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Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

16-ESQ-0061

APR 07 2016

Ms. S. L. Dahl-Crumpler
Nuclear Waste Program
Washington State Department of Ecology
3100 Port of Benton Boulevard
Richland, Washington 99354

Dear Ms. Dahl-Crumpler:

CLASS 1 MODIFICATIONS TO THE HANFORD FACILITY RESOURCE CONSERVATION AND RECOVERY ACT PERMIT, QUARTER ENDING MARCH 31, 2016

In accordance with the Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste Portion for the Treatment, Storage, and Disposal of Dangerous Waste (Permit) Condition I.C.3, enclosed for your notification is a Class 1 Modification for the quarter ending March 31, 2016.

The modification updates information in Part III of the Permit Revision 8C and pertains to the 325 Hazardous Waste Treatment Units, the Integrated Disposal Facility, the 400 Area Waste Management Unit, and the Waste Treatment and Immobilization Plant. The modification is being made to ensure that activities are conducted in compliance with the Permit. A record of the modification is maintained in the Hanford Facility Operating Record.

If you have any questions, please contact me, or your staff may contact Jeffrey A. Frey, Assistant Manager for Safety and Environment on (509) 376-7727.

Sincerely,

Stacy Charboneau

Stacy Charboneau
Manager

ESQ:ACM

Enclosure

cc: See page 2

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cc w/encl:
J. L. Cantu, Ecology (CD ROM)
Administrative Record, TSD: H-0-1, T-3-4, D-2-11, S-4-2, H-0-8 (Hard Copy & CD ROM)
Ecology NWP Library (Hardcopy & CD ROM)
Environmental Portal, G3-30 (CD ROM)
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HF Operating Record (J. K. Perry, MSA, A3-01) (CD ROM)
Portland State University, Government Information (CD ROM)
University of Washington, Suzzallo Library, Govt Publications Department (CD ROM)
Washington State University-Tri-Cities, DOE Reading Room, CIC, (CD ROM)

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L. E. Borneman, WRPS
A. S. Carlson, Ecology
B. L. Curn, URS
K. A. Hadley, WCH
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M. E. Jones, Ecology
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P. W. Martin, CHPRC
S. Murdock, BNI
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ENCLOSURE

CLASS 1 MODIFICATIONS FOR QUARTER ENDING MARCH 31, 2016
Ms. S. L. Dahl-Crumpler, Ecology

Consisting of 407 pages,
including this cover page

Hanford Facility RCRA Permit Modification Notification Forms

Part III, Operating Unit 5

325 Hazardous Waste Treatment Units

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Page 2 of 2: Contingency Plan (Addendum J)

Submitted by Co-Operator: for 3/9/16

Cameron M. Andersen — Date

Reviewed by DOE Program Office: 3/18/16

Mark S. French — Date

Hanford Facility RCRA Permit Modification Form

Unit:	Permit Part
325 Hazardous Waste Treatment Units	***Part III, Operating Unit Group 5***

Description of Modification:

Revision of Contingency Plan, Revision 15 (Addendum J) to make updates to the enforceable portions of the plan. The changes are shown in redline/strikeout format on the following pages (there are too many to individually list in this form).

WAC 173-303-830 Modification Class	Class 1	Class 1	Class 2	Class 3
Please mark the Modification Class:	X			

Enter relevant WAC 173-303-830, Appendix I Modification citation number:

A.1. Administrative and informational changes

B.6.d. Changes in name, address, or phone number of coordinators or other persons or agencies identified in the plan

Modification Approved: [X] Yes [ ] No (state reason for denial)

Reason for denial:

Reviewed by Ecology:

S. L. Dahl-Crumpler 3-24-16 Date

Pacific Northwest
NATIONAL LABORATORY
Proudly Operated by Battelle Since 1965

F&O Building Emergency Procedure

BEP-~~325/RPL~~325RPL

Building Emergency Procedure for the Radiochemical Processing Laboratory (~~RPL~~325RPL)

Revision # ~~14~~15
Revision Date ~~3/12/2015~~01/18/16

Procedure Owner: PT Saueressig
Author: PT Saueressig

Approval: RPL Manager, ~~HF Kerschner~~
EM Hanson

Concurrence: Building Manager, PT Saueressig
Emergency Preparedness, AD Haller
Emergency Preparedness, JE Kinzer

Environmental Planning ~~&~~and Emergency Preparedness, JA Stegen

Waste Operations Manager, TL VanArsdale
Worker Safety ~~&~~and Health, EG Damberg
~~RPL Operations Manager, EM Hanson~~

Work Location: ~~RPL~~325RPL/300 Area

Identified Hazards: N/A
See Section 4.0

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Applicable to RPL ONLY: RPL-2015-058S2016-019S

Use Category: Reference Use

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Approval History for: BEP-325/RPL_R14, Building Emergency Procedure for the 325/RPL Building

Final Process State: APPROVED

Name	Activity Name	Date
ACCEPTED VanAndale, Trevor L.	Review Concurrence 4	2/10/2015 2:39:28 PM
ACCEPTED Stagen, Amanda	Review Concurrence 3	2/10/2015 4:05:37 PM
ACCEPTED Sassaroulis, Paul T	Review Concurrence 1	2/11/2015 8:11:42 AM
ACCEPTED Kinser, Joy E	Review Concurrence 2	2/12/2015 8:43:33 AM
ACCEPTED Dornberg, Eric O	Review Concurrence 5	2/20/2015 5:03:22 PM
ACCEPTED Hanson, Eric M	Review Concurrence 6	3/9/2015 9:42:03 AM
ACCEPTED Kershner, Skip	Review Approval 1	3/9/2015 12:43:32 PM
ACCEPTED Dover, Chris	Independent Review Chair Screener Approval	3/9/2015 3:28:01 PM

* All actions are stored digitally and viewable at https://approvals.pnl.gov/ProcessView.aspx?pid=1916560

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1.0 General Information

The Radiochemical Processing Laboratory (RPL)/325325RPL) Building Emergency Procedure (BEP) has been designed to provide information necessary to minimize risks to personnel, facilities, programs, and the environment in the event of an emergency. This procedure applies to all resident staff, visitors, vendors, and contractor/subcontractor personnel. If an event is of a security nature (bomb threat, hostage situation, or other act of violence), security procedures may supersede this procedure and will be assessed on a case-by-case basis.

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This facility contains both radioactive and hazardous materials in operations, storage, and handling. The RPL facility 325RPL Building poses a possible significant hazard to adjacent facilities, personnel, programs, and the environment.

This BEP includes the contingency plans and emergency procedures for hazardous waste management activities as referenced by the following Washington Administrative CodeCodes (WAC) [173-303-340, -350, and -360]. This plan must be implemented whenever an emergency threatens human health and the environment[4]:).

- WAC-173-303-340, "Preparedness and Prevention"
- WAC-173-303-350, "Contingency Plan and Emergency Procedures"
- WAC-173-303-360, "Emergencies"

This plan must be implemented whenever an emergency threatens human health and the environment.

Emergencies may arise from, but are not limited to, the following:

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- Fire
- Explosion
- Lossfire
- explosion
- loss of service systems
- A medical emergency
- Bombbomb threats
- criticalityCriticality
- Criminal
- criminal activity
- Incidentsincidents at other facilities
- Naturalnatural hazards or natural forces
- Spillpill/release to the environment requiring assistance
- Hazardoushazardous materials release.

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[4] Section 1.0 third paragraph: Permit requirement, Class 1 Modification 6/30/15

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Expected responses are those actions, which are intended to minimize the effects of a situation while providing optimum protection to personnel. Expected responses include notification to the PNNL Security Operations Center, (SOC), Building Manager (BM), Building Emergency Response Organization (BERO), and personnel in the facility. This procedure also provides plans for notifying personnel to take safe actions such as "Take Cover," "Evacuatetake cover," "evacuate," or other planned actions dictated by the event. The procedure provides for formal notification and reporting.

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Other emergency response agencies available to assist the Building Emergency Director (BED) and Incident Commander (IC) from offsite are described in U.S. Department of Energy Richland Operations Office (DOE/RL) 94-02, *Hanford Emergency Management Plan*, Section 3.0, [WAC-173-303-350(3)(d)].

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The BED will provide BERO members with annual BEP training annually. The BED and Alternate BEDs will receive annual training from the Pacific Northwest National Laboratory (PNNL) Emergency Preparedness office (EP).

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ThePNNL policy of PNNL is to provide for the safety of its staff, contractor/subcontractor personnel, visitors, and members of the public in case of an emergency incident. PNNL line management has the responsibility to execute this policy and to see that all staff understandunderstands their own responsibilities and know the actionactions to be taken in an emergency. Every staff member is responsible for using the appropriate safety instructions and procedures and to remainremaining alert to unsafe conditions or acts while performing his or her job. All personnel are responsible for responding to emergency conditions to minimize adverse impacts.

In the event of an emergency condition in the facility, members of the RPL325RPL BERO will perform their duties as described in this procedure. Specific emergency actions for response to events will be applicable as specified in this BEP. Those BERO members whose assistance is needed to mitigate a lesser event will be notified by telephone or personal contact by the BED or delegate. Occupants of the facility who are not members of the BERO shall follow the standard PNNL Emergency Preparedness requirements at HDI, *Basic Staff Practices*How Do I...? (HDI) Work Control, *Basic Staff Practices*.

The building fire alarm is the primary means of evacuation and notification for full activation of the BERO. Emergency telephone numbers are listed in Section 3.0.3.0.

This procedure will be reviewed at least annually and amended if necessary or whenever any of the following occurs. [WAC-173-303-350(5)(d)]

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- The applicable regulations or the Hazardous Waste Treatment (HWTU's Unit (HWTU) permit is revised.
- The procedure fails in an emergency.
- The facility changes in a manner that materially increases or decreases the potential for fire, explosionsexplosion, or release of hazardous waste or hazardous waste constituents, or in any way that changes the response necessary in an emergency.
- The emergency coordinating personnel list changes.
- The emergency equipment list changes[2].

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[2] Section 1.0, eleventh paragraph: Paragraph 11: Permit requirementRequirement, Class 1 modification 6Modification 09/30/15.

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1.1 Facility Name

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Name: Radiochemical Processing Laboratory (RPL), 325 Building

Address: 325 Cypress St., 300 Area

Richland, WA 99354

EPA Generator Identification Number: WA 7890008967

Name	Radiochemical Processing Laboratory (325RPL), 325 Building
Address	325 Cypress St., 300 Area Richland, WA 99354
EPA Generator ID Number	WA 7890008967

1.2 Facility Location

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The RPL325RPL Building is in the southern portion of the 300-Area, north of Cypress-Street.

1.3 Owner/Operator

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The RPL facility 325RPL Building is owned/operated by the U.S. Department of Energy (DOE) and co-operated by Pacific Northwest National Laboratory (PNNL). The RPL325RPL Manager is the senior line manager in the RPL325RPL and has overall responsibility for all aspects of operations in the RPLfacility. The RPL325RPL Manager is part of the Nuclear Operations Division (NOD) within the Facilities &and Operations (F&O) directorateDirectorate. The RPL Building Manager325RPL BM reports directly to the RPL325RPL Manager and supports operations and maintenance in the facility. The RPL Building Manager325RPL BM is also the primary Building Emergency Director (BED).

1.4 Facility Description

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The RPL325RPL Complex, as referred to in this BEP, consists of the RPLfollowing.

- 325RPL Building, RPL
- 325RPL Filter Building, the
- East Storage Yard located east of the RPL325RPL Building, and the
- North Storage Pad located north of the RPL325RPL Building.

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The RPL325RPL Building houses laboratories and specialized facilities including general-purpose chemical laboratories, the High-level Radiochemistry Facility (HLRF), the Shielded Analytical Laboratory (SAL), fissionable material storage areas, and RPL Hazardous Waste Treatment Units (HWTUs).325RPL HWTU. The general-purpose laboratories characterize fuel, single- and double-shell tank waste, environmental samples, fusion/tritium samples, and other wastes. The radiochemistry facility includes areas for glove boxes, hot cells, cask handling, storage, and isolation of isotopes for unique applications like medical use. Analytical laboratory operations are conducted on small amounts of highly radioactive materials such as samples of single-shell tank waste. The HWTU treats hazardous, mixed, low-level radioactive and transuranic waste.

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The RPL325RPL Filter Building is located on the northwest corner of the main RPL structure325RPL Building and houses the final stage high-efficiency particulate air (HEPA) filters and the main exhaust fans.

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The East Storage Yard is a fenced enclosure adjacent to the east side of the RPL325RPL Building and is designated as an outdoor Radioactive Material Area (RMA).

The North Storage Pad is the foundation pad of the former 328 Building and will be designated as an outdoor RMA.

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~~Note: Footnotes in this document note the provisions in the BEP that are subject to RCRA permit# WA7890008967. These actions in the BEP implement RCRA permit requirements.~~

NOTE: *Footnotes in this document note the provisions in the BEP that are subject to Resource Conservation and Recovery Act (RCRA) Permit# WA7890008967. These actions in the BEP implement RCRA permit requirements.*

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1.5 Hanford Site Emergency Sirens/Alarms[3]

~~**Note: Some signals may not be applicable to the building; however, they may be heard in other parts of the Hanford Site. In the event of "Take Cover" alarm, the BERO will respond to the RPL lunchroom/lobby area for BED direction.**~~

***NOTE:** Some signals may not be applicable to the building; however, they may be heard in other parts of the Hanford Site. In the event of "take cover" alarm, the BERO will respond to the 325RPL Building lunchroom/lobby area for BED direction.*

Hanford Site Emergency Sirens/Alarms

Signal	Meaning	Actions
Slow ~~Whoop~~whoop followed by a voice message.	Fire	Vacate building; and proceed to staging area.
Steady tone on whistle, or siren	Area Evacuation	Vacate building; and proceed to staging area. Personnel in vehicles shall proceed to the nearest occupied facility and report to the ~~staging area supervisor~~Staging Area Supervisor (SAS).
Wavering siren or short blasts on whistle or siren.	Take ~~cover~~ Cover (Shelter)	Proceed to shelter or stay indoors. Close all exterior doors, turn off all intake ventilation (only if it can be done safely), and notify manager of whereabouts. Personnel in vehicles shall proceed to the nearest occupied facility and report to facility management. Staff should refrain from eating and drinking during a take cover event if physically able, until an appropriate evaluation of the event can be made
AH-OO-GAH horn (howler) or flashing blue light (in high noise areas)).	Nuclear Criticality~~criticality~~	Run at least 100 feet from building; proceed to staging area; along a path that does not take you closer to the building.
Variable color (red, amber) light with ringing bell or whistle.	Airborne Radioactivity or Area Radiation Monitor	Stop work activities, immediately exit the area; notify Radiological Control personnel.
Communicator Notification System (CNS), telephone call displayed from 375-2124.	PNNL Emergency Communications	Lift receiver, say "HELLO," listen to the message and follow the actions designated.

[3] Section 1.5: Permit ~~requirement~~Requirement, Class 1 Modification ~~6/30/15~~03/31/16

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Hanford Site Emergency Sirens/Alarms		
Signal	**Meaning**	**Actions**
Telephone Notification System (TNS)	Hanford Site Emergency Communications	Lift receiver, say "**HELLO**~~,~~", listen to the message and follow the actions designated ~~(Note: this~~ NOTE: *This system is only applicable to facilities on the Hanford ~~site~~Site (i.e., 300/600 Areas)).*

1.6 Coordination Activities with Local Emergency Responders[4]

Interfaces and coordination with offsite agencies are in the planning, preparedness, response, and recovery elements of the Hanford Emergency Management Program. The DOE has developed and maintains agreements to formalize areas of understanding, cooperation, and support with offsite agencies. These agreements are applicable to all Hanford facilities, including the ~~RPL~~325RPL. Summaries of these ~~memoranda~~Memorandum of ~~agreement (MOA)~~Agreements, or MOAs, are given in ~~Table 3-1 of the *Hanford Emergency Management Plan* (~~DOE/RL-94-02~~)~~. Table 3-1.

1.7 Deviations from Technical Safety Requirements

Emergency actions that depart from ~~an~~ approved Technical Safety Requirements (TSR) may be taken when no actions consistent with the TSRs are immediately apparent, and when these actions are needed to protect workers, the public, or the environment from imminent and significant harm.

Such actions shall be approved, as a minimum, by the ~~RPL Building Manager~~325RPL BM, the ~~RPL~~325RPL Manager, or the ~~RPL~~325RPL BED. If emergency actions are taken, verbal notifications shall be made to the Pacific Northwest Site Office (PNSO) within two hours and by written reports to the DOE Headquarters within 24 hours. [TSR AC 5.11]

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[4] Section 1.6: Permit ~~requirement~~Requirement, Class 1 Modification ~~6/30/15~~03/31/16

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2.0 Purpose of the Building Emergency Procedure

This procedure describes the processes and information necessary in the event of an emergency for the ~~RPL~~ 325RPL BERO members to react to the emergency and to perform the following actions:

- Maximize safety, minimize risk to life, and provide prompt efficient treatment for injured persons.
- Provide all members of the BERO with an understanding of their roles and responsibilities in the event of an emergency.
- Minimize the effects on the health and safety of personnel, property, the environment, programs, and the public.
- Provide prompt internal and external notifications to the responsible authorities.

2.1 Distribution

At a minimum, controlled document copies of this BEP will be located ~~at the following locations~~as follows:

- BED emergency response bag
- ~~RPL~~325RPL Power Operator Office (Room 900)
- ~~Building Manager's~~ BM file
- ~~325 HWTUs~~325RPL HWTU's Operating ~~Record~~Records[5]
- EP Program Office
- PNNL ~~Operations Center~~ SOC
- Hanford Emergency Operations Center (EOC) (Hanford Site facilities only)
- Management Support Group (MSG) emergency response bag ~~(LSB/2D55)~~(LSB/2D55)
- Alternate Incident Command Post (~~350 Building room 161)~~ICP) (Building 350, Room 161).

The ~~RPL~~325RPL BEP may be viewed and/or printed ~~at https://facilities.pnl.gov/weblinks/BEP/325/BEP-325.pdf~~ by clicking on the F&O Building Information webpage link. Copies of the BEP that are printed from this website are considered *uncontrolled copies.*

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[5] Section 2.1, ~~fourth bullet~~ Bullet 4: Permit ~~requirement~~Requirement, Class 1 ~~modification 6/30/15~~ Modification 03/31/16

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2.2 Acronyms

325RPL	Radiochemical Processing Laboratory (325 Building)
BED	Building Emergency Director
BEP	Building Emergency Procedure
BERO	Building Emergency Response Organization
BM	Building Manager
CAM	Continuous Air Monitor
CAS	Criticality Alarm System
CMS	CHA Chemical Hazard Assessor
CMS	Chemical Management System
CNS	Communicator Notification System
CSM	Cognizant Space Manager
DOE	U.S. Department of Energy
DOE/RL	U.S. Department of Energy Richland Operations Office
DSA	Documented Safety Analysis
EAL	Emergency Action Level
EIP	Emergency Information Posting
EOC	Emergency Operations Center
EP&RP	Environmental Protection & Regulatory Programs Emergency Preparedness
EPA	Environmental Protection Agency *(EPA Generator Identification Number)*
EPRP	Environmental Protection Agency and Regulatory Program
ESM	Electronic Storage Media
F&O	Facilities and Operations (Directorate)
FOS	Facility Operations Specialist
FSR	Field Services Representative
HDI	How Do I...?
HEPA	high-efficiency particulate air (filter)
HFD	Hanford Fire Department
HLRF	High-Level Radiochemistry Facility
HWTU	Hazardous Waste Treatment Unit
IC	Incident Commander
ICP	Incident Command Post
IM	Incident Manager
IOPS	Integrated Operations System
LA/LAI	Limited Area Island
MIT	Map Information Tool
MOA	Memorandum of Agreement

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MSG — Management Support Group
N/A — non-applicable
NOD — Nuclear Operations Division
ONC — Occurrence Notification Center
PIV — Post Indicator Valve
OS&Y — outside screw and yoke
PNNL — Pacific Northwest National Laboratory
PNSO — Pacific Northwest Site Office
POC — Patrol Operations Center
PPE — Personnel Protective Equipmentpersonnel protective equipment
RBA — Radiological Buffer Area
RCA — Radiologically Controlled Area
RCRA — Resource Conservation and Recovery Act
RPL — Radiochemical Processing Laboratory
RPT — RHA Radiological Hazard Assessor
RPT — Radiological Protection Technologist
SAL — Shielded Analytical Laboratory
SAS — Staging Area Supervisor
SDS — Safety Data Sheet
SME — Subject Matter Expert
SOC — Security Operations Center
TDP — Testing Designated Position
TNS — Telephone Notification System
TSD — Treatment, Storage, Disposal
TSR — Technical Safety Requirements
UDAC — Uniform Dose Assessment Center
WAC — Washington Administrative Code

2.3 Making Changes to the BEPBuilding Emergency Procedure

PNNL-MA-110, *PNNL Emergency Management Plan*, requires the BED to keep the Emergency Preparedness Office (EPO)(EP) program manager advised of any changes to the BEDs. This may be accomplished by memo to the EPOor email. The Hazardous Waste Treatment Unit (HWTU) Permit Coordinator and the RCRA Subject Matter Expert (SME) are also required to be notified before any changes are made to the BEP.

To request revisions to this procedure, refer to ADM-001, *Document Production & Distribution*.

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3.0 Building Emergency Response Organization

3.1 Emergency Telephone Numbers ~~[WAC-173-303-350(3)(d)]~~

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In the event of an emergency, specific detailed facility information may be needed. Knowledge of the building, utilities, and radiation hazards can be obtained from the staff listed ~~below~~ in the following table. Contact the PNNL ~~Security Operations Center~~ SOC at 375-~~-~~2400 if unable to contact any of these staff members using the numbers provided. [WAC-173-303-350(3)(d)]

Any Emergency – PNNL Security Operations Center (SOC): 375-2400				
~~Note~~NOTE: With the appropriate approval, BED home addresses can be obtained at the PNNL ~~Security Operations Center~~SOC.				
Responsibility	**Name**	**Office**	**Home**	**Cell**
~~*Building Emergency Director (BED)~~[6]	Paul T. Saueressig	~~Office:~~ 375-5352	~~Home:~~ N/A	~~Cell:~~ 619-3873
~~*BED1~~	~~Eric M. Hanson~~	~~Office: 375-5351~~	~~Home: N/A~~	~~Cell: 713-0860~~
~~*BED2~~	~~(HF) Skip Kershner~~	~~Office: 375-5345~~	~~Home: 396-0593~~	~~Cell: 554-4369~~
~~*BED3~~				
BED1	Chris S. Dreyer	~~Office:~~ 375-5468	~~Home:~~ 628-9995	~~Cell:~~ 420-0533
*BED2	Dan G. Wandler	375-5179	N/A	438-1053
*BED3	Eric M. Hanson	375-5351	N/A	713-0860
Additional F&O Management Contacts:				
Utility Operations ~~WTL~~ Work Team Lead	TJ Vanderlinden	~~Office~~ 375-2829		~~Cell~~ 521-8024
Nuclear Operations ~~WTL~~ Work Team Lead	Don Cravens			~~Cell~~ 948-1053
Fire Protection Engineer	Dan Kester	~~Office:~~ 375-5398		~~Cell~~ 308-9108
Safety ~~&~~and Health ~~Rep~~ Representative	Jason Sweesy	~~Office~~ 371-7383		~~Cell~~ 438-4974
F&O ~~Mgt Support Group~~ MSG	Reed Sharp	~~Office~~ 372-4122		
		~~Office~~ 371-7042		
EOC RPL Tech ~~Rep~~ Representatives		~~Office~~ 375-5246		
	Randy Thornhill	~~Office~~ 375-5220		~~Cell~~ 851-6769
	Franciska Steen	~~Office~~ 375-5546		
Unique Program Laboratory Expertise				
Waste ~~Mgt~~Management – 90-Day	Zane Turner	~~Office~~ 375-5088		~~Cell~~ 554-4359
Low Level ~~TSDs~~ TSD	Trevor VanArsdale	~~Office~~ 375-3814		~~Cell~~ 531-6441
Environmental Compliance ~~Rep~~ Representative	John Hollan	~~Office~~ 375-5002		~~Cell~~ 521-1211
Alternate ~~Incident Command Post:~~		~~Office~~ 376-7565		
ICP:	350 ~~Bldg~~ Building / Room 161	~~Fax~~ 376-7965 (FAX)		
Environmental Support Contact *(regulatory notifications only)*		375-2400 375-1648		
~~Richland~~Hanford Fire Department		375-2400 or 373-0911		
Medical and First Aid		375-2400		
Hazardous Materials Response Team (Benton-Franklin County Hazardous Material Response Team)		375-2400		
Ambulance Services		375-2400		

[6] Section 3.1, BED ~~information~~ Information. Permit ~~requirement~~Requirement, Class 1 Modification ~~6/30/15~~03/31/16. See Permit Condition II.A.4.

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Police Department	375-2400
Hanford Patrol	373-3800
PNNL Duty Officer(s) &and PNNL Info|Information Line	375-~~21242154~~
Off Normal Event Reporting	375-2400
Work-related injury/illness of a non-emergency nature: PNNL Occupational Health Clinic, LSB 1st Floor ~~section~~, Section E	371-7848

** These are Testing Designated Positions (TDP) per HDI Exhibit, Perform Substance Abuse Testing. Any changes to these positions require coordination through the ~~Testing Designated Position (TDP)~~TDP Administrator.*

3.2 Building Emergency Response Organization ~~(BERO)~~

The ~~RPL~~325RPL BERO is an emergency response organization with clearly defined responsibilities. The BERO consists of pre-designated and trained individuals ~~who have been~~ assigned to emergency response activities associated with the ~~RPL~~325RPL. In addition, other positions and/or personnel in the ~~RPL~~325RPL have responsibilities associated with emergency responses, preparedness, and notifications.

BERO Position	Primary Responder	1st Alternate	2nd Alternate
~~ICP~~ *Incident Command Post Communicator	Christopher Dreyer Work: 375-5468 Cell: 420-0533 Home: 628-9995	Carl Bowman ~~Teresa Campbell~~ Work: 375-~~5119~~-7558 Cell: ~~947-0332~~ 207-716-7191 Home: ~~943-6122~~ 207-716-7191	Teresa Campbell Work: 375-5119 Cell: 947-0332 Home: 943-6122
Assisting Communicator	Scott Colby Work: 375-5350 Cell: 554-1780	Kathy Hall Work: 375-5346 Cell: 528-5954	
Chemical Hazards Assessor	Jason Sweesy Work: 372-4122 Cell: 438-4974	Mike Zabel Work: 375-5013 Cell: N/A Home: 378-4278	Doug Falk Work: 371-7097 Cell: 308-9101 Home: 967-5063
~~ICP~~ Incident Command Post Hazards Communicator	Terry Milham Work: 375-5007 Cell: 539-3910 Home: 627-0200	Bob Free Work: 375-5597 Cell: 521-5916 Home: 627-0200	Steve Ruisi Work: 375-6656 Cell: 528-6451 Home: N/A
Radiological Hazards Assessor	Lorna Brown Work: 375-5006 Cell: 948-2577 Home: N/A	Jenny Martin Work: 371-7788 Cell: 374-7581 Home: 628-0561	Holly Black-Kania Work: 371-6930 Cell: 539-7283 Home: ~~NA~~ N/A

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~~ICP~~Incident Command Post Recorder	Terri Mars __Work: _375-5661 __Cell: _539-0722	Kathy Hall __Work: 375-5346 __Cell: 528-5954	
*Facility Operations Specialist	Dan Wandler __Work: _375-5179 __Cell: -__438-1053 __Home:-_438-1053	John Logan __Work: _375-5168 __Cell: _438-2079 __Home: _438-2079	Johnny Trevino __Work: -_375-5177 __Cell: —554-8531 __Home: N/A
Staging Area Supervisor	Teresa Schlotman ~~Deborah Coffey~~ __Work: _375-~~5011~~5323 __Cell: ~~—586-909-2122~~ N/A __Home: ~~543-7244~~ N/A	Kristie Lombardo ~~Teresa Schlotman~~ Work: ___375-~~5333~~5353 __Cell: ~~NA~~ 948-5591 __Home: ~~NA~~ N/A	~~Jake Bohlke~~ Victor Sanceda __Work:-_375-~~5563~~5547 __Cell: ~~—303-9613~~ N/A __Home: ~~NA~~ N/A
PNSO Facility Representative	~~Tom Davies~~ Derek Wright __Work: _372-4100 __Cell: —_509-392-9872 __Home: ~~627-3345~~ 803-640-3605	Jeff Carlson __Work: _372-4750 __Cell: __509-539-2044 __Home: _582-9769	Rob Yasek __Work:-_372-4023 __Cell: —_509-554-4471 __Home: _371-8105

** These are Testing Designated Positions (TDP) per HDI subject area Workplace Substance Abuse. Any changes to these positions require coordination through the ~~Testing Designated Position (TDP)~~TDP Administrator.*

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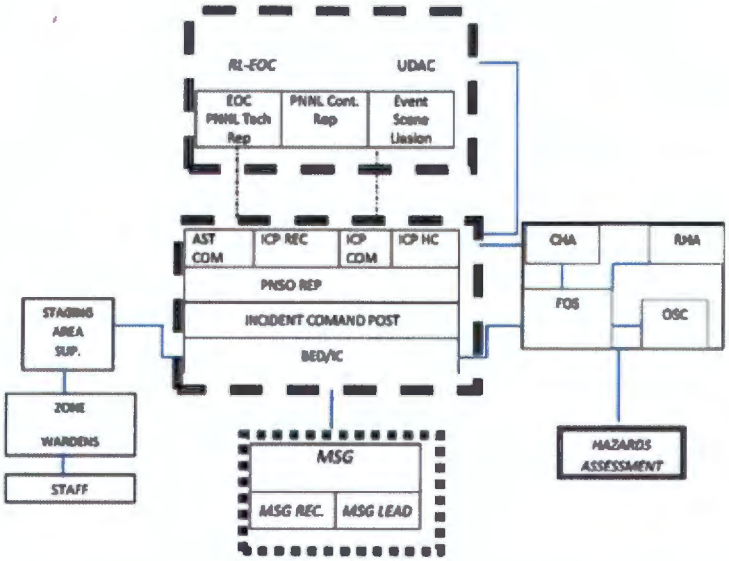
3.3 ~~BERO—EOC~~Building Emergency Response Organization -



Legend			
AST	Assisting	IH	Industrial Hygienist
BED	Building Emergency Director	MSG	Management Support Group
CHA	Chemical Hazards Assessor	OSC	Operations Section Chief
COM	Communicator	REC	Recorder
CONT	Contractor	REP	Representative
EOC	Emergency Operations Center	RHA	Radiological Hazards Assessor
FOS	Facility Operations Specialist	SUP	Supervisor
HC	Hazards Communicator	UDAC	Unified Dose Assessment Center
IC	Incident Commander		
ICP	Incident Command Post		

Emergency Operations Center Interface

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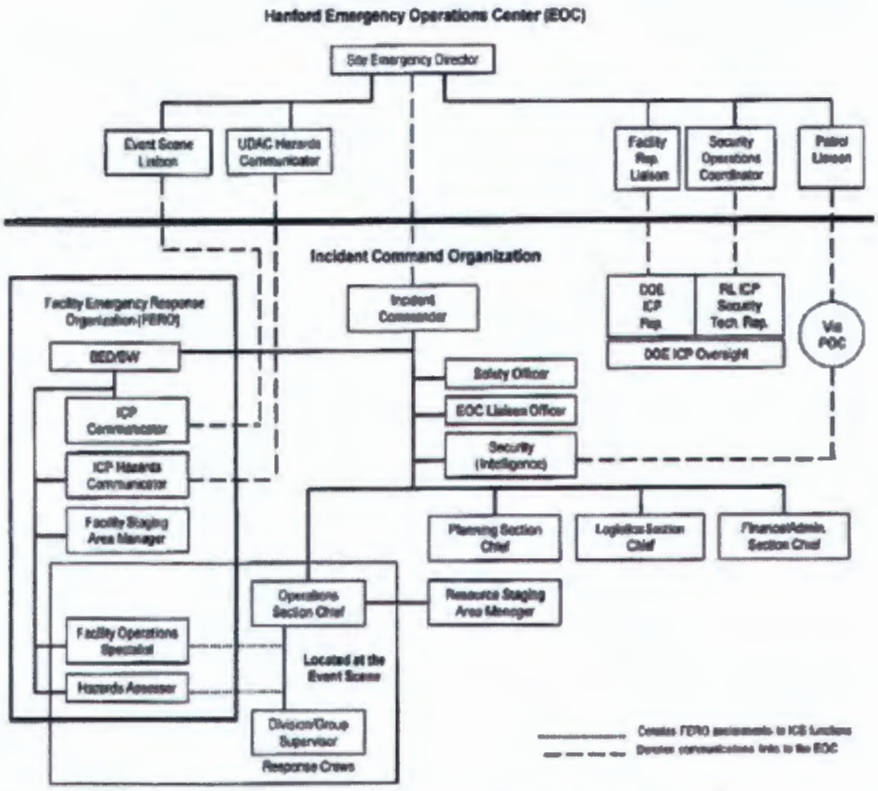

AST	Assisting	IH	Industrial Hygienist
BED	Building Emergency Director	MSG	Management Support Group
CHA	Chemical Hazards Assessor	OSC	Operations Section Chief
COM	Communicator	REC	Recorder
CONT	Contractor	REP	Representative
EOC	Emergency Operations Center	RHA	Radiological Hazards Assessor
FOS	Facility Operations Specialist	SUP	Supervisor
HC	Hazards Communicator	UDAC	Unified Dose Assessment Center
IC	Incident Commander		
ICP	Incident Command Post		

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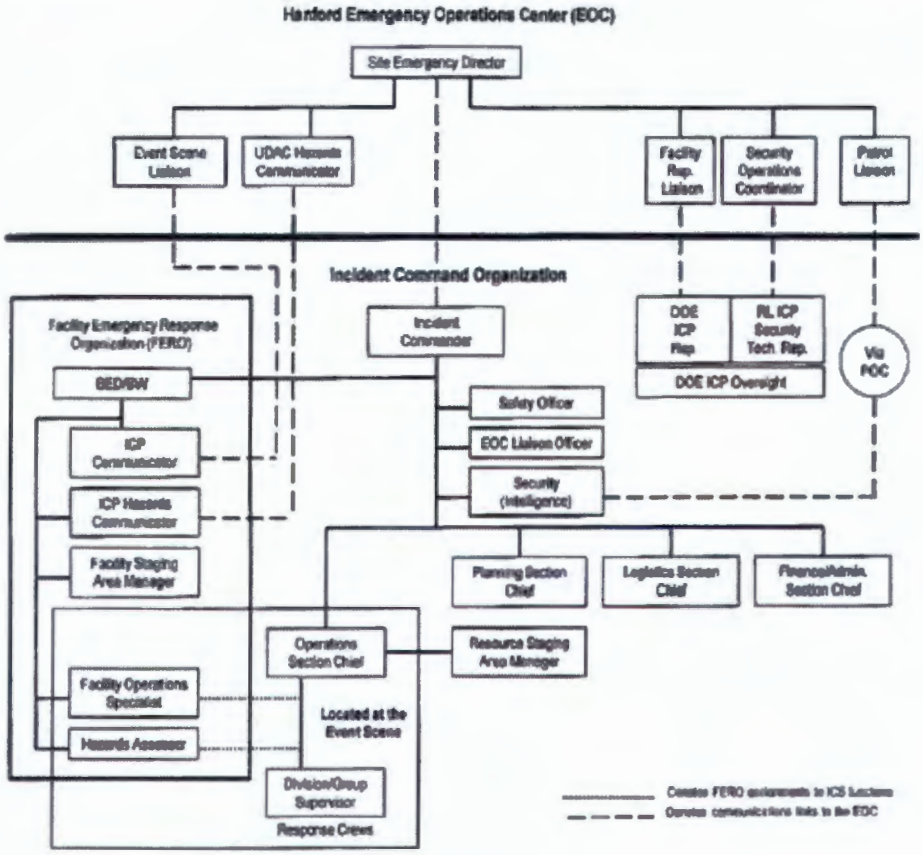

3.4 Building Emergency Directors and Alternates

The BED has the responsibility for the welfare and safety of the building personnel and for directing efforts to control, evaluate, and terminate the event if the building is the site of an event. The BED performs duties of the Emergency Coordinator as prescribed under ~~the~~ WAC ~~[WAC~~ 173-303-360~~]~~ until relieved by the ~~Incident Commander~~IC, and has the authority to commit the resources needed to carry out the BEP.

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The BED manages facility operations and personnel during an emergency and is responsible for implementation of appropriate emergency procedures and their follow-up, 24-hours a day. The BED has the authority to commit the resources necessary to carry out emergency plan activities[7]. Activities include:

- Directing configuration control over facility systems and components at the event scene.
- Activating the BERO.
- Assessing the event scene[8].
- Allocating personnel to conduct facility-specific emergency response actions within the affected facility boundary (including acting as or delegating duty as the Facility Operations Specialist (FOS) and taking appropriate protective actions in response to events occurring in other onsite geographic areas or adjacent facilities).
- Categorizing the incident and notifying the PNNL Environmental Support Contact and/or the EOC Shift Office[9].
- Communicating with the Environmental Protection &and Regulatory Programs. (EPRP).
- Initiating establishmentactivation of a Management Support Group (the MSG).
- Reviewing the Emergency Action LevelsLevel (EAL) criteria (PNNL-EAL-325RPL, *Emergency Action Level Tables for the RPL*) and providing an initial EAL classification to the EOC Shift Office[10].
- Directing implementation of initial preplanned area/site protective actions.
- Identifying an alternate staging area in the event of an extended building evacuation during inclementadverse weather.
- Determining personnel accountability status.
- Performing the necessary steps in the BED Hazardous Material Facilities (RPL) Checklist*EP-BED-325RPL, Building Emergency Director Checklist*.
- Verifying other BERO positions use checklists as appropriate.
- Verifying that preservation of evidence at the event scene is taken into consideration during the event.
- Developing and transmitting event reports to maintain accurate and complete records of events, decisions, and actions during an event.
- Verifying the appropriate alarms are sounded when necessary[11].

