolition of the building. Controlled demolition methods will be used to bring the 232-Z Facility to ground level. The facility will be demolished using methods required to meet the following performance requirements:

- No activity will be conducted that pulverizes an appreciable quantity of concrete to powder.
- No process or mechanical means will be used during demolition that could extract contamination from the concrete.

The 232-Z Demolition Plan (HNF-20890, Sections 3.0, 4.0, and 5.0) will identify the activities that will be performed to demolish the facility.

Prior to beginning the demolition of the 232-Z Facility, the project will evaluate the need to decontaminate the concrete blocks in the southwest corner of the facility. Greenhouses and other contamination control measures will be employed to maintain airborne emissions to "as low as reasonably achievable" (ALARA) levels. The remainder of the 232-Z structure (walls, ceilings, roof, etc.) will be demolished using standard equipment (hydraulic shears, front end loaders, cranes, forklifts, etc.) and disposed at the ERDF as non-TRU waste. Except for the removal of any volumetrically contaminated concrete blocks select areas of the building, the 232-Z Facility will be demolished using standard equipment (hydraulic shears, front end loaders, cranes, forklifts, etc). The project will utilize the most efficient means of debris removal based on the task at hand.

3.5 FACILITY HAZARDS

With the exception of one glovebox, the scrubber cell, and the ventilation system, the 232-Z Facility process equipment has been removed. The hazards associated with the demolition are mostly industrial hazards and are addressed in a site-specific health and safety plan (HNF-20848). At one time the building contained one or more of the hazardous materials that are present in most buildings on the Hanford Site. These hazardous materials could have included the following:

- Polychlorinated biphenyl (PCB) light ballast and non-PCB light ballast.
- Lead paint.
- Lead for shielding.
- Asbestos.
- Mercury switches.
- Fluorescent light bulbs.
- Used oil from motors and pumps.

In general, the hazards associated with these materials are minor because the materials are contained within enclosed equipment and have minimal likelihood for release (e.g., light ballasts, fluorescent bulbs, or mercury switches), are stable in form (e.g., lead paint or shielding), or will be collected and managed through a planned activity (e.g., used oil). Some materials may be contaminated with one or more of these materials, particularly paint and coatings. All of these materials will be contained or fixed prior to removal, however, and will pose an acceptable risk to personnel and the environment during their removal.

There are asbestos-containing materials on piping, filter boxes, and ducts. Based on the construction specifications for the 232-Z Facility and PFP policies for asbestos management, it is expected that these asbestos-containing materials generally will be non-friable or encapsulated through previous activities. Friable asbestos may exist on the interior and exterior of gloveboxes or in rarely accessed areas, such as the 232-Z scrubber cell.

Imbedded or stabilized alpha contamination is likely to exist in the building materials and the rubble resulting from demolition. Therefore, conventional demolition processes could create potential airborne hazards, as well as common industrial hazards. It is anticipated that dismantlement will require careful sectioning and disassembling of the areas that have the highest amount of embedded fissile material, using procedures that minimize the threat for airborne contamination.

Industrial hazards will be typical of construction areas. These include, for example, tripping, falling, sharp edges, and lifting (ergonomic) hazards. The hazards are described in the 232-Z Health and Safety Plan (HNF-20848).

3.6 STRUCTURES, SYSTEMS, AND COMPONENTS THAT PROTECT FACILITY WORKERS

The safety of personnel throughout the duration of this project will be aided by on-site health and safety personnel surveillance(s) and planning support. In addition, the radiological conditions will be monitored on a real time basis by the Radiation Control Technicians. As conditions change, or changes in PPE are required due to evolving site conditions, these changes will be addressed by changes to the Radiological Work Permit(s) (RWP(s)) and/or work packages that are used to control the work.

If airborne contamination levels are expected to exceed lower limits, a greenhouse (any enclosure including gloveboxes – may be quite large if needed) is one of the controls that could be used to ensure adequate contamination control and minimum personnel risk. The enclosure will encompass the entire task/work area to prevent loss of contamination control. Other control methods could include altering the work process, fogging the area of concern, additional encapsulant applications before/during/after the work, etc.

Additional details of the hazards and the mitigation features are described in the Building 232-Z Health and Safety Plan (HNF-20848.).

3.7 SPECIALIZED PROJECT EQUIPMENT

Specialized project equipment will be used in various phases of these decommissioning operations. Equipment for concrete cutting, decontamination, dismantling, etc., could require independent testing and training for safe integration into work activities. In most cases, personnel training will be derived from equipment operational manuals and procedures. More complex equipment might require specialized training by vendor representatives. Modifications to equipment that will limit the exposure to contamination will be incorporated when possible. These modifications generally involve alterations that allow only the working components to be used in contamination areas, with the power/collection/process units maintained in radioactively clean areas.

4.0 SAFETY AND HEALTH MANAGEMENT AND CONTROLS

The health and safety personnel at the PFP are matrixed to the "performing" organizations. Each of the safety functions is separate and uniquely staffed by trained experts in each discipline. This includes Fire Protection, Industrial Safety (IS), Industrial Hygiene (IH), Nuclear Safety (NS), and Radiation Protection (Radcon) organizations. Each of these organizations will review and approve this document and will participate in the preparation of work plans prior to work start. In addition, each of these organizations will be represented on a "real time" basis by surveillance walk-through of the work site, and in response to questions and/or concerns raised by 232-Z demolition personnel.

4.1 EMERGENCY MANAGEMENT

Administration (preparedness and planning) of the Emergency Management Program for the 232-Z Facility D&D project meets the requirements of the *Hanford Emergency Response Plan* (DOE-RL 1994), and ultimately the applicable DOE Orders and State and Federal regulations. All emergency planning and preparedness for this project will be in accordance with Fluor Hanford, Inc. (FH) procedures.

4.2 HEALTH AND SAFETY PROGRAM

4.2.1 Site Specific Health and Safety Plan and Activity Hazards Analysis

A site specific Health and Safety Plan (HASP) has been prepared that evaluates the chemical, radiological, physical, and biological hazards that might be encountered during D&D activities at the 232-Z Facility (HNF-20848). Building work activities are controlled by approved work packages, as required by established FH/PFP procedures. The HASP identifies the site specific controls and requirements for safety and health of D&D activities at the 232-Z Facility and includes the requirements for hazardous waste operations, as specified in 29 CFR 1910.120. The HASP shall be made available to FH/PFP employees and any contractor/subcontractor involved with hazardous waste operations.

As part of work package development, a job hazards analysis is prepared to identify the hazards and necessary controls, associated with specific tasks.

In addition to the HASP, RWPs will be prepared to address the radiological hazards associated with D&D activities. The RWP applies the radiological controls and protection requirements to the specific activity. All personnel assigned to the project and all work site visitors must strictly adhere to provisions identified in the HASP, work package, and RWP.

Before work begins, a pre-job briefing is held with the involved workers. This briefing includes reviews of the hazards that may be encountered and the associated requirements. Throughout an activity, daily briefings may also be held, as well as special briefings prior to major undertakings.

The HASP includes the elements described below.

4.2.1.1 Organizational Roles and Responsibilities

Organizational roles, responsibilities, and interfaces are described in charters and program plans. Specific individual responsibilities are described in position descriptions summarized below. An organizational chart for health and safety responsibilities for the 232-Z D&D is presented on Figure 4-1.

Although personnel may change, the overall project organizational structure will remain as shown in Figure 4-1. Field operations staff support requirements will be determined by the project team, based on the task(s) to be performed:

- **Project Manager**

  The project manager (PM) is the primary point of contact for the project and ensures that all activities are performed and managed in accordance with this plan. The PM provides the appropriate resources needed to safely perform work within cost and schedule, organizes project staffing, coordinates overall operations, and directs or delegates responsibility for project team members and subcontractors activities. The PM reports directly to the PFP Ancillary Facilities Decommissioning Manager.

- **Superintendent**

  The project superintendent interfaces with Site Forces, Subcontractors, and/or Construction on a daily basis to coordinate on-going work and schedule future work. The superintendent organizes, directs, supervises, and coordinates construction and demolition activities, assists with the development of work control packages (WCPs) and procedures, prepares and reviews plans, specifications, drawings, and schedules to determine work phases and priorities, and is accountable for field construction activities. The superintendent reports to the PM.

- **Health and Safety**

  The site safety and health officer (SSHO) ensures that demolition activities are conducted in compliance with the approved Environmental Health and Safety Plan (HASP) (HNF-20848) and all applicable federal, state, and local regulatory requirements. The SSHO is responsible for H&S policies, procedures, programs and plans for this project. The SSHO reports to the PFP Health and Safety Manager and ensures that project management and supervision implements the HASP. The SSHO also identifies potential hazards, provides control measures, and monitors safe-work practices, observes work activities to ensure that safety practices are followed, and ensures that Integrated Safety Management System (ISMS) principles are used during development and use of WCPs.

- **Quality Assurance/Quality Control**

  The quality assurance/quality control (QA/QC) manager incorporates the quality requirements and practices into the demolition activities and verifies that these operations are being performed in accordance with identified requirements. The QA/QC manager also ensures that demolition activities are conducted in compliance with the Quality Assurance Project Plan (QAPP) (HNF-MP-599) and performs assessments and surveillances of demolition activities.

- **Engineering**

  The project engineer (PE) is responsible for WCP development, revisions, approval, and implementation. The PE interfaces with affected disciplines to ensure adequate planning is incorporated into the development of WCPs and coordinates with project personnel regarding technical issues.

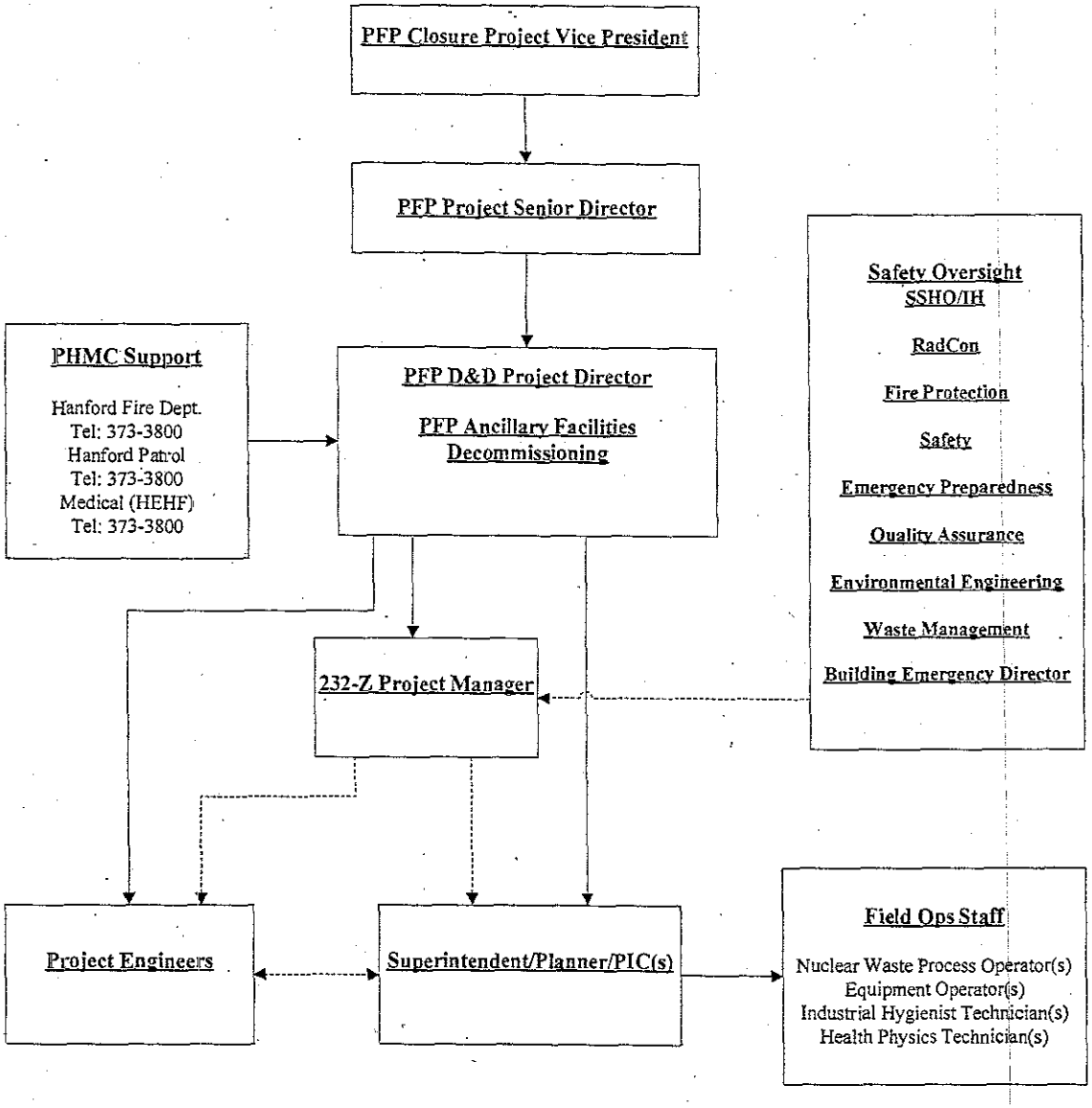
- **Radiological Protection**

  The radiological control technician (RCT) is responsible for Radiation Safety policies, procedures, programs, and plans. The RCT reports to the PFP Radiological Safety Manager and ensures implementation of ISMS and ALARA principles into all work activities. The RCT also ensures all personnel are appropriately trained and provided with Radiological Work Permit (RWP) briefings, oversees work activities in the radiological work environment, and ensures compliance with radiological protection practices.