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[7] Section 3.4, firstParagraphs 1 and second paragraph text 2, Permit requirementRequirement, Class 1 Modification 609/30/15.

[8] Section 3.4, second paragraph, third bulletParagraph 2, Bullet 3, Permit requirementRequirement, Class 1 Modification 609/30/15.

[9] Section 3.4, second paragraph, fifth bullet Paragraph 2, Bullet 5, Permit requirementRequirement, Class 1 Modification 609/30/15.

[10] Section 3.4, second paragraph, eighth bullet Paragraph 2, Bullet 8, Permit requirement Requirement, Class 1 Modification 6/30/15 03/31/16.

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- Providing information and assistance to the responding agencies as requested to mitigate the event, including:
  - Identifying the character, exact source, amount, and extent of any released materials.
  - Taking reasonable measures (e.g., stopping processes/operations, collecting/containing released waste, removing/isolating containers) necessary to make sure that fires, explosions, and releases do not occur, recur, or spread to other dangerous waste.
  - Monitoring for leaks, pressure buildup, gas generation, or ruptures in valves, pipes, or other equipment as appropriate[12].
- Approving ~~reentry~~re-entry and/or rescue operations.
- Arranging care for any injured persons and contacting their line management.
- Notifying the HWTU permit personnel of any planned changes to the BEP.
- Verifying hazardous spill/release events are logged in the HWTU operating records.
- Taking appropriate actions during adverse chemical conditions ~~see HDI, *Response to Normal Chemical Spills/Adverse Chemical Conditions (Exhibit)*.~~; see HDI Exhibit, *Respond to Spill or Adverse Chemical Condition*.
- Providing a thorough ~~turnover~~briefing to the Hanford Site emergency responder (e.g., Hanford Fire Department (HFD), Hanford Patrol~~, etc.~~).
- Maintaining emergency equipment[13].
- Verifying that the ~~environmental support contact~~Environmental Support Contact will provide any necessary notifications to regulatory agencies, such as the Washington State Department of Ecology, and verifying that required written reports to regulatory agencies are completed within 15 days of event termination[14].
- Performing an annual review and update of the 325RPL BEP.
- Planning, conducting, and documenting results of building emergency drills.
- Informing the ~~Emergency Response Organization~~EP program manager of any changes in ~~RPL~~ 325RPL BEDs.
- Being thoroughly familiar with the following:
  - ~~The RPL~~the 325RPL BEP
  - ~~All~~all operations and activities

[11] Section 3.4, ~~second paragraph, sixteenth bullet~~ Paragraph 2, Bullet 16, Permit ~~requirement~~ Requirement, Class 1 Modification ~~6~~09/30/15.

[12] Section 3.4, ~~second paragraph, seventeenth bullet~~ Paragraph 2, Bullet 17, Permit ~~requirement~~Requirement, Class 1 Modification ~~6~~09/30/15.

[13] Section 3.4, ~~second paragraph, twenty-fourth bullet~~ Paragraph 2, Bullet 24, Permit ~~requirement~~Requirement, Class 1 Modification ~~6~~09/30/15.

[14] Section 3.4, ~~second paragraph, twenty-fifth bullet~~ Paragraph 2, Bullet 25, Permit ~~requirement~~Requirement, Class 1 Modification ~~6/30/15~~ 03/31/16.

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- ~~Locations~~locations and characteristics of waste handling
- ~~Locations~~locations of all records
- ~~Physical~~physical layout of the building and area of responsibility[15].

3.5 Incident Command Post ~~(ICP)~~ Communicator

The individual responsible for conveying the event emergency classification to the EOC Shift Office, phoning the ~~POC~~Patrol Operations Center (POC) at (9)911, or 373-0911 (cell) to initiate a conference telephone bridge between the POC, EOC Shift Office, and ICP Communicator. Initiates and maintains a communication line between the Event Scene Liaison at the ~~DOE-~~Hanford EOC and the ICP. As a precautionary measure, the BED makes sure that this position is staffed for all events. The ICP Communicator is responsible for completing ~~Incident Command Post Communicator Checklist.~~ *EP-ICPC, Incident Command Post Communicator Checklist for Hazardous Facilities.*

3.6 Assisting Communicator

Provides assistance to the ICP Communicator as directed by:

- Keeping the IC and BED aware of all transmitted and received information.
- Maintaining a log of communications sent and received.
- Establishing and maintaining a communication line with the Technical Support Representative (376-7148) in the ~~DOE-~~Hanford EOC and the ICP throughout the incident.

3.7 Incident Command Post ~~(ICP)~~ Recorder

Records in a ~~time-line~~timeline format, event-related notifications and activities associated with the direction administered and information received at the ICP.

3.8 Management Support Group ~~(MSG)~~ Lead

The Facilities Operations & Engineering Division ~~(FO&ED)~~ Manager or delegate will respond as the ~~Management Support Group (MSG) leader~~MSG Lead when requested by the BED.

~~**Note: The MSG lead function and alternates is a TDP in accordance with HDI, *Workplace Substance Abuse.***~~

NOTE: *The MSG Lead function and alternates is a Testing Designated Position (TDP) in accordance with HDI Exhibit, PNNL Workplace Substance Abuse Requirements and Protocol.*

The MSG Lead will convene the appropriate staff to fill positions in the MSG as the incident requires. The MSG Lead is also responsible for notifying the PNNL Laboratory Director, other PNNL senior management as appropriate, and ~~DOE-~~PNSO. The MSG's purpose ~~of the MSG~~ is to support the BED by being a resource for technical information, event mitigation strategies,

[15] Section 3.4, ~~second paragraph, twenty-ninth bullet~~ Paragraph 2, Bullet 29, Permit ~~requirement~~Requirement, Class 1 Modification ~~6/30/15~~ 03/31/16

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event termination and ~~recovery plans~~Recovery Plans, and other support as directed/requested by the BED/IC. The coordination of support activities to the IC/ICP for a declared emergency on the Hanford Site is managed by the Hanford EOC.

A representative from ~~DOE~~ PNSO has been established to coordinate with the MSG during large events. In smaller events, a ~~DOE~~ PNSO Facility Representative coordinating with the BED will provide information and support to ~~DOE~~ PNSO management regarding actions occurring at the event scene.

3.9 Management Support Group Liaison

~~Reports~~The MSG Liaison reports to the ICP to facilitate communications between the BED/IC and the MSG. The MSG ~~liaison~~Liaison is responsible for the following:

- Establish phone communications with the MSG, as needed, to communicate with the MSG.
- Convey BED/IC requests for MSG support to the MSG.
- Communicate information from the MSG to the BED, IC, or other appropriate BERO members.

3.10 Staging Area Supervisor

The ~~Staging Area Supervisor (~~SAS~~)~~ will direct all activities at the building staging area and is responsible for:

- Assisting in personnel accountability by receiving the status of building occupancy from the ~~zone wardens~~Zone Wardens and then informing the BED of facility status with regard to personnel, or if help is needed to locate or account for missing personnel.
- Assisting in area evacuation and ~~Take Cover~~take cover.
- Assisting with communications.
- Supporting the BED as requested.
- Maintaining a log of their activities or assigning a ~~log-keeper to~~ recorder (also referred to as a "scribe") to do so.
  - ~~Completing the RPL Staging Area Supervisor Checklist.~~
- Completing *EP-SAS-325RPL, RPL Staging Area Supervisor Checklist.*

3.11 Zone Wardens

Zone ~~wardens~~Wardens provide the results of their accountability sweeps information to the BED via the SAS and ~~assists~~assist in additional duties as determined by the BED. To accomplish this function, the ~~zone wardens~~Zone Wardens:

- ~~confirms~~Confirm that assigned zones have been vacated by staff and ~~determines~~determine if aid and/or rescue is required.
- ~~aids~~Aid those who need help in evacuating the building if it can be done safely.
- ~~reports~~Report the occupancy status of the assigned zone and any additional observations to the ~~Staging Area Supervisor~~ SAS.

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- ~~assists~~Assist the ~~Staging Area Supervisor~~SAS as requested,
- ~~maintains~~Maintain a familiarity with the BEP,
- ~~becomes~~Become knowledgeable of any staff in assigned zones ~~who~~that may require assistance in an emergency event.

~~**Note:** The function of the zone warden is to verify (when possible) that assigned zones have been evacuated as a means of assisting other emergency responders and to verify the locations of building personnel. The function of zone wardens does not include search and rescue; they should not enter any area they feel presents a hazard to them. Once the evacuation alarm is sounded, zone wardens should not enter any location in the facility where there are indications that a hazard may exist. The indications include such things as visible smoke, fire, unusual oders, local alarms, criticality alarms, spilled chemicals, incapacitated personnel, etc. If a zone warden is not in the facility when the evacuation or take cover alarm is initiated, is a significant distance from their assigned zones, or has been isolated from their zone, they should report to the SAS at the staging area that their zone was not swept.~~

NOTE: *The function of the Zone Warden is to assist staff in evacuating the facility and reporting the occupancy status to the SAS.*

The function of Zone Wardens does not include search and rescue.

Zone Wardens should not enter any location in the facility where there are indications that a hazard may exist. The indications include such things as visible smoke, fire, unusual odors, local alarms, criticality alarms, spilled chemicals, incapacitated personnel, etc.

If a Zone Warden is not in the facility when the evacuation or take cover alarm is initiated, is a significant distance from their assigned zones, or has been isolated from their zone, they should report to the SAS at the staging area that their zone was not swept.

3.12 Facility Operations Specialist ~~(FOS)~~

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~~The FOS is responsible for the immediate mitigative actions at the event scene that cannot be delayed without threatening human health and/or the environment.~~ The FOS is responsible for meeting emergency responders at the event scene and providing information on event status and initial actions that are underway. This position will serve under the direction of the BED and coordinate with the ~~Hanford Fire Department~~HFD or Hanford Patrol Operations Section Chiefs, upon their arrival, and will provide facility expertise to support ~~operations section~~Operations Section activities. The FOS is responsible for implementing ~~the Facility Operations Specialist Checklist and~~*EP-FOS, Facility Operations Specialist (FOS) Checklist*, and also maintains a log of activities, conversations, and directives given and received.

3.13 Hazard Communicator

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The Hazard Communicator is a facility or process knowledgeable individual responsible for communicating data received from the Hazards Assessors to the Uniform Dose Assessment Center (UDAC) for further consequence assessment during DOE-declared emergencies. This position is staffed only during DOE-declared emergencies at the request of the BED/IC. The Hazard Communicator:

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- Establishes and maintains an emergency response organization ~~(ERO)~~ communication line with the UDAC Hazards Communicator to provide incident scene radiological or chemical data as reported by the Hazard Assessors.
- Keeps the IC and BED aware of all transmitted and received information.
- Maintains a log, or assigns a ~~log-keeper~~scribe to record all activities, including the date and time information was received or the time when action was taken.
- Responds to requests for information from the UDAC and assures that requests for information are relayed to the Hazards Assessor(s) for response.

~~• Implements the Hazards Communicator Checklist.~~

~~3.14 Hazards Assessors~~

~~There are two different Hazards Assessors for the RPL facility. One assessor deals with radiological hazards and the other deals with chemical hazards.~~

- Implements the *EP-HazCom, Hazards Communicator Checklist*.

~~3.14.1~~3.14 Radiological Hazard Assessors

~~The radiological hazards assessors~~The Radiological Hazards Assessors (RHA) are responsible for coordinating and verifying accomplishment of radiological control functions throughout the event. This position coordinates with the ~~operations section chief~~Operations Section Chief at any location and supervises ~~radiological protection technologist~~Radiological Protection Technologist (RPT) activities.

The RHA is responsible for implementing the ~~checklisted~~checklist duties for non-declared RCRA emergencies and DOE-declared emergencies, as appropriate. See EP_RHA, *Radiological Hazard Assessors Checklist*. In conjunction with the CHA, this individual will make recommendations for personnel protective equipment (PPE) to the ~~Hanford Fire Department (~~HFD~~)~~.

~~3.14.2~~3.15 Chemical Hazard Assessors

This position may be staffed by an ~~industrial hygienist~~Industrial Hygienist assigned to support the HFD ~~HazMat team, HFD medical staff, and HFD safety officer.~~. The Chemical Hazard Assessors (CHA) will provide technical expertise in chemical and toxicological hazard identification, evaluation, reactivity, and dispersion modeling ~~at~~to the ~~incident scene.~~HFD. The CHA may also serve as a chemical/decontamination safety officer, if designated by the IC.

The ~~RPL~~325RPL CHA initially reports to the ICP for an event briefing and then coordinates with the HFD Operations Section Chief; he/she provides technical support for non-radiological hazardous material response. Typically, the ~~RPL industrial hygienist~~325RPL Industrial Hygienist and the ~~industrial hygienist~~Industrial Hygienist assigned to the HFD, ~~HFD Medical Staff, or HFD Safety Officer~~ staff this position. In conjunction with the RHA, this individual will recommend PPE to the HFD ~~safety officer.~~.

When the CHA is activated to respond to an emergency, *EP-CHA, Chemical Hazard Assessors Checklist*, must be completed.

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3.153.16 Individual Staff Member Responsibilities

- Announces or activates the appropriate alarm, calls the PNNL Security Operations CenterSOC (375-2400), and notifies management upon observing an emergency[16].
- AvoidAvoids exposure to harmful and life-threatening conditions.
- During emergencies, if it can be done safely, secure classified documents and electronic storage media (ESM) before leaving limited areas.Limited Areas (LA). If this cannot be done without endangering yourself: 1) take the classified documents and ESM with you, if time permits; 2) report to the staging area, and; 3) inform the BED and then call 375-2400 to report an incident of security concern.
- If evacuating due to a fire alarm and you are wearing special PPE or anti-contamination clothing, segregate yourself from others at the staging area until surveyed by a RPT.
- Provide the BED with any information to assist in evaluating the emergency condition.
- Remain at the staging area and follow the instructions of the BED and SAS[17].
- Read and understand the Emergency Information Posting (EIP) and BEP.
- Become familiar with the location of the BEP on the RPL webpage and HDI, *Basic Staff Practices.* 325RPL webpage and HDI Work Control, *Basic Staff Practices.*
- Wear your Emergency Preparedness information card.
- Know where the nearest fire alarm pull box is located.

> Note: When evacuating the RPL due to a fire or a criticality alarm, all personnel are required to exit the radiological control area(s) without performing radiological exit surveys. Those personnel shall segregate themselves from others at the staging area until surveyed by RPT's.

- Sign into accountability log (paper or electronic).

> NOTE: *When evacuating the 325RPL Building due to a fire or a criticality alarm, all personnel are required to exit the Radiological Control Area(s) without performing radiological exit surveys. Those personnel shall segregate themselves from others at the staging area until surveyed by RPTs.*

3.163.17 PNNL Incident Manager

For moreThe PNNL Incident Manager (IM) is used during complex events, such as those affecting multiple PNNL-managed facilities and/or extending over multiple days, the. The PNNL Incident Manager (IM) may be activated and will assume responsibility for incident management, including. This includes managing the overall event on behalf of PNNL,

[16] Section 3.15, first bullet:Bullet 1: Permit requirementRequirement, Class 1 modification 6Modification 09/30/15

[17] Section 3.15, sixth bullet:Bullet 6: Permit requirementRequirement, Class 1 modification 6Modification 09/30/15

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overseeing BEDs, and coordinating with the PNNL MSG. The PNNL IM will most likely be activated by the MSG Lead. When activated to respond to an emergency, EP_IM, Incident Manager Checklist must be completed. Primary BEDs will continue to manage operations at their facilities, but the overall incident management and distribution of resources will be the responsibility of the PNNL IM.

3.173.18 Facility Visitor Responsibilities

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The safety of building visitors is the responsibility of the facility host who shall assure that visitors are provided a safe and orderly evacuation. The facility host will report the visitor status to the SAS as soon as is practical after an evacuation. Visitors will sign into the accountability log.

3.183.19 Supervisors/Manager Responsibilities

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Account for all staff members. Report missing or injured staff members to the SAS and if requested, assist the SAS.

3.193.20 Unique Program Laboratory Expertise

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The technical knowledge of specific programs/laboratory activities are usually known by the laboratory occupant or program manager. When applicable, cognizant space managers (CSMsCognizant Space Managers (CSM), alternate CSMs, and team leads may be contacted in regards to emergencies or off-normal events in assigned laboratories. Hazard Awareness Summaries containing this information are posted throughout the facility325RPL Complex.

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Rooms 201, 202 and 529 are less than 90-day Radioactive Hazardous Waste Accumulation Areas.

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The Treatment, Storage, and Disposal (TSD) areas consist of the following rooms: Rooms 32, 200, 201, 202, 203, 520, 524, 528, 610, 3714 padPad, and portions of Rooms 603 and 604A.

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These rooms may contain significant quantities of hazardous waste for short periods of time. This waste can be radioactive, toxic, corrosive, ignitable, reactive, carcinogenic, or environmentally persistent according to the WAC [WAC 173-303].

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No one will enter these rooms without permission from one of the individuals whose names are posted on the door.

Wastes stored in these rooms could have significant environmental or health hazards. Incidents involving any of these locations will require hazardous materials expertise by the responders.

3.203.21 Environment, Safety, and Health Advisor Responsibilities

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ProvidesThe Worker Safety and Health Representative will provide guidance for establishing safety requirements for mitigation and recovery actions, which include. This includes coordinating any support needed from other disciplines of the PNNL Environment, Health, Safety, and Security (EHS&S) Directorate (i.e., Environmental Compliance Representatives (ECR), Radiological Control, Hygiene, and Field Services Representatives [FSR]). The ECRs and FSRs conduct activities within specific hazardous waste management activity areas and provide support to the BED in case of an emergency.

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The ~~environmental support contact~~Environmental Support Contact (375-2966) will provide any necessary notifications to regulatory agencies such as the Washington State Department of Ecology and will transmit required written reports to regulatory agencies within 15 days of event~~-~~ termination[18].

~~3.21~~3.22 Line Management

The responsibilities of line management include the following activities:

- ~~accounts~~accounting for staff members
- ~~reports~~reporting missing or injured staff members to the ~~Staging Area Supervisor~~SAS
- ~~assists~~assisting the ~~Staging Area Supervisor~~SAS if requested
- ~~performs~~performing the necessary actions addressed in HDI
- ~~acts~~acting as a health advocate for injured/ill staff members
- ~~keeps~~keeping the BED informed of changes in programmatic activities that could affect an emergency event
- ~~provides~~providing or ~~verifies~~verifying training for staff members~~.~~
- ~~provides~~providing training for unescorted visitors for whom he/she is responsible
- ~~keeps~~keeping the BED and Zone Wardens informed of staff members who may require assistance in an emergency event~~.~~
- ~~Providing~~providing staff, who are residents in the ~~RPL~~325RPL or are qualified Fissionable Material Handlers, with a Personal Nuclear Accident Dosimeter ~~(PNAD).~~.

Line management has the responsibility to assure that each PNNL staff member performing work in or having unescorted access approval into the ~~RPL~~325RPL reviews this BEP annually and documents the review with their ~~training coordinator~~Training Coordinator.

~~3.22~~3.23 New Staff Assigned to ~~RPL~~325RPL

All new assignees to the ~~RPL~~325RPL facility shall complete initial training within 10 (ten) working days of assignment. All temporary personnel with unescorted access are required to receive this training before beginning work in the ~~RPL~~325RPL facility.

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4.0 Implementation of the Building Emergency Procedure (BEP)[19]

The decision to implement the BEP should be made whenever unusual or emergency conditions exist that require the response of facility and/or emergency personnel and the establishment of an ICP.

For RCRA events involving dangerous waste, the BEPBED must be implemented and the Washington State Department of Ecology notified if allusе the following criteria are metto determine if an event is subject to the contingency plan implementation and notifications requirements of WACs 173-303-350 and 173-303-360:

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

   AND

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

   OR:

2. 2bb. The unplanned fire or explosion occurred at a facility or transportation activity subject to RCRA contingency planning requirements;

   AND

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

- Based on evaluation of the event, the BED or alternate BED will implement the BEP to the extent necessary to protect human health and/or the environment. The BED has the authority to commit the resources necessary to carry out the actions required by the BEP.

- The BED will direct that additional checklists that are identified in the BEP be initiated and completed. When the materials and quantities involved in the incident have been identified, it should be possible to evaluate the magnitude of the hazard.

During an emergency event, the BED will take all reasonable measures to assure that fires, explosions, and releases do not occur, recur, or spread to other dangerous waste in the facility. Measures include stopping processes and operations, collecting and containing released waste, and removing or isolating containers as appropriate.

In any emergency, priority is given to protection of the health and safety of persons in the immediate area. Containment and cleanup are secondary choices. When responding to minor spill events, onsite personnel will generally perform immediate cleanup of minor spill or releases using facility equipment. Remediation of such spills and releases would not normally constitute activation of the BEP. A spill or release of dangerous waste is considered 'minor' if **ALL** of the following are true:

- The spill is either contained, or if outside a secondary containment, is minor in quantity (generally less than 10 gallons of liquid or 100 pounds of solids)).
- The composition of the material or waste is known and can be immediately determined from the label, manifest, Safety Data Sheet (SDS:), or other records:.

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- **The spill does not threaten the health and safety of building occupants such that an area evacuation is necessary;**
- **Response personnel have appropriate training and equipment to expeditiously remediate the spill or release.**

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5.0 Facility Hazards

The RPL325RPL contains both radioactive and hazardous chemicals that pose a potential hazard to the public, adjacent facilities, personnel, programs, and the environment during an emergency. Because the location of hazardous materials and equipment within the facility can change on a frequent basis due to specific research needs, a variety of informational tools have been created and integrated into daily operations. Some of the tools available within the facility are the Map Information Tool;

- Map Information Tool (MIT),);
- Chemical Management System (CMS), the RPL)
- 325RPL Operating Envelope webpage, and the
- Integrated Operations System (IOPS) which includes the Hazard Awareness Summaries for each hazardous space in RPLthe 325RPL Complex.

5.1 Hazardous Materials

The RPL building325RPL Building contains hazardous materials including:

- Chemicalschemicals exhibiting one or more hazards such as corrosives, oxidizers, flammable solids and liquids, poisons, etc.
- Radioactiveradioactive materials,
- Hazardoushazardous wastes, including listed wastes and waste exhibiting one or more characteristics such as corrosivity, reactivity, ignitability, toxicity, and/or environmental persistence.
- Mixedmixed wastes (wastes containing both radioactive and hazardous components).

Hazards associated with these materials vary depending on type, quantity, and concentration of the material(s) involved in the incident as well as the type of incident.

During an emergency, the PNNL CMS may be consulted to determine the identity and quantity of hazardous chemicals located in affected areas of the facility.. The listing of satellite and 90-day accumulation areas (are available on the Environmental Protection & Regulatory Programs webpage)Integrated Waste Management System (IWMS) which is maintained by the Materials and Waste Operations Organization and IWMS may also be consulted to identify the location and typetypes of wastes (hazardous and mixed) located in the facility.. The inventory of waste stored in the RPL325RPL RCRA permitted unit may be determined by consulting with EP&RP personnelthe Materials and Waste Operations Organization IWMS database.

Arrangements for local response agencies (fire, police, and medical and emergency response teams) are required to assist in pre-emergency planning. These arrangements include familiarization with the properties of dangerous waste handled at the facility and associated hazards. The Emergency Preparedness Office provides these coordination efforts with input from individual BEDs and others, as appropriate.

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5.2 Physical (Industrial) Hazards

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The ~~RPL building~~325RPL Building contains industrial hazards such as high-voltage equipment, high-temperature equipment, elevated work areas, and overhead hazards. Refer to the IOPS Hazard Awareness Summaries that are posted at the entrance to each space for specific details.

5.3 Dangerous Mixed Waste

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See Section 5.1. Refer to the MIT to identify the location of any dangerous mixed waste location in a specific room.

5.4 Radioactive Materials

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See Section ~~5.1.~~5.1. Refer to the ~~MFF~~MIT to identify the location of any dangerous mixed waste location in a specific room.

5.5 Criticality

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The ~~RPL building~~325RPL Building is a Hazard Category 2 non-reactor nuclear facility designed as a multi-purpose research facility. Fissionable materials are stored ~~in various locations designated controlled areas throughout the building~~ and used in various lab spaces (Controlled Areas). Limits and controls for mitigating the criticality hazards are described in the posted Criticality Safety Specifications. A fissionable material line manager and fissionable material handler supervisor are assigned responsibility for each controlled area.

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~~The RPL~~PNNL-DSA-325, *Radiochemical Processing Laboratory Documented Safety Analysis* ~~(DSA) analyzed~~325RPL's Documented Safety Analysis [DSA], analyzes various scenarios regarding potential criticality incidents and establishes a Nuclear Criticality Safety Program as a safety management program. The Nuclear Criticality Safety Program evaluates fissionable material handling and storage at the ~~RPL~~325RPL and provides engineered features, limits, and administrative controls necessary to assure the possibility of a criticality event remains extremely unlikely.

The criticality safety risk of firefighting within each controlled area is evaluated and areas are posted with appropriate symbols when a limitation on the use of water or other extinguishing agents is warranted. These limitations are also identified within the ~~Hanford Fire Department~~HFD Pre-incident Plan.

A criticality accident at the ~~RPL~~325RPL is a credible event. A ~~criticality alarm system~~ CAS is maintained to mitigate the impact of an accidental criticality on facility staff and visitors through rapid notification and an immediate evacuation. The system is tested on a ~~semiannual~~semi-annual basis.

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6.0 Potential Emergency Conditions and Appropriate Response

6.1 Explosion/Fire/Fire Alarm[20]

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~~**Note: During these events, it is likely that facility integrity may be compromised and that the facility will also experience a concurrent loss of electrical power and/or control of the building ventilation systems. If this is the case, refer to Sections 6.2, *Hazardous Material/Dangerous or Mixed Waste Spill* and Section 6.6, *Loss of Electrical Power/Reduced Ventilation* for concurrent actions as appropriate.**~~

NOTE: *During these events, it is likely that facility integrity may be compromised and that the facility will also experience a concurrent loss of electrical power and/or control of the building ventilation systems. If this is the case, refer to Section 6.2, Hazardous Material/Dangerous or Mixed Waste Spill and Section 6.6, Loss of Electrical Power/Reduced Ventilation for concurrent actions as appropriate.*

If you are involved with, or are in close proximity to an explosion, a fire, or discovery of a fire, or have indication that the fire alarm is sounding, perform the following:

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6.1.1 Fire/Explosion

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6.1.1.1 Sound the alarm by pulling the fire alarm pull box. See the guidance for the exception to this step below.

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Exception to pulling the fire alarm: If a simple and safe action can be taken that will immediately and positively extinguish a small fire (e.g., pulling the plug on a malfunctioning lab instrument, isolating a fuel source such as quickly closing a valve that is immediately at hand, smothering the flame), then pulling the fire alarm pull box is not necessary, and the fire may be extinguished prior to calling the PNNL ~~Security Operations Center~~ SOC at 375-2400.

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~~**Note: If appropriate, the BED will classify the event using the RPL EALs.**~~

NOTE: *If appropriate, the BED will classify the event using the 325RPL EALs.*

6.1.1.2 Evacuate the building through the nearest exit that can be safely used.

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6.1.1.3 Once in a safe location, notify the PNNL ~~Security Operations Center~~ SOC at 375-2400 and provide the following information (if known):

- ~~Nature~~ature and location of the event:

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[20] Section 6.1~~:~~, Permit ~~requirement~~Requirement, Class 1 Modification ~~6/30/15~~ 03/31/16

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- ~~If the~~ conditions of the event appear to be degrading, (i.e., the fire appears to be escalating or building structures are being compromised~~).~~)
- ~~Your~~your name and callback telephone number~~.~~
- ~~Time~~time event began or was discovered~~.~~
- ~~Report the~~ number and condition of any injured personnel~~.~~
- ~~If known, include the following:~~ name(s) and amount(s) of any chemical(s) that are involved or may be burning as a result of ~~the~~ fire.

~~Note: The fire department can be notified directly by calling (9) 911 or 373-0911 (cell). If the fire department was contacted using this option, also call the PNNL Security Operations Center at 375-2400 as soon as possible to initiate PNNL management notification and emergency response.~~

NOTE: *The fire department can be notified directly by calling (9) 911 or 373-0911 (cell). If the fire department was contacted using the cell option, also call the PNNL SOC at 375-2400 as soon as possible to initiate PNNL management notifications and emergency response.*

6.1.1.4 If time permits, and without putting yourself in jeopardy, you may fight the fire under the following conditions:

- You have directed someone to pull the fire alarm pull box~~.~~
- You have verified that someone has called the PNNL ~~Security Operations Center~~ SOC at 375-2400, (9) 911, or 373-0911 (cell~~).~~)
- ~~If you~~You are willing, able, and knowledgeable about the selection of fire extinguisher and its use.

~~Note: Fire extinguishers equipped with the glove piercing tips are for HFD use only.~~

NOTE: *Fire extinguishers equipped with the glove piercing tips are for HFD use only.*

- If the fire is in a hot cell, attempt to smother the fire, ~~or for a large fire, put the fire out using~~if smothering does not work then use the fire extinguishing system, if you are trained to do so.
- If the fire is in a glove box, do not attempt to fight the fire using the gloves. Isolate supply air to the glove box if safe to do so.
- If the fire is small and you know what material is burning, the fire does not involve significant quantities of hazardous materials, and does not present a personnel exposure hazard to smoke or significant heat.

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6.1.1.5 If you have chosen to fight the fire, and after the fire is believed to be out, call the PNNL ~~Security Operations Center~~SOC at 375-2400 and inform them of your actions.

- Unless there are significant amounts of smoke or fumes, remain in the proximity of the fire to verify that the fire does not re-flash.
- In the event the fire re-flashes, perform these actions starting with Step 6.1.1, and do not attempt to fight the fire on your own.

6.1.2 Fire Alarm

~~**Note: If appropriate, the BED will classify the event using the RPL EALs.**~~

NOTE: *If appropriate, the BED will classify the event using the 325RPL EALs.*

6.1.2.1 If time permits, and without placing yourself in jeopardy, perform the following:

- Verify equipment is shutdown or is in a safe configuration.
- Verify nuclear and classified materials are secured.

6.1.2.2 Zone ~~wardens~~Wardens perform an accountability sweep of their assigned areas.

6.1.2.3 Evacuate the building through the nearest exit that can safely be used.

6.1.2.4 Assemble at ~~the~~ staging area located at the lower south parking lot, south end ~~of lane~~ Lane #9.

~~a.~~ Zone ~~wardens~~Wardens report the status of ~~their~~ accountability ~~sweeps~~sweeps to the SAS.

~~b.~~ If classified materials (documents, ~~electronic storage media~~ESM, test materials, etc.) are removed from the ~~Limited Area (~~LA~~)~~ or left unsecured within the LA:

- Inform the SAS that classified material has been left in an unsecured condition or has been removed from the LA.
- Call the PNNL ~~Security Operations Center~~ SOC at 375-2400 and report the details surrounding the classified materials security event.
- The SAS shall provide information to the BED concerning the classified material.

~~c.~~ Personnel who are wearing PPE clothing or are suspected of being contaminated shall be segregated from other building occupants and shall be surveyed by radiological control personnel. PPE will be discarded as directed by the RPT.

~~d.~~ Zone ~~wardens~~Wardens and all staff are to remain at the staging area and follow the instructions of the BED.

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6.2 Hazardous Material/Dangerous or Mixed Waste Spill[21]

~~**Note: If appropriate, the BED will classify the event using the RPL EALs.**~~

NOTE: *If appropriate, the BED will classify the event using the 325RPL EALs.*

6.2.1 Minor Spills

~~6.2.1~~ For minor spills/releases that are relatively small in size, perform the following:.

~~**Note: A spill or release of dangerous waste is considered "minor" if ALL of the following are true. If not, refer to section 6.2.2.**~~

NOTE: *A spill or release of dangerous waste is considered "minor" if ALL of the following are true. If not, refer to Section 6.2.2.*

- The spill/release either is contained or, if outside of a secondary containment, is minor in quantity (generally less than 10 gallons of liquid or 100 pounds of solids).
- The composition of the material or waste is known and can be immediately determined from the label, manifest, SDS, or other records.
- The spill/release does not threaten the health and safety of building occupants such that a building evacuation is necessary.
- Response personnel have appropriate training and equipment to expeditiously remediate the spill or release.

6.2.1.1 Move personnel away from the substance.

6.2.1.2 Notify nearby personnel of the emergency.

6.2.1.3 Prevent personnel exposure by restricting access to the spill area by setting up barricades, closing doors, etc.

6.2.1.4 Notify the PNNL ~~Security Operations Center~~ SOC at 375-2400 and provide the following:

- ~~Nature~~nature and location of the event.
- ~~Name~~name(s) of chemicals involved, amounts, sources, and known hazards about the chemicals.
- ~~If~~if the spill has been contained.
- ~~If~~if any material has been released to the environment.
- ~~Any~~any corrective actions in progress.
- ~~Name~~name(s) of anyone contaminated or injured in connection with the incident.
- ~~Other~~other hazards that may or may not be related to the spill.

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[21] Section 6.2~~.~~, Permit ~~requirement~~Requirement, Class 1 Modification ~~6/30/15~~ 03/31/16

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- Timetime incident began or was discovered.
- The current status of the event. i. (e. g., spill contained or not contained, etc.)
- Namename, location, and callback telephone number of person reporting the incident.

6.2.1.5 Notify the BED, CSM, and the safetySafety and health representativeHealth Representative.

6.2.1.6 Take steps to contain the spill/release **IF, and only IF**:

a. The identity of the substance *is known*.

b. The hazards of the substance are known (flammable, toxic, radioactive, corrosive material) and can either be controlled or they do not present an immediate threat.

- Hazards of the substance are known (flammable, toxic, radioactive, corrosive material) and can either be controlled or they do not present an immediate threat.

c. Appropriate PPE and control/cleanup supplies are readily available.

d. The individual(s) performing the task have had training related to spill/leak control and can safely perform the action(s) without assistance, or assistance is readily available from other trained personnel.

6.2.1.7 Steps to contain the spill/release may include, as appropriate:

a. Build a containment of absorbent materials and restrict access to the affected area.

b. Tighten closures, tip the container to stop the leak, use plugging, or patching materials or over packing.

c. Perform initial cleanup of the spill area by transferring contents to appropriate non-leaking containers using the appropriate procedures and tools.

6.2.2 For a major spill/release, or tank spills, perform the following actions.

Note: If appropriate, the BED will classify the event using the RPL EALs.

NOTE: *If appropriate, the BED will classify the event using the 325RPL EALs.*

6.2.2.1 If the spill/release threatens the health and safety of building occupants such that a building evacuation is necessary, initiate a building evacuation by pulling the fire alarm. If a building evacuation is not necessary, continue at section 6.2.2.2 Section 6.2.2.2.

a. Assemble at the staging area located at the lower south parking lot, south end of lane Lane #9.

i. Zone wardens Wardens report to the SAS.

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2.• If classified materials (e.g., documents, electronic storage mediaESM, test materials, etc.)) are removed from the LA or left unsecured within the LA:

- Inform the SAS that classified material has been left in an unsecured condition or has been removed from a LA.
- Call the PNNL Security Operations CenterSOC at 375-2400 and report the details surrounding the classified materials security event.
- The SAS shall provide information to the BED concerning the classified material.

3.• Personnel who are wearing PPE clothing or are suspected of being contaminated shall be segregated from other building occupants and shall be surveyed by radiological control personnel. PPE will be discarded as directed by the RPT.

4.• Zone wardensWardens and all staff are to remain at the staging area and follow the instructions of the BED.

6.2.2.2 Move personnel away from the substance.

6.2.2.3 Notify nearby personnel of the emergency.

6.2.2.4 Notify the PNNL Security Operations CenterSOC at 375–2400 and provide the following:.

- name, location, and callback telephone number of person reporting the incident.
- name(s) of chemical(s) involved and amount(s) involved in the incident.
- location of incident (identify as closely as possible and include information about multiple building numbers).)
- time incident began or was discovered.
- where the materials involved are going or might go, such as into secondary containment, under doors, through air ducts, etc.
- source and cause, if known.
- name(s) of anyone contaminated or injured in connection with the incident.
- any corrective actions in progress.
- anyone else who the discoverer has contacted.
- any known hazards.
- wherelocation and whentime the chemical condition or spill occurred.
- if any material was released to the environment (e.g., to a stack or a sewer system).)

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- the status of the situation.

6.2.2.5 Prevent personnel exposure (e.g., set up barricades).

6.2.2.6 Contact the Cognizant Space Manager (CSM).

6.2.2.7 Notify the safetySafety and health representativeHealth Representative.

6.2.2.8 Take steps to contain the spill **ONLY IF[ALL THE FOLLOWING EXIST:the following exist.**

- The identity of the substance is known.
  - hazards of the substance are known (flammable, toxic, radioactive, corrosive material) and can either be controlled or they do not present an immediate threatThe hazards of the substance are known (flammable, toxic, radioactive, corrosive material) and can either be controlled or they do not present an immediate threat.
- Appropriate
- appropriate protective equipment and control/cleanup supplies are readily available.
- The individual(s) performing the task have had training related to spill/leak control and can safely perform the action(s) without assistance, or assistance is readily available from other trained personnel.

6.2.2.9 Initiate actions to mitigate a tank spill/leak using trained personnel:

- Stop the source of the leak if possible (shutting valves, turning off pumps, etc.).
- Prevent further additions of liquid to the tank.
- Visually inspect the tank system to determine the source of the leak.
- Within 24 hours, remove Remove as much of the liquid from the tank as is practicablenecessary to prevent further leakage within 24 hours or the earliest practicable time.
- Remove any leakage contained in a secondary containment within 24 hours, or as soon as practicablepossible.
- Prevent any further leakage or migration of the leak to soils or surface waters.