- **Waste Management**

  The Waste Management Officer (WMO) serves as the point of contact for matters relating to characterization, packaging, and management of wastes/materials. The WMO also ensures that waste item packaging and waste management activities, associated with demolition, are conducted in compliance with the approved Waste Receiving and Shipping Plan and applicable waste management procedures.

Figure 4-1. Project Organization.



4.2.1.2 Hazard Identification

The initial hazards identification included the development of preparatory information 1) hazard and energy source identification, 2) definition of the material at risk (MAR), and 3) identification of planned D&D activities. Based on this information, hazardous conditions were identified. All parts of the existing building, waste storage areas, ventilation exhaust system and expected D&D activities were evaluated for potential hazardous conditions due to equipment failure, human error, and external events.

Hazards and energy sources were identified using a checklist developed for this purpose and used in conjunction with other FH Procedures. The checklist provides a list of hazard categories (e.g., electrical, flammable materials, and ionizing radiation sources) to assist in the identification process. The existence of any additional hazards not appearing on the checklist was noted as "Other," with appropriate information added.

Table 4-1 provides a list of some of the most significant hazards identified for the 232-Z Facility demolition activities.

Table 4-1. 232-Z Facility Hazard Identification.

X	Acoustic Energy (Noise/Vibration)	X	Mechanical Energy (Portable Tools)
X	Biological (Animal/Disease)	X	Natural Phenomena (Weather, Earthquake)
X	Chemical Energy (Decon Chemicals)	X	Other (External Hazards)
X	Chemical Materials (Asbestos/Lead/Mercury)	X	Potential Energy (Pressurized Equip, Crane Ops)
X	Electrical Energy	X	Radiological
X	Electrical Energy, Loss of (Ventilation, CAMs)	X	Thermal Energy (Fire)
X	Kinetic Energy (Vehicles, Demolition)		

NOTE: Task-specific hazards will be addressed in the applicable Automated Job Hazard Analysis (AJHA).prepared as part of the work planning process.

AJHA = Automatic Job Hazard Analysis
CAM = continuous air monitor

4.2.1.3 Hazard Mitigation and Control

Methods for control of specific identified hazards are discussed below.

Acoustic Energy: The control of acoustic hazards, and the criteria for employee enrollment into the Hearing Conservation Program, will follow FH guidelines developed for this purpose. The noise sources of potential concern include portable power tools that may be used during equipment disassembly.

Hearing protection will be required when the noise exceeds a time weighted average (TWA) of 85 decibels (dB) for 8 hours (e.g., around heavy equipment). Areas where hearing protection is required will be posted.

Biological: Venomous snakes, scorpions, bees, and spiders may hide under or inside of equipment or in protective clothing storage areas. Workers with known extreme reactions to bee stings should consider carrying an anaphylaxis emergency treatment kit and inform co-workers of the condition. Workers are advised to shake out all protective clothing before donning. The potential for exposure to the Hantavirus is considered to be low, but not nonexistent. If removal/decontamination of rodent and/or bird/bat droppings is to be undertaken, affected personnel will be provided the appropriate PPE, will be trained and will be given the appropriate medical surveillance. If rodent droppings are observed, traps, and poisons shall be used to rid the affected areas.

Chemical Energy:

The Site Safety Representative will approve the use of any new chemicals required for decontamination work in accordance with Contractor procedures. Workers are responsible for reviewing the Material Safety Data Sheet(s) (MSDS) before the use of chemical products. All MSDSs are stored in various locations within the PFP protected area that are readily accessible to all personnel.

Chemical Materials:

- **Asbestos/Lead**
  - Abatement shall be performed with trained workers
  - Personnel shall be blood-lead baselined when working with lead materials
  - Personnel performing asbestos abatement shall be in a medical surveillance program.
- **Mercury**
  - Personnel and/or area monitoring will be conducted when conducting mercury abatement if directed by Safety and Health personnel.

- PCBs
  - Abatement shall be performed with trained workers.
  - Impermeable protective clothing is required to avoid skin contamination.
  - Safety and Health personnel shall direct the disposal and storage requirements for materials contaminated with PCBs.

Electrical Energy:

- Ground fault circuit interrupters: Interrupters shall be used with all extension cords and for all plug- and cord-connected tools or appliances.
- Electrical heaters: Heaters must be mounted or secured so they are not subject to tipping over or being readily movable.
- Electrical equipment: Equipment shall be Underwriters' Laboratories-listed or equivalent.
- Temporary power upgrades: Temporary power upgrades must be compliant with the National Electrical Code.
- Lock and tagout: Lock and tagout must be compliant with FH guidelines.

Electrical Energy, Loss of:

- Ventilation: The D&D plan calls for removing radiological inventory and contamination to leave only minimal amounts, while the ventilation system remains operational. Carbon monoxide is a potential hazard when working around internal combustion engines. If it is necessary to operate engines, sufficient ventilation must be allowed to prevent exhaust gas accumulation.
- Exhaust ventilation system: The facility exhaust ventilation system and the various alarm systems will be tested periodically following approved procedures.
- Exhaust for dismantlement/size reduction: Pre-demolition decontamination and dismantlement (e.g., crimping, cutting, and bagging) of the structures and equipment shall be performed with an operating exhaust ventilation system or a portable HEPA-filtered exhauster, as defined in the Air Monitoring Plan.
- HEPA filter (exhaust) integrity: Local differential pressure (dp) instrumentation readout (high dp alarms) and monitoring of gauges (which indicate dp) will be maintained until final dismantlement of the ventilation system.
- Exhaust fans: Exhaust fans will be shut down in the event of a fire that could potentially threaten the HEPA filters.
- CAMs: Three CAMs are located in the process room. The alarm set points for CAMs will be based on the respiratory protection factors, calculated airborne radioactivity levels, and estimated occupancy duration.

Kinetic Energy:

- **Structural Demolition**

  - Services: All facility utility services will be disconnected before initiating the dismantlement of the 232-Z structure.

  - Heavy Machinery: Various equipment may be present and operating near the 232-Z Facility. Spotters and/or signal persons must be used whenever there is a potential hazard from the movement or operation of machine or vehicle, in accordance with the *Hanford Site Hoisting and Rigging Manual,* DOE/RL-92-36.

  - Demolition: Demolition work will be performed per the requirements of the 29 CFR 1926.850, Subpart T. Hard hat, safety glasses, and substantial foot wear are required within the 40 meter boundary during the demolition activities. All safety measures required for facility dismantlement will be provided, including postings, barriers, personnel directives, and fencing.

Mechanical Energy: Any equipment with defects, safety hazards, or problems will be repaired or otherwise corrected before use.

- **Cuts/Abrasions:** Preventative measures will be incorporated in operations to prevent personnel puncture wounds and/or contamination during cutting operations. Puncture resistant gloves will be used when cutting or handling sharp objects. Protective measures such as taping/padding, or using manufactured caps on cut ends or protective foams on sharp ends may be used.

- **Cutting/Grinding/Welding:**

  - No high-hazard hot work (i.e., electric arc welding, oxy-fuel gas welding/cutting, heavy grinding, etc.) is planned for 232-Z D&D activities.

  - Personnel operating cutting equipment shall wear welding/cutting goggles and/or a welding hood and the appropriate flame-retardant clothing for tasks being performed.

  - Respiratory protection may be required during welding, grinding, and cutting or during other activities that produce respirable dusts, fumes, or vapors. PPE determinations shall be made by the Site Safety and Health Officer (SSHO) or Health Physics Technician (HPT) Supervisor with concurrence from the Field Work Supervisor.

  - A hot work permit is required and must be prepared consistent with the site wide guidelines provided for this purpose.

Natural Phenomena

- **Temperature Extremes:** To the extent practical, the work area will be heated or cooled to minimize the potential for heat stress or cold stress.

  - Monitoring: Monitoring will be conducted for heat stress and cold stress.

  - Work/rest: Periods will be adjusted according to the guidance provided for heat stress control.

  - Symptoms of cold and heat stress: Workers shall be briefed on the symptoms of cold and heat stress.

  - Drinking water: Cool water and disposable drinking cups will be provided in the rest area.

Heat Stress	Symptoms	First Aid
Heat exhaustion	Pale, extreme sweating, headache, dizzy, shortness of breath, and nausea.	Seek medical aid, give sips of water (if conscious), remove clothing, move to cool area, apply moist towels, laydown, and elevate legs.
Heat stroke	Dry skin, drowsy or unconscious, red face, fatigue, incoherent, and hallucinations.	Seek medical aid, give sips of water (if conscious), remove clothing, move to cool are, apply moist towels, laydown, and elevate legs.

Potential Energy: Stored energy sources pose a potential hazard to workers. These hazards include, but are not limited to, electrical, mechanical, hydraulic, pneumatic, chemical, radiation and thermal energy, and various forms of potential energy (e.g., springs, compressed gases, or suspended objects). Lockouts/tagouts shall be used to protect workers from these energy sources.

Other:

- Pre-job briefings: The Field Work Supervisor shall ensure that the applicable requirements are discussed and understood during the pre-job briefings.

- Work packages: Packages will be reviewed and approved as required by the appropriate organizations and by the field procedures.

- Biological hazards: Biological hazards will be addressed in the AJHA.

- Calibration and Maintenance Procedures: Appropriate calibration procedures will be implemented and followed. The surveillance and maintenance procedures will provide response to weather and climatic conditions and will be reviewed to ensure that appropriate maintenance procedures are implemented.

- Trips, Slips, and Falls:
  - Accidental falls: A fall protection system will be used in accordance with safety requirements.
  - Spacing and load limits: Personnel spacing and load limits exist and must be accounted for when preparing a work plan for on-roof operations.

- Confined Spaces: No confined space entry is planned for the D&D activities at the 232-Z Facility. If confined space work is found to be necessary during the course of the work, entries will require a confined space entry permit and a Job Hazard Analysis (JHA) in accordance with the requirements and procedures established to control confined space entries.

Radiological: Engineering controls (e.g., ventilation, and containment) will be used as applicable to maintain exposures ALARA.

- Radiation detection equipment: Equipment will be provided to indicate unanticipated events, contamination, or external dose rate monitoring per RWP.

- Sampling emissions: Continuous sampling of all stack and room emissions during decommissioning activities will be conducted. Emission sampling is performed to detect potential radioactive contaminants that may exceed the protection factor for respiratory protection and the airborne levels that require emergency notification. Final pre-demolition surveys will be conducted, with active ventilation, to assure minimal residual hazards (radiological and toxicological). The ventilation system will be shutdown. Air monitoring during demolition will be supplied in accordance with the approved Air Monitoring Plan.

Thermal energy: In case of fire or medical emergency, call 911 or 373-3800. Fire restrictions or controls that are necessary to reduce or eliminate the potential for a fire in the 232-Z Facility or outside areas of the facility site include the following:

- Smoking: Smoking is not allowed within the controlled areas of the facility (i.e., in contamination reduction and exclusion zones).

- Fire watch: Fire watch is required (by trained personnel) during and a minimum of 30 minutes after cutting and grinding activities.

- Periodic inspections: The Fire Protection Engineer will specify areas for the storage of combustible waste and will complete random inspections of the 232-Z Facility for transient combustibles.

- Temporary structures: Noncombustible or fire-retardant materials and engineered structures will be used to mitigate the effects of fire.

- Combustible liquids: Storage of combustible liquids will be controlled to the requirements of NFPA 30. Storage of combustible liquids is prohibited in areas where there are high radioactive material inventories or high combustible material inventories. Use of combustible liquids requires approval by the Fire Protection Engineer. Combustible liquids will not be routinely used or stored within the facility, although small amounts may be required to support decontamination.

- Exits: Personnel exits shall not be blocked.

- Waste: No waste package that field screens for gram quantities of fissile material (> 50 mRem) will be removed from the 232-Z Facility until the NDA technician is ready to commence analysis.

- Temporary power sources: Temporary power cords are to be protected as directed by the site safety officer.

- Plastics: Materials utilized for glovebags, contamination control curtains, temporary enclosure green houses, or for wrapping and bagging removed materials will be procured to the requirements of NFPA 701.

- Fire detection: The fire alarm and detection system is maintained as functional. When activated, it sounds the alarm signal locally and automatically sends a signal to the Hanford Fire Department via the Radio Fire Alarm Repeater system.

- Evacuation:

  - Personnel working in the facility will be familiar with all exists, warning signals, and required response.

  - At least two egress paths will be maintained to facilitate personnel evacuation from the facility.

  - Emergency lighting, activated upon loss of the temporary task lighting, is to be maintained in the stairwell.

  - The maximum travel distance to an exit is not to exceed 75 feet.

4.2.1.4 Training Requirements For Personnel

The Environmental Safety and Health Training Program provides workers with the knowledge and skills necessary to safely execute assigned duties. All employees receive Hanford General Employee Training (HGET). Requirements for personnel involved with the D&D activities at PFP may include additional training for specific work activities identified during the work planning process. The site-specific training requirements for the 232-Z Facility are identified below:

- Position core training: When Craft personnel are performing work, the Field Work Supervisor is responsible for ensuring that the Craft personnel have received the required qualifications and training.

- Site workers:
  - 40 Hour Hazardous Waste Worker, plus 8 hours of field experience (for work in the exclusion or contamination reduction zones).
  - Pre-entry briefing on the health and safety plan and applicable RWP.
  - Respirator training (as required by job assignment).
  - First aid (two qualified persons per shift/crew).
  - Certified Asbestos Worker and/or Asbestos Awareness (as required by job assignment).
  - Lead Worker (as required by job assignment).
  - Radiation Worker II (as required by RWP).
  - Radiation Worker I (for access to contamination reduction zone/radiological buffer area).