6.2.2.10 Notify the BED, the CSM, and the safetySafety and health representativeHealth Representative of any pertinent information that you may have.

- The discovererDiscoverer of the spill will provide a synopsis of the event and the actions taken to the BED, CSM, and the safetySafety and health representative. Health Representative.
- Upon completion of the event briefing, the BED will direct spill event mitigation activities upon completion of the event briefing.

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6.2.3 For events that involve transportation and/or damaged packaging of hazardous material or dangerous waste that arrives at the RPL325RPL:

Note: If appropriate, the BED will classify the event using the RPL EALs.

6.2.3.1 **DO NOT** move the shipment.

6.2.3.2 Notify the BED, CSM, and the safetySafety and health representativeHealth Representative.

- The receiver of the shipment or discoverer of the damaged package will provide a synopsis of the situation and the actions taken, if any, to the BED, CSM, and the safetySafety and health representativeHealth Representative.

6.2.3.3 The BED will evaluate the event and initiate appropriate actions for minor events/spills per Section 6.2.1 6.2.1 or 6.2.2Section 6.2.2 as appropriate.

- Treat any release from the package as a hazardous material spill and perform response actions as appropriate.

6.3 Unusual, Irritating or Strong Odors[22]

6.3.1 If an unusual odor is detected and the source is unknown, the type and location of the odor should be reported to the BED, and the BED will determine the appropriate actions.

6.3.1.1 If the odor is determined to be potentially dangerous, then:

a. Initiate a building evacuation by pulling the fire alarm.

b. Assemble at the staging area located at the lower south parking lot, south end of laneLane #9.

c. Zone wardensWardens report to the SAS.

d. If classified materials (e.g., documents, electronic storage mediaESM, test materials, etc.)) are removed from the LA or left unsecured within the LA:

- Inform the SAS that classified material has been left in an unsecured condition or has been removed from the LA.
- Call the PNNL Security Operations Center SOC at 375-2400 and report the details surrounding the classified materials security event.
- The SAS shall provide information to the BED concerning the classified material.

e. Personnel who are wearing PPE clothing or are suspected of being contaminated shall be segregated from other building occupants and shall

[22] Section 6.3, Permit requirementRequirement, Class 1 Modification 6/30/15 03/31/16

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be surveyed by radiological control personnel. PPE will be discarded as directed by the RPT.

f.e Zone wardensWardens and all staff are to remain at the staging area and must follow the instructions of the BED.

6.4 Potential Radiological Material Release

Note: If appropriate, the BED will classify the event using the RPL EALs.

Note: If readings are provided in Becquerel's. A Becquerel is a SI unit of radioactivity equal to one disintegration per second. Conversion to dpm (disintegration per minute): Multiply total Becquerel's by 60.

NOTE 1: *If appropriate, the BED will classify the event using the 325RPL EALs.*

NOTE 2: *The RPT may provide radiological survey data in Becquerel's. A Becquerel is a SI unit of radioactivity equal to one disintegration per second. Conversion to disintegration per minute: Multiply total Becquerel's by 60.*

6.4.1 Area Radiation Monitor (ARM)

a.e Stop work.

b.e Alert personnel in the area.

c.e Exit the Radiologically Controlled Area (RCA) that is being monitored by the ARM Area Radiation Monitor.

d.e Notify the RPT and the BED.

e.e Notify the PNNL Security Operations CenterSOC at 375--2400.

6.4.2 Continuous Air Monitor (CAM) or ALPHA Sentry Cam Continuous Air Monitor

a.e Stop work.

b.e Alert personnel in the area.

c.e Exit the area being monitored by the Continuous Air Monitor (CAM) and move into a separate air space.

d.e Notify the RPT and the BED.

e.e Notify the PNNL Security Operations CenterSOC at 375--2400.

6.4.3 Glove box differential pressure alarmBox Differential Pressure Alarm

a.e Stop work.

b.e Alert personnel in the area.

c.e Exit the immediate area.

d.e Notify the RPT and the BED.

e.e Notify the PNNL Security Operations CenterSOC at 375-2400.

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6.4.4 Hot cell differential pressure alarm

a. Stop work.

b. Alert personnel in the area.

c. Exit the immediate area.

d. Notify the RPT and the BED.

e. Notify the PNNL Security Operations CenterSOC at 375-2400.

6.5 Criticality and Criticality Safety Limit Violations

6.5.1 In the event of a potential criticality safety limit violation, perform the following:

6.5.1.1 The staff member discovering an actual or potential criticality safety limit violation shall follow thosethe steps below (also described in the operating documents):).

a. Stop work immediately in the area without making any changes to present conditions.

b. Ensure that any fissionable materials or other equipment and materials close enough to interact with fissionable materials are not moved or disturbed.

c. Immediately notify the Building Manager; ifBM. If not available, call the PNNL Security Operations CenterSOC at 375-2400 and state the problem.

6.5.1.26.5.1.1 Upon notification, the Building ManagerBM shall:

a. Call the PNNL Security Operations Center SOC at 375-2400 and state the problem;

b. Notify the Fissionable Material Line Manager and supervisor for the controlled area; and,

c. Contact the Nuclear Criticality Safety Program Manager 554-8987308-2946 or Nuclear Safety and Facility Authorization Manager 947-2344 to obtain nuclear criticality safety program staff support.

6.5.1.36.5.1.2 Upon notification, the Fissionable Material Line Manager shall:

a. Ensure that all work activities in the affected area are stopped; and,

b. Post warning signs at appropriate locations requiring permission from the fissionable material line manager Fissionable Material Line Manager to enter the area.

6.5.1.46.5.1.3 Upon notification, the Nuclear Criticality Safety Program Manager shall:

a. Confirm whether a limit violation exists; and,

b. If limit has been violated determineDetermine if a second contingency still provides for prevention of criticality or other danger if limit has been violated.

6.5.1.56.5.1.4 Criticality safety limit violations are identified as a loss of process-condition control in the *Event Classifiers Procedure*. The Building ManagerBM shall initiate the associated reporting, critique, and corrective

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action process defined in the HDI, *Report and Event or Occurrence work flow.* Workflow, *Report an Event or Occurrence.*

6.5.1.66.5.1.5 The Nuclear Criticality Safety Program Manager will assist the Building ManagerBM in developing a recovery planRecovery Plan based on a thorough review of the situation and potential hazards associated with the violation.

6.5.2 In the event of a criticality alarmCriticality Alarm, perform the following:.

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Note: If appropriate, the BED will classify the event using the RPL EALs.

NOTE 1: *If appropriate, the BED will classify the event using the 325RPL EALs.*
NOTE 2: *Administrative Controls are in place to restrict movement of additional fissionable material in the HLRF hot cells. The controls prevent a criticality event in the HLRF hot cells. The controls address the concern that a criticality within the HLRF hot cells would not be detected with the Criticality Detection System.*

6.5.2.1 Leave the building immediately through the closest exit, do NOT stop for a survey and run at least 100 feet away from the facility.

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6.5.2.2 Zone wardensWardens are also directed to leave the building immediately without performing accountability sweeps of their zones.

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Note: Obstacles located within 100 feet of the building (fences, walls, trenches, etc.) may prevent running directly away from the building for 100 feet. Choose a path around these barriers that will maximize your distance from the building. When past the obstacle, continue directly away from the building until you are 100 feet from the building. See Attachments 1-3, *Emergency Equipment & Evacuation Routes* for suggested routes to the RPL Staging Area.

NOTE: *Obstacles located within 100 feet of the building (e.g., fences, walls, trenches) may prevent running directly away from the building for 100 feet. Choose a path around these barriers that will maximize your distance from the building. When past the obstacle, continue directly away from the building until you are at least 100 feet from the building. See Attachments 1 – 3, Emergency Equipment & Evacuation Routes for suggested routes to the 325RPL staging area.*

6.5.2.3 Proceed to the staging area along a path that does not take you closer to the building.

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6.5.2.4 Assemble at the staging area located at the lower south parking lot, south end of lane Lane #9. Consider moving to the alternate staging area (350 Building).

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a. Perlnitiate RCP-8.1.02, initiate "Quick-Sort Survey of Personnel:",

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- Any positive quick sort must immediately be reported to the BED.

b. Zone wardensWardens report to the SAS.

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e.• If classified materials (e.g., documents, electronic storage mediaESM, test materials, etc.)) are removed from the LA or left unsecured within the LA:

- Inform the SAS that classified material has been left in an unsecured condition or has been removed from the LA.
- Call the PNNL Security Operations Center SOC at 375-2400 and report the details surrounding the classified materials security event.
- The SAS shall provide information to the BED concerning the classified material.

d.1.1.1.1 Personnel who are wearing PPE clothing or are suspected of being contaminated shall be segregated from other building occupants and shall be surveyed by radiological control personnel. PPE will be discarded as directed by the RPT.

- SAS shall provide information to the BED concerning the classified material.
- Personnel who are wearing PPE clothing or are suspected of being contaminated shall be segregated from other building occupants and shall be surveyed by radiological control personnel. PPE will be discarded as directed by the RPT.

e.• Determine the radiation dose levels at the staging area and in the evacuated area following a criticality accident.

f.• Dose rates and report findings shall be reported to the BED.

g.• Zone wardensWardens and all staff are to remain at the staging area and follow the instructions of the BED.

- Notify first responders to set their Electronic Personal Dosimeters to 3 rem/hour rate in order to keep them far enough away from the criticality event location and to limit dose from a pulse.
- Retrieve Fixed Nuclear Accident Dosimeters in order to reconstruct the dose of the accident.
- Responders wear full respirators or supplied air system to limit inhalation dose.
- Provide shortest route for retrieval of Fixed Nuclear Accident Dosimeters.
- Electronic Personal Dosimeters should be set at the normal level of 100 mrem/hr total.
- If Fixed Nuclear Accident Dosimeters are not retrievable, chemical reagents can be used.

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6.6 Loss of Electrical Power/Reduced Ventilation

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6.6.1 In the event of a loss of or a significant interruption to building electrical power and/or a reduction in ventilation flow, perform the following:

6.6.1.1 Place laboratory or room in safe condition per the following:

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a. Verify fume hoods and sashes are closed.

b. Verify equipment is shutdown.

c. Verify nuclear material(s) are secure.

d. Verify that classified materials are secure.

e. Verify all hazardous materials are secure.

f. Verify that all equipment and heat generating devices inside of laboratory gloveboxes and inside of hot cells are shutdown shut down.

6.6.1.2 If the building electrical power returns and/or standby power are is still available:

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a. Assemblessemble in the lunchroom.

b. Hif classified materials (e.g., documents, electronic storage mediaESM, test materials, etc.)) are removed from the LA or left unsecured within the LA:

- Inform the SAS that classified material has been left in an unsecured condition or has been removed from the LA.
- Call the PNNL Security Operations CenterSOC at 375-2400 and report the details surrounding the classified materials security event.
- The SAS shall provide information to the BED concerning the classified material.

~~e.~~a. Personnel exiting the ~~radiological buffer areas~~Radiological Buffer Areas (RBA) are expected to do so without surveying through the ~~PCMs~~ personnel contamination monitor (PCM).

~~d.~~b. Personnel who are wearing PPE clothing or are suspected of being contaminated shall be segregated from other building occupants and shall be surveyed by radiological control personnel. PPE will be discarded as directed by the RPT.

~~e.~~c. Zone ~~wardens~~Wardens for Zones 2 and 8 are requested to activate the flashing red warning lights.

~~f.~~d. Zone ~~wardens~~Wardens and all staff are to remain at the lunchroom and follow the instructions of the BED.

~~g.~~e. Radiological surveys of the facility shall be performed prior to re-entry.

6.7 Natural Phenomena Events

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~~Note: If appropriate, the BED will classify the event using the RPL EALs.~~

NOTE: *If appropriate, the BED will classify the event using the RPL EALs.*

The natural phenomena events that are considered as having a probability of occurring and are addressed in this procedure are seismic event/earthquake, volcanic eruption/ash fall, high wind/tornado, flood, and range fire.

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If these events were to occur, Hanford TNS messages will most likely be sent before, during, or immediately following the event. Regardless of the receipt of a phone message, the BED will direct activities within the facility in accordance with this procedure and provided by phone messages as appropriate.

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Should it become necessary to evacuate the facility, the BED will report the evacuation to the PNNL ~~Security Operations Center~~SOC at 375-2400, and the EOC Shift Office at 376-2900.

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6.8 Bomb Threats/Suspicious Objects

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~~Note: If appropriate, the BED will classify the event using the RPL EALs.~~

NOTE: *If appropriate, the BED will classify the event using the RPL EALs.*

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6.8.1 If a suspicious object is discovered, or the placement of such an object is observed, perform the following actions:,

6.8.1.1 Do not move, open, or otherwise disturb any suspicious objects.

6.8.1.2 Notify the PNNL Security Operations CenterSOC at 375-2400 and the RPL-BED using office telephones-only.

6.8.1.3 Evacuate the facility. DO NOT USE THE FIRE ALARM PULL BOX TO INITIATE THE EVACUATION as frequencies can detonate devices.

a.• Warn others in the immediate vicinity.

b.• Leave the building immediately via the closest exit.

c.• Zone wardensWardens are also directed to leaveLEAVE the building immediately without performing accountability sweeps of their zones.

6.8.1.4 Use of cellular phones, radios, or other radio frequency generating equipment within 100 feet of the RPL325RPL is prohibited.

6.8.1.5 Assemble at the staging area located at the lower south parking lot, south end of lane Lane #9.

a.• Zone wardensWardens report to the SAS.

b.• If classified materials (e.g., documents, electronic storage mediaESM, test materials, etc.)) are removed from the LA or left unsecured within the LA:

- Inform the SAS that classified material has been left in an unsecured condition or has been removed from a LA.
- Call the PNNL Security Operations CenterSOC at 375-2400 and report the details surrounding the classified materials security event.

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- The SAS shall provide information to the BED concerning the classified material.

c. Personnel who are wearing PPE clothing or are suspected of being contaminated shall be segregated from other building occupants and shall be surveyed by radiological control personnel. PPE will be discarded as directed by the RPT.

d. Zone wardens and all staff are to remain at the staging area and follow the instructions of the BED.

e. The Staging Area will be relocated a minimum of 300 feet away from the facility.

6.8.2 If a telephone bomb threat is received:

6.8.2.1 1.1.1.1 Use the *PNNL Bomb Threat Card* to record the message exactly as dictated and attempt to obtain the following information:

- When will it go off?
- Where it is located?
- What it looks like.
- What kind it is.
- Why it was placed?
- Who placed it?
- How you know so much about it?
- Who placed it?
- Where are you calling from?
- What's your name and address?

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6.8.2.2 Notify the PNNL Security Operations Center at 375-2400 and provide the information given by the caller.

6.8.2.3 Upon completion of the notifications to the PNNL Security Operations Center, also notify the BED and provide the information obtained from the caller.

6.8.3 If a written bomb threat is received,

6.8.3.1 Notify the PNNL Security Operations Center at 375-2400.

6.8.3.2 Provide the written bomb threat to the RPL BED who will forward it to the PNNL Subject Matter Expert/Safeguards and Security Management Official.

6.9 Active Shooter in the building

6.9.1 When condition is observed,

6.9.1.1 RUN Immediately try to get out of the facility to a safe location out of immediate sight of the building and call 375-2400.

6.9.1.2 1.1.1.1 HIDE If evacuation is not possible or safe, take cover in an office with the door closed and lights off. Lock the door if possible and call 375-2400.

6.9.1.3 1.1.1.1 FIGHT If the active shooter has confronted you and evacuation or taking cover is not possible, staff should take whatever actions are necessary to get to safety, this may include negotiating, fighting the intruder, or other. This is a last resort step.

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6.9.1.4 Building Emergency Director Response

6.9.1.5 Make a PA announcement if possible depending on the situation.

6.9.1.6 Request the safeguards and security representative be notified.

6.9.1.71.1.1.1 Do not move any suspicious objects.

6.9.1.81.1.1.1 Post warnings, if applicable.

6.9.1.91.1.1.1 Provide emergency responders with appropriate information upon arrival.

6.9.1.101.1.1.1 Keep staff from entering the affected area.

6.9.1.11 If appropriate, classify the event using the RPL EALs.

6.9.1.12 Activate the MSG.

6.9.1.13 Request medical assistance if necessary.

6.101.1 Notice of a PNNL Lockdown

6.10.1 When condition is observed,

6.10.1.1 Staff will be notified of a PNNL Lockdown over the telephone through the CNS system.

6.10.1.2 Immediately get behind a closed door if possible.

6.10.1.3 Place projects into safe shutdown mode

6.10.1.41.1.1.1 Do not allow anyone into the facility.

6.10.1.5 Await further instructions via CNS

6.111.1 Declared Emergency in the 300 Area

6.11.11.1.1 Personnel will evacuate the facility or take cover as directed by the BED.

6.11.2 If the declared emergency originates in the RPL facility, the BED shall take actions that are in accordance with the BEP and inform and direct other 300 Area contractors and other facility owners of the emergency declaration in accordance with their emergency procedures.

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7.0 Facility Take Cover—Shutdown of HVAC

7.1.1 If outside of the RPL, perform the following:

7.1.1.1 Take cover inside the nearest building.

7.1.1.2 If the building you take cover in is not the RPL, attempt to contact your line manager or team lead and have them report your whereabouts to the RPL SAS.

7.1.1.3 If unable to contact your management, report to the building emergency response organization (BERO) for the building where you are located so your personal accountability may be made.

7.1.1.4 Follow directions provided by that building's emergency organization or BED.

7.1.2 If you take cover inside the RPL, remain inside the RPL.

7.1.2.1 Assemble in the lunchroom.

7.1.2.2 Staff should refrain from eating and drinking during a take cover event if physically able, until an appropriate evaluation of the event can be made.

7.1.2.3 The BED will direct the shutdown of the RPL H&V as needed per SOP-325-003, *325 Building Heating, Ventilation and Air Conditioning Emergency Shutdown.*

7.1.2.4 If classified materials (documents, electronic storage media, test materials, etc.) are removed from the LA, or left unsecured within the LA:

- Inform the SAS that classified material has been left in an unsecured condition, has been removed from the LA, and the status/location of the classified material.
- Call the PNNL Security Operations Center at 375-2400 and report the details surrounding the classified materials as a security event, and provide details as necessary.
- The SAS shall provide information to the BED concerning the classified material.

7.1.2.5 Personnel who are wearing PPE clothing or are suspected of being contaminated shall be segregated from other building occupants and shall be surveyed by radiological control personnel. PPE will be discarded as directed by the RPT.

- Zone Wardens and all staff are to remain at the staging area and follow the instructions of the BED.
- The staging area will be relocated a minimum of 300 feet away from the facility.

6.8.2 If a Telephone Bomb Threat is Received

6.8.2.1 Use the *PNNL Bomb Threat Card* to record the message exactly as dictated and attempt to obtain the following information:

- When will it go off?

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- Where is it is located?
- What does it looks like?
- What kind is it?
- Why was it was placed?
- Who placed it?
- How you know so much about it?
- Where are you calling from?
- What's your name and address?

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6.8.2.2 Notify the PNNL SOC at 375-2400 and provide the information given by the caller.

6.8.2.3 Upon completion of the notifications to the PNNL SOC, also notify the BED and provide the information obtained from the caller.

6.8.3 If a written bomb threat is received:

6.8.3.1 Notify the PNNL SOC at 375-2400.

6.8.3.2 Provide the written bomb threat to the 325RPL BED who will forward it to the PNNL SME Safeguards and Security Management Official.

6.9 Active Shooter in the Building

6.9.1 When Condition is Observed

6.9.1.1 RUN – Immediately try to get out of the facility to a safe location out of immediate sight of the building and call 375-2400.

6.9.1.2 HIDE – If evacuation is not possible or safe, take cover in an office with the door closed and lights off. Lock the door if possible and call 375-2400.

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6.9.1.3 FIGHT – If the active shooter has confronted you and evacuation or taking cover is not possible, staff should take whatever actions are necessary to get to safety which may include fighting the intruder or other. This is a last resort step.

6.9.1.4 BED response:

6.9.1.4.1 Public Announcement (PA) made, if possible, depending on the situation.

6.9.1.4.2 Request the Safeguards and Security Representative be notified.

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6.9.1.5 Do not move any suspicious objects.

6.9.1.6 Post warnings, if applicable.

6.9.1.7 Provide emergency responders with appropriate information upon arrival.

6.9.1.8 Keep staff from entering the affected area.

6.9.1.9 Classify the event using the 325RPL EALs, if appropriate.

6.9.1.10 Activate the MSG by calling 375-2400 and requesting activation.

6.9.1.11 Request medical assistance, if necessary.

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6.10 Notice of a PNNL Lockdown

6.10.1 When Condition is Observed

6.10.1.1 Staff will be notified of a PNNL lockdown over the telephone through the CNS.

6.10.1.2 Immediately get behind a closed door if possible or hidden out of sight.

6.10.1.3 Place projects into safe shutdown mode.

6.10.1.4 Do not allow anyone into the facility.

6.10.1.5 Await further instructions via CNS.

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6.11 Declared Emergency in the 300 Area

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6.11.1 Personnel will evacuate the facility or take cover as directed by the BED.

6.11.2 If the declared emergency originates in the 325RPL facility, the BED shall take actions that are in accordance with the BEP and inform and direct other 300 Area contractors and facility owners of the emergency declaration in accordance with their emergency procedures.

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7.0 Facility Take Cover - Shutdown of Heating, Ventilation, and Air-Conditioning System

7.1.1 If outside of the 325RPL, perform the following.

7.1.1.1 Take cover inside the nearest building.

7.1.1.2 If the building you take cover in is not the 325RPL, attempt to contact your line manager or team lead and have them report your whereabouts to the 325RPL SAS.

7.1.1.3 If unable to contact your management, report to the BERO for the building where you are located so your personal accountability may be made.

7.1.1.4 Follow directions provided by that building's emergency organization or BED.

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7.1.2 If you take cover inside the 325RPL, remain inside the 325RPL.

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7.1.2.1 Assemble in the lunchroom.

7.1.2.2 Staff should refrain from eating and drinking during a take cover event, if physically able, until an appropriate evaluation of the event can be made.

7.1.2.3 The BED will direct the shutdown of the 325RPL H&V as needed per SOP-325-003, *325 Building Heating, Ventilation and Air Conditioning Emergency Shutdown*.

7.1.2.4 If classified materials (e.g., documents, ESM, test materials) are removed from the LA, or left unsecured within the LA:

- Inform the SAS that classified material has been left in an unsecured condition, has been removed from the LA, and the status/location of the classified material.
- Call the PNNL SOC at 375-2400 and report the details surrounding the classified materials as a security event and provide details as necessary.
- SAS shall provide information to the BED concerning the classified material.

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7.1.2.5 Personnel who are wearing PPE clothing or are suspected of being contaminated shall be segregated from other building occupants and shall be surveyed by radiological control personnel. PPE will be discarded as directed by the RPT.

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7.1.2.6 ~~wardens~~Zone Wardens for zones two and eight are requested to activate the flashing red warning lights.

7.1.2.7 Zone ~~wardens~~Wardens and all staff are to remain in the lunchroom and follow the instructions of the BED.

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8.0 Utility Disconnects

Utility disconnects may be necessary under extreme emergency conditions. The RPL325RPL BED will determine if utility disconnects need to be disconnected/shut. Locations of the utility disconnects or valves are described as followsidentified below:

8.1 Electrical

The RPL325RPL Building main electrical control center switchgear is located on the second floor (northwest corner) in room Room 904. Extreme caution shall be used if disconnecting this power.

8.2 Potable/Process Water

The internal valves are located in the southwest corner of room Room 22 in the basement. The external ground -valve, SCW-1-VLV (blue cover, operating handle located in RPL 325RPL Shop) is located outside at the southwest corner of the RPL building325RPL Building.

8.3 Gas Supplies

The P-10 gas distribution system is located at the northeast end of the north gas cylinder dock. Turn cylinders off as directed by the RPL-325RPL BED.

8.4 Steam

The high-pressure steam supply valves are located above the power operator's workstation entry door on the second floor east equipment room. Steam to the RPL325RPL may also be isolated using valves inside the Johnson Controls-operated 325B boiler house, if access to the RPL325RPL Building is not possible.

8.5 Air

The external high-pressure compressed air supply may be isolated in one of two locations; CA-18-VLV in the basement adjacent to the main air receiver tank or CA-90-VLV outside at the north bottle dock adjacent to the Fire Riser 1 connection. Compressed air from the main air compressor may be isolated in one of two locations; CA-186-VLV on the second floor in the discharge piping at the main air compressor or CA-16-VLV in the basement adjacent to the main air receiver tank.

The main air compressor may be isolated in one of two ways: OPEN the electrical disconnect (S-DIS-074) for the main air compressor or by CLOSING valve CA-186-VLV; both of the components are located adjacent to the main air compressor in the second floor mechanical room. If time permits, the preferred method of shutting down the main air compressor is to press the STOP pushbutton located on the front of the compressor.

8.6 Compressed Air

To remove all sources (except gas cylinders) of high and low pressure compressed air in the RPL and the RPL Filter Building, compressed air fromof compressed air, the standby compressor (CA-97-COMP) located in the northwest corner of the basement) must also

be isolated or shutdown in addition to isolating the standbymain air compressor shutdown. Isolation of compressed air from the standby compressor is accomplished by shuttingOPENING the electrical S-DIS-073 or CLOSING valve CA-96-VLV, which is; both components are located just north ofadjacent to the standby air compressor. If time permits, the preferred method of shutting down the standby air compressor. The compressor may be shutdown using its is to place the control switch to the OFF position; the switch is located on the compressor or by turning off electrical power to the compressor by opening disconnect switch "S-DIS-073" or breaker in SMCC-B-B2, cubicle 2D which is located in the northwest corner of the basement.

8.6 top of the compressor controller. Ventilation

Facility exhaust and supply fan controls are located:

- At at the power operator workstation (room Room 900).)
- The Power Operators METASYS work stationstations in any PNNL facility may be used to secure the RPL325RPL main supply and exhaust fans as well as a majority of the building H&V. heating and ventilation (H&V).
- In in the north part of the basement, west of the elevator.
- Additional exhaust fan controls are on the starter enclosure for each exhaust fan inside the RPL325RPL Filter Building.

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External shutdown of the main exhaust and supply fans may be accomplished under extreme circumstances by removing both normal and standby electrical power from the building. A more controlled external shutdown of the main exhaust and supply fans is a complicated evolution involving multiple operating locations that must be accomplished in a specific sequence under supervision of RPL325RPL knowledgeable staff to prevent the risk of loss of building containment due to creation of a positive pressure inside the building.

8.7 Fire Protection Supply Water

Fire Suppression Supply Water Post Indicator Valves (Red PIVsred) for Risers 1 through 5 are located outside the RPL building325RPL Building in the following locations:

- Riser #1 PIV is located at the northwest corner of the RPL325RPL building.
- Riser #2 PIV is located north of the RPL 325RPL
- Riser #3 PIV is located at the southwest corner of the RPL325RPL building.
- Riser #4 PIV is located southeast of the RPL 325RPL A annex.
- Riser #5 PIV is located southeast of the RPL 325RPL A annex.

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8.8 Dry Pipe OS&YOutside Screw and Yoke (Riser #6)

The outside screw and yoke (OS&Y) valve for the dry pipe fire suppression system on the north gas cylinder dock is located on the second floor in the east equipment room at the north wall.

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Suppression water for this system is supplied from Riser-# 2 and may be isolated external to the RPL325RPL by shutting the PIV for Riser-# 2.

8.9 RPL325RPL Ramp Sump Pump

Water runoff down the RPL325RPL basement truck ramp at the southwest corner of the building is collected in a sump at the bottom of the ramp. The associated sump pump empties the sump as needed to prevent it from overflowing into the RPL325RPL basement through the roll-up door. The sump pump discharges to the street in front of the RPL325RPL.

Potentially contaminated fire suppression water runoff from inside the RPL325RPL basement could also enter this sump and be pumped to the street in front of the building resulting in an unacceptable spread of contamination.

The local disconnect for the sump pump is located inside the south roll-up door on the east side of the door.

8.10 RPL325RPL Decontamination Shower/Sink

A decontamination shower and sink is located in Room 426 with a tempered water supply for use as an emergency decontamination system. The contaminated water is routed to two 250 gallons-gallon storage tanks located in Room-94B.

The system is designed with the drains directed to one of the two tanks. A high-level alarm activates locally when the selected tank reaches 66-% percent volume. The high-level alarm is used to prevent overfilling of the tank. The water supply is manually isolated to allow valve alignment to the second tank for water receipt. The high-high alarm at 75- percent of the tank volume will automatically isolate water to the shower or sink. The tanks have a common overflow for upset conditions (i.e., automatic water isolation fails, improper valve alignment).

9.0 Termination, Incident Recovery, and Restart

9.1 Termination

The Incident CommanderIC, in consultation with the BED, will recommend termination of the event when conditions indicate that it is safe to do so. The Event Closeout FormEP_ECF, *Event Closeout Form*, should be completed before any recommendation is made to terminate a declared emergency.

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9.2 Recovery

Depending on the circumstances of the event, a recovery team consisting of the Incident Commander, RPLIC, 325RPL BED, and appropriate SMEs, will develop and recommend a recovery planRecovery Plan for restoring the facility to operable status. Emphasis will be placed on the careful cleanup of released material and contaminated debris to minimize further risk to personnel, the public, or the environment while preserving evidence at the event scene. All waste materials generated by the cleanup will be containerized in drums or other appropriate containers and stored in an approved storage area pending characterization and determination of the final treatment/disposal requirements. The recovery planRecovery Plan will be reviewed and approved and must meet the requirements of PNNL-MA-110, the *PNNL-MA-110, Emergency Management Plan*, Termination and Recovery.

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The BED is responsible for assuring that emergency equipment is clean and fit for its intended use prior to resumption of operations. Equipment used during an incident will be decontaminated (if practicable) or disposed of as spill debris. Decontaminated equipment will be checked for proper operation prior to storage for subsequent use. Consumables and disposed materials will be restocked. Fire extinguishers will be recharged or replaced.

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For emergency events involving the TSD or a 90-day accumulation area, the recovery planRecovery Plan will include the appropriate notification of the Washington State Department of Ecology and appropriate local authorities of recovery actions taken prior to restart. The operator of the TSD will also provide a written report to the Department of Ecology within 15 days after the incident or within 30 days after the incident for a release from a tank system to the environment that does not result in an activation of the contingency plan[23].

> **NOTE:** *For classified events recovery planning and activities will be the responsibility of the recovery director assigned at the Hanford EOC.*

9.2.1 Emergency Decontamination Facilities

The RPL325RPL facility has decontamination capability as discussed in section 8.10Section 8.10. Radiological control personnel are the only staff that may perform personnel decontamination.

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If an evacuation of the RPL facility325RPL Building occurs and re-entry is not possible to decontaminate affected personnel, radiological control supervision may use the 3410

[23] Section 9.2, first three paragraphs Paragraphs 1, 2, and 3, Permit requirement, Class 1 Modification 6/30/15 03/31/16

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building Building personnel decontamination facility located in room Room 1601. In the event that the affected personnel are injured, they should be transported directly to Kadlec Medical Center a hospital. If large group decontamination facilities are requested, request assistance from the Hanford Fire DepartmentHFD Mobile Decontamination Facility.

9.2.2 Emergency Radiological Exposure Guidelines

In extremely rare cases, emergency exposure to radiation may be required to rescue personnel or protect major property. Emergency exposure may be authorized in accordance with the provisions contained in 10 CFR 835, "Occupational Radiation Protection". The dose limits for personnel performing these operations are listed in Table 9.1.

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Note: Only RadWorker 2 trained staff are allowed to volunteer for receiving emergency radiological exposures.

NOTE: *Only RadWorker 2-trained staff is allowed to volunteer for receiving emergency radiological exposures.*

The lens of the eye dose limit should be three times the listed values. The shallow dose limit to the skin of the whole body and the extremities is ten times the listed values.

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Table 9.1 - Emergency Dose Limits

Dose Limit (Total Effective Dose Equivalent) in rem	Activity Performed	Conditions
5 rem	All	N/A
10 rem	Protecting major property	Only on a voluntary basis where lower dose limit not practicable
25 rem	Lifesaving or protection of large populations	Only on a voluntary basis where lower dose limit not practicable
> 25 rem	Lifesaving or protection of large populations	Only on a voluntary basis to personnel fully aware of the risk involved

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9.3 Restart

In most cases the Event Closeout FormIn most cases, EP_ECF, *Event Closeout Form*, will be sufficient for supporting recovery from an event and actions needed for resumption of normal operations. For complex events with significant facility damage or a need for incident staffing for more than 48 hours, a recovery planRecovery Plan and process will be required. Restart of the facility following complex emergencies will be conducted with a recovery plan Recovery Plan developed using EPIP-3.0, *Recovery Plan* and led by a Recovery Director identified by the MSG. The recovery planRecovery Plan will be developed with support from both the RPL Facility325RPL Manager and RPL Building Manager 325RPL BM.

The following documents should be consulted, used as reference, and implemented if needed:.

- ADM-EPIP-3.0, *Recovery Plan*, ~~ADM-EPIP-3.0 *Recovery Plan*,~~
- *PNNL Guides for Post-Natural Phenomena Hazard Building Inspection*, ~~and~~
- RPL-PLN-701, *RPL Business Continuity Plan*.

For severe damage to the facility due to natural phenomena (e.g., extreme weather conditions, seismic events, wildfires, external flooding) or other causes (e.g., severe fire, physical attack, explosions, events in neighboring facilities), the ~~recovery plan~~Recovery Plan shall describe the process for a systems engineering assessment and evaluation of the facility ~~safety significant,~~including environmental protection, mission critical and other essential systems~~.~~ (safety significant and equipment important to safety). The purpose of these assessments is to define actions needed to place the facility into a safe configuration within the Safety Basis requirements pending any resumption of operations.

Recovery for events that involve a container storage area within the HWTU, require the container storage and containment system to be evaluated before restart.

If the event involved a tank system leak, repairs must be certified by an independent, qualified, registered, professional engineer.

Before operations are resumed in the facility, all emergency equipment used during the emergency shall be cleaned and restored to usable, operable condition[24].

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[24] Section 9.3, ~~last~~Last three paragraphs: -Permit ~~requirement~~Requirement, Class 1 Modification ~~6~~09/30/15-

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10.0 Emergency Equipment[25]

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Support equipment available to assist in responding to an emergency can be found by referring to DOE/RL 94-02, Section 11.2, and the Hanford Fire DepartmentHFD emergency equipment listing in DOE/RL 94-02, Appendix C of 94-02.

10.1 Portable Emergency Equipment

None

10.2 Fire Control Equipment

- Portable Class ABC Fire Extinguishersfire extinguishers are located throughout the facility. Each Class-ABC extinguisher is capable of suppressing fires involving ordinary combustible materials, flammable liquids, oils, paints, flammable gases, and fires involving electrical equipment. Class D extinguishers will be located in areas vulnerable to Class-D fires if reactive metals are stored there (e.g., dangerous waste storage room). Manual dry chemical fire extinguishers are installed in the SAL Shielded Analytical Laboratory hot cells and are available outside the HLRF A and B-hot cells. The fire extinguisher locations are identified on the floor plans (Attachments-1-3).
- Portable Class ABC Fire Extinguishersfire extinguishers with piercing tips are located in each lab that contains a glovebox. These extinguishers are for the HFD use only. RPL325RPL staff have not been trained in their use. The piercing tipped fire extinguisher locations are identified on the floor plans (Attachments 1-3).
- RPL325RPL is equipped with an automatic fire detection, alarm, and suppression system. Five wet pipe and one dry pipe sprinkler system provide automatic fire suppression.
- A Mobile Command Post Vehicle can be obtained from the Hanford Fire Department (HFD) at 373-2230. The HFD Battalion Commander will approve and dispatch the vehicle.

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10.3 Communications Equipment/Warning Systems

- **Fire alarm pull boxesAlarm Pull Boxes** are located throughout the facility. The primary locations are at all exits of the facility. All locations are shown on the floor plans (Attachments-1-3).
- **Hanford Site Telephone Notification System (TNS)** is a component of the Hanford Emergency Notification System and designed to use the existing telephone system to notify individual employees. When the phone is answered, a recorded message will provide event information and inform staff of protective actions they are expected to take.

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[25] Section 10, Permit requirementRequirement, Class 1 Modification 6/30/15 03/31/16

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- **PNNL Communicator Notification System (CNS)** is a system that will allow emergency messages to be communicated quickly to all staff via the PNNL phone system.–, other subscribed phones (e.g., text or voice call to personal cell phones), and the PNNL email system. Phones at PNNL in offices, conference rooms, labs, and common areas such as lobbies, conference rooms, and lunchrooms are connected tonotified by the system. When the phone is answered, a recorded message will provide event information and inform staff of protective actions they are expected to take. This can be activated by having the BEDBM, IM, or MSG Lead call 375-2400.
- A criticality alarm systemCriticality Alarm System (CAS) is present in the building. The system is equipped with neutron–sensitive criticality detectors. The CAS alarms in locations where the expected dose from an accidental criticality may exceed 12-rads in free air. The system is tested and maintained in accordance with preventive maintenance procedures.

Note: These systems are not considered emergency equipment and may not be available during all types of emergencies.

NOTE: *These systems are not considered emergency equipment and may not be available during all types of emergencies.*

- Other non-emergency communications equipment installed in RPL325RPL include:
  - Publicpublic address system. (#8(1234 on any RPLthe BM phone)
  - Publicpublic address system in the fire alarm control panel.
  - Commercialcommercial telephone system that may also be used to summon assistance during an emergency.
  - Hand-hand-held radios provided by the BED.

10.4 Personal Protective Equipment (PPE)

Safety showers and eyewash units are installed at several locations throughout the facility including waste storage areas. All locations are shown on the floor plans (Attachments 1-through 3).

Personnel protective clothing and respiratory equipment is available in the facility for use during both routine and emergency operations. This equipment includes:

- Chemically-chemically-resistant suits, aprons, boots, and gloves.
- Protectiveprotective glasses.
- Chemicalchemical goggles.
- Faceface shields.
- Fullfull-face respirators with extra cartridges.
- Radiologicalradiological clothing.

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Kits containing a variety of radiation monitoring instruments, forms, and equipment are available for use in an emergency. PNNL maintains these kits, which contain protective apparel, instruments, and equipment for personnel decontamination and other immediate emergency needs. These supplies and equipment are only adequate to fulfill immediate needs during the initial stages of an emergency.

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10.5 Spill Control and Containment Supplies

Spill kits are located throughout the facility and are maintained by the CSMs. Additional spill kit materials can be obtained in ~~room~~ Room 527. The following emergency equipment is maintained in (or adjacent to) each of the 90-day hazardous waste accumulation areas. The amount of material maintained varies depending on the amount of waste being accumulated at the individual 90-day area.

- ~~Commercially~~commercially available granular absorbent (e.g. diatomaceous earth)
- ~~Absorbent~~absorbent pads
- ~~Commercially~~commercially available acid neutralizer[1] (e.g. granular sodium bicarbonate)
- ~~Commercially~~commercially available caustic neutralizer[2] (e.g. dilute boric acid solution)
- Personal Protective Equipment
  - ~~Safety~~safety glasses with side shields
  - ~~Lab~~lab coat
  - ~~Leather~~leather gloves
  - ~~Chemical~~ chemical-resistant gloves (e.g. nitrile)

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[1] Required in accumulation areas containing liquid acidic wastes.
[2] Required in accumulation areas containing liquid caustic wastes.

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11.0 Evacuation of Persons and Visitors

1. RPL325RPL occupants shall be aware of visitors that may require evacuation. Alternate housing for any staff that areis sensitive to excessive hot or cold conditions (temperately disabled) may be required due to emergency response actions.

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Note: Alternate Staging Area – in the event of an extended building evacuation during inclement weather, the 350 building, or other indoor locations deemed safe may be used for housing staff at the discretion of the BED[26].

NOTE: *Alternate staging area – in the event of an extended building evacuation during adverse weather, the 350 Building, or other indoor locations deemed safe, may be used for housing staff at the discretion of the BED*[27].

2. Facility and research management providesprovide safety and emergency preparedness briefings for large visitor groups or tours. Individual visitors are briefed by their host.

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3. In all cases, the safety of building visitors is the responsibility of the host, who shall assure that visitors are provided a safe and orderly evacuation. The host shall ensure that the visitor has signed in and report the visitor status to the appropriate zone wardenZone Warden as soon as is practical, after the evacuation.

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[26] Section 11, Note: Permit requirement: Section 11.0 Note, Class 1 Modification 6/30/15

[27] Section 11, Note, Permit Requirement: Section 11.0 Note, Class 1 Modification 03/31/16

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12.0 Emergency Action Levels

12.1 300 Area Protective Actions

300 Area Onsite Protective Actions		
Classification	**Action**	**Implemented By**
Alert	• Evacuate or shelter affected facility personnel.	Facility
	• Shelter[1] 300 Area and adjacent 600 Area. • Initially restrict access at: →Route 4S at Milepost 19; →George Washington Way Extension (to 300 Area) intersection with George Washington Way; and →George Washington Way intersection with Stevens Drive. (NOTE: *Roadblocks can be relocated based upon consequence assessment upon approval by the IC/SED.*)	POC (Quick Reaction Checklist)/ EOC Shift Office
Site Area/ General Emergency	• Evacuate or shelter affected facility personnel.	Facility
	• Shelter[1] 300 Area, HAMMER, Patrol Training Academy, Cold Test Facility, and adjacent 600 Areas. • Restrict access at: →Route 4S at Milepost 19; →George Washington Way Extension (to 300 Area) intersection with George Washington Way; and →Horn Rapids intersection with Stevens Drive.	POC (Quick Reaction Checklist)/ EOC Shift Office
	• Plan for subsequent 300 Area evacuation as required.	Hanford EOC

[1] *Automatic sheltering for entire areas will not be implemented during a seismic event. If a seismic event occurs, facility management will implement protective actions appropriate for their facility conditions. After a seismic event, site protective actions based upon incident assessment will be identified, planned, and communicated from Incident/Area Command and/or the Hanford EOC.*

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300 Area Offsite Protective Actions and Recommendations		
Classification	**Action**	**Implemented By**
Alert	• None	N/A
Site Area Emergency	• Implement evacuation of Columbia River from White Bluffs Ferry Landing to Leslie Groves Park.	Counties (RLEP 3.3)
General Emergency	• Implement evacuation of Columbia River from White Bluffs Ferry Landing to Leslie Groves Park.	Counties (RLEP 3.3)
	• Evacuate 2 2-mile radius.	Benton/Franklin Counties

12.2 RPL325RPL Emergency Action Levels

The Emergency Action Level (EAL) Tables are published in DOE-0223, *Emergency Plan Implementation Procedure for RPL*RLEP 1.0 – Appendix 1-PNNL-325, and can be obtained from the RPL Building Manager. 325RPL BM.

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13.0 Attachments

Attachment 1 — *Emergency Equipment &and Evacuation Routes - 1st Floor*

Attachment 2 — *Emergency Equipment &and Evacuation Routes – 2nd &and 3rd Floors*

Attachment 3 — *Emergency Equipment &and Evacuation Routes – Mezzanine &and Basement*

Attachment 4 — *Zone Warden Areas – 1st Floor*

Attachment 5 — *Zone Warden Areas – 2nd &and 3rd Floors*

Attachment 6 — *Zone Warden Areas – Mezzanine &and Basement*

Attachment 7 — *325RPL Staging Area Map*

Attachment 8 — *325RPL Alternate Staging Area Map*

Attachment 9 — *Location of ~~RPL~~325RPL in the 300 Area*

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Attachment-_1 —— Emergency Equipment &and Evacuation Routes - 1st Floor[28]

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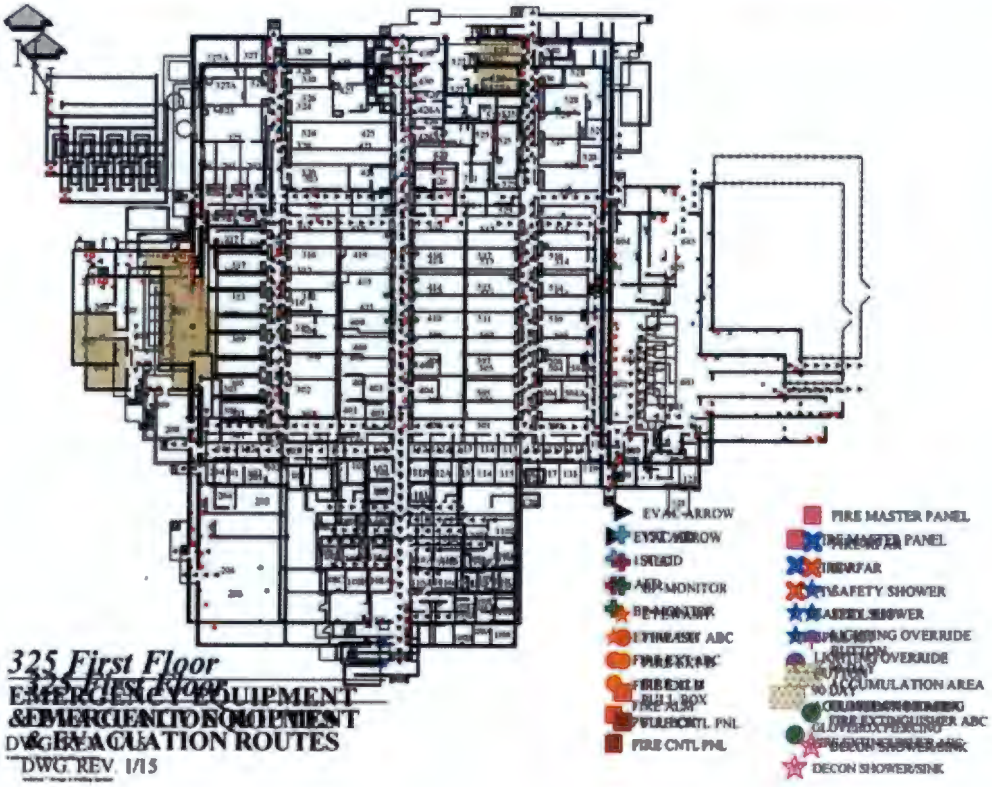

[28] Section-_13.0, Attachment-_1: Permit requirement Requirement, Class-_1 Modification 609/30/15-

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Attachment 2 — Emergency Equipment &and Evacuation Routes– 2nd &and 3rd Floors[29]

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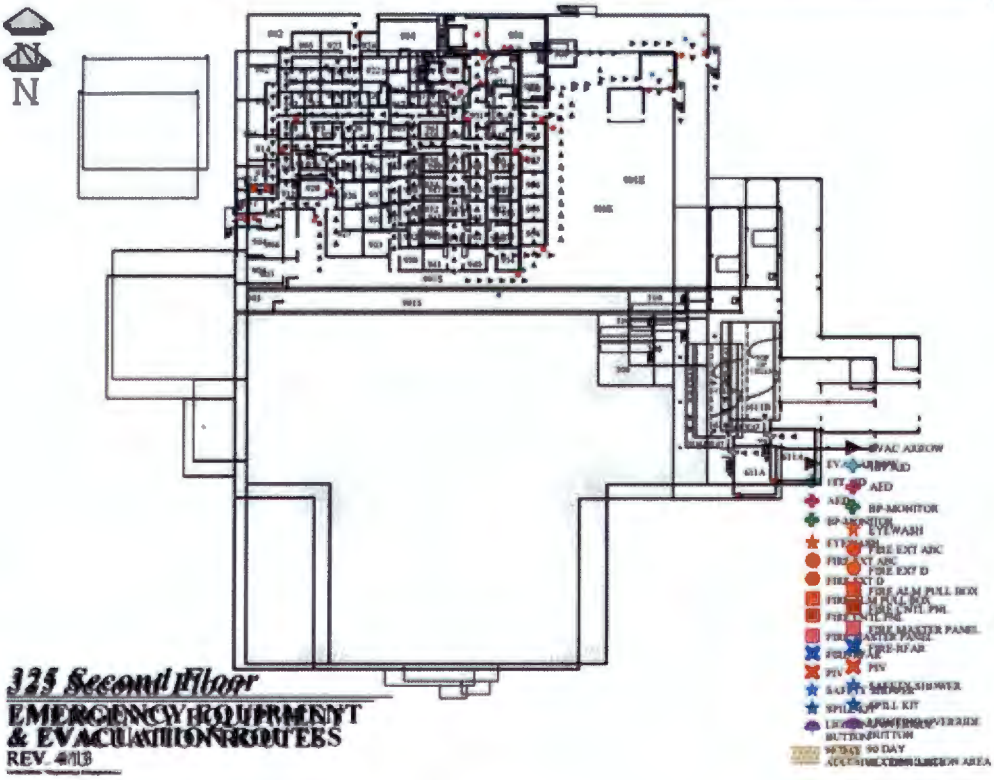

[29] Section 13.0, Attachment 2: Permit requirementRequirement, Class 1 Modification 609/30/15.

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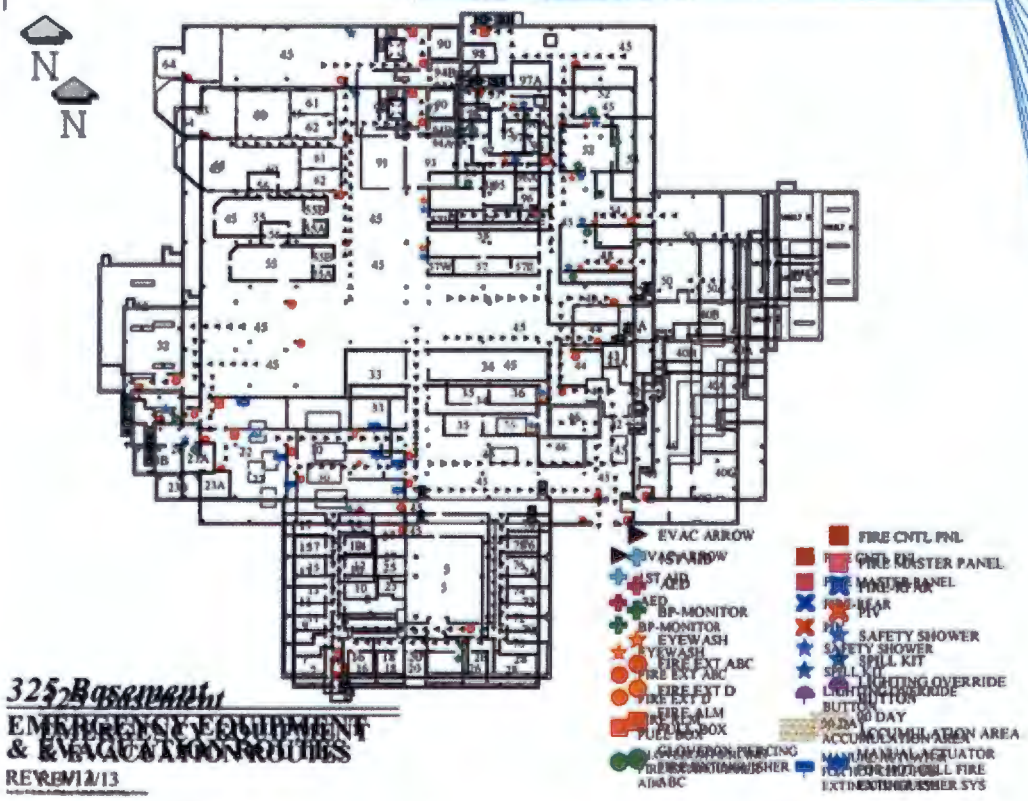
Attachment 3 — Emergency Equipment &and Evacuation Routes–
Mezzanine &and Basement[30]



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[30] Section 13.0, Attachment 3: Permit requirementRequirement, Class 1 Modification 609/30/15

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Attachment 4 — Zone Warden Areas—
1st Floor

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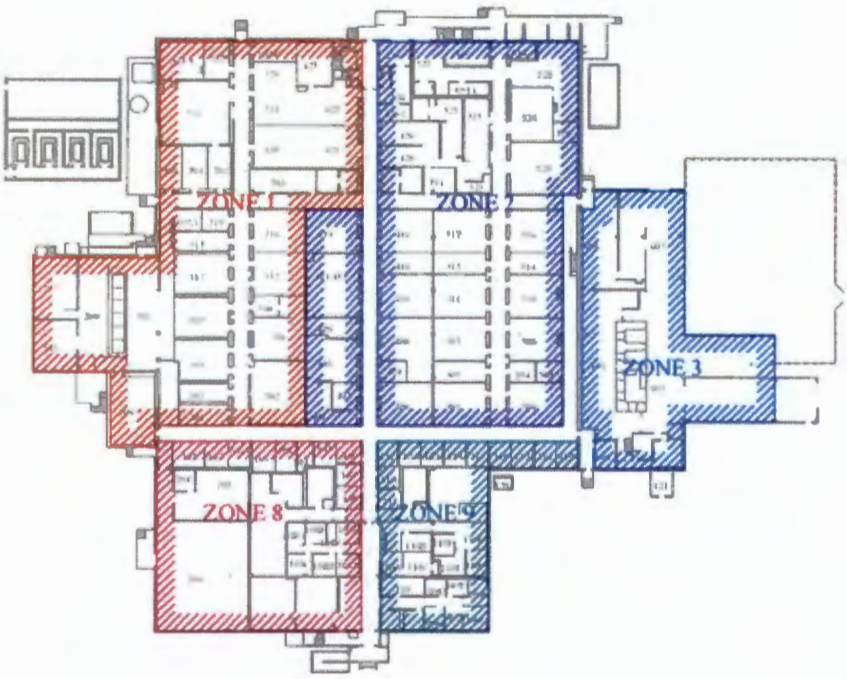

325 First Floor

ZONE WARDEN MAP

REV. 3/14

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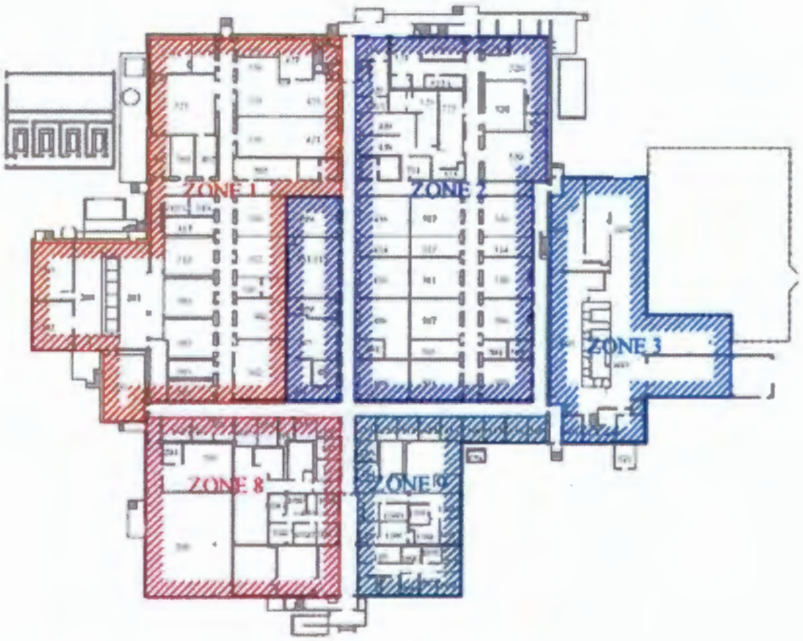

325 First Floor

ZONE WARDEN MAP

REV. 3/14

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Attachment 5 — Zone Warden Areas—
2nd &and 3rd Floors

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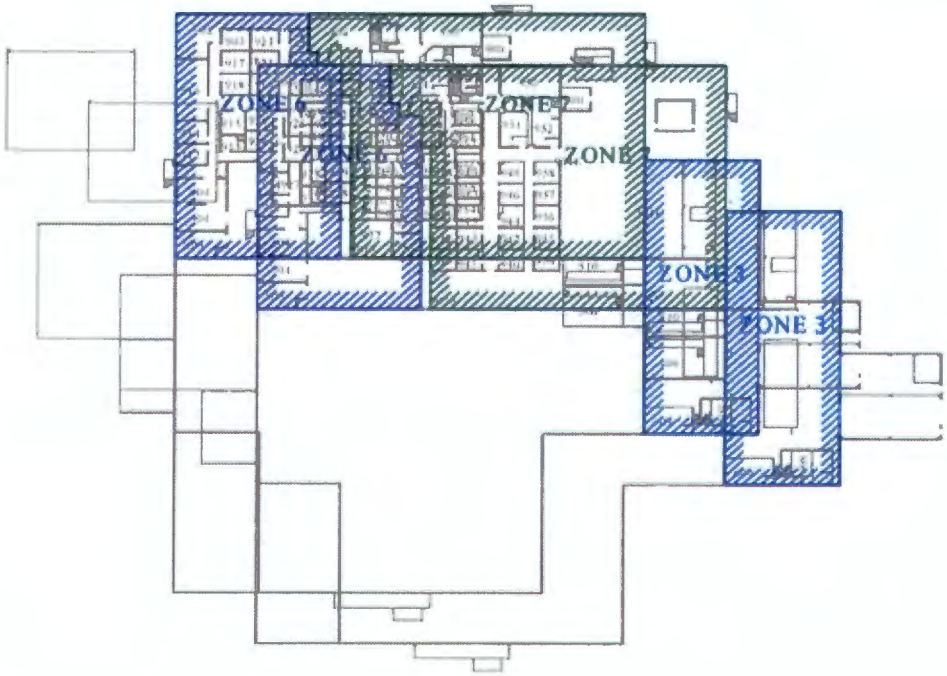

325 Second Floor

ZONE WARDEN MAP

REV. 3/14

325 Second Floor

ZONE WARDEN MAP

REV. 3/14

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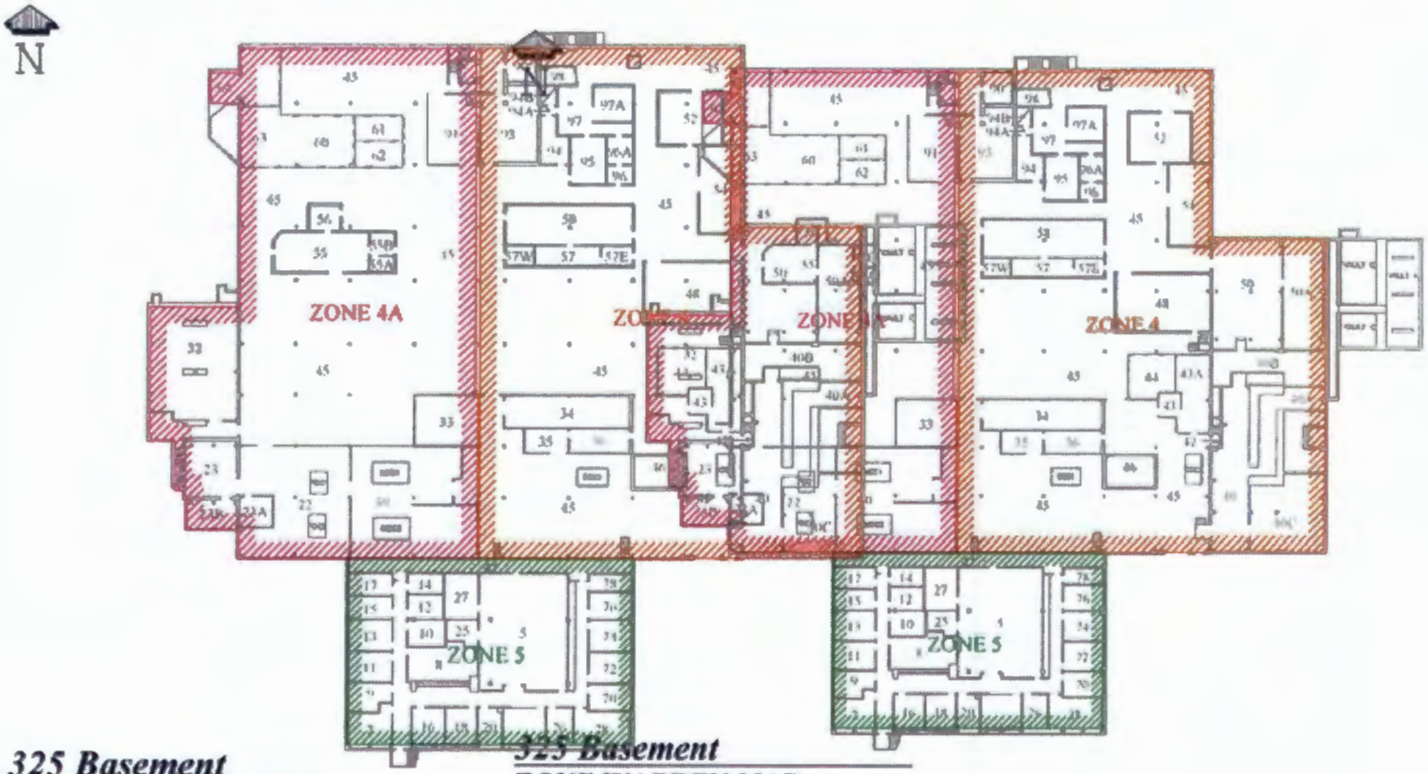
Attachment 6 — Zone Warden Areas, Mezzanine &and Basement



325 Basement
ZONE WARDEN MAP
REV. 3/14

325 Basement
ZONE WARDEN MAP
REV. 3/14

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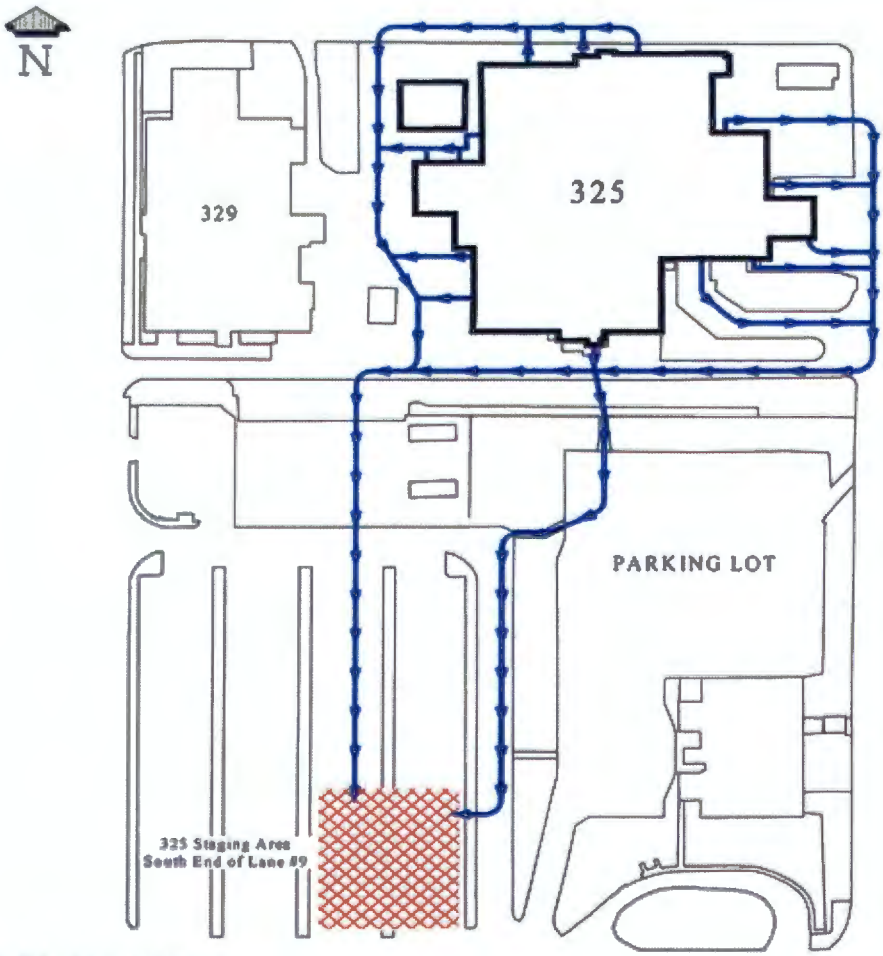
Attachment 7 ~~RPL~~ 325RPL Staging Area Map[31]



325 Building

EMERGENCY EVACUATION ROUTES & STAGING AREA

~~REV. 2/14~~

[31] Section 13.0, Attachment 7: Permit ~~requirement~~Requirement, Class 1 Modification ~~6/30/15~~ 03/31/16

Unless stamped and numbered as a Controlled Copy, the online version is the official version of this procedure. Before using a printed copy, verify that it is the most current version by checking the revision number against an official copy

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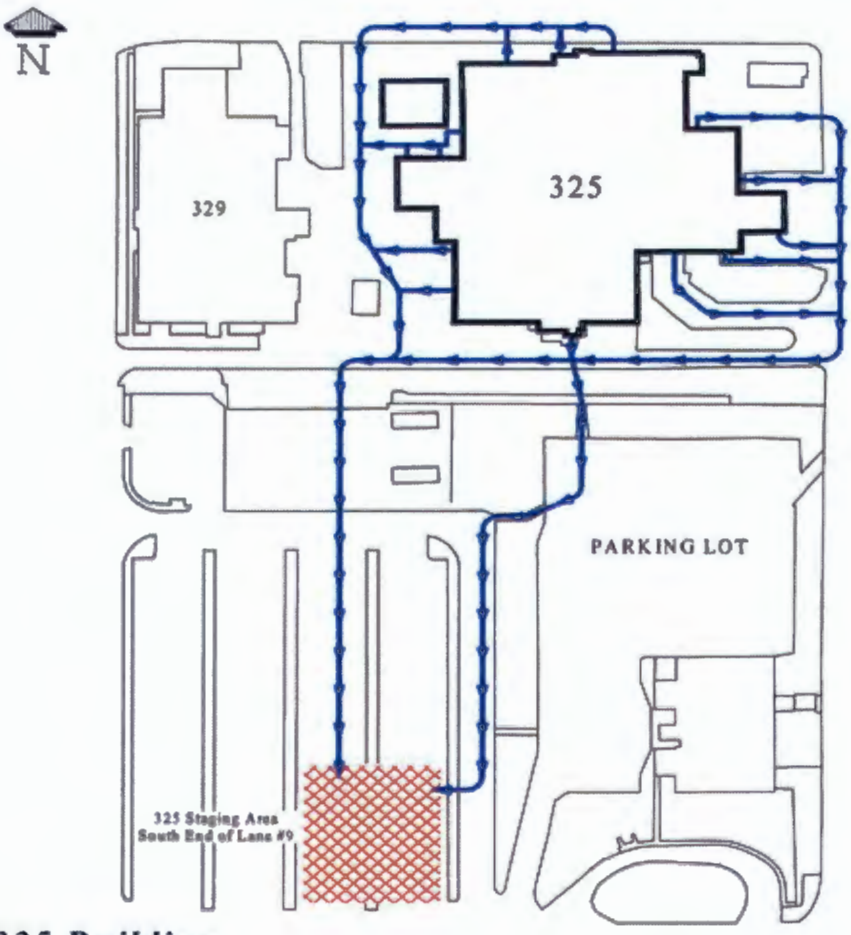

325 Building

EMERGENCY EVACUATION ROUTES & STAGING AREA

REV. 2/14

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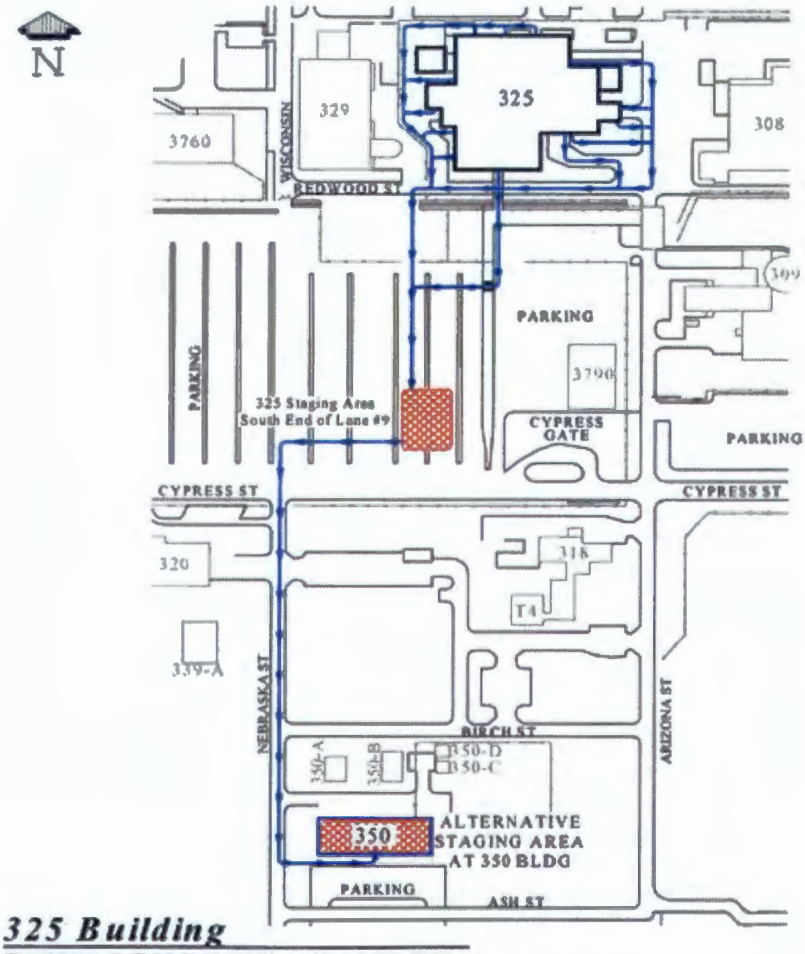
Attachment 8 – RPL – 325RPL Alternate Staging Area[32]



325 Building

EMERGENCY EVACUATION ROUTES & ALTERNATE STAGING AREA

REV. 2/14

[32] Section 13.0, Attachment 8: Permit ~~requirement~~Requirement, Class 1 Modification ~~6/30/15~~ 03/31/16

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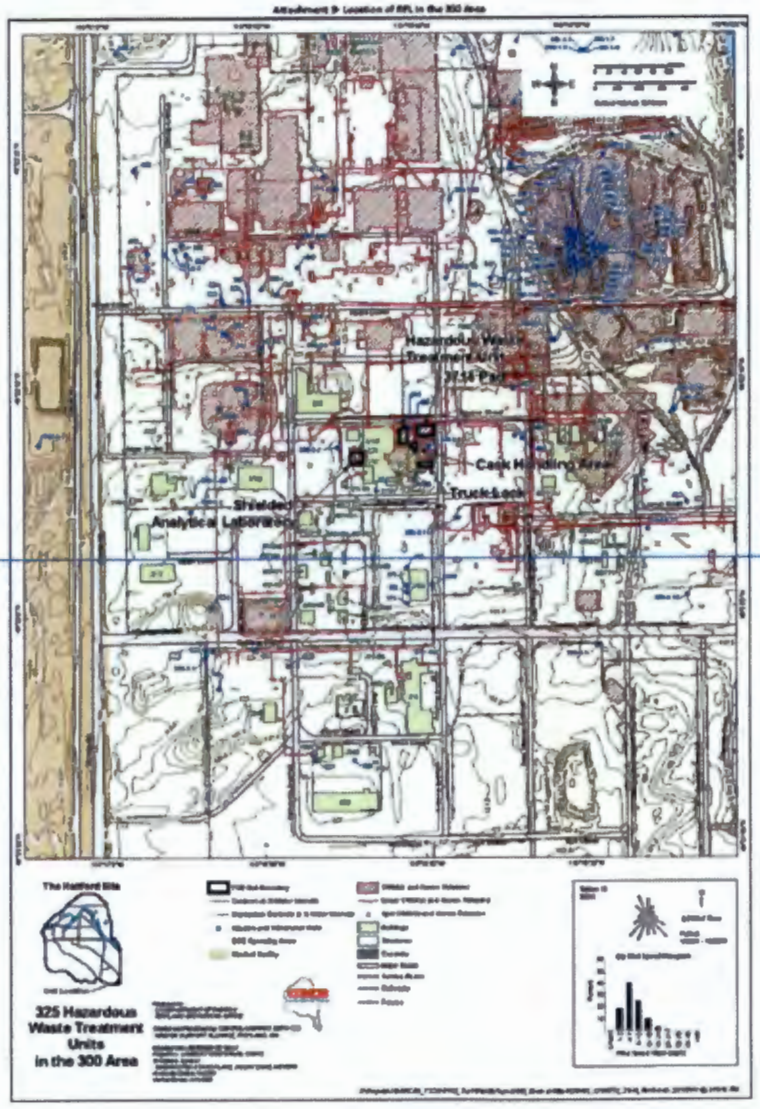
Attachment 9 — Location of ~~RPL~~ 325RPL in the 300 Area



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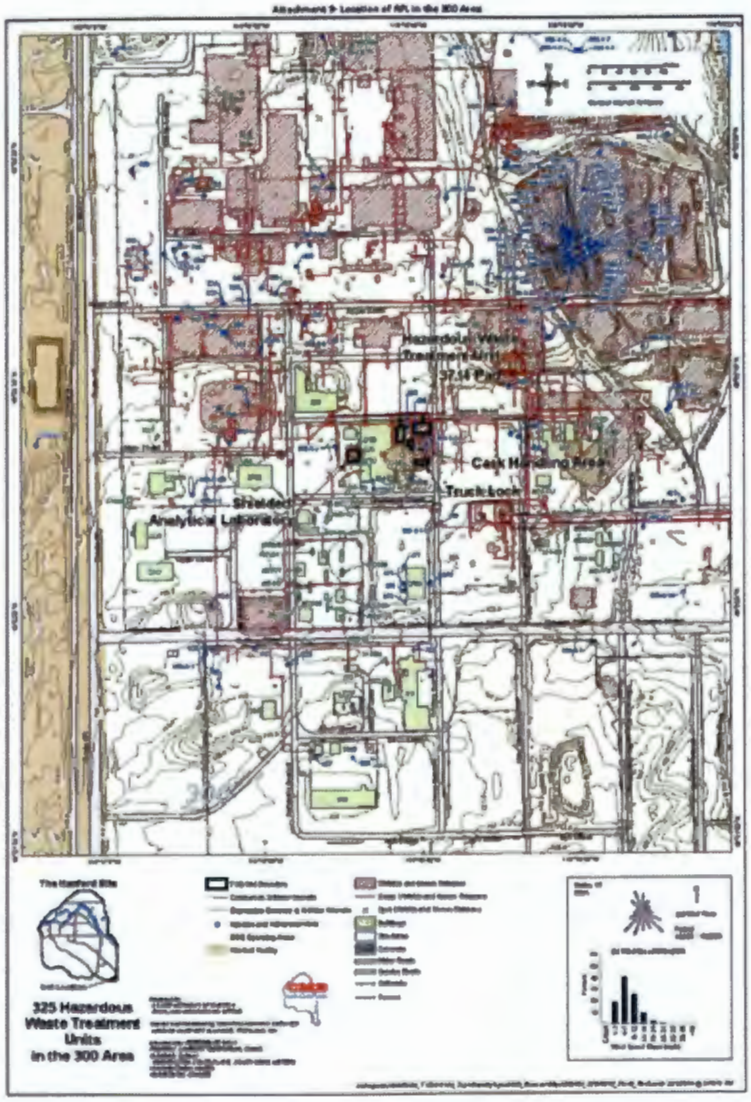
Attachment 1- Location of RPL in the 300 Area



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14.0 References and Source Requirements

14.1 References (as revised)

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ADM-001, *Document Production and Distribution*

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ADM-EPIP-2.0, *Management Support Group Procedure*

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ADM-EPIP-3.0, *Recovery Plan*

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ADM-EPIP-7.0, *PNNL Active Shooter Response Procedure*

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~~HDI, *Basic Staff Practices*~~

~~HDI, *Responding to Normal Chemical Spills-Adverse Chemical Conditions (Exhibit)*~~

~~HDI, *Workplace Substance Abuse*~~

~~HDI, *Report and Event or Occurrence*~~

~~PNNL-DSA-325, *Radiochemical Processing Laboratory Documented Safety Analysis*~~

~~PNNL-EAL-RPL, *Emergency Action Level Tables for the RPL*~~

HDI Exhibit, *PNNL Workplace Substance Abuse Requirements and Protocol*

HDI Exhibit, *Respond to Spill or Adverse Chemical Condition*

HDI Work Control, *Basic Staff Practices*

HDI Workflow, *Report an Event or Occurrence*

PNNL Guides for Post-Natural Phenomena Hazard Building Inspection

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PNNL-DSA-325, *Radiochemical Processing Laboratory Documented Safety Analysis*

PNNL-MA-110, *PNNL Emergency Management Plan*

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RCP-8.1.02, *Quick Sort Survey of Personnel*

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RPL-PLN-701, *RPL Business Continuity Plan*

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SOP-325-003, *325 Building Heating, Ventilation and Air Conditioning Emergency Shutdown*

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14.2 Source Requirements (as amended)

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~~Washington Administrative Code, WAC-173-303-340, -350, -360~~

~~Washington State Patrol, RL-EP3.3~~

~~DOE~~-10 CFR 835, "Occupational Radiation Protection," *Code of Federal Regulations*.