- Visitors: Visitors and personnel not normally assigned to the 232-Z project who perform work in the fenced area shall have facility orientation and HGET or General Employee Radiological Training or an escort.
  - Visitors must sign in and out of the facility entry binder.
  - Visitors must follow the same rules and wear the same PPE as any team member in the zones.

- Medical requirements (typical for work in the exclusion zone as described in the RWP):
  - Hazardous waste worker physical
  - Chest count
  - Plutonium bioassay
  - Mask fit
  - Respirator user examination (persons not required to have hazardous waste work physical).

4.2.1.5 Personal Protective Equipment

The specific levels of PPE and necessary components for each level have been divided into four categories according to the degree of protection afforded. General guidelines for use are:

- Level A: Highest level of respiratory, skin, and eye protection.
- Level B: Highest level of respiratory protection, lesser level of skin protection.
- Level C: Air-purifying respirator required, lesser level of skin protection.
- Level D: No respiratory protection required.

Industrial Hygiene and Health Physics personnel must evaluate the hazards identified during work planning and characterization analysis. If engineered safeguards and/or administrative controls cannot be used, appropriate PPE will be required to protect employees from the known and potential hazards likely to be encountered for the task at hand. Health Physics will identify PPE requirements for radiological hazards via the RWP. The AJHA will specify PPE for chemical hazards. Where PPE is necessary to address both chemical and radiological concerns, the Industrial Hygienist, Person in Charge (PIC), and Health Physics staff will jointly determine requirements through the work planning and/or ALARA review processes.

The basic Industrial Safety PPE for entry into the exclusion area when demolition activities are being conducted is:

- Substantial footwear
- Safety glasses with side shields
- Hard hat (when bumping or overhead hazards exist).

The minimum required Radiological PPE for radiological protection shall be identified in the Radiation Work Permit prepared for the scope of work.

4.2.1.6 Biological Monitoring/Medical Surveillance

This project requires medical surveillance or biological monitoring procedures beyond the routine medical surveillance program as identified in the individual Employee Job Task Analysis.

- Lead: Blood lead program (if working with lead).
- Asbestos: Asbestos worker physical (if working with asbestos).

4.2.1.7 Personnel And Environmental Monitoring Requirements

Work Activity Monitoring: A JHA of planned work activities shall be performed to ensure that all hazards that might affect employee health have been considered before worker entry into the work area.

- Personnel Monitoring: Personnel monitoring consists of attaching various sampling devices to an employee during their work tasks and evaluating any determinant exposures.

- Area Monitoring: Area monitoring involves the collection and analysis of samples in the general area where work is taking place. Area monitoring can include both entry and assessment monitoring, if entry monitoring has been defined as a control measure for the specific agent.

Industrial Hygiene Sampling Plan: An industrial hygiene monitoring and sampling plan will be used to determine the necessary sampling and to evaluate and document occupational exposures to the chemical and physical hazards associated with the D&D work.

Radiological Sampling: Radiological surveys shall be conducted to assess direct radiation levels, surface contamination levels and airborne contamination levels. The frequency of each type of survey shall be based on potential radiological conditions, probability of change in conditions, and occupancy factors. Air sampling utilizing CAMs shall be conducted to trend and record air contaminant concentrations. Three CAMs are located in the process room. The CAMs will alert personnel to increased levels of airborne radioactivity that may exceed the respiratory protection factors.

Environmental Monitoring Plan: De-energizing the ventilation system and subsequent dismantlement of the 296-Z-14 Stack and the 232-Z Building has been identified as a Comprehensive Environmental Response, Compensation, and Liability Act of 1980 program activity.

- Air Monitoring: Quantification of radioactive air emissions and air monitoring have been identified as requirements for D&D activities. Monitoring activities may include:

  - Temporary ambient air monitors (at a minimum, one upwind and two downwind alpha continuous air monitors with alarms will be located at the demolition zone boundary).

  - Radiological smear surveys (Indicator – effluent air emission estimated rates are based on gross residual contamination levels).

  - Near field ambient air monitoring (currently is being performed at several locations around the PFP Complex).

Evacuation: In the event of a situation resulting in evacuation from the facility, re-entry to work area shall be coordinated by operations management and conducted by Industrial Hygiene and Health Physics personnel.

4.2.1.8 Decontamination

Care for injured personnel takes precedence over decontamination procedures. Do not attempt personal decontamination if the injury will be aggravated. An injured person should first be removed from immediate danger (if possible to move without further injury). Then, if it is determined to be necessary by the SSHO and HPT, decontamination can take place prior to leaving the site for medical treatment. A decontamination trailer is located on the PFP site. If

the extent of personal injury is unknown, emergency medical response personnel (i.e., the Hanford Fire Department) will make the decision to move the injured person. The SSHO and HPT may need to escort the injured person to the hospital.

The following decontamination equipment is required:

- Personnel decontamination kit:
  - Potable water
  - Portable eye wash/drench hose
  - Spill absorbent
  - Wipes/towels
  - Buckets/wash tubs.

4.2.1.9 Radiological

- Radiological conditions: Radiological work is addressed in 10 CFR 835, Occupational Radiation Protection, the Hanford specific procedures that implement 10 CFR 835, and in specific RWPs prepared for each work element..
- Health Physics Technician coverage: HPT coverage as required by the applicable RWP.
- Authorized HPT: HPT pool.
- PPE for radiological hazards: The required PPE for radiological work is addressed in task-specific requirements provided in the applicable RWP.
- Radiation dosimetry external: Refer to the applicable RWP.
- Radiation monitoring: Radiological monitoring shall be performed in accordance with applicable technical assessments. Task-specific requirements will be provided in the applicable RWP.

4.2.1.10 Work Site Control Measures

Control boundaries will be established and are defined below:

- Support zone: Area outside of the controlled contamination; this area is a clean zone.
- Contamination reduction zone/radiological buffer area: Area between the exclusion zone and the support zone, used for controlling the spread of contamination.
- Exclusion zone/contamination area/high contamination area/airborne radioactivity area: Inner work area, known or highly probable contamination.

The location of these boundaries will change as the demolition progresses. The exclusion zone may be expanded as demolition is initiated to ensure the safety of support personnel. The control boundaries will be clearly marked and personnel briefed upon revision.

4.2.1.11 Emergency Management

Administration (preparedness and planning) of the emergency management program for the 232-Z Facility D&D project meets the requirements of the *Hanford Emergency Management Plan* (DOE-RL 1994) and the applicable emergency management DOE orders and state and Federal regulations.

The Emergency Coordinator is the Building Emergency Director (BED), who has the authority to authorize resources to respond to an abnormal incident or emergency (Tel. No. 373-2337). The FH EP Coordinator is to be notified of any Building Emergency Director (BED) changes and will provide the changes to the Hanford Site Emergency Preparedness Organization.

The complete building emergency organization list of positions, names, work locations, and telephone numbers for the 232-Z Facility is maintained separately. Copies of this list are distributed and placed at the following locations: The Patrol Operations Center (POC) and FH EP.

The activities at the 232-Z Facility will utilize HNF-IP-0263-PFP, *Building Emergency Plan for Plutonium Finishing Plant Complex*. All PFP staff working on the 232-Z Facility will attend a PFP emergency response briefing addressing the following topics:

- Evacuation Procedure
- Procedure to Account for All Employees
- Emergency Equipment Location
  - Fixed Emergency Equipment
  - Portable Emergency Equipment
  - Communications Equipment
  - Personal Protective Equipment
  - Spill Kits and Spill Control Equipment
- Rescue and Medical Duties
- Fire Prevention Plan

Implementation of the Emergency Plan

The BED shall use the following guidelines to determine if an event has met the requirements of WAC 173-303-360(2)(d), Emergency Reporting:

1. The event involved an unplanned spill, release, fire, or explosion,

AND

2.a The unplanned spill or release involved a dangerous waste, or the material involved became a dangerous waste as a result of the event (e.g., product that is not recoverable.)

OR

2.b The unplanned fire or explosion occurred at the worksite or with a transportation activity subject to RCRA contingency planning requirements,

AND

3. Time-urgent response from an emergency services organization was required to mitigate the event or a threat to human health or the environment exists.

As soon as possible after stabilizing event conditions, the BED shall determine, in consultation with the FH Site contractor environmental single point-of-contact, if notification to Ecology is needed to meet WAC-173-303-360 (2)(d) reporting requirements. If all of the conditions under 1, 2, and 3 are met, notifications are to be made to Ecology. Additional information is found in DOE/RL-94-02, section 4.2.

If review of all available information does not yield a definitive assessment of the danger posed by the incident, a worst-case condition will be presumed and appropriate protective actions and notifications will be initiated. The BED is responsible for initiating any protective actions based on their best judgment of the incident.

The BED must assess each incident to determine the response necessary to protect the personnel, facility, and the environment. If assistance from Hanford Patrol, Hanford Fire Department, or ambulance units is required, the Hanford Emergency Response Number (911) must be used to contact the POC and request the desired assistance. To request other resources or assistance from outside the 232-Z Facility, the POC business number is used (373-3800).

Evacuation

There is no building evacuation or take cover alarm at the 232-Z Facility. The 200 Area evacuation and take cover sirens are controlled from the POC. Personnel may be notified of the need to evacuate the area or building(s) in which they are working by area emergency sirens (steady siren), radios, cellular telephones, or runners.

In the event of an area evacuation alarm, personnel in the immediate vicinity of the 232-Z shall assemble at the identified primary staging area (or if directed by the Building Emergency Director, the secondary staging area) for accountability. In the event that the Safeguards and Materials Control Building is involved in the emergency or the primary staging area is otherwise an inappropriate location, personnel shall report to the secondary staging area. Report accounting of personnel to the BED or to the operations supervisor. Evacuating employees should report any personnel remaining in the affected evacuation area to the Staging Area Manager.

NOTE: Personnel should always stage upwind from the facility or the location of the event. Personnel who are dressed in PPE are to report to the PPE staging area.

Accountability of facility personnel shall be completed within 30 (not to exceed 45) minutes of the decision to evacuate the facility. The Staging Area Manger shall determine if anyone has been potentially exposed to hazardous materials and, if so, request help for medical evaluation.

NOTE: Depending on the nature of the emergency, wind direction, wind speed, etc., at the primary staging area, the Staging Area Manager, under the direction of the BED, has the authority to change the location of the primary staging area to the alternate staging area.

Emergency Response Procedures

The BED is responsible for:

- Event notification
- Protective actions
- Personnel accountability
- Notifying the contractor environmental single point-of-contact
- Notifying the Occurrence Notification Center
- Developing and transmitting event reports
- Using a checklist developed to aid the BED in mitigating an event.

4.2.1.12 Environmental Protection Requirements For Spills

Only trained personnel shall respond to a hazardous material or hazardous waste spill. Appropriate MSDS shall be referenced before performing cleanup. All spill responses will be conducted in accordance with the PFP Building Emergency Response Plan.

It is the responsibility of the employee identifying the spill to notify the BED immediately in the event of a release to the environment, or if unexpected contaminated spills are encountered. The BED will determine whether the spill is a reportable occurrence under DOE Order 5000.3B, Occurrence Reporting and Processing of Operations Information. The requirements for notifying state or other regulatory agencies are included in the FH reporting procedures.

Small Controlled Spills – When the spill is a small, controlled amount and the identity of the spilled substance is known, the spill can be cleaned up by personnel who have received appropriate training. To clean up a spill, the following actions and MSDS guidelines for the substance should be followed:

- Stop the spill
- Warn other people of the spill
- Isolate the area around the spill
- Minimize personnel exposure.

Large Controlled/Uncontrolled Spills – When the spill is large, the Hanford Fire Department Hazardous Material (HAZMAT) Response Team should be notified to clean up the spill. The HAZMAT Response Team will develop a plan of action on each response.

4.2.1.13 Hazard Communication Requirements

Hazard Communication – Hazard communication related to the 232-Z D&D activities will be implemented in a manner consistent with PFP hazard communication requirements identified in

FH site procedures.. The purpose of this program is to communicate to workers the potential for illnesses and injuries related to the work environment. This program requires managers to inform their workers of the hazards in the work area and how they can protect themselves. The written program will be kept in various locations and will be available to all employees. MSDS are available to all employees via the Record Management Information System electronic system. Hard copies are available from the Hazardous Materials Coordinator in MO-429, Room 7.

4.2.2 Radiological Controls and Protection

Radiation control commitments that will be employed in the 232-Z Facility demolition process could include application of fixatives, temporary confinement enclosures, misting devices, protective clothing, and respiratory protection equipment. Air samplers and dosimetry will be used to determine and document work conditions and personnel exposures.

The engineering of temporary contamination control structures will provide proper airflow conditions. Contamination control structures will be erected to support potential high-contamination operations and to provide adequate protective areas for supplemental operations (i.e., process system component packaging, equipment and tool decontamination, and repackaging if needed). Temporary structures will employ portable HEPA-filtered exhausters. Glovebag enclosures will be single-use protective measures used to prevent contamination release during specific operations (e.g., pipe cutting, sample collection). Glovebags will be available in a variety of sizes and designs or tailored to a specific application.

Misting operations will be used at specific times to reduce airborne contamination concentrations and/or to assist decontamination activities. Fine, aerosol-size water particles have been demonstrated to capture contaminant particles in air and remove them to a surface that can be cleaned or stabilized using fixatives.

4.2.3 Training

Specific work activities will expose personnel to different and changing contaminants and industrial hazards. The D&D Plan for PFP (HNF-20861, Sections 3.0, 4.0, and 5.0) identifies the work scope and types of activities. The training requirements for these activities are identified in FH site wide procedures prepared for this purpose.

For unique tasks, such as the planned glovebox interior decontamination, the Project Manager, aided by the PFP safety organization (Radcon, IH, IS, and NS), will identify additional training if such is warranted.

In addition to the site wide procedures, PFP has prepared an additional training document that describes the level of training required for various D&D tasks and activities, as well as the documentation requirements to record personnel training. Section 6.5 of this document provides an overview of the training requirements for this project.

4.2.4 Fire Protection

Fire safety requirements for this project will be based on the fire hazard evaluation and the evaluation of fire protection in RLID 5480.7 (DOE-RL 1994). Currently, the fire detection system remains active; however, the fire suppression system has been deactivated.

5.0 ENVIRONMENTAL MANAGEMENT AND CONTROLS

This section describes the plans and processes that will be implemented to ensure that the environment surrounding the 232-Z Facility will not be contaminated from the demolition activities. Monitoring functions and operational commitments are discussed, as well as the planned characterization efforts designed to identify environmental conditions throughout the project. The management of waste products created in this project also is discussed, including the commitments instituted to ensure that facility contaminants are not released during waste handling operations. References to applicable regulations and guidelines are made where appropriate.

5.1 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

On-site response activities under CERCLA must comply with applicable or relevant and appropriate requirements (ARARs) from other regulations. Applicable requirements mean those substantive environmental requirements promulgated under Federal or State environmental law that specifically address a hazardous substance, remedial action, location, or other circumstance found at a CERCLA site. Relevant and appropriate requirements are those standards that address problems or situations sufficiently similar to those encountered at the CERCLA site so their use is well-suited to the conditions at the site. If a requirement is relevant, it may or may not be appropriate for application at the site, depending on the conditions.

The ARARs must be followed to the extent practicable for activities performed to support the removal action. The EE/CA for the 232-Z Facility provides an analysis of the ARARs for the removal action (DOE/RL-2003-29, Section 5.1.3, page 17); the Action Memorandum lists the specific ARARs for this project.

The following discussion considers the ARARs that will be applied to the 232-Z removal action.

5.1.1 Waste Management Standards

It is anticipated that all LLW and LLMW generated during the removal action will be disposed of at the ERDF, which is managed under standards that are equivalent to those established by the Nuclear Regulatory Commission in 10 CFR 61, Subpart C.

The *Resource Conservation and Recovery Act of 1976* (RCRA) regulations found in 40 CFR 260 et seq., as implemented by the State of Washington Dangerous Waste regulations (WAC 173-303), govern the identification, storage, treatment, and disposal of hazardous waste and the hazardous component of mixed waste. Dangerous waste debris and miscellaneous dangerous wastes will be identified consistent with the provisions of 40 CFR 261 and WAC 173-303 -070 to 110 and managed according to the relevant requirements of the 40 CFR 268 and WAC 173-303-140 and 141, and 160/161. Under CERCLA, a permit is not required for the management of the materials as they are generated; however, disposal will be at a regulated facility. Dangerous wastes will be evaluated to ensure their proper designation prior to disposal, and treated as appropriate to comply with land disposal requirements (40 CFR 268) and the waste acceptance criteria for the disposal facility (BHI 00139, 2003).

The *Toxic Substances Control Act of 1976* (TSCA) regulates the management and disposal of PCBs and PCB waste; implementing regulations are found in 40 CFR 761. The ERDF is authorized to accept solid PCB waste for disposal. Liquid wastes in incidental quantities containing PCBs $\leq$ 500 ppm may be disposed to ERDF provided the wastes are pretreated to remove or stabilize free liquids.

Wastes must conform to the ERDF Waste Acceptance Criteria (BHI 2003). Although waste generated during the removal action will in most cases be shipped directly to the ERDF, TRU wastes will be transferred to the CWC for storage.

> **NOTE**: It may be necessary to obtain an EPA off-site determination for transfer of the wastes to the CWC for storage prior to shipping any TRU materials from a CERCLA removal activity to that facility.

5.1.2 Waste Management Strategy

In conducting the 232-Z Facility removal action, different waste streams will be generated. These waste streams will include LLW, hazardous waste, and LLMW, as well as, potentially, TRU waste and TRU-mixed waste. Any TRU waste that is generated will be packaged for transfer to the CWC for storage; all other waste will be shipped to the ERDF for disposal. Each waste stream will require specific processing and disposal. Each of these waste streams is defined and discussed in the Waste Management Plan for the 232-Z Facility (HNF-20862).

Specific detailed instructions governing the waste management activities will be provided in one or more site-specific waste management instructions.

5.1.2.1 Waste Characterization and Designation

Before performing removal actions in any particular area or on any specific system, sampling and analyses or other characterization events will be performed to identify contaminants. This information, in addition to process knowledge and historical analytical data, will be used to profile and to designate each waste form as one of the waste stream categories identified in the Waste Management Plan (HNF-20862). Additional information obtained by waste package assaying and the implementation of mathematical estimation techniques, as discussed in the SAP, will assist in waste stream identification. Quantities will be tracked in the 232-Z Facility site-specific waste management instruction. Waste characterization and designation will be performed in accordance with 40 CFR 761 and WAC 173-303 and 304.

5.1.2.2 Waste Handling, Storage, and Packaging

The area of contamination within the scope of the RAWP is the footprint of the 232-Z Facility. Waste will be packaged and managed within the facility in areas established for this purpose; these areas will change as work proceeds in various building areas. Additional on-site areas have been established where waste will be staged within the PFP fence and, if necessary, temporarily stored before being transferred from the PFP. An interim storage area also has been established

outside the fence for transfer of waste to the ERDF. Waste-handling procedures, including containerizing and inspecting, will meet the requirements of WAC 173-303, *Dangerous Waste Regulations,* and 40 CFR 761 for PCBs.

5.1.2.3 Waste Treatment

Some of the waste streams (e.g., LLMW) generated from this removal action may require treatment prior to disposal at the ERDF to comply with the Land Disposal Requirements (40 CFR 268). In general, the approach for these wastes will be to document their make up and provide this information to ERDF staff as the wastes are generated. Treatment will normally take place at the ERDF using their existing capabilities.

5.1.2.4 Waste Transportation and Shipping

All waste will be packaged on site prior to staging in waste management areas within and external to the PFP Complex. LLW and LLMW will be stored temporarily at locations within the PFP fence, and then staged at a location currently outside the fence for transport to the ERDF. Roll-off boxes and other waste containers will be moved to the external staging area as they are filled to await transport to the ERDF. Empty containers will be stored at this location outside the fence until required. Any TRU materials that are generated will be staged at a temporary pad within the fence prior to shipment to the CWC for storage. The Waste Management Plan (HNF-20862) provides the details for waste packaging, labeling, and record keeping.

The transportation services for waste generated during the 232-Z Facility demolition may be provided by a subcontractor who will be responsible for using and maintaining appropriate transport motor vehicles and providing qualified commercial drivers. Trucks will be placarded and shipments will be in proper condition for transportation. Because of the security requirements for access to the PFP, waste containers will be staged in and out from a staging pad located outside of the PFP fence.

5.1.2.5 Disposal

It is anticipated that most of the LLW, LLMW, and debris from the removal action will be disposed on-site at the ERDF, which is designed to meet RCRA minimum technical requirements for land disposal. Any PCB, TRU, and TRU-mixed waste that do not meet the ERDF waste acceptance criteria will be sent to the on-site CWC for storage. Dangerous waste that does not meet the ERDF waste acceptance criteria will also be transported to the CWC for storage.

5.1.2.6 Residual Radiation Release Criteria

The operational history of the facility indicates that failures of equipment, as well as spills, resulted in the release of radionuclide and other contamination to the building and external soils. Because of the nature of the operations involved within the facility and the concern over the

residual radionuclide inventory within the facility, it is not anticipated that any materials associated with the Removal Action will allow materials to be released from the facility for public use.

5.1.3 Air Emissions

The federal Clean Air Act of 1990 and Amendments (42 United States Code 7401 et seq.), and the Washington Clean Air Act (RCW 70.94) require regulation of air pollutants. Under federal implementing regulations, the Title 40 CFR Part 61, Subpart H requires that radionuclide airborne emissions from the facility shall be controlled so as not to exceed amounts that would cause an exposure to any member of the public of greater than 10 millirem per year effective dose equivalent. The same regulation addresses point sources (i.e., stacks or vents) emitting radioactive airborne emissions, requiring monitoring of such sources with a major potential for radioactive airborne emissions, and requiring periodic confirmatory measurement of such sources sufficient to verify low emissions. Under state implementing regulations, the federal regulations are paralleled by adoption, and in addition require added control of radioactive airborne emissions where economically and technologically feasible [WAC 246-247-040(3) and –040(4) and associated definitions]. In order to address the substantive aspect of these requirements, best or reasonable control technology will be addressed by ensuring that applicable emission control technologies (those reasonably operated in similar applications) will be utilized when economically and technologically feasible (i.e., based upon cost/benefit). Additionally, the substantive aspect of the requirements for monitoring of fugitive or non-point sources emitting radioactive airborne emissions [WAC 246-247-075(8)] will be addressed by sampling the effluent streams and/or ambient air as appropriate using reasonable and effective methods.

The federal implementing regulations also contain requirements for managing asbestos material associated with demolition and waste disposal (Title 40 CFR Part 61, Subpart M).

Airborne Source Information

Handling radiologically contaminated materials during 232-Z Facility D&D activities has the potential to generate particulate radioactive air emissions. Conservative estimates of potential emissions were calculated based on the unit dose factors in *Calculating Potential-to-Emit Releases and Doses for FEMPs and NOCs*, HNF EP 3602, Rev. 1, dated January 2002, to determine the annual unabated and abated potential-to-emit to the maximum public receptor (MPR). The distance to the MPR at the Laser Interferometer Gravitational Wave Observatory (LIGO) receptor is 18,310 meters East-Southeast of the 200 West Area.

The primary radionuclides of concern are plutonium-238, plutonium-239/240, plutonium-241, neptunium-237, uranium-235, and americium-241. Other radionuclides may also be encountered during the D&D activities.

The conservative unabated potential-to-emit from 232-Z Facility D&D activities is 4,800 mrem/yr to the receptor. The abated emission estimate is 1.8E-02 mrem/yr to the MPR with credit taken for two stages of HEPA filter collection efficiency for stack emissions.

A substantial portion of the inventory has been removed during prior decontamination and process equipment removal. As progress is made on D&D activities, potential fugitive emissions will be evaluated to ensure that applicable emission control technologies are being utilized considering economical and technological feasability.

Emission Controls

Based on analysis of the potential emissions and evaluation of available control technologies, the following controls have been selected for use during the removal action:

- Water will be applied, as needed, during any excavation, backfilling and demolition activities for suppression of fugitive emissions and dust.

- As practicable, activities would be conducted using HEPA filtration (recognized as a best or reasonable control technology for particulates). For example, in support of the activities described, activities conducted within the 232-Z Building structure will be ventilated through the 232-Z emission control system until such time that a decision is made that the 232-Z emission control system is not needed to provide beneficial control of airborne effluent. At such time, the 232-Z emission control system, and associated stack, will be shutdown and removed from service.

- Radiological survey (e.g., smears) will be taken of equipment, tools, and materials in areas where there is the potential for smearable contamination.

- Equipment, tools, and materials with smearable contamination above 100,000 dpm/100 cm^2 beta/gamma or 2000 dpm/100 cm^2 alpha will be wrapped or the contamination otherwise fixed by an appropriate means prior to being moved from the 232-Z Facility.

- Appropriate controls such as water, fixatives, covers, containment tents, or windscreens would be applied, if needed, as determined by the Radiological Control organization.

- Fixatives or cover material (e.g., soil, gravel, plastic, etc.) will be applied to disturbed contaminated soils associated with the 232-Z Facility when field activities will be inactive for more than 24 hours. Additionally, if the sustained wind speed is predicted overnight to be greater than 32 km/hr (20 mph) based on the Hanford Meteorological Station morning forecast, fixative or cover material will be applied, as needed to allow the project enough time, if necessary, to prepare for the application of dust control measures. If a fixative has already been applied and the contaminated items will remain undisturbed, further use of fixatives will not be needed. The fixatives or other controls will not be applied when the contaminated items are frozen, or it is raining, snowing, or other freezing precipitation is falling at the end of work operations.

- As appropriate, before starting intrusive activities (such as isolating utilities and piping, or dismantling the exhaust system), removable contamination in the affected area(s) would be fixed or reduced to as low as reasonably achievable. Measures such as

decontamination solutions, expandable foam, fixatives, or glovebags also could be used to help reduce the spread of contamination.

- The waste packages will remain closed, except during repackaging and/or waste inspection activities, once they are staged outside the 232-Z Building, but within the CERCLA onsite area.

- The transuranic waste containers will remain closed, except during packaging and waste inspection activities. The trucks will be loaded with the waste containers and the loaded containers will be covered at the staging area before being transported to either ERDF or CWC.

- The vacuum cleaners and portable exhausters used at the 232-Z Building will be equipped with HEPA rated filters (considered a best or reasonable control technology for particulate airborne radioactive emissions at the Hanford Site).

- Temporary contamination control structures may be utilized with or without a portable HEPA filtered exhauster(s) during some portion of the decommissioning activities, as needed and specified in a radiation work permit (RWP) and/or operating procedures.

Monitoring

While the existing ventilation system for the 232-Z Building is active, the existing monitoring system for the 296-Z-14 NESHAP major stack would be operational. Substantive monitoring requirements during this period include operating the record sampler for the 296-Z-14 Stack continuously, collecting the resultant particulate sample filters biweekly, and processing the sample filters for laboratory analysis to support emissions reporting. If at any point the stack is operated as a NESHAP minor stack, the record sampler would be operated during representative period of operation and at a minimum, a four week sample will be collected per year (as a periodic confirmatory measurement of low emissions) and analyzed for gross alpha/beta activity. When it is determined that the 232-Z emission control system is no longer needed for contamination and emission control, the 232-Z emission control system and associated stack will be shutdown and removed from service.