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

DOE-0223, *RL Emergency Implementing Procedures – Applicable to PNNL-Managed Facilities on the Hanford Site*, U.S. Department of Energy Richland Office

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~~DOE/RL-94-02~~RCRA Site-Wide Permit WA7890008967, *Hanford Facility Dangerous Waste Permit*, Resource Conservation and Recovery Act of 1976.

RLEP 1.0 – Appendix 1-PNNL-325

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WAC-173-303-340, "Preparedness and Prevention," *Washington Administrative Code*, Olympia, Washington, http://apps.leg.wa.gov/WAC/default.aspx?cite=173-303-340.

WAC-173-303-350, "Contingency Plan and Emergency ~~*Response Plan—Applicable to PNNL Managed Facilities and Activities on the Hanford Site*~~Procedures," *Washington Administrative Code*, Olympia, Washington, http://apps.leg.wa.gov/WAC/default.aspx?cite=173-303-350.

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WAC-173-303-360, "Emergencies," *Washington Administrative Code*, Olympia, Washington, http://apps.leg.wa.gov/WAC/default.aspx?cite=173-303-360.

14.3 Emergency Preparedness Checklists (as revised)

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~~14.3a BED Hazardous Material Facilities (RPL) Checklist~~

~~14.3b Chemical Hazard Assessors Checklist~~

~~14.3c Event Closeout Form~~

~~14.3d Facility Operations Specialist (FOS) Checklist~~

~~14.3e Hazards Communicator Checklist~~

~~14.3f Incident Command Post Communicator Checklist~~

~~14.3g Incident Manager Checklist~~

~~14.3h Radiological Hazard Assessors Checklist~~

~~14.3i RPL Staging Area Supervisor Checklist~~

~~14.3j PNNL Emergency Evacuation Report Form~~

EP-BED-325RPL, *Building Emergency Director Checklist*

EP-CHA, *Chemical Hazard Assessors Checklist*

EP_ECF, *Event Closeout Form*

EP-FOS, *Facility Operations Specialist (FOS) Checklist*

EP-HazCom, *Hazards Communicator Checklist*

EP-ICPC, *Incident Command Post Communicator Checklist for Hazardous Facilities*

EP_IM, *Incident Manager Checklist*

EP_EmerEvacReport, *PNNL Emergency Evacuation Report Form*

EP-RHA, *Radiological Hazard Assessors Checklist*

EP-SAS-325RPL, *325RPL Staging Area Supervisor Checklist*

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Procedure Revision History

Date	Rev. #No.	Description
4/01/03	0	• Revised and edited for annual update, including insertion of history page.
7/30/03	0	Made the following name changes ~~to the RPL BEP~~ and distributed changes to all holders of controlled copies: 1. ~~In~~ Exhibit 12.1 on page 52 change the MSG Lead 1st and 2nd alternates to ~~Larry~~L Maples and ~~Reed~~R Sharp respectively. 2. Change the primary warden for Zone 4 to ~~Todd~~T Haynie, 372-3067. 3. Change the secondary warden for zone 4A to ~~Todd~~T Haynie, 372-3067. • 4. In Table 14.a on page 59, change the 90-Day Storage Emergency Contact to ~~Raymond D~~ RD Bell, Work Phone 376-2321, Cell Phone 521-4505.
~~9~~09/03/03	0	Replaced ~~Larry~~L Page with ~~Tracy~~T Eaton on pages 52 and 57.
~~9~~09/11/03	0	Replaced ~~Shane~~S Loper with ~~Greg~~G Varljen as Secondary Zone Warden for Zone 4 and Primary Zone Warden for Zone 4A on pages 56 and 57.
~~9~~09/30/03	0	Insert Maria Olivarez as ~~the~~ 1st Alternate for Assisting Communicator and the ICP Recorder in Exhibit 12.1. (sma)
11/17/03	0	Change William Buyers' cellular telephone number to his current number. (sma)
11/21/03	0	Replaced ~~Katherine~~K Carson with ~~Darlene~~D Winter as Primary Zone Warden and replaced ~~Tracy~~T Eaton with ~~Katherine~~K Carson as Secondary Zone Warden for Zone 7 on page 57. (sma)
~~3~~03/30/04	0	Annual BEP update (nem-m)
~~5~~05/06/04	0	Update Evacuation Routes—2nd and 3rd Floors map, correction of room numbers. (sma)
~~7~~07/07/04	0	Made the following change to section 9.2.1 Emergency Decontamination Facilities: ~~The~~ RPL Facility Personnel Decontamination Room is located in Room 606 has only limited decontamination capability (a small sink). Radiological Control Personnel are the only staff that may perform Personnel Decontamination. The decontamination shower in this room is out of service. If an evacuation of the RPL Facility occurs and re-entry is not possible to decontaminate affected personnel, Radiological Control Supervision may use the 329 Building Personnel Decontamination Facility. In the event that affected personnel are injured, they should be transported directly to Kadlec Medical Center. If large group decontamination facilities are required, request assistance from the ~~Hanford Fire Department~~HFD Mobile Decontamination Facility. (lef)
~~8~~08/11/04	0	• Replace ~~Tracy~~T Eaton with ~~Jason~~J Armstrong as ICP Hazards Communicator. • Remove Stan Jones as BED and ICP Communicator Alternates. Also ~~on~~ Exhibit 12.2.1. • Remove ~~Teresa~~T Schlotman as the Primary SAS and move the alternates up one step. • Put ~~Andrea~~A Kwiecinski in as Primary ICP recorder and move Bob and Maria to alternates. • Remove ~~Abby~~A Nicholson and ~~Scott~~S Nickerson as ICP Chemical Hazards Assessor alternates.

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Date	Rev. #No.	Description
		• ~~On~~ Exhibit 12.2.4, Change "RPL Facility Project ~~Manger~~Manager" to "Nuclear Work Team Leader" and add Environmental Compliance ~~Rep~~ Representative as ~~John~~J Holland in the Waste Management block. • Replace ~~Wayne~~W Larson as TSD POC (Table 14.a) and replace with ~~Ron~~R Del Mar. (lef)
~~8~~08/25/04	0	Fix name spelling of ~~Andrea "~~A Kwiecinski~~"~~ as ICP Recorder (lef)
~~9~~09/28/04	0	• Made the following name changes to the RPL BEP and EIPs: • Change assisting Communicator to ~~Maria~~M Olivarez, remove alternates • Change ICP Chemical Hazards Assessor to ~~Kevin~~K Sheffield. • Change ICP Communicator to ~~Holly~~H Black-Kania. • Change MSG Recorder (1st Alternate) to ~~Mary~~M Bradshaw. • Zone Warden changes: ~~-~~Zone 4A primary to ~~Matthew~~M Fountain; Zone 6 Secondary~~:~~ ~~Joyce~~ J McGuffey~~;~~ Zone 7 Primary~~—Gregg~~ G Lumetta, Secondary~~—Clark~~ C Lindenmeier~~;~~ Zone 9 Secondary~~: Paul~~ P Bredt~~;~~; Move the North Dock/Cylinder Storage Area from Zone 2 to Zone 7. • ~~Staging Area Supervisor~~SAS: Move ~~Bob~~B Schumacher to 2nd Alternate and put ~~Debra~~D Coffey as the 1st Alternate. • ~~Throughout document, change~~Global update from PNNL SPC or PNNL Single ~~Point Contact~~POC to PNNL Operations Center. • Change RPL Facilities Project Manager to Nuclear ~~Work Team Leader~~WTL. • Change RPL Building Ventilation & Power Operations Supervisor to Utility Operations Work Team Leader.
• 10/19/04	• 0	~~Remove~~Removed 43, 45, 63, 517, and 601 from the list of 90-day waste accumulation sites from ~~the second paragraph in section~~ Section 3.6, Paragraph 2 on the bottom of page 16. ~~Also change the~~Changed 1st Alternate MSG Recorder to ~~Laura~~ L Fuher. (lef)
11/01/04	0	Replace HEHF with new Hanford medical contractor AMH. Update ICP Hazards Assessor~~:~~ 1~~-Todd~~ T Haynie, ~~#2—Kevin~~ K Sheffield (lef)
~~3~~03/21/05	1	2005 Annual Update. Changes include: ~~1.~~•Standardized appearance of the word AH-OO-GAH throughout the BEP. ~~2.~~•Section 2—~~Added~~, added Acronyms section. ~~3.~~•Section 3.1.1, added information on preservation of evidence to BED responsibilities. Added ~~Testing Designated Position (~~TDP~~)~~ requirement to BED position responsibilities. ~~4.~~•Section 3.2.1, added TDP requirement to the ICP position responsibilities. ~~5.~~•Section 3.2.8, added TDP requirement to the MSG Lead position responsibilities. ~~6.~~•Section 3.2.5, Created new description for MSG Liaison duties. Renumbered remaining sections in chapter. ~~7.~~•Section 3.2.8, added the words criticality alarms in zone warden indication of hazards. ~~8.~~•Section 3.2.9, added TDP requirement to the FOS position responsibilities. ~~9.~~•Section 3.3, Individual Staff Responsibilities, added information regarding discarding PPE on building evacuations and PCM use for fire/criticality. ~~10.~~•Sections 5.5 Criticality, added editorial comment. ~~11.~~•Section 6.1.1, item 3, added "If the RPL has a loss of electrical power and Standby Power is still available, assemble in the ~~Lunch Room~~lunch room. Personnel exiting Radiological Buffer Areas do so without surveying through the PCMs. If personnel are wearing Personal Protective Equipment (PPE) clothing, are suspected of being contaminated, or have exited a Radiological Buffer Area, isolate them from other building occupants and request they be surveyed by Radiological Control Personnel.

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		a. Refer to Section 6.1.11 for Reduced Ventilation Flows. 12. Section 6.1.10, Criticality, removed the last sentence from item Item 3, bullet Bullet 1. 13. Section 6.1.10 new item 3: Personnel exiting Radiological Buffer AreasRBAs do so without surveying through the PCMs. If personnel are wearing Personal Protective Equipment (PPE) clothing, are suspected of being contaminated, or have exited a Radiological Buffer AreaRBA, isolate them from other building occupants and request they be surveyed by Radiological Control Personnel. 14. Section 6.3 Natural Phenomena, to each event added the words "If evacuating the facility, have 375-2400 report the evacuation to the ONCOccurrence Notification Center (376-2900)." 15. Section 8., Utility Disconnects: Added information on the Ramp Sump Pump local disconnect location. a. Exhibit 12.1, Updated BERO members. Added new position of MSG Liaison b. Section 12.2.1, Updated BED name (DavidD Clark) and phone numbers. Added BillB Buyers contact info as 2nd alternate BED. Added and * to TDP positions with the note to coordinate changes in these positions with the TDP Administrator. c. Section 12.2.4, Added MSG Contact name and phone number to the emergency contact list. d. Exhibit 12.4, BED Checklist – e. Step 1, added requests for Hanford Fire departmentHFD and Hanford Patrol for certain events. RLEP 1.1, Checklist 3.1 consistency. f. Step 2, added additional equipment to note regarding building evacuation due to bomb threats. RLEP 1.1, Checklist 3.1 consistency. g. Step 2, added new bullet regarding actions for evacuation while under a take cover. RLEP 1.1, Checklist 3.1 consistency. h. Step 6, added info regarding transportation events and event classification. Also added box with RCRA criteria. RLEP 1.1, Checklist 3.1 consistency. i. Step 8, minor wording change. RLEP 1.1, Checklist 3.1 consistency. j. Step 12 (new) regarding preservation of evidence at event scene. RLEP 1.1, Checklist 3.1 and MA-110, Exhibit A.16 consistency. k. Renumbered all steps after 12. l. Exhibit 12.5, ICP Communicator Checklist- m. Inserted new step 5, related to actions required if event does NOT reach EAL criteria. PNNL-MA-110, Exhibit A.17 consistency. n. Renumbered remaining steps. o. Step 15, editorial change coy to copy. p. Exhibit 12.6, ICP Hazard Assessor Checklist q. Step 3, minor editorial change, RLEP 1.1, Checklist 3.9 consistency. r. Step 8, minor editorial change, RLEP 1.1, Checklist 3.9 consistency. s. Part 2, Step 8, added not regarding decision to transport injured and contaminated personnel. RLEP 1.1, Checklist 3.9 consistency. t. Exhibit 12.7, Staging Area Supervisor Checklist- u. Step 2, Revised Warning regarding use of additional electronic equipment in bomb threats. RLEP 1.1, Checklist 3.11 consistency v. Added new step 7 to query staff regarding medications or medical conditions of which the BED needs to be made aware. Renumbered remaining steps. Change requested by SAS. w. Added new step to remind SAS to have RHA confirm habitability of staging area

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		and ICP. ~~x.~~ Exhibit 12.10, MSG Checklist ~~y.~~ Added a step to have the MSG Liaison get safe route of travel and be dispatched to ICP. ~~z.~~ Added new step for notifying BMI.(Their emergency number is (614) 424-4444) ~~aa.~~ Added new step related to preservation of evidence. ~~bb.~~ Exhibit 12.11, Facility Operation Specialist Checklist ~~cc.~~ Step 2, added statement to remind FOS to communicate location of event scene operations to the BED. RLEP 1.1, Checklist 3.13 consistency. ~~dd.~~ Exhibit 12.13, ICP Hazard Communicator checklist- ~~ee.~~ Step 2 and 3, added shading to text boxes. RLEP 1.1, Checklist 3.10 consistency. ~~ff.~~ Added new step 5 to provide PNNL exposure evaluator number for the hazard communicator if needed. ~~gg.~~ Exhibits 13.5, 6, 7 added new emergency equipment maps from the MIT. ~~hh.~~ Exhibit 14.a, 300 Area Protective Actions, revised table per RLEP 1.1, Appendix C, added 300 Area offsite Protective Actions & Recommendations. (amm/lef)
4~~0~~4/15/05	1	Fixed page numbering to start at page 2 on second page. Updated Bill Buyers phone number to 376-5612~~, and~~, changed Jeff Rencken as ~~Facility Operations Specialist~~FOS and Zone ~~warden~~Warden to Ed Arel. lef
6~~0~~6/13/05	1	Updated BERO contact names & numbers on pages 54-55, changed the MSG Support Lead to Mike Moran on page 62. (lef)
8~~0~~8/22/05	1	Updated ICP Hazards Communicator- Primary/~~Jack~~J Horne and Alternate/~~Lindsay~~L Nelson. Updated ICP Hazard Assessor/Radiological –Primary/~~Bob~~B Free and Alternate/~~Jack~~J Horne. Updated Zone Wardens: Zone 4A Alternate –~~Don~~D Kelly; Zone 7 Alternate –~~Mike~~M Lindberg; and Zone 9 Primary –~~Lewis~~ L Hogan. ~~On page~~Page 49, section 9.2.2, added Note: Only Rad Worker 2 trained staff ~~are~~is allowed to volunteer for receiving emergency radiological exposures. lef
~~0~~9/09/05	1	~~On page~~Page 60, replaced ~~Todd~~T Haynie as Zone Warden for Zone 4A and Industrial Hygiene/Occupational Safety -with ~~Don~~D Kelly on page 62, and added Don's cell phone. lef
9~~0~~9/13/05	1	Updated Rad Hazards Assessors to ~~Lindsay~~L Nelsen (primary) and ~~Rob~~R Sitsler (secondary) and Hazards Communicators Jack Horne (primary), ~~Holly~~H Black-Kania (1st Alternate) and ~~Forrest~~F Bronson (2nd Alternate). -lef
9~~0~~9/26/05	1	Updated ~~the~~ "Section 14.1, 300 Area Protective Actions"~~ section 14.1~~ per -TL Bettendorf "the RLEP has changed". Added Table of Contents. -Fixed spelling error for ~~Deborah~~D Coffey, SAS Secondary. lef
11/~~0~~07/05	1	Page 36 - Updated Section 6.1.8 #2a,per TL Bettendorf: • Move personnel from affected area to a safe location. • If the health and safety of the building occupants is such that a building evacuation is necessary, pull the fire alarm. • Notify the PNNL Operations Center at 375-2400. • Notify the Safety and Health Representative. Page 64, Section 12.2.4, Table 14.a per DE Clark: • New 90-day Storage Area SFO: ~~Greg~~G Varljen; • -New 90-Day Storage Non-SFO ~~Mark~~M Vucelick. (lef)
2~~0~~2/2006	2006	• Reformatted per F&O guidelines. • Added ~~Cindy~~C Caldwell as Safety & Health approval signature.

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		• Clarified the acronyms throughout the document. • Updated SPC to PNNL Operations Center throughout the BEP. • Section 1.6, added a building specific alarm for Hot cell DP at ~~Randy~~R. Thornhill and ~~Randy~~R. Scheele's request to standardize HLRF response procedures. • Replaced DOE-RL throughout the document with DOE. • Section 3.2.8, ~~clarified~~Clarified that responses apply to ZW alternates also. • Section 3.3, Clarified where individuals can find the electronic copy of the RPL BEP. • Section 6.1.5.1, added a bullet regarding need to notify the Environmental Support Contact to perform appropriate notifications to the Department of Ecology for a major tank spill. • Section 6.1.9, ~~added~~ clarification that various alarms may occur on Radiological Material Release. • Section 6.3, editorial change. • Section 6.4.2 "Hostage Situation/Armed Intruder/Violence in the Workplace" added information based on drills from violence in the workplace. • Section 7.5, corrected location of the air compressor isolation valve. • Section 7.9, corrected location of the local disconnect switch for RPL ramp sump pump. • Section 8.2. Added clarification for the need to notify the ~~Dept~~Department of Ecology within 30 days after an incident involving a release from a tank system to the environment that does not result in an activation of the contingency plan. • Attachment 13.1, update BERO listing to new members. • Attachment 13.1, updated BED (Francis Buck), 1st Alt BED (Bill Buyers), 2nd Alternate N/A. • Attachment 13.1, updated ICP Communicator adding ~~Karla~~K. Smith as Primary Responder; ~~Robert~~R. Schumacher as 1st Alternate and ~~Francis~~F. Buck as 2nd Alternate. • Attachment 13.5, updated names for ZW assignments. • Attachment 13.6, New ~~Staging Area Supervisor~~SAS- Deborah Coffey, 1st Alternate- ~~Karla~~K. Smith, 2nd Alternate-N/A. • Attachment 13.7, added the secondary phone line number for the PNNL Operations Center. • Exhibit 13.13 – Handling of Radiologically Contaminated/Deceased Worker Checklist, added a step to verify the appropriate DOE Facility Representative has been notified. (nmm) • Added Zone Warden Area maps and updated other building MIT maps. • SES: RPL-2006-021D. FG Buck. (lef)
~~4~~04/25/06	2006	• Update FG Buck cell phone: 528-0141 and WT Buyers cell phone 521-0217. • Page 65, Deleted ~~Forrest~~F. Bronson as ICP Hazards Communicator. Replaced ~~Jack~~J. Horne/ICP Hazards Assessor (Radiological)/Primary with ~~Bob~~B. Free. ~~Jack~~J. Horne is now 1st Alternate and ~~Holly~~H. Black-Kania is 2nd Alternate. • Page 65: ICP Hazards Communicator: ~~Lindsay~~L. Nelson/Primary and ~~Rob~~R. Sitsler/1st Alternate. • Replaced MSG Checklist with current checklist from the EP Office, per TL Bettendorf. (lef) CE: RPL-2004-194D. USQE FG Buck
~~8~~08/10/06	2006	• Update 1st Alternate BED to ~~Sanjay~~S. Sanan. • Deleted home phone number for ~~Lori~~L. Ashbeck • Updated ~~Management Support Group~~MSG Contact. RD Sharp.(lef) • CE: RPL-2004-194D. USQE/FG Buck
10/24/06	2006	• Fixed spelling and grammar errors, web link errors, Attachment numbers, and font sizes throughout document.

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		• Attachment 13.1 – New Assisting Communicator #1 – ~~Lori~~L Ashbeck. New ICP Hazards Communicators: 1- ~~Jack~~J Horne, 2 – ~~Bob~~B Free, and 3 – ~~Rob~~R Sitsler. New ICP Hazards Assessors – 1–~~Bob~~ B Free, 2- ~~Jack~~J Horne, and 3- ~~Holly~~H Black-Kania. • Attachment 13.7 - New MSG Contact – ~~Reed~~R Sharp. • CE: RPL-2004-194D. FG Buck/USQE 10/24/06
~~4~~01/10/07	2006	Updates to the BERO staff, Waste Management, and Communicators are as follows: Primary: Assisting Communicator: Lori Arel (W:376-3611, H:734-1574); 2nd Alternate ICP Hazards Communicator T Milham (Work: 376-0700), 1st Alternate ICP Recorder L Arel (W: 376-3611, H: 734-1574); Zone 4A Primary R Del Mar (376-2822); Zone 5 Primary L Hogan (372-1427); Zone 8 Secondary J Logan (376-1382); Zone 9: Primary J Logan (376-1382) ~~*2nd Alternate ICP Hazards Communicator: Terry Milham (Work: 376-0700)*~~ 1st Alternate ~~*ICP Recorder: Lori Arel (W: 376-3611, H: 734-1574)*~~ ~~*Zone 4A Primary: Ron Del Mar (376-2822)*~~ ~~*Zone 5 Primary: Lewis Hogan (372-1427)*~~ ~~*Zone 8: Secondary: John Logan (376-1382)*~~ ~~*Zone 9: Primary: John Logan (376-1382)*~~ ~~*1st Alternate Staging Area Supervisor: Jeff*~~SAS L Andrie (376-0502~~)~~ ~~)~~, 2nd Alternate ~~*Staging Area Supervisor: Terrou*~~SAS T Schlotman (376-3206) Under Waste Management: Remove ~~*Greg*~~G Varljen, Add ~~*Ron*~~R Del Mar (W:376-2822, C: 530-8308) CE: RPL-2004-194D. FG Buck/USQE
~~3~~/02/05/07	2007-~~2~~1	Annual BEP Update: • ~~Pg~~Page 5, editorial correction, ~~second paragraph~~Paragraph 2, "whose" • ~~Pg~~Page 9, deleted last sentence in ~~paragraph~~Paragraph 1.7. Incorrect statement. • Throughout the BEP deleted specific section reference number to PNNL-MA-110. MA-110 has been revised and all the references are now out of date. Removing section references will allow changes to be made to PNNL-MA-110 without requiring BEP revision. (~~pgs~~pages 12, 21, 46 • ~~Pg~~Page 14, added a responsibility to the BED Section 3.1 for planning conducting and documenting emergency drills per MA 110 requirements. • ~~Pg~~Page 41, updated the step 2 of the Bomb Threat actions per RLEP 1.1 • ~~Pg~~Page 48, Section 9.1 first bullet, revised wording related to location of Class D fire extinguishers if reactive metals are present. • ~~Pg~~Page 63, Updated drawing to show building removals and be consistent with TSD maps. • ~~PG~~Page 65, new Alternate Assisting Communicator and Primary ICP Recorder–~~Terri~~ T Mars. 2nd- Alternate ICP Hazards Communicator–~~Woody~~ W Buckner. 1st ~~Alt Staging Area Supervisor–Jim~~Alternate SAS J Jao and 2nd Alternate –~~Karl~~K Pool. • ~~Pg~~Page 72, replaced ~~Terri~~T Mars/TSD contact with JK Larsen. • ~~Pg~~Page 73, Nuclear Work Team Leader cell phone correction 521-6072 and deleted the pager. • Throughout all the checklists, revised RL to Hanford as appropriate. RLEP's refer to everything as Hanford vs. RL now. (e.g., RL Notification Form is now the Hanford Emergency Notification form.) • ~~Pg~~Page 79, BED Checklist ~~step~~Step 19, revised wording for personnel health advocate notification per RLEP 1.1, and corrected attachment number to 13.13. • ~~Pg~~Page 79, Step 20, added IC or the Liaison Officer, RLEP 1.1 consistency and correct attachment number 13.13. • ~~Pg~~Page 79, Step 23, corrected attachment number to 13.18, relocated the note regarding

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		event closeout to ~~step~~Step 23. • ~~Pg~~Page 81, ICP Communicator Checklist, step 3, revised Hazard Assessors to Hazard Communicator, RLEP 1.1 consistency. • ~~Pg~~Page 81, ICP Communicator Checklist, reformatted ~~sub-step~~Substep to A. • ~~Pg~~Page 84, Attachment 13.10 Removed ICP from Hazard Assessors checklist title. RLEP 1.1 consistency. • ~~Pg~~Page 88, SAS Checklist, editorial change to note in ~~step~~Step 2. • ~~Pg~~Page 88, Step 4 added note regarding injured personnel. RPL Drill Security 07-02 corrective action. • ~~Pg~~Page 91, Attachment 13.13, editorial change, RLEP consistency. • ~~Pg~~Page 96, Deleted duplicate steps from the MSG checklist. • ~~Pg~~Page 98, FOS checklist, minor editorial change ~~step~~Step 1 ~~&and~~ 2, RLEP consistency. Added note regarding injured personnel. RPL Drill Security 07-02 corrective action. • ~~Pg~~Page 100, ICP Hazard Communicator ~~checklist~~Checklist. Added several bullets for RLEP consistency. (NMM/lef) CAT EX: RPL-2004-194D. FG Buck/USQE.
~~8/6~~08/06/07	2007	• Section 1.3, replaced RSEG ownership of the RPL with the Director of Nuclear Operations as senior line manager. • Updated Alternate ICP Communicator, Primary Responder/Chemical Assessor, 1st Alternate ~~Staging Area Supervisor~~SAS, and 2nd Alternate ~~Staging Area Supervisor~~SAS, and changed Zones 4 and 4A Zone Wardens per L. Arel. (lef) • CE: RPL-2004-194D. FG Buck/USQE
~~9~~09/17/07	2007	• Page 65, change title of MSG Lead to MSG Liaison per RPL Bldg Managers office. (lef) • CE: RPL-2004-194D, FG Buck/USQE.
10/29/07	2007	• Replaced ~~Francis~~F Buck with ~~Dan~~DG Wandler as BED per BM Durst. • New ICP Communicator 1st Alt: John Logan; ICP Communicator 2nd ~~Alt~~Alternate-NONE. • New FOS 1st Alt: ~~Dan~~D Wandler and no FOS 2nd Alt. • CE: RPL-2004-194D DGW/USQE
11/10/07	2007-2	Major revision consisting of: • New signature page/approvers per LO Casazza. • Section 1.3, revised Owner/Operator to the new NOD organization manager. • Section 1.6, Deleted the word "High" from ~~Glove-Box~~Glovebox Differential Pressure Alarm (Signal) box. • Section 2.3, added references to ~~aDM~~ADM-001, *Document Production & Distribution* for making minor and major revisions to this procedure. • Section 6.1.11, added ~~new~~ 3rd bullet "Zone Wardens for Zone 2 and Zone 8, activate flashing red warning lights. • Section 6.4.4, added ~~new~~ 3rd bullet: "Zone Wardens for Zone 2 and Zone 8 activate flashing red warning lights." • Attachment 13.11, Deleted #5: Verify that the Zone 2 and Zone 8 Zone Wardens turned on the flashing red access warning lights identified in the Zone Warden Checklist"; renumbered remaining items in the checklist. • Attachment 13.12, #1, added "In the event of Reduced Ventilation or Take Cover…" • New BERO staff assignments: 1st Alternate Assisting Communicator: ~~Bob~~B Schumacher; 1st Alternate ~~Facility Operations Specialist, John~~FOS, J Logan.

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Date	Rev. #No.	Description
		• New Zone Warden assignments: Zone 8 Secondary and Zone 9 Primary: ~~Bob~~B Schumacher. (lla/lef) • CE: RPL-2004-194D. DGW
~~6~~06/13/~~2008~~ 08	2008	• Annual review. • Replaced the following checklists from PNL-MA-110: Attachment 13.10, Hazards Assessors; Attachment 13.15, Facility Operations Specialist; Attachment 13.17, ICP Hazards Communicator; and Attachment 13.14, MSG Checklist. Deleted Attachment 13.16, Hanford Emergency Notification Form. • Updated phone numbers for members of ~~the~~ BERO; Attachments 13.1, 13.5, and 13.7. (lef) • RPL-2008-120S. DGW
~~9~~09/25/08	2008	• Updated signature page with new BED, NOD, and FSR signatures. • Multiple updates to the RPL BERO staff list. • Added PNNL ~~Communicator Notification System~~CNS to ~~section~~Section 1.5. • Updated fire signal ~~on~~ Section 1.5 from gong/electric chime to ~~Slow Whoop~~low whoop followed by voice message. (DGW/lef) • CE: RPL-2004-194D. DGW 9/16/08.
12/~~1~~01/08	2008	• Replaced crash alarm system with the ~~Telephone Notification System (~~TNS~~)~~ and the ~~Communicator Notification System (~~CNS~~)~~ as appropriate. • Deleted crash alarm phone location on Attachment 12.5. • Updated maps from MIT. • Changed location ~~of the~~ ICP from Building 3760 ~~bldg~~ to Building 350 ~~bldg and~~; added new fax number for ~~the~~Building 350 ~~bldg~~ ICP. • SES: RPL-2008-231S. DGW/USQE
12/11/08	2008	• Section 1.0, updated WAC [WAC 173-303-350 (3)(d)] per HT Tilden. • Updated location of ICP in 350 building to Room 131. (cak) • Moved Section 6.10, Facility Take Cover to Section 7.0 for consistency throughout ~~ALL~~all BEPs and renumbered all subsequent sections and attachments as appropriate. • Updated BED checklist, #7: • Brief hazard assessors and FOS on event and if practical deploy them to the event scene as soon as possible. • Updated BED Checklist #15, added new NOTE: • If the location of the ICP has or will be changed call 375-2400 and assure the POC will be made aware of its new location. (lef/TLB) CE: RPL-2008-087D. USQE/~~DG Wandler~~DGW 1/7/09
~~1~~01/15/09	2008	• Attachment 14.7, Added EOC phone numbers for 350 building: 372-0727, 372-0801 and fax 372-0723. (lef) CE: RPL-2008-087D. DGW/USQE 1/15/09
~~6~~06/10/09	2009	• DSA Update and BERO staff changes: • Approval changes: new Waste Operations signature: K McDowell • New Section 1.7, "Deviations from Technical Safety Requirements" • Section 3.6: Deleted 90-day storage areas in ~~rooms~~Rooms 44, 61, 603, and the East Storage Yard and added the Shielded Analytical Laboratory ~~(SAL)~~ Hot Cells as a new 90-day storage area. • Section 6.4 – moved NOTE from ~~the~~ top of Section 6.4 to ~~the~~ end of subsection 6.4.1.2: *If local audible alarm actuates as a result of a transient condition associated with a known*

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		work condition, then it is acceptable (as applicable) to attempt to manually reset the alarm or wait 10 seconds for the alarm to automatically reset before taking emergency actions. If the alarm lasts longer than 10 seconds or the direct cause of the alarm is unknown, then immediately perform emergency actions. • Section 9.2.1: Added 326 Building to the list of emergency decontamination facilities. • Section 12.2: The ~~Emergency Action Levels (~~EALs~~)~~ are considered ~~Official Use Only (~~OUO~~)~~ information have have been removed from the server, therefore, the EALs statement has been revised removing the weblink and directing staff to obtain copies of the EALs for RPL from the RPL ~~Building Manager~~BM. • Attachments 13.5 and 13.7 – updated building maps identifying new locations of the 90-day storage areas. • Attachment 14.0 – per ~~Emergency Preparedness office – deleted Management Support Group~~EPO: Deleted MSG Checklist (old Attachment 14.14) – (this checklist is now a standalone procedure; see ADM-EPIP-7.2). Renumbered remaining Attachments in Attachment 14 – 14.14 is now ~~Facility Operations Specialist~~FOS – Checklisted Duties; 14.15 is ~~Incident Command Post~~ICP Hazards Communicator Checklisted Duties, and Attachment 14.16 is Emergency Closeout Checklisted Duties. • Attachment 14.1: New BED2 ~~–Skip~~HF Kerschner. New ICP Communicators ~~1- Tony~~T DeGuia, ~~2- Teresa and~~ T Campbell, 3- ~~Isadore~~I Henderson. New Assisting Communicator ~~Kathy~~ K Rightmire. New Chemical Assessors ~~–Kevin~~ K Sheffield and ~~Abby~~A Nicholson. ICP Hazards Communicator cell phone update • Attachment 14.4 : New BED2 HF Kerschner • Attachment 14.5: Rearranged the attachment to list the zone areas on top of the zone warden assignments. New Zone Wardens: Zone 2 Secondary ~~–Jim~~J Larsen; Zone 3 Secondary ~~–Tim~~T Smith; Zone 5 Primary ~~–Lanson~~L Oukrop; Zone 8 Primary –Jamin Trevino; Zone 9 Secondary ~~–Kristie~~ K Lombardo. • Attachment 14.7: New Safety & Health ~~Rep: Kevin~~Representative K Sheffield. New Waste Management TSD contact ~~–Kip~~ K McDowell. • Updated Staging Area Map. • Attachment 14.16: Per ~~the Emergency Preparedness office~~EPO, reorganized table for better flow of information. (NMM/CAK/lef)
~~6~~06/10/09	2009	Replaced ~~3~~three Emergency checklists per the ~~Emergency Preparedness office~~EPO: Attachment 14.4 – Facility Operations Specialist (FOS) Checklist, Attachment 14.8 – BED Hazardous Material Facilities (RPL) Checklist, and Attachment 14.16, (renamed) Event Closeout Form. (lef) USQ: RPL-200
~~6~~06/15/09	2009	Attachment 14.1, Per the ~~Emergency Preparedness Office~~EPO and the Department of Ecology, added "Environmental Support Contact" (regulatory notifications only) and the PNNL Operations Center phone number 375-2400. (lef) CX: RPL-2008-087D
~~1~~01/11/10	2009	Updated names and points of contact management personnel for the BERO. Deleted information Note regarding audible glove box alarms. (ld) Updated Hanford ~~Patrol Operations Center~~POC phone number from 373-3800 to 373-0911 per EP Office. (lef)

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~~0~~5/24/10	2010	Updated the 350 ~~Bldg~~Building alternate ICP room number. Replaced references for SBMS with HDI. Added steps to fight fires in hot cells and gloveboxes. Updates to criticality alarm tests are now semiannual, not quarterly. Added alpha sentry ~~cams~~CAMs to potential alarms. Updated emergency decontamination facility information. Corrected the location of the compressed air isolation. Added paging system information. Updated names and points of contact for BERO and standardized emergency telephone number list with the rest of the BEPs. Moved the emergency contacts to section 3.0 and added EOC Tech Reps Patello, Thornhill, and Steen. Section 4.1, added ~~Mike~~M Zabel as Primary Chemical Assessor, ~~Doug~~D Falk as 1st Alternate and Abby Nicholson as 2nd Alternate. Deleted zone warden list, moving it to RBAC. New Section 15.0 which lists all referenced documents and weblinks for emergency preparedness checklists. Section 4.1 – deleted MSG Recorder, ~~Barb~~B Ekstrom per ~~EP Office.~~ EPO: Per Environmental ~~Managements'~~Management request, ~~section~~Section 11.4 has been revised to list the items in the spill kits. Section 8.1.2.2, Facility Take Cover event –inside RPL, added: Staff should refrain from eating and drinking during a take cover event if physically able, until an appropriate evaluation of the event can be made. (cak/tlb/lef)
10/20/10	2010	• Added the following Note in sections 6.1.1, 6.1.2, 6.2, 6.2.2, 6.2.3, 7.4, 6.5, 6.7, 6.8 and added it as a step in 6.9.2: If appropriate, classify the event using the RPL EALs. • Updated first floor and basement emergency equipment maps. • Merged Sections 3.0, Emergency Telephone Numbers and Section 4.0 ~~Building Emergency Response Organization~~, BERO into one section/Section 3.0, ~~Building Emergency Response Organization~~BERO and adjusted section reference numbers throughout the document. • Replaced ~~Kip~~K McDowell with KM McDonald as Low Level TSD contact. • Deleted ~~room~~Room 32 as TSD in section 3.19. (tlb/cak/lef)
~~4~~04/7/~~2011~~ 11	2011	• Updated emergency equipment and evacuation route maps. • Updated phone numbers due to VOIP system installation. • Changed location of the decon shower to 3410. • Updated locations of TSDs and 90-day storage areas per EL Grohs. • Updated name for AMH to CSC Hanford Occupational Health Services (CSC HOHS). • Updated S&H Rep from D. Falk to M. Zabel. (cak/lef)
~~6~~06/17/~~2011~~11	2011a	~~Update section~~Updated Section 1.7 in accordance with revised wording in TSR. AC 5.11. Added clarification notes in ~~sections~~Sections 6.1.1.4 and 10.2 that fire extinguishers with glove piercing tips are for HFD use only. (tac)
~~8~~08/15/11	2011b	Updated BERO staff listing. Added 373-0911 to be dialed from cell phones and added Note about Becquerel conversion to ~~dpm~~disintegration per minute in Section 6.4. (CAK/lef)
~~9~~09/20/11	2011-2	Verified HDI title changes and F&O organizational titles are correct. Section 5.5, updated Criticality Hazards. Section 6.5 was also revised. Updated the location of the RPL building within in the 300 ~~area~~Area and the PIV locations. (cak/lef)
~~1~~01/30/12	2012	Further definition of restart process consistent with DOE O 420.1B, Facility Safety. Added references to PNNL institutional plans/ procedures for event recovery.
~~11~~01/01/13	2013	Updated per HF Kerschner's request, changing Section 11.0 and staff response to visitors. Updated HDI references. Updated PNNL's Occupational Health Provider (OH). Revised references for ADM–EPIP–7.2 to ADM–EPIP–2.0. Updated mailing address: zip code to 99354. Deleted 3790 as an alternate staging area. Changed Section 6.9 from Hostage Situation/Armed Intruder to "Active Shooter in Building." Revised Section 11.0. Added more information about H&V emergency shutdown
~~3~~03/14/13	2013a	Replaced emergency equipment maps due to emergency equipment changes.