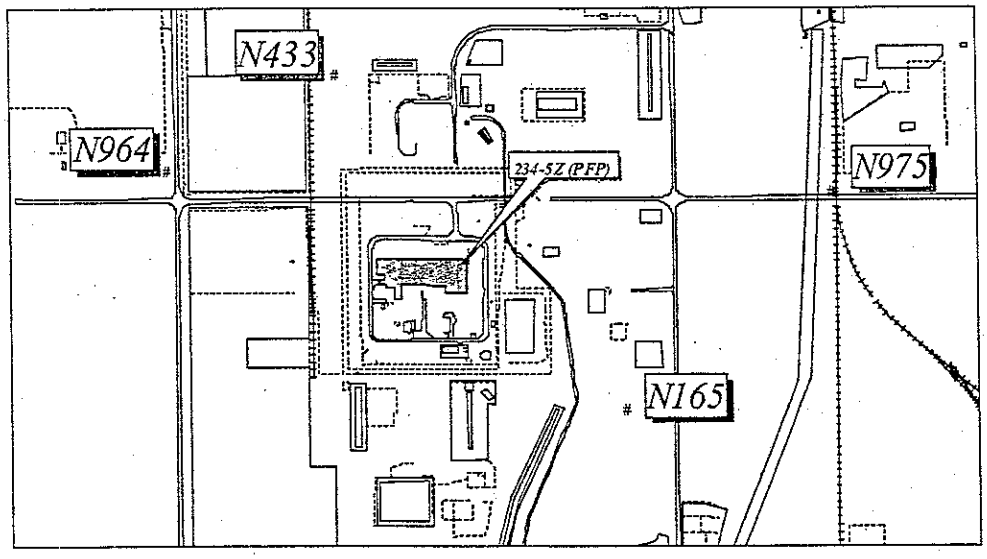
HEPA vacuums intended for 232-Z Building deactivation/decommissioning will vary in size and primarily be small portable units currently in use on the Hanford site with flow capacities between 50 and 300 cubic feet per minute (CFM), but a larger capacity unit with flow rates up to 2,000 CFM could be used. These units would be used to remove contaminated soil from outdoor areas including soils associated with excavations associated with 232-Z Building deactivation/decommissioning. Vacuuming using one of these devices has no specific contamination limit; but rather would be controlled based on the specifics of the situation. If contamination levels over 2,000 disintegrations per minute (dpm) alpha/100 cm^2 (i.e., high surface contamination area) are exceeded, a separate evaluation regarding any monitoring adjustments would be conducted.

Portable HEPA-type-filtered vacuums, portable HEPA-type-filtered exhausters, and various types of containments will also be used, as needed. To demonstrate minor emissions, a contamination survey of the outlet of the HEPA-type filtered device will be performed at the completion of each use.

Due to the nature of the activities using HEPA-type-filtered air movers, significant abated release associated with these devices is not anticipated, and the near field monitoring network would be used to measure air emissions for the activities associated with these temporary point sources in conjunction with the fugitive unit. To demonstrate minor emissions, a contamination survey of the outlet of the HEPA-type-filtered device will be performed at the completion of each use.

Near field ambient air monitoring currently is being performed at several locations around the PFP Complex. Three monitors, designated as N165, N964, and N975, shown in Figure 5-1, will continue to be operated during all activities and operations described in this radioactive air monitoring plan. The Hanford site protocol established for near-facility monitors will be followed for data collection, sampling frequencies, sample analysis, and data reporting (DOE/RL-91-50, or latest revision). Emissions will be reported as part of the Hanford Site annual reporting.

Figure 5-1. Near-Facility Monitoring Stations.



5.1.4 Cultural and Ecological Resource Protection

There are no cultural or ecological resource protection items remaining to be resolved for this removal action.

5.1.5 Surface and Ground Water Impacts

The Washington State Waste Discharge Program (WAC 173-216-020) requires the use of all known available and reasonable methods to prevent and control the discharge of wastes into the waters of the state. Building dismantlement will involve the use of water sprays to limit the amount of dust generated. Water volumes and run off controls will be managed consistent with site-wide discharge and surface water control plans.

5.1.6 Ventilation

The existing 232-Z Facility ventilation system will be maintained for much of the duration of the D&D activities. For those activities that present a potential for significant airborne levels of contaminants inside the structure, alternative approaches to ensure clean air for workers include the use of glovebags, construction of greenhouses, and use of supplied air. As the existing, contaminated sections of the ventilation system are removed, new temporary systems will be installed as needed to ensure adequate air flow is provided to the work areas.

5.2 ADDITIONAL RELEVANT CONTROLS OR ACTIONS

The PFP is a security area within the Hanford Site. Because of the controls related to site access (see Section 6.2), roll-on/roll-off boxes used for transport of waste to the ERDF must be staged for transportation. Boxes filled with debris from demolition will be transferred to a staging area outside the PFP fence, on Camden Avenue to the North of 19th Street, where they will be left in a secure storage area for pick up and transport to the ERDF. Drivers will pick up an empty roll-on container for return to the D&D site. This approach will facilitate the transfer of waste materials without requiring the clearance of ERDF drivers for access to the PFP.

In addition, the 232-Z Facility is in close proximity to other PFP structures. Demolition activities will need to be conducted with the appropriate level of care to ensure that equipment does not inadvertently penetrate the exterior of one of these adjacent buildings, resulting in a security or radiological release concern.

6.0 PROJECT MANAGEMENT AND ORGANIZATION

The project management structure for this removal action is illustrated in Figure 6-1. Personnel roles are discussed in Section 4.2. The balance of this section discusses various aspects of the project organization and program requirements.

6.1 PROJECT SCHEDULE AND COST ESTIMATE

A resource-loaded schedule (Baseline Schedule) has been developed to include activity logic, manpower, and equipment requirements and the cost has been developed accordingly. The schedule is broken down into work activities and project management, and environmental documentation. The work activities include:

- Glovebox process equipment removal
- Glovebox decontamination
- Glovebox removal
- Scrubber Cell decontamination and process equipment removal
- Process exhaust equipment removal
- Filter box & downstream of filter box decontamination and equipment removal
- Characterization of the underground duct between 232-Z and 291-Z
- Removal of remaining building equipment
- Final pre-dismantlement survey
- Structure dismantlement
- 291-Z duct removal
- Structure post dismantlement (slab cover and area posting)
- Endpoint documentation & project closeout.

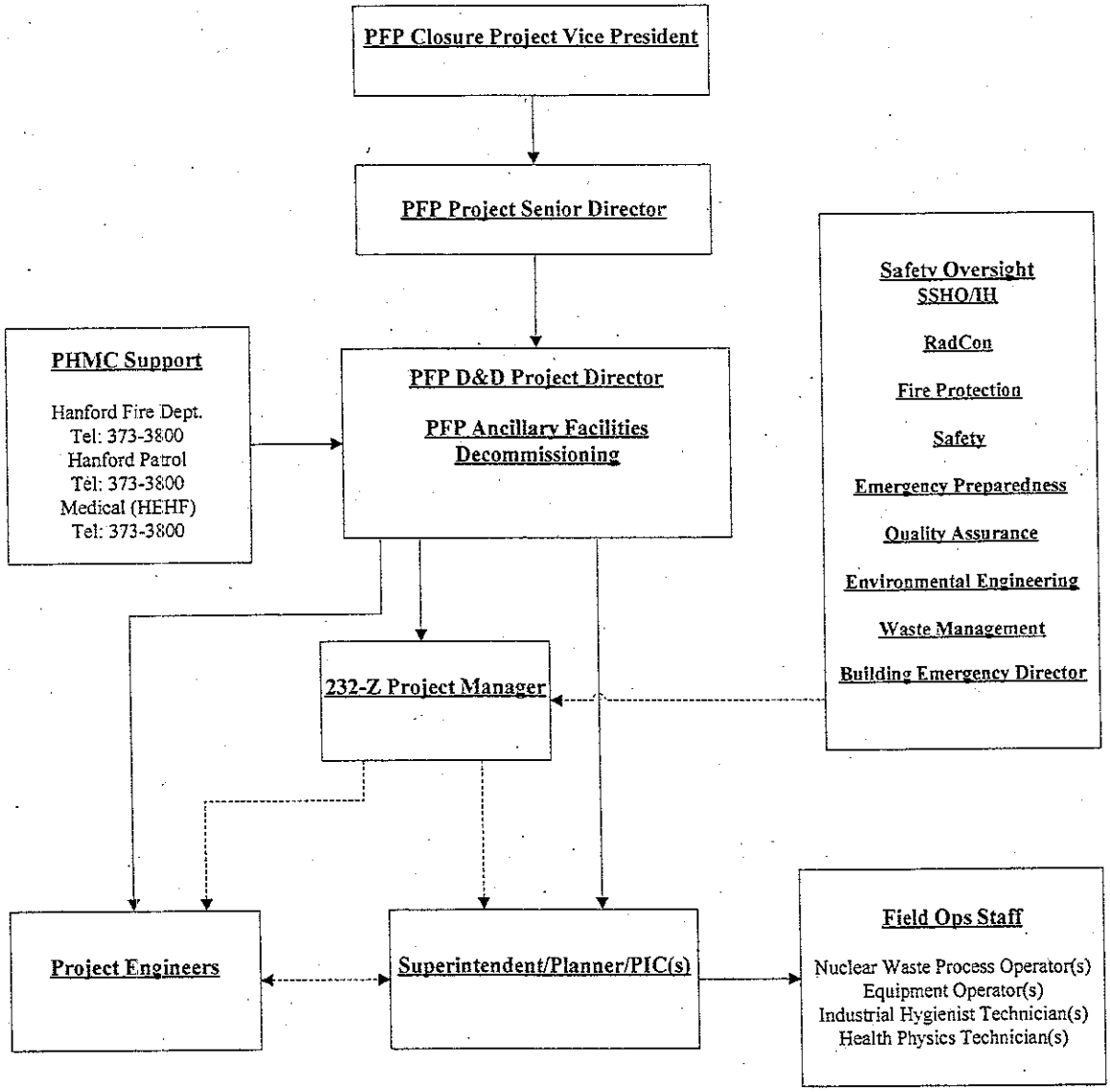
Environmental & waste disposal documentation includes:

- Data quality objectives
- Sampling Analysis Plan
- Removal Action Work Plan
- Sampling and analysis results
- Completion of ERDF documentation.

Earned value methodologies are to be in accordance with FH procedures. Additional major efforts involved in the project include engineering evaluations, project management, waste assaying, and waste processing, which are continuous throughout the project. Weekly 232-Z subproject status meetings are conducted to monitor status against the detailed schedule. Project status is reported monthly to FH PFP D&D management.

The Project completion cost is estimated at $7.12 million and the estimated completion date for the project is September 30, 2006. Appendix B provides the basis of estimate that was used for development of the working budget. Appendix C contains an abbreviated schedule for the removal action identifying the key stages of the project.

Figure 6-1. Project Organization.



6.2 CONDUCT OF OPERATIONS

The conduct of operations guidance for the PFP is contained in a conduct of operations manual. This manual contains all the procedures needed to meet the requirements of DOE Order 5480.19, Conduct of Operations Requirements for DOE Facilities. Excellence in operations is accomplished through establishment of high operating standards by management, communicating operating standards to the workers, providing sufficient resources to the operation organization, ensuring personnel are well trained and properly use written procedures, monitoring operating performance, and by holding all personnel accountable for their performance in conducting activities.

Conduct of operations strongly emphasizes technical competency, workplace discipline, and personal accountability to ensure the achievement of a high level of performance during all activities. Project personnel are responsible for fully complying with the procedures. If conflict arises with other instructions or directions, then work will safely be stopped until resolution is achieved. Safety is the number one priority and all planning shall include appropriate safety analyses to identify potential safety and health risks and the means to appropriately mitigate them. Personnel will not start work until approved safety procedures, instructions, and directions are understood for both normal and abnormal operations. Conduct of operations applies directly to all operating activities at the PFP.

6.3 SECURITY REQUIREMENTS

The PFP is enclosed in a Protected Area (PA) within the 200 West Area of the Hanford Site. Access is restricted to mission-essential personnel with a defined need to enter.

- For unescorted access to the PA, individuals must possess an "L" or "Q" security clearance and a valid DOE security badge with a "Z" access symbol on the badge, or be issued a Special Entrance Authorization (SEA).
- For escorted access to the PA, individuals must request a Special Entrance Authorization at least 24-hours in advance and arrange for a security escort. The PFP security escort must possess the appropriate DOE security badge with the "Z" access symbol. Personnel who must be issued an SEA to enter the PA cannot act as security escorts.
- Possess the proper dosimeter for entry into PFP areas, including a Personal Nuclear Accident Dosimeter.
- Complete PFP Facility Orientation.
- Be entered into the Personnel Accountability System by scanning the barcode on their security badge when entering and exiting.

Additional Requirements:

- Personnel must be cognizant of, and familiar with procedures for Control of Special Nuclear Material (TRU-Waste) during D&D of 232-Z. These controls are identified in the Plutonium Finishing Plant Administrative Manual.

- Personnel must be cognizant of, and familiar with Nuclear Material Transfer and Control requirements identified in the Plutonium Finishing Plant Administrative Manual.

6.4 CHANGE MANAGEMENT AND CONFIGURATION CONTROL

This PFP Configuration Management Plan is implemented by specific procedures whose purpose is to ensure the status and configuration of systems and components are known at all times. These procedures prescribe an integrated Configuration Management (CM) program that supports safe, compliant operation, deactivation, surveillance and maintenance, and decommissioning of the PFP. The program includes the following goals:

- Provide safe operation of PFP through all phases of its life cycle.
- Focus PFP resources and attention in accordance with the importance of requirements, designs, structures, systems, and components to safety and the missions of the PFP, thus enhancing safe, cost-effective performance.
- Collect and disseminate information regarding facility configuration.
- Understand the status of equipment during operation, maintenance, and D&D, including reasons for that status.
- Provide assurance that information about equipment and documents within the CM program is accurate.