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909/25/13	2013-1	Changed BED/~~Bldg Manager~~BM from CA Kooiker to ~~Eric~~EM Hanson (acting)~~-~~). Changed Utility Operations Supervisor from RL McKinney to D Cravens, deleted supervisor's pager. Changed ~~Deborah~~ D Coffey's contact information. Added ~~step~~Step 6.6.1.1 – Verify that all equipment and heat generating devices inside of laboratory gloveboxes and inside of hot cells are shut down. Step 6.8.1.4 modified to allow RF equipment outside 100 feet from the RPL. Revised staging area location to the south end of ~~lane~~Lane #9. Added Alternate Staging Area Map, Attachment 8. Added CS Dreyer as BED3.
~~1~~01/29/14	2014	Updated to include the North Storage Pad as part of the RPL facility. Deleted "klaxon horn" from "Take Cover" alarms in Section 1.5. Identified new Hazards Communicators and Hazards Assessors. Updated Section 8.0 and reformatted cover page; updated BM to PT Saueressig
202/27/14	2014-1	Changed organization title from EMSD to EP&RP ~~(Environmental Protection & Regulatory Programs)~~. Changed BEDs: BED: PT Saueressig, BED1: EM Hanson and changed FOS to DG Wandler. Updated emergency equipment and evacuation route maps. Replaced UO WTL Don Cravens with TJ Vanderlinden and changed EOC RPL Tech Rep from Gertrude Patello to Karl Pool. Section 2.2 – Acronyms – added PNSO Section 3.2 – Added PNSO representatives to table Section 3.3 – Added PNSO representatives to graphic Updated links to emergency preparedness forms.
~~8~~05/15/14	12	• Changed revision number to 12 to support Vault implementation. • Changed Safety ~~&~~and Health ~~Rep~~Representative to ~~Pam~~P Aardal • Changed Chemical Assessor assignments: Added ~~Pam~~P Aardal as Primary Responder moved ~~Mike~~ M Zabel to 1st Alternate and moved ~~Doug~~D Falk to 2nd Alternative. • Changed terminology for MSDS (Material Safety Data Sheets) to SDS (Safety Data Sheets). • Updated Zone Warden maps. • Changed ~~Staging Area Supervisor~~SAS Assignments: ~~Moved Teresa~~moved T Schlotman to 1st Alternate ~~and~~; added ~~Jake~~J Bohlke ~~as~~ 2nd Alternate. • Changed ~~Facility Operations Specialist~~FOS Assignments: Added Johnny Trevino ~~as~~ 2nd Alternative.
10/20/14	13	• Section 3.19, added ~~rooms~~Rooms 610, 3714 pad, and portions of 603 and 604A ~~to the~~ TSD locations. • Unique Program Laboratory Expertise: added cell numbers for Trevor VanArsdale and John Holland. • Added footnote language to be the same style as used in DOE-94-02 per ~~Harold~~H Tilden's request per the 3/2014 Ecology inspection. • Replaced ~~Ed~~E Arel/WTL with ~~Don~~D Cravens as WTL; replaced ~~Pam~~P Aardal/S&H Rep with ~~Mike~~ M Zabel. Pts/lef • Changed reference to ADM-EPIP-8.0 (retired) to ADM-EPIP-3.0, *Recovery Plan* per TL Bettendorf and change approved by PT Saueressig prior to release of this revision. • Changed out the 300 Area site map (Attachment 9). • Updated Section 12.1 per the recent DOE-0223 updates (TLB). • During routing, the following were requested to be added to the BEP per PT Saueressig: 1. Adding a note prior to the first footnote.

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		2. Changing the table so that only take cover addresses gathering in the lunchroom. 3. Changing the footnote to makemaking it clear and, concise (less redundant). This would apply to all of the footnotes. 4. Adding the permit to the reference documents.
302/12/15	14	• Added JasonJ Sweesy to section Section 3.2 as the Primary Chemical Hazards Assessor (moved Mike M Zabel and DougD Falk to 1st first and 2nd Alternatesecond alternate, respectively). Revised Section 8.2, Air. • Added new sectionSection 8.10, Decontamination Shower/Sink. This information was included in sectionSection 9.2.1 and Attachment 1. • Updated pages 52 and 53 with the latest 300 Area Protective Actions info from RLEP-1.1, 404/30/14 per TL Bettendorf. Changes during approval per HT Tilden and approved per PT Saueressig:- footnote corrections and added the requirement to maintaining a controlled copy BEP in the 325 HWTUs operating record. Section 3.20, moved the paragraph break between the first and second paragraphs so that only the second paragraph is RCRA enforceable. (htt/pts) 303/10/15: per email from CS Dreyer: USQ RPL-2015-058S is still valid for these changes. Thank you. (csd) •
01/18/16	15	Updated the following: • Section 3.1 and Section 3.2 tables (new personnel) • Compressor air system information • Integrated Waste Management System information • Criticality response actions in response to a criticality event derived from Criticality Accident Assessment • Updated RPL EALs reference in Section 12.2 to RLEP 1.0 – Appendix 1-PNNL 325. Technical editing of the entire document for consistency (format, titles, names, abbreviations, website links, etc.), including new checklist names and weblinks.

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Addendum J, all pages of the Building Emergency Procedure (do not delete the existing Applicability Matrix)

Pacific Northwest
NATIONAL LABORATORY
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F&O Building Emergency Procedure

BEP-325RPL

Building Emergency Procedure for the Radiochemical Processing Laboratory (325RPL)

Revision #	15
Revision Date	01/18/16
Procedure Owner:	PT Saueressig
Author:	PT Saueressig
Approval:	RPL Manager, EM Hanson
Concurrence:	Building Manager, PT Saueressig Emergency Preparedness, AD Haller Emergency Preparedness, JE Kinzer Environmental Planning and Emergency Preparedness, JA Stegen Waste Operations Manager, TL VanArsdale Worker Safety and Health, EG Damberg
Work Location:	325RPL/300 Area
Identified Hazards:	N/A *See Section 4.0*
SES/USQ Reviewer:	PT Saueressig
Applicable to RPL ONLY:	RPL-2016-019S
Use Category:	Reference Use

Use only the current procedure revision available on the F&O website, or procedures numbered and stamped "Controlled Copy."

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1.0 General Information

The Radiochemical Processing Laboratory (325RPL) Building Emergency Procedure (BEP) has been designed to provide information necessary to minimize risks to personnel, facilities, programs, and the environment in the event of an emergency. This procedure applies to all resident staff, visitors, vendors, and contractor/subcontractor personnel. If an event is of a security nature (bomb threat, hostage situation, or other act of violence), security procedures may supersede this procedure and will be assessed on a case-by-case basis.

This facility contains both radioactive and hazardous materials in operations, storage, and handling. The 325RPL Building poses a possible significant hazard to adjacent facilities, personnel, programs, and the environment.

This BEP includes the contingency plans and emergency procedures for hazardous waste management activities as referenced by the following Washington Administrative Codes (WAC).

- WAC-173-303-340, "Preparedness and Prevention"
- WAC-173-303-350, "Contingency Plan and Emergency Procedures"
- WAC-173-303-360, "Emergencies"

This plan must be implemented whenever an emergency threatens human health and the environment.

Emergencies may arise from, but are not limited to, the following:

- fire
- explosion
- loss of service systems
- medical emergency
- bomb threats
- criticality
- criminal activity
- incidents at other facilities
- natural hazards or natural forces
- pill/release to the environment requiring assistance
- hazardous materials release.

Expected responses are those actions which are intended to minimize the effects of a situation while providing optimum protection to personnel. Expected responses include notification to the PNNL Security Operations Center (SOC), Building Manager (BM), Building Emergency Response Organization (BERO), and personnel in the facility. This procedure also provides plans for notifying personnel to take safe actions such as "take cover," "evacuate," or other planned actions dictated by the event. The procedure provides for formal notification and reporting.

Other emergency response agencies available to assist the Building Emergency Director (BED) and Incident Commander (IC) from offsite are described in U.S. Department of Energy Richland Operations Office (DOE/RL) 94-02, *Hanford Emergency Management Plan*, Section 3.0. [WAC 173-303-350 (3)(d)].

The BED will provide BERO members with annual BEP training. The BED and Alternate BEDs will receive annual training from Pacific Northwest National Laboratory (PNNL) Emergency Preparedness (EP).

PNNL policy is to provide for the safety of its staff, contractor/subcontractor personnel, visitors, and members of the public in case of an emergency incident. PNNL line management has the responsibility to execute this policy and to see that all staff understands their own responsibilities and actions to be taken in an emergency. Every staff member is responsible for using the appropriate safety instructions and procedures and remaining alert to unsafe conditions or acts while performing his or her job. All personnel are responsible for responding to emergency conditions to minimize adverse impacts.

In the event of an emergency condition in the facility, members of the 325RPL BERO will perform their duties as described in this procedure. Specific emergency actions for response to events will be applicable as specified in this BEP. Those BERO members whose assistance is needed to mitigate a lesser event will be notified by telephone or personal contact by the BED or delegate. Occupants of the facility who are not members of the BERO shall follow the standard PNNL Emergency Preparedness requirements at How Do I...? (HDI) Work Control, *Basic Staff Practices*.

The building fire alarm is the primary means of evacuation and notification for full activation of the BERO. Emergency telephone numbers are listed in Section 3.0.

This procedure will be reviewed at least annually and amended if necessary or whenever any of the following occurs. [WAC-173-303-350(5)]

- The applicable regulations or the Hazardous Waste Treatment Unit (HWTU) permit is revised.
- The procedure fails in an emergency.
- The facility changes in a manner that materially increases or decreases the potential for fire, explosion, or release of hazardous waste or hazardous waste constituents, or in any way that changes the response necessary in an emergency.
- The emergency coordinating personnel list changes.
- The emergency equipment list changes[1].

1.1 Facility Name

Name	Radiochemical Processing Laboratory (325RPL), 325 Building
Address	325 Cypress St., 300 Area Richland, WA 99354
EPA Generator ID Number	WA 7890008967

1.2 Facility Location

The 325RPL Building is in the southern portion of the 300 Area, north of Cypress Street.

[1] Section 1.0, Paragraph 11: Permit Requirement, Class 1 Modification 09/30/15

1.3 Owner/Operator

The 325RPL Building is owned/operated by the U.S. Department of Energy (DOE) and co-operated by PNNL. The 325RPL Manager is the senior line manager in the 325RPL and has overall responsibility for all aspects of operations in the facility. The 325RPL Manager is part of the Nuclear Operations Division (NOD) within the Facilities and Operations (F&O) Directorate. The 325RPL BM reports directly to the 325RPL Manager and supports operations and maintenance in the facility. The 325RPL BM is also the primary BED.

1.4 Facility Description

The 325RPL Complex, as referred to in this BEP, consists of the following.

- 325RPL Building
- 325RPL Filter Building
- East Storage Yard located east of the 325RPL Building
- North Storage Pad located north of the 325RPL Building.

The 325RPL Building houses laboratories and specialized facilities including general-purpose chemical laboratories, the High-level Radiochemistry Facility (HLRF), the Shielded Analytical Laboratory, fissionable material storage areas, and 325RPL HWTU. The general-purpose laboratories characterize fuel, single- and double-shell tank waste, environmental samples, fusion/tritium samples, and other wastes. The radiochemistry facility includes areas for glove boxes, hot cells, cask handling, storage, and isolation of isotopes for unique applications like medical use. Analytical laboratory operations are conducted on small amounts of highly radioactive materials such as samples of single-shell tank waste. The HWTU treats hazardous, mixed, low-level radioactive and transuranic waste.

The 325RPL Filter Building is located on the northwest corner of the main 325RPL Building and houses the final stage high-efficiency particulate air (HEPA) filters and the main exhaust fans.

The East Storage Yard is a fenced enclosure adjacent to the east side of the 325RPL Building and is designated as an outdoor Radioactive Material Area (RMA).

The North Storage Pad is the foundation pad of the former 328 Building and will be designated as an outdoor RMA.

NOTE: *Footnotes in this document note the provisions in the BEP that are subject to Resource Conservation and Recovery Act (RCRA) Permit# WA7890008967. These actions in the BEP implement RCRA permit requirements.*

1.5 Hanford Site Emergency Sirens/Alarms[2]

NOTE: *Some signals may not be applicable to the building; however, they may be heard in other parts of the Hanford Site. In the event of "take cover" alarm, the BERO will respond to the 325RPL Building lunchroom/lobby area for BED direction.*

Hanford Site Emergency Sirens/Alarms		
Signal	**Meaning**	**Actions**
Slow whoop followed by a voice message.	Fire	Vacate building and proceed to staging area.
Steady tone on whistle, or siren.	Area Evacuation	Vacate building and proceed to staging area. Personnel in vehicles shall proceed to the nearest occupied facility and report to the Staging Area Supervisor (SAS).
Wavering siren or short blasts on whistle or siren.	Take Cover (Shelter)	Proceed to shelter or stay indoors. Close all exterior doors, turn off all intake ventilation (only if it can be done safely), and notify manager of whereabouts. Personnel in vehicles shall proceed to the nearest occupied facility and report to facility management. Staff should refrain from eating and drinking during a take cover event if physically able, until an appropriate evaluation of the event can be made.
AH-OO-GAH horn (howler) or flashing blue light (in high noise areas).	Nuclear Criticality	Run at least 100 feet from building; proceed to staging area along a path that does not take you closer to the building.
Variable color (red, amber) light with ringing bell or whistle.	Airborne Radioactivity or Area Radiation Monitor	Stop work activities; immediately exit the area; notify Radiological Control personnel.
Communicator Notification System (CNS), telephone call displayed from 375-2124.	PNNL Emergency Communications	Lift receiver, say **"HELLO"**, listen to the message and follow the actions designated.
Telephone Notification System (TNS)	Hanford Site Emergency Communications	Lift receiver, say **"HELLO"**, listen to the message and follow the actions designated. **NOTE:** *This system is only applicable to facilities on the Hanford Site (i.e., 300/600 Areas).*

[2] Section 1.5: Permit Requirement, Class 1 Modification 03/31/16

1.6 Coordination Activities with Local Emergency Responders[3]

Interfaces and coordination with offsite agencies are in the planning, preparedness, response, and recovery elements of the Hanford Emergency Management Program. The DOE has developed and maintains agreements to formalize areas of understanding, cooperation, and support with offsite agencies. These agreements are applicable to all Hanford facilities, including the 325RPL. Summaries of these Memorandum of Agreements, or MOAs, are given in DOE/RL 94-02, Table 3-1.

1.7 Deviations from Technical Safety Requirements

Emergency actions that depart from approved Technical Safety Requirements (TSR) may be taken when no actions consistent with the TSRs are immediately apparent, and when these actions are needed to protect workers, the public, or the environment from imminent and significant harm.

Such actions shall be approved, as a minimum, by the 325RPL BM, the 325RPL Manager, or the 325RPL BED. If emergency actions are taken, verbal notifications shall be made to the Pacific Northwest Site Office (PNSO) within two hours and by written reports to the DOE Headquarters within 24 hours. [TSR AC 5.11]

[3] Section 1.6: Permit Requirement, Class 1 Modification 03/31/16

2.0 Purpose of the Building Emergency Procedure

This procedure describes the processes and information necessary in the event of an emergency for the 325RPL BERO members to react to the emergency and to perform the following actions:

- Maximize safety, minimize risk to life, and provide prompt efficient treatment for injured persons.
- Provide all members of the BERO with an understanding of their roles and responsibilities in the event of an emergency.
- Minimize the effects on the health and safety of personnel, property, the environment, programs, and the public.
- Provide prompt internal and external notifications to the responsible authorities.

2.1 Distribution

At a minimum, controlled document copies of this BEP will be located as follows:

- BED emergency response bag
- 325RPL Power Operator Office (Room 900)
- BM file
- 325RPL HWTU's Operating Records[4]
- EP Program Office
- PNNL SOC
- Hanford Emergency Operations Center (EOC) (Hanford Site facilities only)
- Management Support Group (MSG) emergency response bag (LSB/2D55)
- Alternate Incident Command Post (ICP) (Building 350, Room 161).

The 325RPL BEP may be viewed and/or printed by clicking on the F&O Building Information webpage link. Copies of the BEP that are printed from this website are considered *uncontrolled copies.*

[4] Section 2.1, Bullet 4: Permit Requirement, Class 1 Modification 03/31/16

2.2 Acronyms

325RPL	Radiochemical Processing Laboratory (325 Building)
BED	Building Emergency Director
BEP	Building Emergency Procedure
BERO	Building Emergency Response Organization
BM	Building Manager
CAM	Continuous Air Monitor
CAS	Criticality Alarm System
CHA	Chemical Hazard Assessor
CMS	Chemical Management System
CNS	Communicator Notification System
CSM	Cognizant Space Manager
DOE	U.S. Department of Energy
DOE/RL	U.S. Department of Energy Richland Operations Office
DSA	Documented Safety Analysis
EAL	Emergency Action Level
EIP	Emergency Information Posting
EOC	Emergency Operations Center
EP	Emergency Preparedness
EPA	Environmental Protection Agency *(EPA Generator Identification Number)*
EPRP	Environmental Protection and Regulatory Program
ESM	Electronic Storage Media
F&O	Facilities and Operations (Directorate)
FOS	Facility Operations Specialist
FSR	Field Services Representative
HDI	How Do I...?
HEPA	high-efficiency particulate air (filter)
HFD	Hanford Fire Department
HLRF	High-Level Radiochemistry Facility
HWTU	Hazardous Waste Treatment Unit
IC	Incident Commander
ICP	Incident Command Post
IM	Incident Manager
IOPS	Integrated Operations System
LA/LAI	Limited Area Island
MIT	Map Information Tool
MOA	Memorandum of Agreement

MSG	Management Support Group
N/A	non-applicable
NOD	Nuclear Operations Division
OS&Y	outside screw and yoke
PNNL	Pacific Northwest National Laboratory
PNSO	Pacific Northwest Site Office
POC	Patrol Operations Center
PPE	personnel protective equipment
RBA	Radiological Buffer Area
RCA	Radiologically Controlled Area
RCRA	Resource Conservation and Recovery Act
RHA	Radiological Hazard Assessor
RPT	Radiological Protection Technologist
SAS	Staging Area Supervisor
SDS	Safety Data Sheet
SME	Subject Matter Expert
SOC	Security Operations Center
TDP	Testing Designated Position
TNS	Telephone Notification System
TSD	Treatment, Storage, Disposal
TSR	Technical Safety Requirements
UDAC	Uniform Dose Assessment Center
WAC	Washington Administrative Code

2.3 Making Changes to the Building Emergency Procedure

PNNL-MA-110, *PNNL Emergency Management Plan*, requires the BED to keep the Emergency Preparedness (EP) program manager advised of any changes to the BEDs. This may be accomplished by memo or email. The HWTU Permit Coordinator and the RCRA Subject Matter Expert (SME) are also required to be notified before any changes are made to the BEP.

To request revisions to this procedure, refer to ADM-001, *Document Production & Distribution*.

3.0 Building Emergency Response Organization

3.1 Emergency Telephone Numbers

In the event of an emergency, specific detailed facility information may be needed. Knowledge of the building, utilities, and radiation hazards can be obtained from the staff listed in the following table. Contact the PNNL SOC at 375-2400 if unable to contact any of these staff members using the numbers provided. [WAC-173-303-350(3)(d)]

Any Emergency – PNNL Security Operations Center (SOC): 375-2400				
NOTE: With the appropriate approval, BED home addresses can be obtained at the PNNL SOC.				
Responsibility	**Name**	**Office**	**Home**	**Cell**
***BED**[5]	Paul T. Saueressig	375-5352	N/A	619-3873
***BED1**	Chris S. Dreyer	375-5468	628-9995	420-0533
***BED2**	Dan G. Wandler	375-5179	N/A	438-1053
***BED3**	Eric M. Hanson	375-5351	N/A	713-0860
Additional F&O Management Contacts				
Utility Operations Work Team Lead	TJ Vanderlinden	375-2829		521-8024
Nuclear Operations Work Team Lead	Don Cravens	375-5398		948-1053
Fire Protection Engineer	Dan Kester	371-7383		308-9108
Safety and Health Representative	Jason Sweesy	372-4122		438-4974
F&O MSG	Reed Sharp	371-7042		
EOC RPL Tech Representatives	Karl Pool	375-5246		851-6769
	Randy Thornhill	375-5220		
	Franciska Steen	375-5546		
Unique Program Laboratory Expertise				
Waste Management – 90-Day	Zane Turner	375-5088		554-4359
Low Level TSD	Trevor VanArsdale	375-3814		531-6441
Environmental Compliance Representative	John Holland	375-5002		521-1211
Alternate ICP:	350 Building / Room 161	376-7565 376-7965 (FAX)		
Environmental Support Contact *(regulatory notifications only)*		375-2400 375-1648		
Hanford Fire Department		375-2400 or 373-0911		
Medical and First Aid		375-2400		
Hazardous Materials Response Team (Benton-Franklin County Hazardous Material Response Team)		375-2400		
Ambulance Services		375-2400		
Police Department		375-2400		
Hanford Patrol		373-3800		
PNNL Duty Officer(s) and PNNL Information Line		375-2154		
Off Normal Event Reporting		375-2400		
Work-related injury/illness of a non-emergency nature: PNNL Occupational Health Clinic, LSB 1st Floor, Section E		371-7848		

** These are Testing Designated Positions (TDP) per HDI Exhibit, Perform Substance Abuse Testing. Any changes to these positions require coordination through the TDP Administrator.*

[5]Section 3.1, BED Information: Permit Requirement, Class 1 Modification 03/31/16. See Permit Condition II.A.4.

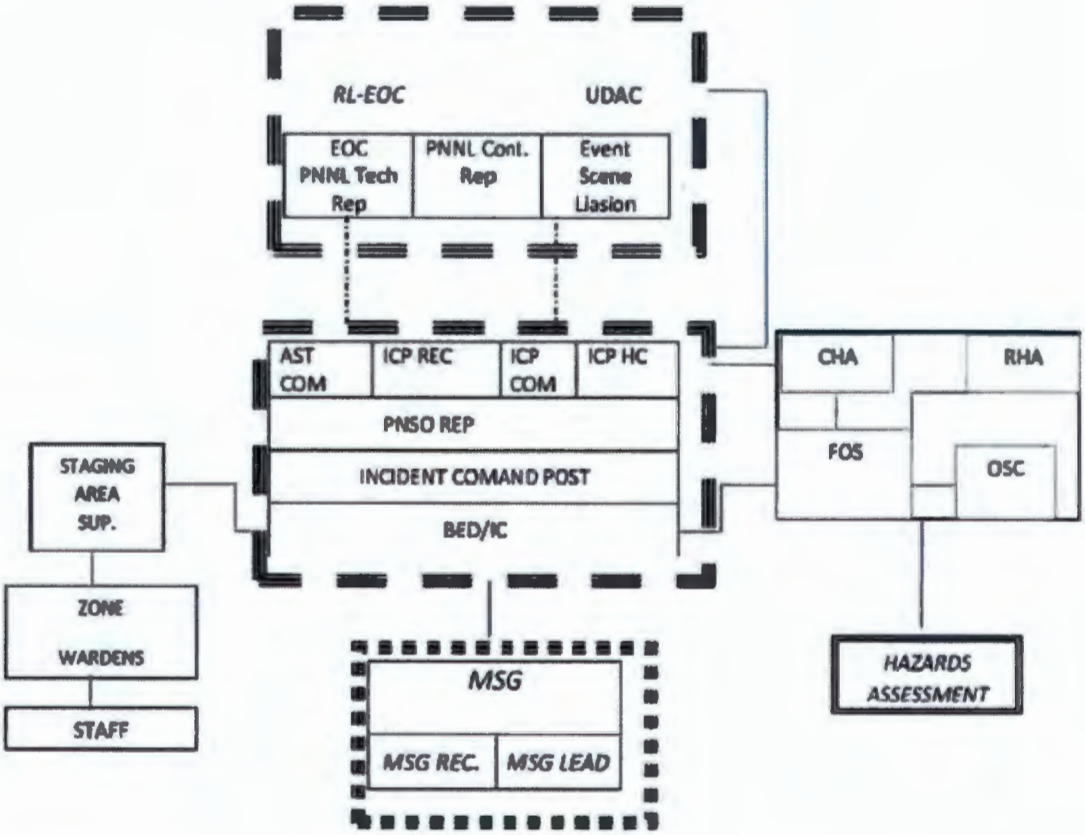
3.2 Building Emergency Response Organization

The 325RPL BERO is an emergency response organization with clearly defined responsibilities. The BERO consists of pre-designated and trained individuals assigned to emergency response activities associated with the 325RPL. In addition, other positions and/or personnel in the 325RPL have responsibilities associated with emergency responses, preparedness, and notifications.

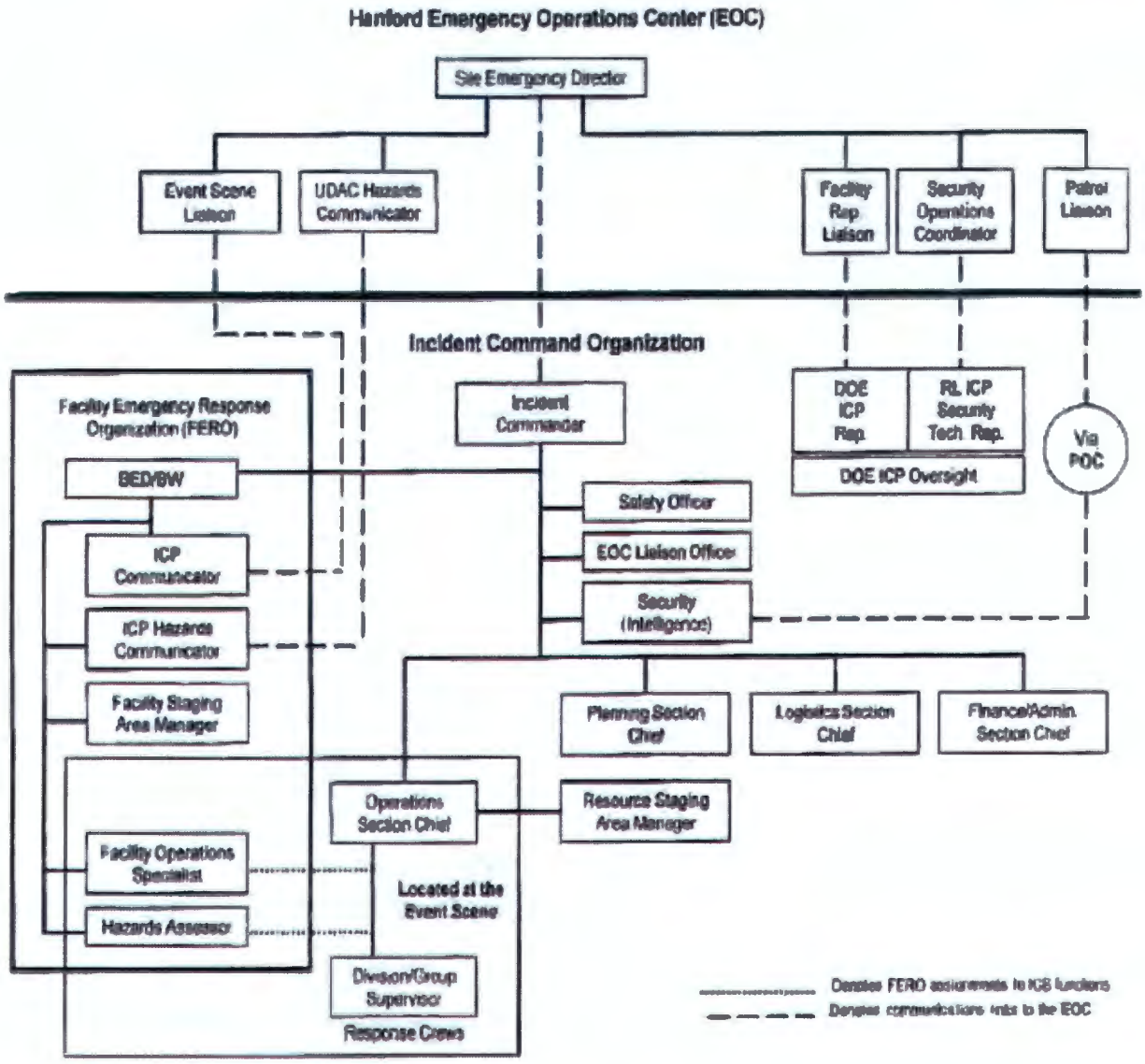
BERO Position	Primary Responder	1st Alternate	2nd Alternate
*Incident Command Post Communicator	Christopher Dreyer Work: 375-5468 Cell: 420-0533 Home: 628-9995	Carl Bowman Work: 375-7558 Cell: 207-716-7191 Home: 207-716-7191	Teresa Campbell Work: 375-5119 Cell: 947-0332 Home: 943-6122
Assisting Communicator	Scott Colby Work: 375-5350 Cell: 554-1780	Kathy Hall Work: 375-5346 Cell: 528-5954	
Chemical Hazards Assessor	Jason Sweesy Work: 372-4122 Cell: 438-4974	Mike Zabel Work: 375-5013 Cell: N/A Home: 378-4278	Doug Falk Work: 371-7097 Cell: 308-9101 Home: 967-5063
Incident Command Post Hazards Communicator	Terry Milham Work: 375-5007 Cell: 539-3910 Home: 627-0200	Bob Free Work: 375-5597 Cell: 521-5916 Home: 627-0200	Steve Ruisi Work: 375-6656 Cell: 528-6451 Home: N/A
Radiological Hazards Assessor	Lorna Brown Work: 375-5006 Cell: 948-2577 Home: N/A	Jenny Martin Work: 371-7788 Cell: 374-7581 Home: 628-0561	Holly Black-Kania Work: 371-6930 Cell: 539-7283 Home: N/A
Incident Command Post Recorder	Terri Mars Work: 375-5661 Cell: 539-0722	Kathy Hall Work: 375-5346 Cell: 528-5954	
*Facility Operations Specialist	Dan Wandler Work: 375-5179 Cell: 438-1053 Home: 438-1053	John Logan Work: 375-5168 Cell: 438-2079 Home: 438-2079	Johnny Trevino Work: 375-5177 Cell: 554-8531 Home: N/A
Staging Area Supervisor	Teresa Schlotman Work: 375-5323 Cell: N/A Home: N/A	Kristie Lombardo Work: 375-5353 Cell: 948-5591 Home: N/A	Victor Sauceda Work: 375-5547 Cell: N/A Home: N/A
PNSO Facility Representative	Derek Wright Work: 372-4100 Cell: 509-392-9872 Home: 803-640-3605	Jeff Carlson Work: 372-4750 Cell: 509-539-2044 Home: 582-9769	Rob Yasek Work: 372-4023 Cell: 509-554-4471 Home: 371-8105

** These are Testing Designated Positions (TDP) per HDI subject area Workplace Substance Abuse. Any changes to these positions require coordination through the TDP Administrator.*

3.3 Building Emergency Response Organization - Emergency Operations Center Interface



Legend			
AST	Assisting	IH	Industrial Hygienist
BED	Building Emergency Director	MSG	Management Support Group
CHA	Chemical Hazards Assessor	OSC	Operations Section Chief
COM	Communicator	REC	Recorder
CONT	Contractor	REP	Representative
EOC	Emergency Operations Center	RHA	Radiological Hazards Assessor
FOS	Facility Operations Specialist	SUP	Supervisor
HC	Hazards Communicator	UDAC	Unified Dose Assessment Center
IC	Incident Commander		
ICP	Incident Command Post		



3.4 Building Emergency Directors and Alternates

The BED has the responsibility for the welfare and safety of the building personnel and for directing efforts to control, evaluate, and terminate the event if the building is the site of an event. The BED performs duties of the Emergency Coordinator as prescribed under WAC 173-303-360 until relieved by the IC, and has the authority to commit the resources needed to carry out the BEP.

The BED manages facility operations and personnel during an emergency and is responsible for implementation of appropriate emergency procedures and their follow-up, 24 hours a day. The BED has the authority to commit the resources necessary to carry out emergency plan activities[6]. Activities include:

- Directing configuration control over facility systems and components at the event scene.
- Activating the BERO.
- Assessing the event scene[7].
- Allocating personnel to conduct facility-specific emergency response actions within the affected facility boundary (including acting as or delegating duty as the Facility Operations Specialist (FOS) and taking appropriate protective actions in response to events occurring in other onsite geographic areas or adjacent facilities).
- Categorizing the incident and notifying the PNNL Environmental Support Contact and/or the EOC Shift Office[8].
- Communicating with the Environmental Protection and Regulatory Programs (EPRP).
- Initiating activation of the MSG.
- Reviewing the Emergency Action Level (EAL) criteria (PNNL-EAL-325RPL, *Emergency Action Level Tables for the RPL*) and providing an initial EAL classification to the EOC Shift Office[9].
- Directing implementation of initial preplanned area/site protective actions.
- Identifying an alternate staging area in the event of an extended building evacuation during adverse weather.
- Determining personnel accountability status.
- Performing the necessary steps in *EP-BED-325RPL, Building Emergency Director Checklist*.
- Verifying other BERO positions use checklists as appropriate.
- Verifying that preservation of evidence at the event scene is taken into consideration during the event.
- Developing and transmitting event reports to maintain accurate and complete records of events, decisions, and actions during an event.
- Verifying the appropriate alarms are sounded when necessary[10].

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[6] Section 3.4, Paragraphs 1 and 2: Permit Requirement, Class 1 Modification 09/30/15
[7] Section 3.4, Paragraph 2, Bullet 3: Permit Requirement, Class 1 Modification 09/30/15
[8] Section 3.4, Paragraph 2, Bullet 5: Permit Requirement, Class 1 Modification 09/30/15
[9] Section 3.4, Paragraph 2, Bullet 8: Permit Requirement, Class 1 Modification 03/31/16
[10] Section 3.4, Paragraph 2, Bullet 16: Permit Requirement, Class 1 Modification 09/30/15

- Providing information and assistance to the responding agencies as requested to mitigate the event, including:
  - Identifying the character, exact source, amount, and extent of any released materials.
  - Taking reasonable measures (e.g., stopping processes/operations, collecting/ containing released waste, removing/isolating containers) necessary to make sure that fires, explosions, and releases do not occur, recur, or spread to other dangerous waste.
  - Monitoring for leaks, pressure buildup, gas generation, or ruptures in valves, pipes, or other equipment as appropriate[11].
- Approving re-entry and/or rescue operations.
- Arranging care for any injured persons and contacting their line management.
- Notifying the HWTU permit personnel of any planned changes to the BEP.
- Verifying hazardous spill/release events are logged in the HWTU operating records.
- Taking appropriate actions during adverse chemical conditions; see HDI Exhibit, *Respond to Spill or Adverse Chemical Condition*.
- Providing a thorough briefing to the Hanford Site emergency responder (e.g., Hanford Fire Department (HFD), Hanford Patrol).
- Maintaining emergency equipment[12].
- Verifying that the Environmental Support Contact will provide any necessary notifications to regulatory agencies, such as the Washington State Department of Ecology, and verifying that required written reports to regulatory agencies are completed within 15 days of event termination[13].
- Performing an annual review and update of the 325RPL BEP.
- Planning, conducting, and documenting results of building emergency drills.
- Informing the EP program manager of any changes in 325RPL BEDs.
- Being thoroughly familiar with the following:
  - the 325RPL BEP
  - all operations and activities
  - locations and characteristics of waste handling
  - locations of all records
  - physical layout of the building and area of responsibility[14].

[11] Section 3.4, Paragraph 2, Bullet 17: Permit Requirement, Class 1 Modification 09/30/15
[12] Section 3.4, Paragraph 2, Bullet 24: Permit Requirement, Class 1 Modification 09/30/15
[13] Section 3.4, Paragraph 2, Bullet 25: Permit Requirement, Class 1 Modification 03/31/16
[14] Section 3.4, Paragraph 2, Bullet 29: Permit Requirement, Class 1 Modification 03/31/16

3.5 Incident Command Post Communicator

The individual responsible for conveying the event emergency classification to the EOC Shift Office, phoning the Patrol Operations Center (POC) at (9)911, or 373-0911 (cell) to initiate a conference telephone bridge between the POC, EOC Shift Office, and ICP Communicator. Initiates and maintains a communication line between the Event Scene Liaison at the Hanford EOC and the ICP. As a precautionary measure, the BED makes sure that this position is staffed for all events. The ICP Communicator is responsible for completing *EP-ICPC, Incident Command Post Communicator Checklist for Hazardous Facilities*.