6.5 PERSONNEL TRAINING AND QUALIFICATIONS

Personnel who will support the D&D activities for the 232-Z Facility must receive training that conforms to the requirements found in the PFP D&D Training Plan.

The on-site Environmental Safety and Health Training Program provides personnel with the knowledge and skills necessary to safely execute their assigned duties. A graded approach is used to ensure that personnel receive a level of training commensurate with their responsibility and complies with applicable DOE Orders and government regulations. Highlights of the training requirements are as follows:

- All employees receive HGET.

- Visitors and personnel not normally assigned to the D&D of the 232-Z, who perform work in the fenced area, shall have facility orientation and HGET, or GERT and an escort.

- As determined by the Project Manager, dismantlement/demolition procedures for the facility will be reviewed and validated prior to implementation.

When craft personnel are performing work, the Field Work Supervisor is responsible for ensuring that the personnel have received the required site-specific training. Examples of the site-specific training requirements are identified below:

- 40-Hour Hazardous Waste Worker, plus eight hours of field experience (for work in the exclusion or contamination reductions zones).
- Pre-entry briefing on the health and safety plan and applicable RWP.
- Respirator training (as required by job assignment).
- First aid (two qualified persons per shift/crew).
- Certified Asbestos Worker and/or Asbestos Awareness (as required by job assignment).
- Lead Worker (as required by job assignment).
- Radiation Worker II (as required by RWP).
- Radiation Worker I (for access to contamination reduction zone/radiological buffer area).

Specialized personnel training also includes pre-job briefings, on the job training, emergency preparedness, plans of the day, and facility/work-site orientations. Specialized training will occur, as needed, to instruct personnel in the use of non-standard equipment, performance of abnormal operations, and hazards associated with specific activities.

6.6 PLAN FOR READINESS

The plan for readiness is governed by DOE Order 425.1B, "Startup and Restart of Nuclear Facilities" . This DOE Order is implemented site wide for FH managed activities via guidance that identifies the level of detail and preparation that must be achieved prior to initiation of any task. The project will employ a phased startup process for ensuring project readiness. Activities will be evaluated to determine the level of project readiness review required prior to work initiation.

Activities associated with decontamination of the facility include:

- Glovebox process equipment removal
- Glovebox decontamination
- Glovebox size reduction and removal
- Scrubber cell decontamination and equipment removal (including SW corner of building)
- Decontamination and removal of process exhaust ducting and filter boxes
- Removal of the 296-Z-14 stack, ducting and fans
- Characterization of the ventilation ducting below the 232-Z Facility
- Waste packaging, removal and shipment.

Initiation of the first decontamination activity, glovebox process equipment removal, has already been graded and requires a contractor readiness assessment. Initiation of follow-on decontamination activities will be governed by the 232-Z Decommissioning Startup Plan. This startup plan requires focused interim oversight for follow-on decontamination activities.

Initiation of building dismantlement and initiation of site stabilization will be evaluated to determine the appropriate level of readiness review.

6.7 QUALITY ASSURANCE REQUIREMENTS

The quality assurance (QA) requirements for the 232-Z D&D project are described within FH quality program documents. HNF-MP-599, *Quality Assurance Program Description* (QAPD), provides FH the overall basis for quality on the Hanford Site, consistent with EPA QA/R-2. Specific requirements, not addressed in the QAPD, are addressed in subordinate Quality Assurance Program Plans (QAPPs) and Quality Assurance Project Plans (QAPjPs). QA specific to 232-Z D&D activities is described in a quality assurance plan prepared specifically for the D&D of the 232-Z Facility.

7.0 PROJECT CLOSEOUT

Removal of the 232-Z Facility will be completed when the building has been removed with the slab and foundation left intact (slab-on grade). Swipes and chips will be taken of the slab to characterize residual contamination prior to placement of a cover cap or other fixative, if needed, and the area surrounding the slab will be surveyed in accordance with the regulator-approved sampling plan. The characterization effort will verify the remaining conditions at the conclusion of the removal action. The final status characterization report will be submitted to the DOE and Ecology in accordance with the final status SAP and entered into the administrative record.

The slab and any subsurface/soil contamination adjacent to the facility will be addressed as part of a future, integrated remedial action for below-grade structures and contamination within the PFP.

8.0 REFERENCES

10 CFR 61, "Licensing Requirements for Land Disposal of Radioactive Waste," *Code of Federal Regulations*, as amended.

10 CFR 835, "Department of Energy Occupational Radiation Protection," *Code of Federal Regulations,* as amended.

29 CFR 1910, "Occupational Safety and Health Standards," *Code of Federal Regulations*, as amended.

29 CFR 1926, "Safety and Health Regulations for Construction," *Code of Federal Regulations,* as amended.

40 CFR 61, "National Emission Standards for Hazardous Air Pollutants," *Code of Federal Regulations*, as amended.

40 CFR 260, "Hazardous Waste Management System," *Code of Federal Regulations,* as amended.

40 CFR 268, " Land Disposal Restrictions," *Code of Federal Regulations,* as amended.

40 CFR 761, "Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions," *Code of Federal Regulations*, as amended.

49 CFR 171, "General Information, Regulations, and Definitions," *Code of Federal Regulations*, as amended.

49 CFR 172, "Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements," *Code of Federal Regulations*, as amended.

49 CFR 173, "Shippers – General Requirements for Shipments and Packagings," *Code of Federal Regulations*, as amended.

49 CFR 174, "Carriage by Rail," *Code of Federal Regulations*, as amended.

49 CFR 175, "Carriage by Aircraft," *Code of Federal Regulations*, as amended.

49 CFR 176, "Carriage by Vessel," *Code of Federal Regulations*, as amended.

49 CFR 177, "Carriage by Public Highway," *Code of Federal Regulations*, as amended.

49 CFR 178, "Specifications for Packagings," *Code of Federal Regulations*, as amended.

49 CFR 179, "Specifications for Tank Cars," *Code of Federal Regulations*, as amended.

BHI, 2003, *Environmental Restoration Disposal Facility Waste Acceptance Criteria,* BHI-00139, as revised, Bechtel Hanford, Inc., Richland, Washington.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 USC 9601 et seq.

DOE/EPA, 1995, *Policy on Decommissioning of Department of Energy Facilities Under CERCLA,* U.S. Department of Energy and U.S. Environmental Protection Agency.

DOE-RL, 1993, *Hanford Site Hoisting and Rigging Manual,* DOE/RL-92-36, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE-RL, 1994, *Hanford Emergency Management Plan,* DOE/RL-94-02, as amended, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE-RL, 2003, *Engineering Evaluation/Cost Analysis for the Removal of the Contaminated Waste Recovery Process Facility Building 232-Z,* DOE/RL-2003-29, Rev. 2, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-2004-22, 2004, *Sampling and Analysis Plan for the Contaminated Waste Recovery Process Facility, Building 232-Z,* Fluor Hanford, Richland, Washington.

Ecology, 2003, "Hanford Federal Facility Agreement and Consent Order," Document No. 89-10, Washington State Department of Ecology.

HNF-20848, 2004, *232-Z Site Specific Health and Safety Plan,* Rev. 0, Fluor Hanford, Inc., Richland, Washington.

HNF-20861, 2004, *Quality Assurance Project Plan for Decontamination and Decommissioning of the Plutonium Finishing Plant 232-Z Facility,* Rev. 0, Fluor Hanford, Inc., Richland, Washington.

HNF-20862, 2004, *232-Z Contaminated Waste Recovery Process Facility Waste Management Plan,* Rev. 0, Fluor Hanford, Inc., Richland, Washington.

HNF-20863, 2004, *Radioactive Air Monitoring Plan for the Deactivation and Decommissioning of the 232-Z Facility,* Rev. 0, Fluor Hanford, Inc., Richland, Washington.

HNF-20890, *232-Z Contaminated Waste Recovery Process Facility Demolition Plan,* Fluor Hanford, Inc., Richland, Washington.

HNF-IP-0263-PFP, *Building Emergency Plan for Plutonium Finishing Plant Complex,* Rev. 5, Westinghouse Hanford Company, Richland, Washington.

HNF-MP-599, "Quality Assurance Program Description," Rev. 11, 1/13/03, Fluor Hanford, Richland, Washington.

HNF-SD-CP-SAR-021, 2002, *Plutonium Finishing Plant Final Safety Analysis Report*, Rev. 4, Fluor Hanford, Richland, Washington.

NFPA 30, *Flammable & Combustible Liquids Code,* 1996 Edition, National Fire Protection Association, Quincy, Massachusetts.

NFPA 701, *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films,* 1999 Edition, National Fire Protection Association, Quincy, Massachusetts.

WAC 173-216, "State Waste Discharge Permit Program," *Dangerous Waste Regulations*, Washington Administrative Code, as amended.

WAC 173-303, "Dangerous Waste Characteristics," *Dangerous Waste Regulations*, Washington Administrative Code, as amended.

WAC 246-247, "Radiation Protection – Air Emissions," *Dangerous Waste Regulations*, Washington Administrative Code, as amended.

Westsik, G.A., 2002, "Review of 232-Z E-4 Ductwork Assay Information," internal letter to D.W. Nelson, August 2,2002, Richland, Washington.

Letter, 04-AMCP-0486, K. A. Klein, DOE-RL to M. A. Wilson, Ecology, *Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Non-Time Critical Removal Action Memorandum for Removal of the 232-Z Contaminated Waste Recovery Process Facility at the Plutonium Finishing Plan.*

APPENDIX A

SAMPLING SUMMARY APPROACH

CONTENTS

TABLES

ACRONYMS

COC	contaminants of concern
PFP	Plutonium Finishing Plant
RCRA	*Resource Conservation and Recovery Act of 1976*
SAP	sampling and analysis plan

A.1.0 INTRODUCTION

The *Sampling and Analysis Plan for the Contaminated Waste Recovery Process Facility, Building 232-Z* (DOE/RL-2004-22) defines the characterization process for the 232-Z facility based on the following facility-specific considerations:

- The radiological characteristics (Phase 1 and Phase 2).
- The non-radiological characteristics.

A summary level description of the sampling design as discussed in the Sampling and Analysis Plan (SAP) is provided below. Detailed instructions, utilizing the existing Plutonium Finishing Plant (PFP) Fluor Hanford, Inc. work control system (i.e. work packages and procedures), will be developed to implement the sampling approach. The work package and/or procedure(s) to be developed for collecting the samples will provide instructions on what samples will be taken and from where.

Phase 1 samples will be collected and analyzed to establish the baseline radionuclide contamination levels and establish the radionuclide ratios for specific areas. During the Phase 1 radiological characterization, non-radiological characterization samples also will be collected. The non-radiological samples will assist in the determination of the presence and concentration of dangerous waste constituents. Phase 2 will include radiological evaluation of specific areas to support designation of debris streams.

A.2.0 RADIOLOGICAL CHARACTERIZATION

The SAP discussed the following types of samples to be collected for radiological analysis:

- Surface measurements (swipes and direct measurement).
- Volumetric contamination within a matrix (such as sludge).
- Contamination entrapped within paint.

Areas of potential contamination were defined in the SAP based on the potential contamination levels within the 232-Z Facility (high, medium, and low). The implementation process for collecting samples within the 232-Z Facility will provide instruction on how to sample the areas, which were defined as follows:

- GloveBox (high potential for radioactivity)
- Scrubber Cell (high potential for radioactivity)
- Process Room (medium potential for radioactivity)
- Exhaust/Filter/Storage room (medium potential for radioactivity)
- Chemical Mix Room (medium potential for radioactivity)
- Exhaust Stack and External fans (medium potential for radioactivity)
- Ventilation Supply Room (low potential for radioactivity)
- Electrical Room (low potential for radioactivity)

- Exterior roof (low potential for radioactivity)
- Pipes (all areas)
- Slab and remaining below grade (To Be Determined prior to sampling).

Each of the above areas within the 232-Z Facility is further defined for the radiological characterization, as follows:

- Painted cement block walls and cement floor, interior ceiling, walls.
- Unpainted metal, glass and plastic not sprayed with fixative.
- Painted metal, glass, and plastic.
- Southwest Block Wall (additional characterization considerations).
- Cement Floor in Southwest Corner (Assume Southwest Area Under the Scrubber – additional characterization considerations).

The characteristics of the areas discussed above (i.e., high, medium, and low) will determine the type of samples that may be needed. As the work package and/or procedure for collecting samples is implemented, instructions will describe which areas will have paint samples composited, where surface contamination measurements will be taken, and where volumetric samples (for sludges) are required.

A.3.0 NON-RADIOLOGICAL CHARACERIZATION

The non-radiological sampling will consist of identification of contaminants of concern (COCs) within the areas defined below:

- Process Room
- Scrubber Cell
- Ventilation Supply Room
- Exhaust/Filter/Storage room
- Electrical Room
- Chemical Mix Room
- Exhaust Stack and External fans
- Roof
- Slab and remaining below grade.