3.6 Assisting Communicator

Provides assistance to the ICP Communicator as directed by:

- Keeping the IC and BED aware of all transmitted and received information.
- Maintaining a log of communications sent and received.
- Establishing and maintaining a communication line with the Technical Support Representative (376-7148) in the Hanford EOC and the ICP throughout the incident.

3.7 Incident Command Post Recorder

Records in a timeline format, event-related notifications and activities associated with the direction administered and information received at the ICP.

3.8 Management Support Group Lead

The Facilities Operations & Engineering Division Manager or delegate will respond as the MSG Lead when requested by the BED.

NOTE: *The MSG Lead function and alternates is a Testing Designated Position (TDP) in accordance with HDI Exhibit, PNNL Workplace Substance Abuse Requirements and Protocol.*

The MSG Lead will convene the appropriate staff to fill positions in the MSG as the incident requires. The MSG Lead is also responsible for notifying the PNNL Laboratory Director, other PNNL senior management as appropriate, and PNSO. The MSG's purpose is to support the BED by being a resource for technical information, event mitigation strategies, event termination and Recovery Plans, and other support as directed/requested by the BED/IC. The coordination of support activities to the IC/ICP for a declared emergency on the Hanford Site is managed by the Hanford EOC.

A representative from PNSO has been established to coordinate with the MSG during large events. In smaller events, a PNSO Facility Representative coordinating with the BED will provide information and support to PNSO management regarding actions occurring at the event scene.

3.9 Management Support Group Liaison

The MSG Liaison reports to the ICP to facilitate communications between the BED/IC and the MSG. The MSG Liaison is responsible for the following:

- Establish phone communications with the MSG, as needed, to communicate with the MSG.
- Convey BED/IC requests for MSG support to the MSG.
- Communicate information from the MSG to the BED, IC, or other appropriate BERO members.

3.10 Staging Area Supervisor

The SAS will direct all activities at the building staging area and is responsible for:

- Assisting in personnel accountability by receiving the status of building occupancy from the Zone Wardens and then informing the BED of facility status with regard to personnel, or if help is needed to locate or account for missing personnel.
- Assisting in area evacuation and take cover.
- Assisting with communications.
- Supporting the BED as requested.
- Maintaining a log of their activities or assigning a recorder (also referred to as a "scribe") to do so.
- Completing *EP-SAS-325RPL, RPL Staging Area Supervisor Checklist*.

3.11 Zone Wardens

Zone Wardens provide the results of their accountability sweeps information to the BED via the SAS and assist in additional duties as determined by the BED. To accomplish this function, the Zone Wardens:

- Confirm that assigned zones have been vacated by staff and determine if aid and/or rescue is required.
- Aid those who need help in evacuating the building if it can be done safely.
- Report the occupancy status of the assigned zone and any additional observations to the SAS.
- Assist the SAS as requested.
- Maintain a familiarity with the BEP.
- Become knowledgeable of any staff in assigned zones that may require assistance in an emergency event.

NOTE: *The function of the Zone Warden is to assist staff in evacuating the facility and reporting the occupancy status to the SAS.*

The function of Zone Wardens does not include search and rescue.

Zone Wardens should not enter any location in the facility where there are indications that a hazard may exist. The indications include such things as visible smoke, fire, unusual odors, local alarms, criticality alarms, spilled chemicals, incapacitated personnel, etc.

If a Zone Warden is not in the facility when the evacuation or take cover alarm is initiated, is a significant distance from their assigned zones, or has been isolated from their zone, they should report to the SAS at the staging area that their zone was not swept.

3.12 Facility Operations Specialist

The FOS is responsible for meeting emergency responders at the event scene and providing information on event status and initial actions that are underway. This position will serve under the direction of the BED and coordinate with the HFD or Hanford Patrol Operations Section Chiefs, upon their arrival, and will provide facility expertise to support Operations Section activities. The FOS is responsible for implementing *EP-FOS, Facility Operations Specialist (FOS) Checklist*, and also maintains a log of activities, conversations, and directives given and received.

3.13 Hazard Communicator

The Hazard Communicator is a facility or process knowledgeable individual responsible for communicating data received from the Hazards Assessors to the Uniform Dose Assessment Center (UDAC) for further consequence assessment during DOE-declared emergencies. This position is staffed only during DOE-declared emergencies at the request of the BED/IC. The Hazard Communicator:

- Establishes and maintains an emergency response organization communication line with the UDAC Hazards Communicator to provide incident scene radiological or chemical data as reported by the Hazard Assessors.
- Keeps the IC and BED aware of all transmitted and received information.
- Maintains a log, or assigns a scribe to record all activities, including the date and time information was received or the time when action was taken.
- Responds to requests for information from the UDAC and assures that requests for information are relayed to the Hazards Assessor(s) for response.
- Implements the *EP-HazCom, Hazards Communicator Checklist.*

3.14 Radiological Hazard Assessors

The Radiological Hazards Assessors (RHA) are responsible for coordinating and verifying accomplishment of radiological control functions throughout the event. This position coordinates with the Operations Section Chief at any location and supervises Radiological Protection Technologist (RPT) activities.

The RHA is responsible for implementing the checklist duties for non-declared RCRA emergencies and DOE-declared emergencies, as appropriate. See EP_RHA, *Radiological*

Hazard Assessors Checklist. In conjunction with the CHA, this individual will make recommendations for personnel protective equipment (PPE) to the HFD.

3.15 Chemical Hazard Assessors

This position may be staffed by an Industrial Hygienist assigned to support the HFD. The Chemical Hazard Assessors (CHA) will provide technical expertise in chemical and toxicological hazard identification, evaluation, reactivity, and dispersion modeling to the HFD. The CHA may also serve as a chemical/decontamination safety officer, if designated by the IC.

The 325RPL CHA initially reports to the ICP for an event briefing and then coordinates with the HFD Operations Section Chief; he/she provides technical support for non-radiological hazardous material response. Typically, the 325RPL Industrial Hygienist and the Industrial Hygienist assigned to the HFD, staff this position. In conjunction with the RHA, this individual will recommend PPE to the HFD.

When the CHA is activated to respond to an emergency, *EP-CHA, Chemical Hazard Assessors Checklist,* must be completed.

3.16 Individual Staff Member Responsibilities

- Announces or activates the appropriate alarm, calls the PNNL SOC (375-2400), and notifies management upon observing an emergency[15].
- Avoids exposure to harmful and life-threatening conditions.
- During emergencies, if it can be done safely, secure classified documents and electronic storage media (ESM) before leaving Limited Areas (LA). If this cannot be done without endangering yourself: 1) take the classified documents and ESM with you, if time permits; 2) report to the staging area, and; 3) inform the BED and then call 375-2400 to report an incident of security concern.
- If evacuating due to a fire alarm and you are wearing special PPE or anti-contamination clothing, segregate yourself from others at the staging area until surveyed by a RPT.
- Provide the BED with any information to assist in evaluating the emergency condition.
- Remain at the staging area and follow the instructions of the BED and SAS[16].
- Read and understand the Emergency Information Posting (EIP) and BEP.
- Become familiar with the location of the BEP on the 325RPL webpage and HDI Work Control, *Basic Staff Practices*.
- Wear your Emergency Preparedness information card.
- Know where the nearest fire alarm pull box is located.
- Sign into accountability log (paper or electronic).

[15] Section 3.15, Bullet 1: Permit Requirement, Class 1 Modification 09/30/15
[16] Section 3.15, Bullet 6: Permit Requirement, Class 1 Modification 09/30/15

> **NOTE:** *When evacuating the 325RPL Building due to a fire or a criticality alarm, all personnel are required to exit the Radiological Control Area(s) without performing radiological exit surveys. Those personnel shall segregate themselves from others at the staging area until surveyed by RPTs.*

3.17 PNNL Incident Manager

The PNNL Incident Manager (IM) is used during complex events, such as those affecting multiple PNNL-managed facilities and/or extending over multiple days. The PNNL IM will assume responsibility for incident management. This includes managing the overall event on behalf of PNNL, overseeing BEDs, and coordinating with the PNNL MSG. The PNNL IM will most likely be activated by the MSG Lead. When activated to respond to an emergency, EP_IM, Incident Manager Checklist must be completed. Primary BEDs will continue to manage operations at their facilities, but the overall incident management and distribution of resources will be the responsibility of the PNNL IM.

3.18 Facility Visitor Responsibilities

The safety of building visitors is the responsibility of the facility host who shall assure that visitors are provided a safe and orderly evacuation. The facility host will report the visitor status to the SAS as soon as is practical after an evacuation. Visitors will sign into the accountability log.

3.19 Supervisors/Manager Responsibilities

Account for all staff members. Report missing or injured staff members to the SAS and if requested, assist the SAS.

3.20 Unique Program Laboratory Expertise

The technical knowledge of specific programs/laboratory activities are usually known by the laboratory occupant or program manager. When applicable, Cognizant Space Managers (CSM), alternate CSMs, and team leads may be contacted in regards to emergencies or off-normal events in assigned laboratories. Hazard Awareness Summaries containing this information are posted throughout the 325RPL Complex.

Rooms 201, 202 and 529 are less than 90-day Radioactive Hazardous Waste Accumulation Areas.

The Treatment, Storage, and Disposal (TSD) areas consist of Rooms 32, 200, 201, 202, 203, 520, 524, 528, 610, 3714 Pad, and portions of Rooms 603 and 604A.

These rooms may contain significant quantities of hazardous waste for short periods of time. This waste can be radioactive, toxic, corrosive, ignitable, reactive, carcinogenic, or environmentally persistent according to the WAC [WAC 173-303].

No one will enter these rooms without permission from one of the individuals whose names are posted on the door.

Wastes stored in these rooms could have significant environmental or health hazards. Incidents involving any of these locations will require hazardous materials expertise by the responders.

3.21 Environment, Safety, and Health Advisor Responsibilities

The Worker Safety and Health Representative will provide guidance for establishing safety requirements for mitigation and recovery actions. This includes coordinating any support needed from other disciplines of the PNNL Environment, Health, Safety, and Security Directorate (i.e., Environmental Compliance Representatives (ECR), Radiological Control, Hygiene, and Field Services Representatives [FSR]). The ECRs and FSRs conduct activities within specific hazardous waste management activity areas and provide support to the BED in case of an emergency.

The Environmental Support Contact (375-2966) will provide any necessary notifications to regulatory agencies such as the Washington State Department of Ecology and will transmit required written reports to regulatory agencies within 15 days of event termination[17].

3.22 Line Management

The responsibilities of line management include the following activities:

- accounting for staff members
- reporting missing or injured staff members to the SAS
- assisting the SAS if requested
- performing the necessary actions addressed in HDI
- acting as a health advocate for injured/ill staff members
- keeping the BED informed of changes in programmatic activities that could affect an emergency event
- providing or verifying training for staff members
- providing training for unescorted visitors for whom he/she is responsible
- keeping the BED and Zone Wardens informed of staff members who may require assistance in an emergency event
- providing staff, who are residents in the 325RPL or are qualified Fissionable Material Handlers, with a Personal Nuclear Accident Dosimeter.

Line management has the responsibility to assure that each PNNL staff member performing work in or having unescorted access approval into the 325RPL reviews this BEP annually and documents the review with their Training Coordinator.

3.23 New Staff Assigned to 325RPL

All new assignees to the 325RPL facility shall complete initial training within 10 (ten) working days of assignment. All temporary personnel with unescorted access are required to receive this training before beginning work in the 325RPL facility.

[17] Section 3.20, Paragraph 2: Permit Requirement, Class 1 Modification 03/31/16

4.0 Implementation of the Building Emergency Procedure (BEP)[18]

The decision to implement the BEP should be made whenever unusual or emergency conditions exist that require the response of facility and/or emergency personnel and the establishment of an ICP.

For events involving dangerous waste, the BED must use the following criteria to determine if an event is subject to the contingency plan implementation and notifications requirements of WACs 173-303-350 and 173-303-360:

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

   AND

2. a. The unplanned spill or release involves a dangerous waste, or the material involved becomes 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 a facility or transportation activity subject to RCRA contingency planning requirements;

   AND

3. The event could pose a threat to human health or the environment.

Based on evaluation of the event, the BED or alternate BED will implement the BEP to the extent necessary to protect human health and/or the environment. The BED has the authority to commit the resources necessary to carry out the actions required by the BEP.

The BED will direct that additional checklists that are identified in the BEP be initiated and completed. When the materials and quantities involved in the incident have been identified, it should be possible to evaluate the magnitude of the hazard.

During an emergency event, the BED will take all reasonable measures to assure that fires, explosions, and releases do not occur, recur, or spread to other dangerous waste in the facility. Measures include stopping processes and operations, collecting and containing released waste, and removing or isolating containers as appropriate.

In any emergency, priority is given to protection of the health and safety of persons in the immediate area. Containment and cleanup are secondary choices. When responding to minor spill events, onsite personnel will generally perform immediate cleanup of minor spill or releases using facility equipment. Remediation of such spills and releases would not normally constitute activation of the BEP. A spill or release of dangerous waste is considered 'minor' if **ALL** of the following are true:

- The spill is either contained, or if outside a secondary containment, is minor in quantity (generally less than 10 gallons of liquid or 100 pounds of solids).
- The composition of the material or waste is known and can be immediately determined from the label, manifest, Safety Data Sheet (SDS), or other records.

[18] Section 4.0, Permit Requirement, Class 1 Modification 03/31/16

- The spill does not threaten the health and safety of building occupants such that an area evacuation is necessary.
- Response personnel have appropriate training and equipment to expeditiously remediate the spill or release.

5.0 Facility Hazards

The 325RPL contains both radioactive and hazardous chemicals that pose a potential hazard to the public, adjacent facilities, personnel, programs, and the environment during an emergency. Because the location of hazardous materials and equipment within the facility can change on a frequent basis due to specific research needs, a variety of informational tools have been created and integrated into daily operations. Some of the tools available within the facility are the:

- Map Information Tool (MIT)
- Chemical Management System (CMS)
- 325RPL Operating Envelope webpage
- Integrated Operations System (IOPS) which includes the Hazard Awareness Summaries for each hazardous space in the 325RPL Complex.

5.1 Hazardous Materials

The 325RPL Building contains hazardous materials including:

- chemicals exhibiting one or more hazards such as corrosives, oxidizers, flammable solids and liquids, poisons, etc.
- radioactive materials
- hazardous wastes, including listed wastes and waste exhibiting one or more characteristics such as corrosivity, reactivity, ignitability, toxicity, and/or environmental persistence
- mixed wastes (wastes containing both radioactive and hazardous components).

Hazards associated with these materials vary depending on type, quantity, and concentration of the material(s) involved in the incident as well as the type of incident.

During an emergency, the PNNL CMS may be consulted to determine the identity and quantity of hazardous chemicals located in affected areas of the facility. The listing of satellite and 90-day accumulation areas are available on the Integrated Waste Management System (IWMS) which is maintained by the Materials and Waste Operations Organization and IWMS may also be consulted to identify the location and types of wastes (hazardous and mixed) located in the facility. The inventory of waste stored in the 325RPL RCRA permitted unit may be determined by consulting with the Materials and Waste Operations Organization IWMS database.

Arrangements for local response agencies (fire, police, and medical and emergency response teams) are required to assist in pre-emergency planning. These arrangements include familiarization with the properties of dangerous waste handled at the facility and associated hazards. Emergency Preparedness provides these coordination efforts with input from individual BEDs and others, as appropriate.

5.2 Physical (Industrial) Hazards

The 325RPL Building contains industrial hazards such as high-voltage equipment, high-temperature equipment, elevated work areas, and overhead hazards. Refer to the IOPS Hazard Awareness Summaries that are posted at the entrance to each space for specific details.

5.3 Dangerous Mixed Waste

See Section 5.1. Refer to the MIT to identify the location of any dangerous mixed waste location in a specific room.

5.4 Radioactive Materials

See Section 5.1. Refer to the MIT to identify the location of any dangerous mixed waste location in a specific room.

5.5 Criticality

The 325RPL Building is a Hazard Category 2 non-reactor nuclear facility designed as a multi-purpose research facility. Fissionable materials are stored and used in various lab spaces (Controlled Areas). Limits and controls for mitigating the criticality hazards are described in the posted Criticality Safety Specifications. A fissionable material line manager and fissionable material handler supervisor are assigned responsibility for each controlled area.

PNNL-DSA-325, *Radiochemical Processing Laboratory Documented Safety Analysis* (325RPL's Documented Safety Analysis [DSA]), analyzes various scenarios regarding potential criticality incidents and establishes a Nuclear Criticality Safety Program as a safety management program. The Nuclear Criticality Safety Program evaluates fissionable material handling and storage at the 325RPL and provides engineered features, limits, and administrative controls necessary to assure the possibility of a criticality event remains extremely unlikely.

The criticality safety risk of firefighting within each controlled area is evaluated and areas are posted with appropriate symbols when a limitation on the use of water or other extinguishing agents is warranted. These limitations are also identified within the HFD Pre-incident Plan.

A criticality accident at the 325RPL is a credible event. A CAS is maintained to mitigate the impact of an accidental criticality on facility staff and visitors through rapid notification and an immediate evacuation. The system is tested on a semi-annual basis.

6.0 Potential Emergency Conditions and Appropriate Response

6.1 Explosion/Fire/Fire Alarm[19]

> **NOTE:** *During these events, it is likely that facility integrity may be compromised and that the facility will also experience a concurrent loss of electrical power and/or control of the building ventilation systems. If this is the case, refer to Section 6.2, Hazardous Material/Dangerous or Mixed Waste Spill and Section 6.6, Loss of Electrical Power/Reduced Ventilation for concurrent actions as appropriate.*

If you are involved with, or are in close proximity to an explosion, a fire, or discovery of a fire, or have indication that the fire alarm is sounding, perform the following:

6.1.1 Fire/Explosion

6.1.1.1 Sound the alarm by pulling the fire alarm pull box. See the guidance for the exception to this step below.

Exception to pulling the fire alarm: If a simple and safe action can be taken that will immediately and positively extinguish a small fire (e.g., pulling the plug on a malfunctioning lab instrument, isolating a fuel source such as quickly closing a valve that is immediately at hand, smothering the flame), then pulling the fire alarm pull box is not necessary, and the fire may be extinguished prior to calling the PNNL SOC at 375-2400.

> **NOTE:** *If appropriate, the BED will classify the event using the 325RPL EALs.*

6.1.1.2 Evacuate the building through the nearest exit that can be safely used.

6.1.1.3 Once in a safe location, notify the PNNL SOC at 375-2400 and provide the following information (if known):

- nature and location of the event
- conditions of the event appear to be degrading, (i.e., the fire appears to be escalating or building structures are being compromised)
- your name and callback telephone number
- time event began or was discovered
- number and condition of any injured personnel
- name(s) and amount(s) of any chemical(s) that are involved or may be burning as a result of a fire.

[19] Section 6.1, Permit Requirement, Class 1 Modification 03/31/16

NOTE: *The fire department can be notified directly by calling (9) 911 or 373-0911 (cell). If the fire department was contacted using the cell option, also call the PNNL SOC at 375-2400 as soon as possible to initiate PNNL management notifications and emergency response.*

6.1.1.4 If time permits, and without putting yourself in jeopardy, you may fight the fire under the following conditions:

- You have directed someone to pull the fire alarm pull box
- You have verified that someone has called the PNNL SOC at 375-2400, (9) 911, or 373-0911 (cell)
- You are willing, able, and knowledgeable about the selection of fire extinguisher and its use.

NOTE: *Fire extinguishers equipped with the glove piercing tips are for HFD use only.*

- If the fire is in a hot cell, attempt to smother the fire, if smothering does not work then use the fire extinguishing system, if you are trained to do so.
- If the fire is in a glove box, do not attempt to fight the fire using the gloves. Isolate supply air to the glove box if safe to do so.
- If the fire is small and you know what material is burning, the fire does not involve significant quantities of hazardous materials, and does not present a personnel exposure hazard to smoke or significant heat.

6.1.1.5 If you have chosen to fight the fire, and after the fire is believed to be out, call the PNNL SOC at 375-2400 and inform them of your actions.

- Unless there are significant amounts of smoke or fumes, remain in the proximity of the fire to verify that the fire does not re-flash.
- In the event the fire re-flashes, perform these actions starting with Step 6.1.1, and do not attempt to fight the fire on your own.

6.1.2 Fire Alarm

NOTE: *If appropriate, the BED will classify the event using the 325RPL EALs.*

6.1.2.1 If time permits, and without placing yourself in jeopardy, perform the following:

- Verify equipment is shutdown or is in a safe configuration.
- Verify nuclear and classified materials are secured.

6.1.2.2 Zone Wardens perform an accountability sweep of their assigned areas.

6.1.2.3 Evacuate the building through the nearest exit that can safely be used.

6.1.2.4 Assemble at staging area located at the lower south parking lot, south end of Lane #9.

- Zone Wardens report the status of accountability sweeps to the SAS.
- If classified materials (documents, ESM, test materials, etc.) are removed from the LA or left unsecured within the LA:
- Inform the SAS that classified material has been left in an unsecured condition or has been removed from the LA.
- Call the PNNL SOC at 375-2400 and report the details surrounding the classified materials security event.
- The SAS shall provide information to the BED concerning the classified material.
  - Personnel who are wearing PPE clothing or are suspected of being contaminated shall be segregated from other building occupants and shall be surveyed by radiological control personnel. PPE will be discarded as directed by the RPT.
  - Zone Wardens and all staff are to remain at the staging area and follow the instructions of the BED.

6.2 Hazardous Material/Dangerous or Mixed Waste Spill[20]

NOTE: *If appropriate, the BED will classify the event using the 325RPL EALs.*

6.2.1 Minor Spills

For minor spills/releases that are relatively small in size, perform the following.

NOTE: *A spill or release of dangerous waste is considered "minor" if ALL of the following are true. If not, refer to Section 6.2.2.*

- The spill/release either is contained or, if outside of a secondary containment, is minor in quantity (generally less than 10 gallons of liquid or 100 pounds of solids).
- The composition of the material or waste is known and can be immediately determined from the label, manifest, SDS, or other records.

[20] Section 6.2, Permit Requirement, Class 1 Modification 03/31/16

- The spill/release does not threaten the health and safety of building occupants such that a building evacuation is necessary.
- Response personnel have appropriate training and equipment to expeditiously remediate the spill or release.

6.2.1.1 Move personnel away from the substance.

6.2.1.2 Notify nearby personnel of the emergency.

6.2.1.3 Prevent personnel exposure by restricting access to the spill area by setting up barricades, closing doors, etc.

6.2.1.4 Notify the PNNL SOC at 375-2400 and provide the following:

- nature and location of the event
- name(s) of chemicals involved, amounts, sources, and known hazards about the chemicals
- if the spill has been contained
- if any material has been released to the environment
- any corrective actions in progress
- name(s) of anyone contaminated or injured in connection with the incident
- other hazards that may or may not be related to the spill
- time incident began or was discovered
- current status of the event (e.g., spill contained or not contained)
- name, location, and callback telephone number of person reporting the incident.

6.2.1.5 Notify the BED, CSM, and the Safety and Health Representative.

6.2.1.6 Take steps to contain the spill/release **IF, and only IF**:

- The identity of the substance *is known*.
- Hazards of the substance are known (flammable, toxic, radioactive, corrosive material) and can either be controlled or they do not present an immediate threat.
- Appropriate PPE and control/cleanup supplies are readily available.
- The individual(s) performing the task have had training related to spill/leak control and can safely perform the action(s) without assistance, or assistance is readily available from other trained personnel.

6.2.1.7 Steps to contain the spill/release may include, as appropriate:

- Build a containment of absorbent materials and restrict access to the affected area.

- Tighten closures, tip the container to stop the leak, use plugging, or patching materials or over packing.
- Perform initial cleanup of the spill area by transferring contents to appropriate non-leaking containers using the appropriate procedures and tools.

6.2.2 For a major spill/release, or tank spills, perform the following actions.

NOTE: *If appropriate, the BED will classify the event using the 325RPL EALs.*

6.2.2.1 If the spill/release threatens the health and safety of building occupants such that a building evacuation is necessary, initiate a building evacuation by pulling the fire alarm. If a building evacuation is not necessary, continue at Section 6.2.2.2.

- Assemble at the staging area located at the lower south parking lot, south end of Lane #9.
- Zone Wardens report to the SAS.
- If classified materials (e.g., documents, ESM, test materials) are removed from the LA or left unsecured within the LA:
  - Inform the SAS that classified material has been left in an unsecured condition or has been removed from a LA.
  - Call the PNNL SOC at 375-2400 and report the details surrounding the classified materials security event.
  - SAS shall provide information to the BED concerning the classified material.
- Personnel who are wearing PPE clothing or are suspected of being contaminated shall be segregated from other building occupants and shall be surveyed by radiological control personnel. PPE will be discarded as directed by the RPT.
- Zone Wardens and all staff are to remain at the staging area and follow the instructions of the BED.

6.2.2.2 Move personnel away from the substance.

6.2.2.3 Notify nearby personnel of the emergency.

6.2.2.4 Notify the PNNL SOC at 375-2400 and provide the following.

- name, location, and callback telephone number of person reporting the incident
- name(s) of chemical(s) involved and amount(s) involved in the incident

- location of incident (identify as closely as possible and include information about multiple building numbers)
- time incident began or was discovered
- where the materials involved are going or might go, such as into secondary containment, under doors, through air ducts, etc.
- source and cause, if known
- name(s) of anyone contaminated or injured in connection with the incident
- any corrective actions in progress
- anyone else who the discoverer has contacted
- any known hazards
- location and time the chemical condition or spill occurred
- if any material was released to the environment (e.g., to a stack or a sewer system)
- the status of the situation.

6.2.2.5 Prevent personnel exposure (e.g., set up barricades).

6.2.2.6 Contact the CSM.

6.2.2.7 Notify the Safety and Health Representative.

6.2.2.8 Take steps to contain the spill **ONLY** if **ALL** the following exist.

- identity of the substance is known
- hazards of the substance are known (flammable, toxic, radioactive, corrosive material) and can either be controlled or they do not present an immediate threat
- appropriate protective equipment and control/cleanup supplies are readily available
- individual(s) performing the task have had training related to spill/leak control and can safely perform the action(s) without assistance, or assistance is readily available from other trained personnel.

6.2.2.9 Initiate actions to mitigate a tank spill/leak using trained personnel:

- Stop the source of the leak if possible (shutting valves, turning off pumps, etc.).
- Prevent further additions of liquid to the tank.
- Visually inspect the tank system to determine the source of the leak.
- Remove as much of the liquid from the tank as is necessary to prevent further leakage within 24 hours or the earliest practicable time.

- Remove any leakage contained in a secondary containment within 24 hours, or as soon as possible.
- Prevent any further leakage or migration of the leak to soils or surface waters.

6.2.2.10 Notify the BED, the CSM, and the Safety and Health Representative of any pertinent information that you may have.

- Discoverer of the spill will provide a synopsis of the event and the actions taken to the BED, CSM, and the Safety and Health Representative.
- BED will direct spill event mitigation activities upon completion of the event briefing.

6.2.3 For events that involve transportation and/or damaged packaging of hazardous material or dangerous waste that arrives at the 325RPL:

6.2.3.1 **DO NOT** move the shipment.

6.2.3.2 Notify the BED, CSM, and the Safety and Health Representative.

- The receiver of the shipment or discoverer of the damaged package will provide a synopsis of the situation and the actions taken, if any, to the BED, CSM, and the Safety and Health Representative.

6.2.3.3 The BED will evaluate the event and initiate appropriate actions for minor events/spills per Section 6.2.1 or Section 6.2.2 as appropriate.

- Treat any release from the package as a hazardous material spill and perform response actions as appropriate.

6.3 Unusual, Irritating or Strong Odors[21]

6.3.1 If an unusual odor is detected and the source is unknown, the type and location of the odor should be reported to the BED and the BED will determine the appropriate actions.

6.3.1.1 If the odor is determined to be potentially dangerous, then:

- Initiate a building evacuation by pulling the fire alarm.
- Assemble at the staging area located at the lower south parking lot, south end of Lane #9.
- Zone Wardens report to the SAS.
- If classified materials (e.g., documents, ESM, test materials) are removed from the LA or left unsecured within the LA:
  - Inform the SAS that classified material has been left in an unsecured condition or has been removed from the LA.

[21] Section 6.3, Permit Requirement, Class 1 Modification 03/31/16

- Call the PNNL SOC at 375-2400 and report the details surrounding the classified materials security event.
- SAS shall provide information to the BED concerning the classified material.

- Personnel who are wearing PPE clothing or are suspected of being contaminated shall be segregated from other building occupants and shall be surveyed by radiological control personnel. PPE will be discarded as directed by the RPT.
- Zone Wardens and all staff are to remain at the staging area and must follow the instructions of the BED.

6.4 Potential Radiological Material Release

NOTE 1: *If appropriate, the BED will classify the event using the 325RPL EALs.*

NOTE 2: *The RPT may provide radiological survey data in Becquerel's. A Becquerel is a SI unit of radioactivity equal to one disintegration per second. Conversion to disintegration per minute: Multiply total Becquerel's by 60.*

6.4.1 Area Radiation Monitor

- Stop work.
- Alert personnel in the area.
- Exit the Radiologically Controlled Area (RCA) that is being monitored by the Area Radiation Monitor.
- Notify the RPT and the BED.
- Notify the PNNL SOC at 375-2400.

6.4.2 Continuous Air Monitor or ALPHA Sentry Continuous Air Monitor

- Stop work.
- Alert personnel in the area.
- Exit the area being monitored by the Continuous Air Monitor (CAM) and move into a separate air space.
- Notify the RPT and the BED.
- Notify the PNNL SOC at 375-2400.

6.4.3 Glove Box Differential Pressure Alarm

- Stop work.
- Alert personnel in the area.
- Exit the immediate area.

- Notify the RPT and the BED.
- Notify the PNNL SOC at 375-2400.

6.4.4 Hot cell differential pressure alarm

- Stop work.
- Alert personnel in the area.
- Exit the immediate area.
- Notify the RPT and the BED.
- Notify the PNNL SOC at 375-2400.

6.5 Criticality and Criticality Safety Limit Violations

6.5.1 In the event of a potential criticality safety limit violation, perform the following.

The staff member discovering an actual or potential criticality safety limit violation shall follow the steps below (also described in the operating documents).

- Stop work immediately in the area without making any changes to present conditions.
- Ensure that any fissionable materials or other equipment and materials close enough to interact with fissionable materials are not moved or disturbed.
- Immediately notify the BM. If not available, call the PNNL SOC at 375-2400 and state the problem.

6.5.1.1 Upon notification, the BM shall:

- Call the PNNL SOC at 375-2400 and state the problem.
- Notify the Fissionable Material Line Manager and supervisor for the controlled area.
- Contact the Nuclear Criticality Safety Program Manager 308-2946 or Nuclear Safety and Facility Authorization Manager 947-2344 to obtain nuclear criticality safety program staff support.

6.5.1.2 Upon notification, the Fissionable Material Line Manager shall:

- Ensure that all work activities in the affected area are stopped.
- Post warning signs at appropriate locations requiring permission from the Fissionable Material Line Manager to enter the area.

6.5.1.3 Upon notification, the Nuclear Criticality Safety Program Manager shall:

- Confirm whether a limit violation exists.
- Determine if a second contingency still provides for prevention of criticality or other danger if limit has been violated.

6.5.1.4 Criticality safety limit violations are identified as a loss of process-condition control in the *Event Classifiers Procedure*. The BM shall initiate

the associated reporting, critique, and corrective action process defined in the HDI Workflow, *Report an Event or Occurrence.*

6.5.1.5 The Nuclear Criticality Safety Program Manager will assist the BM in developing a Recovery Plan based on a thorough review of the situation and potential hazards associated with the violation.

6.5.2 In the event of a Criticality Alarm, perform the following.

> **NOTE 1:** *If appropriate, the BED will classify the event using the 325RPL EALs.*
> **NOTE 2:** *Administrative Controls are in place to restrict movement of additional fissionable material in the HLRF hot cells. The controls prevent a criticality event in the HLRF hot cells. The controls address the concern that a criticality within the HLRF hot cells would not be detected with the Criticality Detection System.*

6.5.2.1 Leave the building immediately through the closest exit, do NOT stop for a survey and run at least 100 feet away from the facility.

6.5.2.2 Zone Wardens are also directed to leave the building immediately without performing accountability sweeps of their zones.

> **NOTE:** *Obstacles located within 100 feet of the building (e.g., fences, walls, trenches) may prevent running directly away from the building for 100 feet. Choose a path around these barriers that will maximize your distance from the building. When past the obstacle, continue directly away from the building until you are at least 100 feet from the building. See Attachments 1 – 3, Emergency Equipment & Evacuation Routes for suggested routes to the 325RPL staging area.*

6.5.2.3 Proceed to the staging area along a path that does not take you closer to the building.

6.5.2.4 Assemble at the staging area located at the lower south parking lot, south end of Lane #9. Consider moving to the alternate staging area (350 Building).

- Initiate RCP-8.1.02, Quick Sort Survey of Personnel.
- Any positive quick sort must immediately be reported to the BED.
- Zone Wardens report to the SAS.
- If classified materials (e.g., documents, ESM, test materials) are removed from the LA or left unsecured within the LA:
- Inform the SAS that classified material has been left in an unsecured condition or has been removed from the LA.
- Call the PNNL SOC at 375-2400 and report the details surrounding the classified materials security event.
- SAS shall provide information to the BED concerning the classified material.

- Personnel who are wearing PPE clothing or are suspected of being contaminated shall be segregated from other building occupants and shall be surveyed by radiological control personnel. PPE will be discarded as directed by the RPT.
- Determine the radiation dose levels at the staging area and in the evacuated area following a criticality accident.
- Dose rates and report findings shall be reported to the BED.
- Zone Wardens and all staff are to remain at the staging area and follow the instructions of the BED.
- Notify first responders to set their Electronic Personal Dosimeters to 3 rem/hour rate in order to keep them far enough away from the criticality event location and to limit dose from a pulse.
- Retrieve Fixed Nuclear Accident Dosimeters in order to reconstruct the dose of the accident.
- Responders wear full respirators or supplied air system to limit inhalation dose.
- Provide shortest route for retrieval of Fixed Nuclear Accident Dosimeters.
- Electronic Personal Dosimeters should be set at the normal level of 100 mrem/hr total.
- If Fixed Nuclear Accident Dosimeters are not retrievable, chemical reagents can be used.

6.6 Loss of Electrical Power/Reduced Ventilation

6.6.1 In the event of a loss of or a significant interruption to building electrical power and/or a reduction in ventilation flow, perform the following:

6.6.1.1 Place laboratory or room in safe condition per the following:

- Verify fume hoods and sashes are closed.
- Verify equipment is shutdown.
- Verify nuclear material(s) are secure.
- Verify that classified materials are secure.
- Verify all hazardous materials are secure.
- Verify that all equipment and heat generating devices inside of laboratory gloveboxes and inside of hot cells are shut down.

6.6.1.2 If the building electrical power returns and/or standby power is still available:

- assemble in the lunchroom.

- if classified materials (e.g., documents, ESM, test materials) are removed from the LA or left unsecured within the LA:
  - Inform the SAS that classified material has been left in an unsecured condition or has been removed from the LA.
  - Call the PNNL SOC at 375-2400 and report the details surrounding the classified materials security event.
  - SAS shall provide information to the BED concerning the classified material.

a. Personnel exiting the Radiological Buffer Areas (RBA) are expected to do so without surveying through the personnel contamination monitor (PCM).

b. Personnel who are wearing PPE clothing or are suspected of being contaminated shall be segregated from other building occupants and shall be surveyed by radiological control personnel. PPE will be discarded as directed by the RPT.

c. Zone Wardens for Zones 2 and 8 are requested to activate the flashing red warning lights.

d. Zone Wardens and all staff are to remain at the lunchroom and follow the instructions of the BED.

e. Radiological surveys of the facility shall be performed prior to re-entry.

6.7 Natural Phenomena Events

NOTE: *If appropriate, the BED will classify the event using the RPL EALs.*

The natural phenomena events that are considered as having a probability of occurring and are addressed in this procedure are seismic event/earthquake, volcanic eruption/ash fall, high wind/tornado, flood, and range fire.

If these events were to occur, Hanford TNS messages will most likely be sent before, during, or immediately following the event. Regardless of the receipt of a phone message, the BED will direct activities within the facility in accordance with this procedure and provided by phone messages as appropriate.

Should it become necessary to evacuate the facility, the BED will report the evacuation to the PNNL SOC at 375-2400 and the EOC Shift Office at 376-2900.

6.8 Bomb Threats/Suspicious Objects

NOTE: *If appropriate, the BED will classify the event using the RPL EALs.*

6.8.1 If a suspicious object is discovered, or the placement of such an object is observed, perform the following actions.

6.8.1.1 Do not move, open, or otherwise disturb any suspicious objects.

6.8.1.2 Notify the PNNL SOC at 375-2400 and the RPL BED using office telephones only.

6.8.1.3 Evacuate the facility. DO NOT USE THE FIRE ALARM PULL BOX TO INITIATE THE EVACUATION as frequencies can detonate devices.

- Warn others in the immediate vicinity.
- Leave the building immediately via the closest exit.
- Zone Wardens are also directed to LEAVE the building immediately without performing accountability sweeps of their zones.

6.8.1.4 Use of cellular phones, radios, or other radio frequency generating equipment within 100 feet of the 325RPL is prohibited.

6.8.1.5 Assemble at the staging area located at the lower south parking lot, south end of Lane #9.

- Zone Wardens report to the SAS.
- If classified materials (e.g., documents, ESM, test materials) are removed from the LA or left unsecured within the LA:
  - Inform the SAS that classified material has been left in an unsecured condition or has been removed from a LA.
  - Call the PNNL SOC at 375-2400 and report the details surrounding the classified materials security event.
  - SAS shall provide information to the BED concerning the classified material.
- Personnel who are wearing PPE clothing or are suspected of being contaminated shall be segregated from other building occupants and shall be surveyed by radiological control personnel. PPE will be discarded as directed by the RPT.
- Zone Wardens and all staff are to remain at the staging area and follow the instructions of the BED.
- The staging area will be relocated a minimum of 300 feet away from the facility.