Table A.3-1 summarizes the sampling within the 232-Z facility:

Table A.3-1. Building 232-Z Sampling Design. (2 Sheets)

COC		Sample Description [b,c]	Number of Samples for Fixed Laboratory Analysis
SAMPLE LOCATION: SCRUBBER CELL SOUTHWEST CORNER WALLS AND FLOOR BETWEEN 5-12 SAMPLES TOTAL TO BE COLLECTED			
GROUP 1 [a]	Radiological	Concrete block (lower ¼th of wall, remaining wall and floor – 3 separate strata)	3 from each stratum in this area.
	Non-Radiological	Southwest wall and floor Construction Material - Concrete block and floor	1 to 3 depending on volume for pH.
	Radiological	Floor drain	1-3 (depending on volume) from pooled drain sediments from all HIGH areas.
	Non-Radiological	Floor drain	1 to 3 depending on available volume
	Radiological	Paint	Composite 5-7 scraped areas (all colors) into one sample from the 'HIGH' area. Analyze 3 aliquots of composite.
	Non-Radiological	Paint	Collect 1 composite sample for each color of paint from scrubber area
	Radiological	Equipment (painted)	If painted, 1 per each color of paint
	Radiological	Equipment (unpainted)	1 to 3 depending on available volume
	Non-Radiological	Equipment	If painted, 1 per each color of paint
	Radiological	Piping interior and exterior	1-3 (depending on volume) from each container of pooled liquid
	Non-Radiological	Piping interior	pH test
SAMPLE LOCATION: PROCESS ROOM, EXHAUST/ FILTER AREA, STORAGE ROOM, CHEMICAL MIX ROOM, AND PIPING (ALL AREAS) BETWEEN 7-11 SAMPLES TOTAL TO BE COLLECTED			
GROUP 2 [a]	Radiological	Floor drain	1-3 (depending on volume) from pooled drain sediments from all MEDIUM areas
	Non-Radiological	Floor drain	1-3 (depending on volume) from pooled drain sediments from all MEDIUM areas
	Radiological	Paint	Composite 5-7 scraped areas to one sample from this functional area in the MEDIUM area. Analyze one aliquot of composite.
	Non-Radiological	Paint	Composite 5-7 samples from Group 2 and 3 (total) for each color.
	Radiological	Filter and filter box	3 filters will be cored
	Radiological	Equipment (painted)	1 to 3 depending on available volume
	Radiological	Equipment (unpainted)	1 to 3 depending on available volume
	Non-radiological	Equipment (painted)	1 to 3 depending on available volume

Table A.3-1. Building 232-Z Sampling Design. (2 Sheets)

COC		Sample Description [b,c]	Number of Samples for Fixed Laboratory Analysis
	Radiological	Piping interior and exterior	1-3 (depending on volume) from each container of pooled liquid
	Non-Radiological	Piping interior	pH test
SAMPLE LOCATION: VENTILATION SUPPLY ROOM, CHANGE ROOM, AND ELECTRICAL ROOM BETWEEN 4-9 SAMPLES TOTAL TO BE COLLECTED SAMPLES TOTAL			
GROUP 3 [a]	Radiological	Paint	Composite 5-7 scraped areas to one sample from this functional area in the LOW area. Analyze one aliquot of composite
	Non-Radiological	Paint	Composite 5-7 samples from Group 2 and 3 (total) for each color.
	Radiological	Equipment (painted)	1 to 3 depending on available volume
	Radiological	Equipment (unpainted)	1 to 3 depending on available volume
	Non-Radiological	Equipment (painted)	1 to 3 depending on available volume
	Radiological	Oil reservoirs	1 to 3 depending on the volume from each container of pooled oil from all areas in the LOW area.
	Non-Radiological	Oil reservoirs	1 per container of oil or per type of oil
	Non-Radiological	Bearing grease	1 per container of grease and composite
	Radiological	Piping interior and exterior	1-3 (depending on volume) from each container of pooled liquid
	Non-Radiological	Piping interior	pH test
	Radiological	Floor drain	1-3 (depending on volume) from pooled drain sediments from all LOW areas
	Non-Radiological	Floor drain	1-3 (depending on volume) from pooled drain sediments from all LOW areas
Other Sampling			
Exterior Roof	Radiological	Composite of the roof	1 to 3 based on walk down
Slab and below grade structures	Radiological and Non-Radiological	TBD	TBD

Table A.3-1. Building 232-Z Sampling Design. (2 Sheets)

COC	Sample Description [b,c]	Number of Samples for Fixed Laboratory Analysis

a. The SAP discusses the groupings listed above as: Group 1: High Potential For Radioactivity, Group 2: Medium Potential For Radioactivity, and Group 3: Low Potential For Radioactivity
b. Paint is assumed to be oil based and will be sampled for RCRA metals and PCBs. If paint is latex, mercury will be added as a COC.
c. The radiological and non-radiological samples identified per the SAP will be analyzed for the COC depending on the identified matrix. The equipment (unpainted) will represent: glove box materials, fluorescent light ballast/tubes, miscellaneous equipment, incandescent light bulbs, fans, stack, asbestos, led packing, etc. The areas within the 232-Z will be systematically inventoried to determine the contents in each area. The actual sample media are discussed in the SAP Table 3-3 for the non-radiological COCs.

COC = contaminant of concern
PCB = polychlorinated biphenyl
RCRA = *Resource Conservation and Recovery Act of 1976*
SAP = sampling and analysis plan

A.4.0 REFERENCES

DOE/RL-2004-22, 2004, *Sampling and Analysis Plan for the Contaminated Waste Recovery Process Facility, Building 232-Z*, Fluor Hanford, Richland, Washington.

DOE-RL-91-50, Revision 3, *Environmental Monitoring Plan,* U.S. Department of Energy-Richland Operations Office, Richland, Washington.

HNF-3602, Revision 1, *Calculating Potential-to-Emit Releases and Doses for Facility Environmental Monitoring Plan (FEMP) and NOCs,* January 2002.

APPENDIX B

232-Z BASIS OF ESTIMATE BY ACTIVITY/RESOURCE(S)

This page intentionally left blank.

232-Z Basis of Estimate by Activity/Resource(s)

WBS Number 3.03.03.05.01.01 ***WBS Title*** Transition 232-Z

The resources and durations identified are based upon proposed project plan discussions with PFP Engineering, Operations, and Maintenance personnel during two (2) workshop reviews with PFP Subject Matter Experts (Sees). Additionally, walk-throughs of the 232-Z building in July and August 2002 confirmed known pre-requisite activities to glovebox re-activation and served to validate the preliminary schedule and resource requirements. In addition, these estimates are based on information obtained during a site visit to the Rocky Flats Environmental Technology Site (RFETS), where decommissioning Lessons Learned were discussed and field activities were witnessed. Also, these estimates incorporate pertinent data from the Power Tool estimate performed in 1999.

WBS Number 3.03.03.05.01.01.02 ***WBS Title*** 232-Z Decon/Process Equipment Removal

Schedule Activity ID EAAAJ005 ***Title*** 232-Z Glovebox-Decon/Process Equipment Removal
This activity accounts for those resources necessary to:

1. Perform general room preparation activities to commence the glovebox process equipment removal phase.
2. Remove the process equipment inside the glovebox, and attempt to decontaminate the glovebox. Decontamination activities will be conducted as part of a Field Alternative Technology Evaluation (FATE).
3. Design, build, and install a greenhouse and anteroom to provide containment for removing waste from the building.

Schedule Activity ID EAAAJ010 ***Title*** 232-Z Glovebox Removal
This activity accounts for those resources necessary to:

1. Execute the installation and removal of glovebox size reduction system(s) for physical removal and disposal of the gloveboxes and other contaminated glovebox support equipment outside of the glovebox.
2. Size-reduce the glovebox as part of the Field Alternative Technology Evaluation (FATE). Included in this activity is packaging the waste for disposal to either the LLW burial grounds or to WIPP.
3. Design, build, and install a greenhouse and anteroom for glovebox size reduction.

Schedule Activity ID EAAAJ020 ***Title*** 232-Z Scrubber Cell-Decon/Process Equipment Removal
This activity accounts for the resources necessary to:

1. Design, build, and install a greenhouse and anteroom for entry into the scrubber cell via the north door.
2. Perform general housekeeping and maintenance activities prior to initiating decontamination and process equipment removal activities inside the scrubber cell. This includes, but is not limited to, re-lamping, re- activation of differential pressure gauges on the north wall of the scrubber cell, and verification of the open electrical wiring protruding from electrical conduit.
3. Remove the process-contaminated equipment inside the scrubber cell. Direct–contact and potential remote technologies/techniques will be employed to decontaminate the cell and remove process equipment. These technologies/techniques would include, but are not limited to chemical, brushing, washing, scrubbing, and vacuum cleaning. Process equipment removal activities will be conducted in an Airborne Radioactivity Area (ARA), therefore requiring supplied breathing air for the workers involved. Heavy equipment inside will require special lifting devices for removal to the scrubber cell door and to the final disposal container.

Schedule Activity ID EAAAJ025 ***Title*** 232-Z Process Exhaust – Decon/Process Equipment Removal
This activity accounts for the resources necessary to:

1. Prepare the room for removal of the process exhaust ductwork inside the process room. This effort entails the installation of scaffolding to support elevated work conditions.
2. Design, build, and install glovebags for containment.
3. Decontaminate the process exhaust as part of a Field Alternative Technology Evaluation (FATE), based on Lessons Learned from the glovebox FATE.
4. Package waste for disposal to WIPP.

Specific resource types and estimated quantities were initially developed on preliminary estimate worksheets during two (2) workshop reviews with PFP Subject Matter Experts (SMEs). Information from these worksheets was provided to P3 schedulers for input into resources by activity. It was determined that maintaining configuration control of the preliminary estimate worksheets would not be cost effective. For example, consumables (cost element 10P) were removed from each activity and moved to one project management activity (WBS 3.03.03.05.21). Other changes have included adjustments in waste volume, subcontract and consultant requirements. Waste volume projections were estimated by a former RFETS solid waste employee and are based on field/drawing measurements and a validated RFETS expansion factor of 30%. Preliminary activity identification values were modified to the P3 "smart" identification codes. This statement applies to all activities within WBS 3.03.03.05.

Schedule Activity ID EAAAJ030 ***Title*** 232-Z Filter Boxes - Decon/Process Equipment Removal
This activity accounts for the resources necessary to:

1. Prepare the room for removal of the two process exhaust filterboxes inside the process room.
2. Design, build, and install containment greenhouses.

3. Decontaminate the filterboxes as part of a Field Alternative Technology Evaluation (FATE), based on Lessons Learned from the glovebox FATE.
4. Package waste for disposal to WIPP.

Schedule Activity ID EAABJ050 ***Title*** 291-Z Duct Isolation-Decon/Process Equipment Removal

This activity accounts for the resources necessary to:

1. Prepare the room for removal of the inactive portion of the 232-Z exhaust duct inside 291-Z.
2. Design, build, and install containment greenhouses for duct removal.
3. Remove the duct.
4. Decontaminate ductwork as part of a Field Alternative Technology Evaluation (FATE), based on Lessons Learned from the glovebox and process exhaust FATE.
5. Package waste for disposal to WIPP.

Schedule Activity ID EAABJ050 ***Title*** 291-Z Duct Isolation-Decon/Process Equipment Removal

This activity is a continuation of schedule activity GAABJ030 into fiscal year 05 and accounts for the resources necessary to:

1. Continue the duct removal process.
2. Decontaminate ductwork as part of a Field Alternative Technology Evaluation (FATE), based on Lessons Learned from the glovebox and process exhaust FATE.
3. Package waste for disposal to WIPP.
4. Seal the duct at the west wall of 291-Z.

Schedule Activity ID EAAAJ035 ***Title*** 232-Z Downstream of Filter Boxes - Decon/Process Equipment Removal

This activity accounts for the resources necessary to:

1. Prepare the room for removal of the duct down stream of the filter boxes and upstream of the testable HEPA filters in the HEPA filter room.
2. Design, build, and install containment greenhouses for duct removal.
3. Remove the duct.
4. Decontaminate ductwork as part of a Field Alternative Technology Evaluation (FATE), based on Lessons Learned from the glovebox and process exhaust FATE.
5. Package for disposal to either the LLW burial grounds or to WIPP.

WBS Number 3.03.03.05.01.01.03 ***WBS Title*** 232-Z Deactivation

Schedule Activity ID GAACJ045 ***Title*** 232-Z Deactivate Utilities Outside Glovebox

This activity accounts for the resources necessary to:

1. Deactivate utilities/equipment that supplies/supports the gloveboxes in preparation for glovebox removal activities and building dismantlement
2. Package for disposal to either the LLW burial grounds or to WIPP.

The following lists general activities associated with facility deactivation:

1. Deactivation and removal of differential pressure gauges and tubing not previously removed,
2. Removal of portable items, supplies and equipment,
3. Decontamination of removed equipment to meet criteria for waste disposal,

Schedule Activity ID GAACJ050 ***Title*** 232-Z-Deactivate Utilities Outside Scrubber Cell

This activity accounts for the resources necessary to:

1. Deactivate utilities/equipment that supplies/supports the scrubber cell in preparation for glovebox removal activities and building dismantlement
2. Package for disposal to either the LLW burial grounds or to WIPP.

The following lists general activities associated with facility deactivation:

1. Deactivation and removal of magnahelic differential pressure gauges and tubing,
2. Removal of portable items, supplies and equipment,
3. Decontamination of removed equipment to meet criteria for waste disposal,

Schedule Activity ID GAACJ055 ***Title*** 232-Z-Deactivate and Remove Utilities Outside Filter Boxes

This activity accounts for the resources necessary to:

1. Deactivate utilities/equipment that supplies/supports the scrubber cell in preparation for glovebox removal activities and building dismantlement
2. Package for disposal to either the LLW burial grounds or to WIPP.

The following lists general activities associated with facility deactivation:

1. Deactivation and removal of magnahelic differential pressure gauges and tubing,
2. Removal of portable items, supplies and equipment,
3. Decontamination of removed equipment to meet criteria for waste disposal,

Schedule Activity ID GAACJ060 ***Title*** 291-Z-Inactive Duct Isolation-Deactivate Utilities

This activity accounts for the resources necessary to:

1. Deactivate utilities/equipment that supplies/supports the scrubber cell in preparation for glovebox removal activities and building dismantlement
2. Package for disposal to either the LLW burial grounds or to WIPP.

The following lists general activities associated with facility deactivation:

1. Deactivation and removal of magnahelic differential pressure gauges and tubing,
2. Removal of portable items, supplies and equipment,
3. Decontamination of removed equipment to meet criteria for waste disposal,

Schedule Activity ID EAABJ030 ***Title*** 232-Z-Deactivate Inactive Duct

This activity accounts for the resources necessary to:

1. Prepare the room for the application of fixatives/concrete to deactivate the inactive duct.
2. Design, build, and install containment greenhouses for inactive duct deactivation.
3. Deactivate inactive duct.

Schedule Activity ID GAACK070 ***Title*** 232-Z Downstream Filter Boxes-Deactivate Utilities

This activity accounts for the resources necessary to:

1. Deactivate utilities/equipment that supplies/supports the filter boxes in preparation for glovebox removal activities and building dismantlement
2. Package for disposal to either the LLW burial grounds or to WIPP.

The following lists general activities associated with facility deactivation:

1. Deactivation and removal of magnahelic differential pressure gauges and tubing,
2. Removal of portable items, supplies and equipment,
3. Decontamination of removed equipment to meet criteria for waste disposal,

Schedule Activity ID GAACK075 ***Title*** 232-Z-Deactivate and Remove Utilities from Structure

This activity accounts for the resources necessary to:

1. Deactivate utilities/equipment that supplies/supports the 232-Z building in preparation for building dismantlement
2. Removal of portable items, supplies and equipment,
3. Decontamination of removed equipment to meet criteria for waste disposal,
4. Package for disposal to either the LLW burial grounds or to WIPP.

WBS Number 3.03.03.05.01.01.01.04 ***WBS Title*** 232-Z Decon/Equipment Removal

Schedule Activity ID EAACK045 ***Title*** Characterize Inactive Ventilation Duct East To West

This activity accounts for the resources necessary to:

1. Prepare the 291-Z room for east to west characterization activities.
2. Characterize the inactive underground duct from east to west for SNM holdup and structural integrity as part of a Field Alternative Technology Evaluation (FATE).
3. Remove/decontaminate characterization equipment to prepare for west to east underground duct characterization activities.
4. Seal the duct at the west wall of 291-Z at the completion of the characterization activity.

Schedule Activity ID EAABK015 ***Title*** Characterize Inactive Ventilation Duct West To East

This activity accounts for the resources necessary to:

1. Prepare the 232-Z room for west to east characterization activities.
2. Characterize the inactive underground duct from west to east for SNM holdup and structural integrity as part of a Field Alternative Technology Evaluation (FATE).
3. Remove/decontaminate characterization equipment for other PFP characterization activities.
4. Seal the ducts inside 232-Z per the approved End Points.

Schedule Activity ID EAABK035 ***Title*** 232-Z Structure-Equipment Removal-Fans/Duct/Stack

This activity accounts for the resources necessary to:

1. Remove and size-reduce the equipment/duct in the HEPA filter room and the duct, fans and stack located outside the facility. Most of this equipment/duct will be disposed of as building rubble and is forecasted in WBS number 3.03.03.05.01.01.05. However, some items will require removal due to pre-dismantlement space requirements and characterization activities and worker safety constraints.
2. Construct a greenhouse on the outside and on the inside of the southwest corner of the facility for contaminated cinderblock disposition.
3. Assemble air mover to exhaust greenhouse into existing ventilation system.
4. Characterize (in-house) load-bearing, contaminated cinderblocks on the southwest corner of the facility
5. Shore up the area where the load-bearing, contaminated cinderblocks on the southwest corner of the facility will be removed, if necessary. Remove blocks and package as TRU waste.
6. Complete formal stack closure activities.

Schedule Activity ID EAABK040 ***Title*** Final 232-Z Survey-Pre-Dismantlement

This activity accounts for the resources necessary to:

1. Characterize (radiological and chemical for off-site analysis) the facility per the approved Sampling and Analysis Plan (SAP) in preparation for dismantlement.
2. Perform final radiological and other surveys in preparation for dismantlement.

WBS Number 3.03.03.05.01.01.05 ***WBS Title*** 232-Z Dismantlement

Schedule Activity ID EAACK015 ***Title*** 232-Z Structure-Dismantlement

This activity accounts for the resources necessary to:

1. Apply any required fixatives in preparation for building demolition.
2. Remove and dispose of the building structure and any remaining equipment for disposal to ERDF.

WBS Number 3.03.03.05.01.01.06 ***WBS Title*** 232-Z Post-Dismantlement Stabilization

Schedule Activity ID EAACK020 ***Title*** 232-Z Structure-Post-Dismantlement

This activity accounts for the resources necessary to:

1. Prepare for the installation of a clean slab on grade for 20-year surveillance and maintenance activities, per the approved End Points.
2. Decontaminate portions of the remaining structure that are exposed to the weather.
3. Decontaminate or fix in place any near surface soil contamination.
4. Install a 20-year covering over dismantled structures or fixed in place soil contamination.
5. Perform all other actions necessary to transition the remaining structure to a surveillance and maintenance (S&M) mode, per the approved End Points.

WBS Number 3.03.03.05.01.01.07 ***WBS Title*** 232-Z Modification

Schedule Activity ID GAAGH115 ***Title*** Install Room Air Coolers

This activity accounts for the resources necessary to:

1. Install three room air coolers.

This estimate is based on upon proposed project plan discussions with PFP Engineering, Operations, and Maintenance personnel during two (2) workshop reviews with PFP Subject Matter Experts (SMEs).

Schedule Activity ID EAABJ025 ***Title*** Fab/Install New Room Exhaust into Process Room

This activity accounts for the resources necessary to:

2. Fabricate a new room exhaust duct.
3. Install a new room exhaust duct into the process room prior to the deactivation of the east-west portion of the inactive 232-Z/291-Z duct and prior to approval to dismantle.

WBS Number 3.03.03.05.01.01.08 ***WBS Title*** 232-Z Project Support

Schedule Activity ID GAAHH160 ***Title*** FY03-232-Z-Prepare EE/CA and Action Memo

This activity includes all engineering, field walk-downs and other tasks necessary to prepare, review and approve the Engineering Evaluation/Cost Analysis (EE/CA) and Action Memorandum to support D&D transition activities. In addition, this activity includes a qualitative streamlined risk evaluation and a Community Relations interface activity. The estimated cost for this activity is based on FH Environmental Engineering best judgment.

Schedule Activity ID GAAHH155 ***Title*** FY03-232-Z-Prepare DSA

This activity includes all engineering, field walk-downs and other tasks necessary to prepare, review and approve the DOE-STD-1120 Documented Safety Analysis (DSA) for 232-Z. The estimated cost for this activity is based on Authorization Basis SME best judgment.\

Schedule Activity ID GAAHH205 ***Title*** 232-Z D&D New Hire Training

This activity includes the cost of hiring and training 17 employees for the 232-Z D&D Project Team. This Team consists of: 1 manager, 1 Planner, 1 PIC, 5 NCOs, 2 RCTs, 1 electrician, 2 pipefitters, 2 sheet metal workers, 1 professional and 1 other craft.

Schedule Activity ID EAAAJ015 ***Title*** 232-Z Project Support (FY03)

This activity includes all engineering, field walk-downs and other tasks necessary to implement the Field Alternative Technology Evaluation (FATE) for decontamination. Two or more technology decontamination agents will be assessed during the performance of the 232-Z Glovebox-Decon/Process Equipment Removal activity. The cost for this activity includes labor (Test Plans/Final Reports and technical assistance), materials, contracts, travel and Pacific Northwest National Laboratory (PNNL) support.
This activity includes all engineering, field walk-downs and other tasks necessary to implement the Field Alternative Technology Evaluation (FATE) for size reduction. The cost for this activity includes a 5-day mockup installation task at a non-PFP facility, demonstration & training for 15 days and disassembly of the mockup activity at 2 days.

This activity includes engineering and project management consulting services to provide assistance in developing detailed working level schedules. These schedules supported by historical knowledge from other decommissioned facilities will assist in expediting the decommissioning activities of 232-Z and other PFP facilities. In addition, these contractors, by working in the field, will monitor actual progress, successes and failures, to develop real time lessons learned to refine future planning activities. These specific contractors will have "L" or "Q" cleared personnel with decommissioning, operations, maintenance, planning/scheduling, and basis of estimate experience.

This activity includes field walk-down support from engineering, supervisors, planners, craftsmen, safety professionals NCOs and RCTs and all other tasks necessary to prepare detailed work packages. This activity also includes the procurement of all 232-Z-specific materials/equipment, such as supplied breathing air manifolds, tools, etc.

This activity includes travel for PFP employees to capture Lessons Learned from other D&D sites. Three (3) trips (six (6) employees @ $12K per trip.

This activity includes all engineering, field walk-downs and other tasks necessary to procure/lease and install a change trailer.

Schedule Activity ID EAABJ080 ***Title*** Prepare RAWP; HASP, DQO, SAP, AMP, WMP, EPHA, QAPjP

This activity includes all engineering, field walk-downs and other tasks necessary to prepare, review and approve the Remedial Action Work Plan (RAWP), which includes the following components: Health and Safety Plan (HASP), Data Quality Objectives (DQO), Sampling & Analysis Plan (SAP), Quality Assurance Project Plan (QAPjP), Air Monitoring Plan (AMP), Stack Closure Plan, Waste Management Plan (WMP) and Emergency Preparedness Hazard Assessment (EPHA). The estimated cost for this activity is based on FH Environmental Engineering best judgment.

Schedule Activity ID EAABJ015 ***Title*** 232-Z Project Support (FY04)

This activity includes all engineering, field walk-downs and other tasks necessary to implement the Field Alternative Technology Evaluation (FATE) for duct characterization. The cost for this activity includes labor (Test Plans/Final Reports and technical assistance), materials, travel and Pacific Northwest National Laboratory (PNNL) support.

This activity includes all engineering, field walk-downs and procurement of a duct crawler for characterization of the east-west portion of the inactive 232-Z/291-Z duct from 232-Z to 291-Z. This 36-inch diameter tile duct is approximately 150 feet in length. In addition, a camera will be utilized with the crawler to assist in providing data for an integrity assessment performed in the activity below.

This activity includes engineering and project management consulting services to provide assistance in developing detailed working level schedules and work packages. These schedules and work packages, supported by historical knowledge from other decommissioned facilities will assist in expediting the decommissioning activities of 232-Z and other PFP facilities. In addition, these contractors, by working in the field, will monitor actual progress, successes and failures, to develop real time lessons learned to refine future planning activities. These specific contractors will have "L" or "Q" cleared personnel with decommissioning, operations, maintenance, planning/scheduling, and basis of estimate experience.

This activity includes travel for PFP employees to capture Lessons Learned from other D&D sites. Three (3) trips (six (6) employees @ $12K per trip.

Schedule Activity ID EAACK010 ***Title*** 232-Z Project Support (FY05)

This activity includes engineering and project management consulting services to provide assistance in developing detailed working level schedules and work packages. These schedules and work packages, supported by historical knowledge from other decommissioned facilities will assist in expediting the decommissioning activities of 232-Z and other PFP facilities. In addition, these contractors, by working in the field, will monitor actual progress, successes and failures, to develop real time lessons learned to refine future planning activities. These specific contractors will have "L" or "Q" cleared personnel with decommissioning, operations, maintenance, planning/scheduling, and basis of estimate experience.

This activity includes all engineering, field walk-downs, and other necessary steps to support a contractor to perform an integrity assessment of the underground inactive duct (two 24 inch diameter tile duct lines approximately 57 ft. in length) underneath the 232-Z building foundation. This assessment will determine if this duct can withstand the weight of an additional 4-inch concrete slab over the existing slab in its present

condition. If the duct cannot withstand the weight, the assessment must provide recommended solutions with an approximate estimate for implementing the solution. In addition, a 36-inch diameter tile duct lies just north of 232-Z approximately 7 feet underground. This duct is believed to have plutonium (undetermined amount) in it. The integrity assessment must also include this 150 ft. section of duct.

Schedule Activity ID EAACK025 ***Title*** 232-Z Endpoint Documentation Completion

This activity includes project engineering and records specialist services to close out the project end points and other documentation.

Schedule Activity ID EAACK030 ***Title*** M-83-40: Complete Dismantlement of 232-Z

APPENDIX C

232-Z PROJECT SCHEDULE

This page intentionally left blank.

4.01.02.02.05.01 - Transition 232-Z | FLUOR HANFORD COMPANY | Sheet 1 of 1

Activity ID	Activity Description	Current Start	Current Finish	Orig Dur	Budgeted Cost	WBS
	Project Hanford Management Contract					
	Project Hanford Cleanup Work					
	200 Area Cleanup Work					
	Plutonium Finishing Plant (PFP) Cleanup					
	Disposition PFP Facility					
+ Transition 232-Z P1EAAA		01OCT03	29SEP06	756	5,705,562.07	

FY03 | FY04 | FY05 | FY06

Early Bar
Progress Bar
Critical Activity

Plutonium Finishing Plant
4.01.02.02.05.01 - Transition 232-Z
BOE Schedule

Run Date 16NOV04 08:06
Data Date 01OCT02

Project Manager: Steve Norton
Project Controls: Juli Widney

Project: APRT
Layout: LT-5A: 4.01.02.02.05.01 - BOE Schedule
Filter: FL-5A: 4.01.02.02.05.01 - BOE Schedule