6.8.2 If a Telephone Bomb Threat is Received

6.8.2.1 Use the *PNNL Bomb Threat Card* to record the message exactly as dictated and attempt to obtain the following information:

- When will it go off?

- Where is it is located?
- What does it looks like?
- What kind is it?
- Why was it was placed?
- Who placed it?
- How you know so much about it?
- Where are you calling from?
- What's your name and address?

6.8.2.2 Notify the PNNL SOC at 375-2400 and provide the information given by the caller.

6.8.2.3 Upon completion of the notifications to the PNNL SOC, also notify the BED and provide the information obtained from the caller.

6.8.3 If a written bomb threat is received:

6.8.3.1 Notify the PNNL SOC at 375-2400.

6.8.3.2 Provide the written bomb threat to the 325RPL BED who will forward it to the PNNL SME Safeguards and Security Management Official.

6.9 Active Shooter in the Building

6.9.1 When Condition is Observed

6.9.1.1 RUN – Immediately try to get out of the facility to a safe location out of immediate sight of the building and call 375-2400.

6.9.1.2 HIDE – If evacuation is not possible or safe, take cover in an office with the door closed and lights off. Lock the door if possible and call 375-2400.

6.9.1.3 FIGHT – If the active shooter has confronted you and evacuation or taking cover is not possible, staff should take whatever actions are necessary to get to safety which may include fighting the intruder or other. This is a last resort step.

6.9.1.4 BED response:

6.9.1.4.1 Public Announcement (PA) made, if possible, depending on the situation.

6.9.1.4.2 Request the Safeguards and Security Representative be notified.

6.9.1.5 Do not move any suspicious objects.

6.9.1.6 Post warnings, if applicable.

6.9.1.7 Provide emergency responders with appropriate information upon arrival.

6.9.1.8 Keep staff from entering the affected area.

6.9.1.9 Classify the event using the 325RPL EALs, if appropriate.

6.9.1.10 Activate the MSG by calling 375-2400 and requesting activation.

6.9.1.11 Request medical assistance, if necessary.

6.10 Notice of a PNNL Lockdown

6.10.1 When Condition is Observed

6.10.1.1 Staff will be notified of a PNNL lockdown over the telephone through the CNS.

6.10.1.2 Immediately get behind a closed door if possible or hidden out of sight.

6.10.1.3 Place projects into safe shutdown mode.

6.10.1.4 Do not allow anyone into the facility.

6.10.1.5 Await further instructions via CNS.

6.11 Declared Emergency in the 300 Area

6.11.1 Personnel will evacuate the facility or take cover as directed by the BED.

6.11.2 If the declared emergency originates in the 325RPL facility, the BED shall take actions that are in accordance with the BEP and inform and direct other 300 Area contractors and facility owners of the emergency declaration in accordance with their emergency procedures.

7.0 Facility Take Cover - Shutdown of Heating, Ventilation, and Air-Conditioning System

7.1.1 If outside of the 325RPL, perform the following.

7.1.1.1 Take cover inside the nearest building.

7.1.1.2 If the building you take cover in is not the 325RPL, attempt to contact your line manager or team lead and have them report your whereabouts to the 325RPL SAS.

7.1.1.3 If unable to contact your management, report to the BERO for the building where you are located so your personal accountability may be made.

7.1.1.4 Follow directions provided by that building's emergency organization or BED.

7.1.2 If you take cover inside the 325RPL, remain inside the 325RPL.

7.1.2.1 Assemble in the lunchroom.

7.1.2.2 Staff should refrain from eating and drinking during a take cover event, if physically able, until an appropriate evaluation of the event can be made.

7.1.2.3 The BED will direct the shutdown of the 325RPL H&V as needed per SOP-325-003, *325 Building Heating, Ventilation and Air Conditioning Emergency Shutdown.*

7.1.2.4 If classified materials (e.g., documents, ESM, test materials) are removed from the LA, or left unsecured within the LA:

- Inform the SAS that classified material has been left in an unsecured condition, has been removed from the LA, and the status/location of the classified material.
- Call the PNNL SOC at 375-2400 and report the details surrounding the classified materials as a security event and provide details as necessary.
- SAS shall provide information to the BED concerning the classified material.

7.1.2.5 Personnel who are wearing PPE clothing or are suspected of being contaminated shall be segregated from other building occupants and shall be surveyed by radiological control personnel. PPE will be discarded as directed by the RPT.

7.1.2.6 Zone Wardens for zones two and eight are requested to activate the flashing red warning lights.

7.1.2.7 Zone Wardens and all staff are to remain in the lunchroom and follow the instructions of the BED.

8.0 Utility Disconnects

Utility disconnects may be necessary under extreme emergency conditions. The 325RPL BED will determine if utility disconnects need to be disconnected/shut. Locations of the utility disconnects or valves are identified below:

8.1 Electrical

The 325RPL Building main electrical control center switchgear is located on the second floor (northwest corner) in Room 904. Extreme caution shall be used if disconnecting this power.

8.2 Potable/Process Water

The internal valves are located in the southwest corner of Room 22 in the basement. The external ground valve, SCW-1-VLV (blue cover, operating handle located in 325RPL Shop) is located outside at the southwest corner of the 325RPL Building.

8.3 Gas Supplies

The P-10 gas distribution system is located at the northeast end of the north gas cylinder dock. Turn cylinders off as directed by the 325RPL BED.

8.4 Steam

The high-pressure steam supply valves are located above the power operator's workstation entry door on the second floor east equipment room. Steam to the 325RPL may also be isolated using valves inside the Johnson Controls-operated 325B boiler house, if access to the 325RPL Building is not possible.

8.5 Air

The main air compressor may be isolated in one of two ways: OPEN the electrical disconnect (S-DIS-074) for the main air compressor or by CLOSING valve CA-186-VLV; both of the components are located adjacent to the main air compressor in the second floor mechanical room. If time permits, the preferred method of shutting down the main air compressor is to press the STOP pushbutton located on the front of the compressor.

8.6 Compressed Air

To remove all sources of compressed air, the standby compressor (located in the northwest corner of the basement) must also be isolated or shutdown in addition to isolating the main air compressor. Isolation of the standby compressor is accomplished by OPENING the electrical S-DIS-073 or CLOSING valve CA-96-VLV; both components are located adjacent to the standby air compressor. If time permits, the preferred method of shutting down the standby air compressor is to place the control switch to the OFF position; the switch is located on the top of the compressor controller. Ventilation Facility exhaust and supply fan controls are located:

- at the power operator workstation (Room 900)

- Power Operators METASYS work stations in any PNNL facility may be used to secure the 325RPL main supply and exhaust fans as well as a majority of the building heating and ventilation (H&V).
- in the north part of the basement, west of the elevator
- Additional exhaust fan controls are on the starter enclosure for each exhaust fan inside the 325RPL Filter Building.

External shutdown of the main exhaust and supply fans may be accomplished under extreme circumstances by removing both normal and standby electrical power from the building. A more controlled external shutdown of the main exhaust and supply fans is a complicated evolution involving multiple operating locations that must be accomplished in a specific sequence under supervision of 325RPL knowledgeable staff to prevent the risk of loss of building containment due to creation of a positive pressure inside the building.

8.7 Fire Protection Supply Water

Fire Suppression Supply Water Post Indicator Valves (red) for Risers 1 through 5 are located outside the 325RPL Building in the following locations:

- Riser 1 PIV is located at the northwest corner of the 325RPL building
- Riser 2 PIV is located north of the 325RPL
- Riser 3 PIV is located at the southwest corner of the 325RPL building
- Riser 4 PIV is located southeast of the 325RPL-A annex
- Riser 5 PIV is located southeast of the 325RPL-A annex.

8.8 Dry Pipe Outside Screw and Yoke (Riser 6)

The outside screw and yoke (OS&Y) valve for the dry pipe fire suppression system on the north gas cylinder dock is located on the second floor in the east equipment room at the north wall. Suppression water for this system is supplied from Riser 2 and may be isolated external to the 325RPL by shutting the PIV for Riser 2.

8.9 325RPL Ramp Sump Pump

Water runoff down the 325RPL basement truck ramp at the southwest corner of the building is collected in a sump at the bottom of the ramp. The associated sump pump empties the sump as needed to prevent it from overflowing into the 325RPL basement through the roll-up door. The sump pump discharges to the street in front of the 325RPL.

Potentially contaminated fire suppression water runoff from inside the 325RPL basement could also enter this sump and be pumped to the street in front of the building resulting in an unacceptable spread of contamination.

The local disconnect for the sump pump is located inside the south roll-up door on the east side of the door.

8.10 325RPL Decontamination Shower/Sink

A decontamination shower and sink is located in Room 426 with a tempered water supply for use as an emergency decontamination system. The contaminated water is routed to two 250-gallon storage tanks located in Room 94B.

The system is designed with the drains directed to one of the two tanks. A high-level alarm activates locally when the selected tank reaches 66 percent volume. The high-level alarm is used to prevent overfilling of the tank. The water supply is manually isolated to allow valve alignment to the second tank for water receipt. The high-high alarm at 75 percent of the tank volume will automatically isolate water to the shower or sink. The tanks have a common overflow for upset conditions (i.e., automatic water isolation fails, improper valve alignment).

9.0 Termination, Incident Recovery, and Restart

9.1 Termination

The IC, in consultation with the BED, will recommend termination of the event when conditions indicate that it is safe to do so. EP_ECF, *Event Closeout Form*, should be completed before any recommendation is made to terminate a declared emergency.

9.2 Recovery

Depending on the circumstances of the event, a recovery team consisting of the IC, 325RPL BED, and appropriate SMEs, will develop and recommend a Recovery Plan for restoring the facility to operable status. Emphasis will be placed on the careful cleanup of released material and contaminated debris to minimize further risk to personnel, the public, or the environment while preserving evidence at the event scene. All waste materials generated by the cleanup will be containerized in drums or other appropriate containers and stored in an approved storage area pending characterization and determination of the final treatment/disposal requirements. The Recovery Plan will be reviewed and approved and must meet the requirements of PNNL-MA-110, the *PNNL Emergency Management Plan*, Termination and Recovery.

The BED is responsible for assuring that emergency equipment is clean and fit for its intended use prior to resumption of operations. Equipment used during an incident will be decontaminated (if practicable) or disposed of as spill debris. Decontaminated equipment will be checked for proper operation prior to storage for subsequent use. Consumables and disposed materials will be restocked. Fire extinguishers will be recharged or replaced.

For emergency events involving the TSD or a 90-day accumulation area, the Recovery Plan will include the appropriate notification of the Washington State Department of Ecology and appropriate local authorities of recovery actions taken prior to restart. The operator of the TSD will also provide a written report to the Department of Ecology within 15 days after the incident or within 30 days after the incident for a release from a tank system to the environment that does not result in an activation of the contingency plan[22].

NOTE: *For classified events recovery planning and activities will be the responsibility of the recovery director assigned at the Hanford EOC.*

9.2.1 Emergency Decontamination Facilities

The 325RPL facility has decontamination capability as discussed in Section 8.10. Radiological control personnel are the only staff that may perform personnel decontamination.

If an evacuation of the 325RPL Building occurs and re-entry is not possible to decontaminate affected personnel, radiological control supervision may use the 3410 Building personnel decontamination facility located in Room 1601. In the event that the affected personnel are injured, they should be transported directly to a hospital. If large group decontamination facilities are requested, request assistance from the HFD Mobile Decontamination Facility.

[22] Section 9.2, Paragraphs 1, 2, and 3: Permit requirement, Class 1 Modification 03/31/16

9.2.2 Emergency Radiological Exposure Guidelines

In extremely rare cases, emergency exposure to radiation may be required to rescue personnel or protect major property. Emergency exposure may be authorized in accordance with the provisions contained in 10 CFR 835, "Occupational Radiation Protection". The dose limits for personnel performing these operations are listed in Table 9.1.

NOTE: *Only RadWorker 2-trained staff is allowed to volunteer for receiving emergency radiological exposures.*

The lens of the eye dose limit should be three times the listed values. The shallow dose limit to the skin of the whole body and the extremities is ten times the listed values.

Table 9.1 - Emergency Dose Limits

Dose Limit (Total Effective Dose Equivalent) in rem	Activity Performed	Conditions
5	All	N/A
10	Protecting major property	Only on a voluntary basis where lower dose limit not practicable
25	Lifesaving or protection of large populations	Only on a voluntary basis where lower dose limit not practicable
> 25	Lifesaving or protection of large populations	Only on a voluntary basis to personnel fully aware of the risk involved

9.3 Restart

In most cases, EP_ECF, *Event Closeout Form*, will be sufficient for supporting recovery from an event and actions needed for resumption of normal operations. For complex events with significant facility damage or a need for incident staffing for more than 48 hours, a Recovery Plan and process will be required. Restart of the facility following complex emergencies will be conducted with a Recovery Plan developed using EPIP-3.0, *Recovery Plan* and led by a Recovery Director identified by the MSG. The Recovery Plan will be developed with support from both the 325RPL Manager and 325RPL BM.

The following documents should be consulted, used as reference, and implemented if needed.

- ADM-EPIP-3.0, *Recovery Plan*
- *PNNL Guides for Post-Natural Phenomena Hazard Building Inspection*
- RPL-PLN-701, *RPL Business Continuity Plan*

For severe damage to the facility due to natural phenomena (e.g., extreme weather conditions, seismic events, wildfires, external flooding) or other causes (e.g., severe fire, physical attack, explosions, events in neighboring facilities), the Recovery Plan shall describe the process for a systems engineering assessment and evaluation of the facility including environmental protection, mission critical and other essential systems (safety significant and equipment important to safety). The purpose of these assessments is to define actions needed to place the facility into a safe configuration within the Safety Basis requirements pending any resumption of operations.

Recovery for events that involve a container storage area within the HWTU, require the container storage and containment system to be evaluated before restart.

If the event involved a tank system leak, repairs must be certified by an independent, qualified, registered, professional engineer.

Before operations are resumed in the facility, all emergency equipment used during the emergency shall be cleaned and restored to usable, operable condition[23].

[23] Section 9.3, Last three paragraphs: Permit Requirement, Class 1 Modification 09/30/15

10.0 Emergency Equipment [24]

Support equipment available to assist in responding to an emergency can be found by referring to DOE/RL 94-02, Section 11.2, and the HFD emergency equipment listing in DOE/RL 94-02, Appendix C.

10.1 Portable Emergency Equipment

None

10.2 Fire Control Equipment

- Portable Class ABC fire extinguishers are located throughout the facility. Each Class ABC extinguisher is capable of suppressing fires involving ordinary combustible materials, flammable liquids, oils, paints, flammable gases, and fires involving electrical equipment. Class D extinguishers will be located in areas vulnerable to Class D fires if reactive metals are stored there (e.g., dangerous waste storage room). Manual dry chemical fire extinguishers are installed in the Shielded Analytical Laboratory hot cells and are available outside the HLRF A and B hot cells. The fire extinguisher locations are identified on the floor plans (Attachments 1 - 3).
- Portable Class ABC fire extinguishers with piercing tips are located in each lab that contains a glovebox. These extinguishers are for the HFD use only. 325RPL staff have not been trained in their use. The piercing tipped fire extinguisher locations are identified on the floor plans (Attachments 1 – 3).
- 325RPL is equipped with an automatic fire detection, alarm, and suppression system. Five wet pipe and one dry pipe sprinkler system provide automatic fire suppression.
- A Mobile Command Post Vehicle can be obtained from the HFD at 373-2230. The HFD Battalion Commander will approve and dispatch the vehicle.

10.3 Communications Equipment/Warning Systems

- **Fire Alarm Pull Boxes** are located throughout the facility. The primary locations are at all exits of the facility. All locations are shown on the floor plans (Attachments 1-3).
- **Hanford Site Telephone Notification System (TNS)** is a component of the Hanford Emergency Notification System and designed to use the existing telephone system to notify individual employees. When the phone is answered, a recorded message will provide event information and inform staff of protective actions they are expected to take.

[24] Section 10, Permit Requirement, Class 1 Modification 03/31/16

- **PNNL Communicator Notification System (CNS)** is a system that will allow emergency messages to be communicated quickly to all staff via the PNNL phone system, other subscribed phones (e.g., text or voice call to personal cell phones), and the PNNL email system. Phones at PNNL in offices, conference rooms, labs, and common areas such as lobbies, conference rooms, and lunchrooms are notified by the system. When the phone is answered, a recorded message will provide event information and inform staff of protective actions they are expected to take. This can be activated by having the BM, IM, or MSG Lead call 375-2400.
- A **Criticality Alarm System** (CAS) is present in the building. The system is equipped with neutron-sensitive criticality detectors. The CAS alarms in locations where the expected dose from an accidental criticality may exceed 12-rads in free air. The system is tested and maintained in accordance with preventive maintenance procedures.

> **NOTE:** *These systems are not considered emergency equipment and may not be available during all types of emergencies.*

- Other non-emergency communications equipment installed in 325RPL include:
  - public address system. (1234 on the BM phone)
  - public address system in the fire alarm control panel
  - commercial telephone system that may also be used to summon assistance during an emergency
  - hand-held radios provided by the BED.

10.4 Personal Protective Equipment

Safety showers and eyewash units are installed at several locations throughout the facility including waste storage areas. All locations are shown on the floor plans (Attachments 1 through 3).

Personnel protective clothing and respiratory equipment is available in the facility for use during both routine and emergency operations. This equipment includes:

- chemically-resistant suits, aprons, boots, and gloves
- protective glasses
- chemical goggles
- face shields
- full-face respirators with extra cartridges
- radiological clothing.

Kits containing a variety of radiation monitoring instruments, forms, and equipment are available for use in an emergency. PNNL maintains these kits, which contain protective apparel, instruments, and equipment for personnel decontamination and other immediate emergency needs. These supplies and equipment are only adequate to fulfill immediate needs during the initial stages of an emergency.

10.5 Spill Control and Containment Supplies

Spill kits are located throughout the facility and are maintained by the CSMs. Additional spill kit materials can be obtained in Room 527. The following emergency equipment is maintained in (or adjacent to) each of the 90-day hazardous waste accumulation areas. The amount of material maintained varies depending on the amount of waste being accumulated at the individual 90-day area.

- commercially available granular absorbent (e.g. diatomaceous earth)
- absorbent pads
- commercially available acid neutralizer[1] (e.g. granular sodium bicarbonate)
- commercially available caustic neutralizer[2] (e.g. dilute boric acid solution)
- Personal Protective Equipment
  - safety glasses with side shields
  - lab coat
  - leather gloves
  - chemical-resistant gloves (e.g., nitrile)

[1] Required in accumulation areas containing liquid acidic wastes.
[2] Required in accumulation areas containing liquid caustic wastes.

11.0 Evacuation of Persons and Visitors

- 325RPL occupants shall be aware of visitors that may require evacuation. Alternate housing for any staff that is sensitive to excessive hot or cold conditions (temperately disabled) may be required due to emergency response actions.

> **NOTE:** *Alternate staging area – in the event of an extended building evacuation during adverse weather, the 350 Building, or other indoor locations deemed safe, may be used for housing staff at the discretion of the BED*[25].

- Facility and research management provide safety and emergency preparedness briefings for large visitor groups or tours. Individual visitors are briefed by their host.
- In all cases, the safety of building visitors is the responsibility of the host, who shall assure that visitors are provided a safe and orderly evacuation. The host shall ensure that the visitor has signed in and report the visitor status to the appropriate Zone Warden as soon as practical, after the evacuation.

[25] Section 11, Note: Permit Requirement: Section 11.0 Note, Class 1 Modification 03/31/16

12.0 Emergency Action Levels

12.1 300 Area Protective Actions

300 Area Onsite Protective Actions		
Classification	**Action**	**Implemented By**
Alert	Evacuate or shelter affected facility personnel.	Facility
	Shelter[1] 300 Area and adjacent 600 Area. Initially restrict access at: • Route 4S at Milepost 19 • George Washington Way extension (to 300 Area) intersection with George Washington Way • George Washington Way intersection with Stevens Drive. **NOTE:** *Roadblocks can be relocated based upon consequence assessment upon approval by the IC/SED.*	POC (Quick Reaction Checklist)/ EOC Shift Office
Site Area/ General Emergency	Evacuate or shelter affected facility personnel.	Facility
	Shelter[1] 300 Area, HAMMER, Patrol Training Academy, Cold Test Facility, and adjacent 600 Areas. Restrict access at: • Route 4S at Milepost 19 • George Washington Way Extension (to 300 Area) intersection with George Washington Way • Horn Rapids intersection with Stevens Drive.	POC (Quick Reaction Checklist)/ EOC Shift Office
	Plan for subsequent 300 Area evacuation as required.	Hanford EOC

[1] *Automatic sheltering for entire areas will not be implemented during a seismic event. If a seismic event occurs, facility management will implement protective actions appropriate for their facility conditions. After a seismic event, site protective actions based upon incident assessment will be identified, planned, and communicated from Incident/Area Command and/or the Hanford EOC.*

300 Area Offsite Protective Actions and Recommendations		
Classification	**Action**	**Implemented By**
Alert	None	N/A
Site Area Emergency	Implement evacuation of Columbia River from White Bluffs Ferry Landing to Leslie Groves Park.	Counties (RLEP 3.3)
General Emergency	Implement evacuation of Columbia River from White Bluffs Ferry Landing to Leslie Groves Park.	Counties (RLEP 3.3)
	Evacuate 2.2-mile radius.	Benton/Franklin Counties

12.2 325RPL Emergency Action Levels

The EAL Tables are published in RLEP 1.0 – Appendix 1-PNNL.325, and can be obtained from the 325RPL BM.

13.0 Attachments

Attachment 1 — *Emergency Equipment and Evacuation Routes - 1st Floor*

Attachment 2 — *Emergency Equipment and Evacuation Routes - 2nd and 3rd Floors*

Attachment 3 — *Emergency Equipment and Evacuation Routes - Mezzanine and Basement*

Attachment 4 — *Zone Warden Areas - 1st Floor*

Attachment 5 — *Zone Warden Areas - 2nd and 3rd Floors*

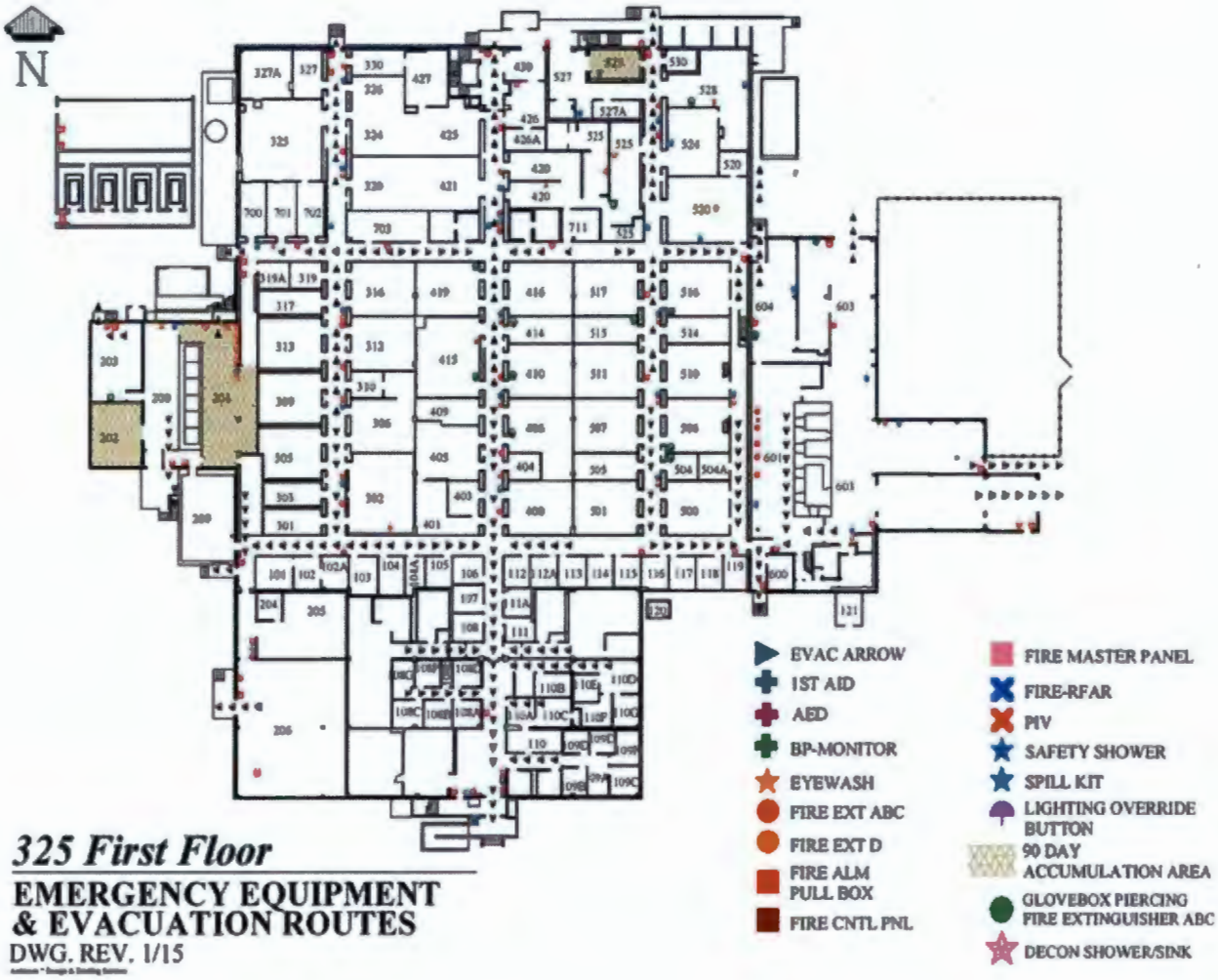
Attachment 6 — *Zone Warden Areas - Mezzanine and Basement*

Attachment 7 — *325RPL Staging Area Map*

Attachment 8 — *325RPL Alternate Staging Area Map*

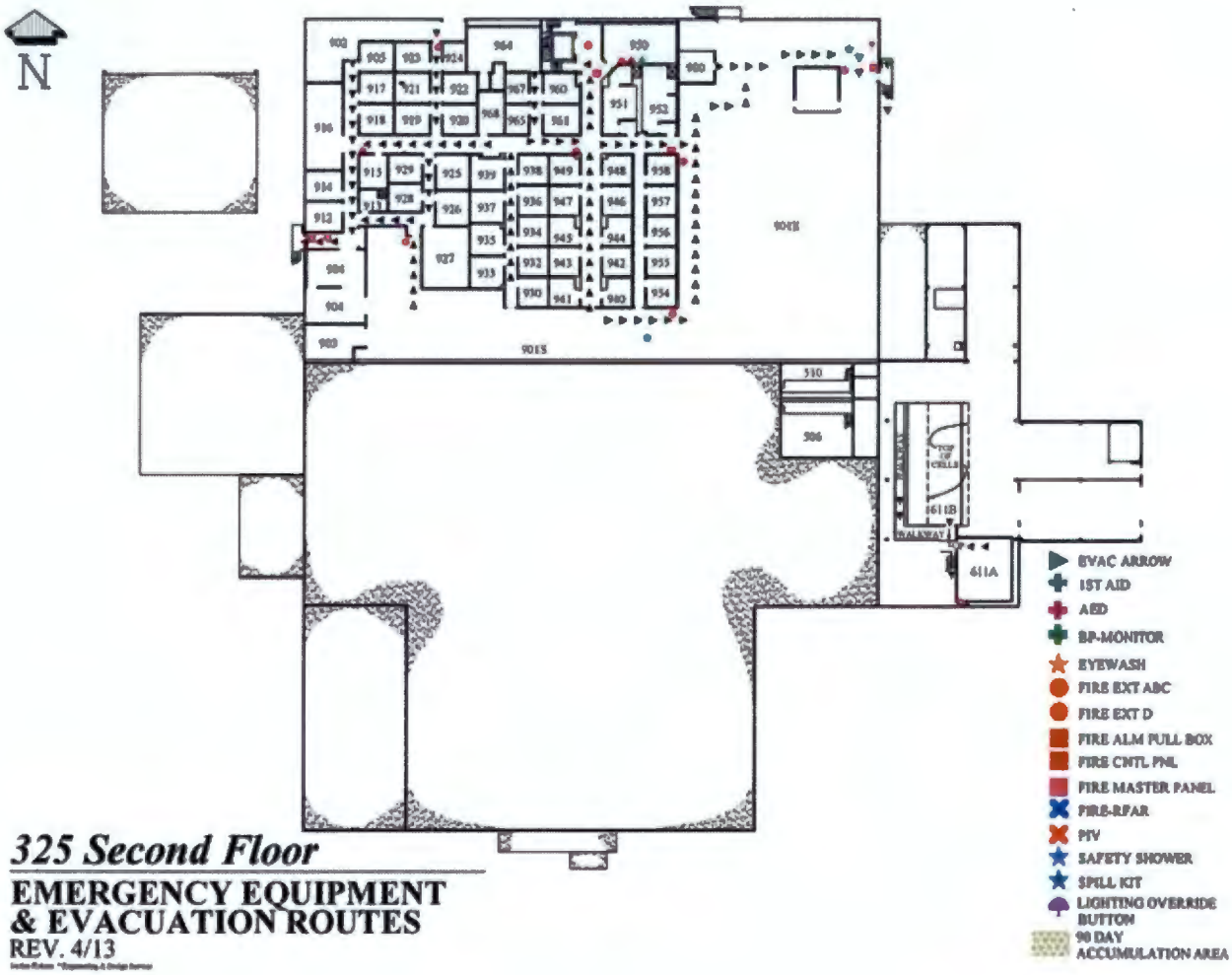
Attachment 9 — *Location of 325RPL in the 300 Area*

Attachment 1 — Emergency Equipment and Evacuation Routes - 1st Floor [26]



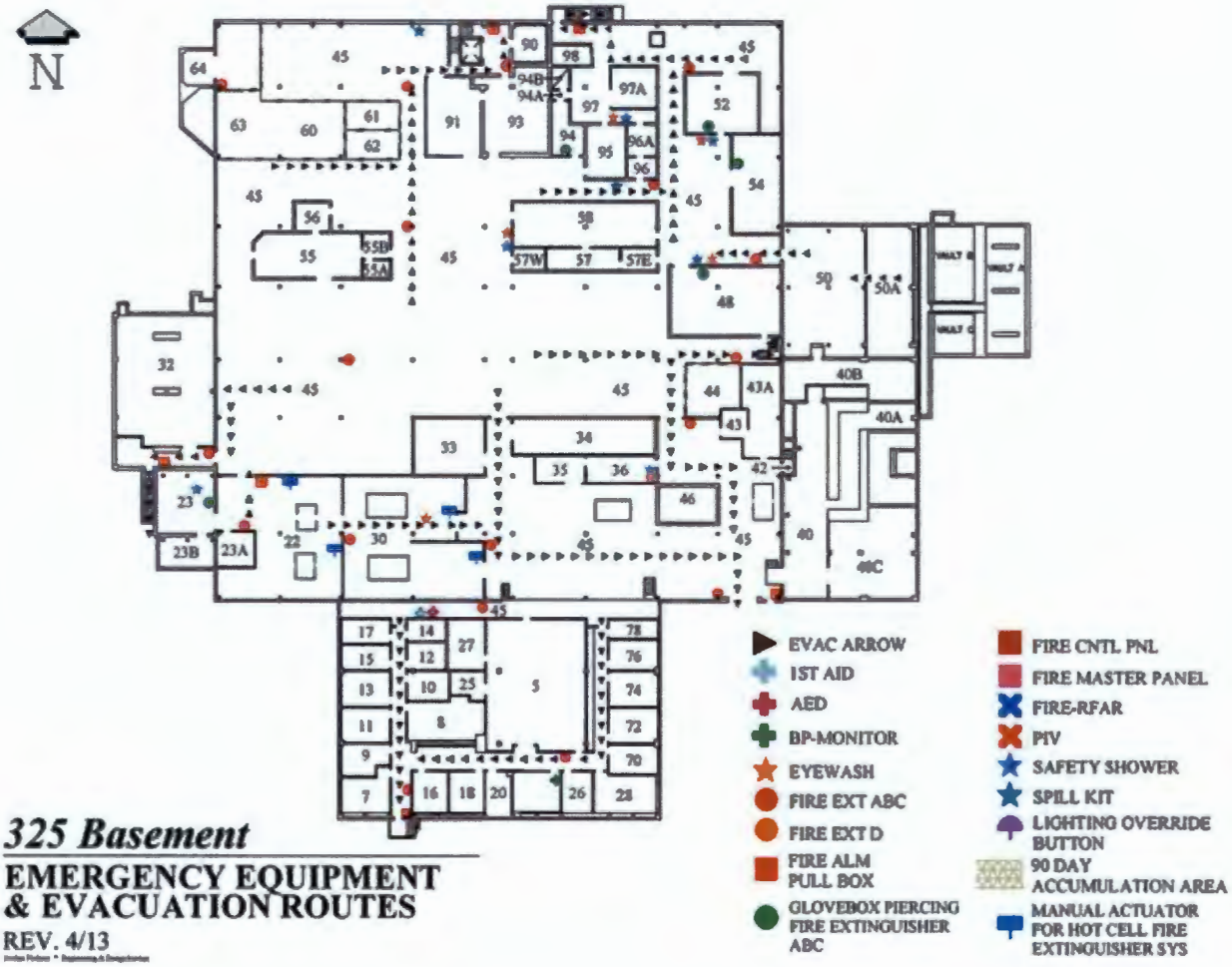
[26] Section 13.0, Attachment 1: Permit Requirement, Class 1 Modification 09/30/15

Attachment 2 — Emergency Equipment and Evacuation Routes 2nd and 3rd Floors[27]



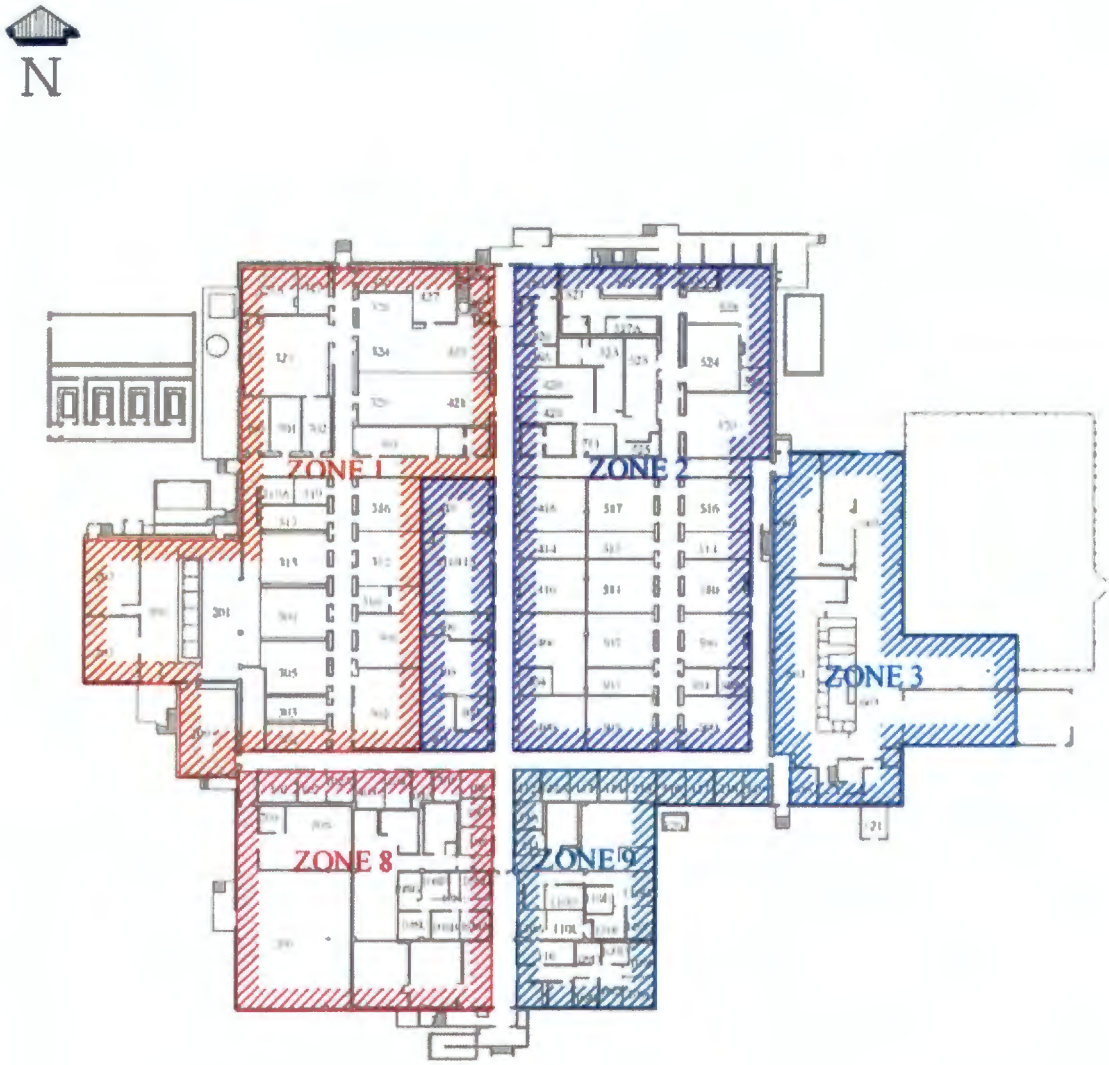
[27] Section 13.0, Attachment 2: Permit Requirement, Class 1 Modification 09/30/15.

Attachment 3 — Emergency Equipment and Evacuation Routes Mezzanine and Basement[28]



[28] Section 13.0, Attachment 3: Permit Requirement, Class 1 Modification 09/30/15

Attachment 4 — Zone Warden Areas
1st Floor

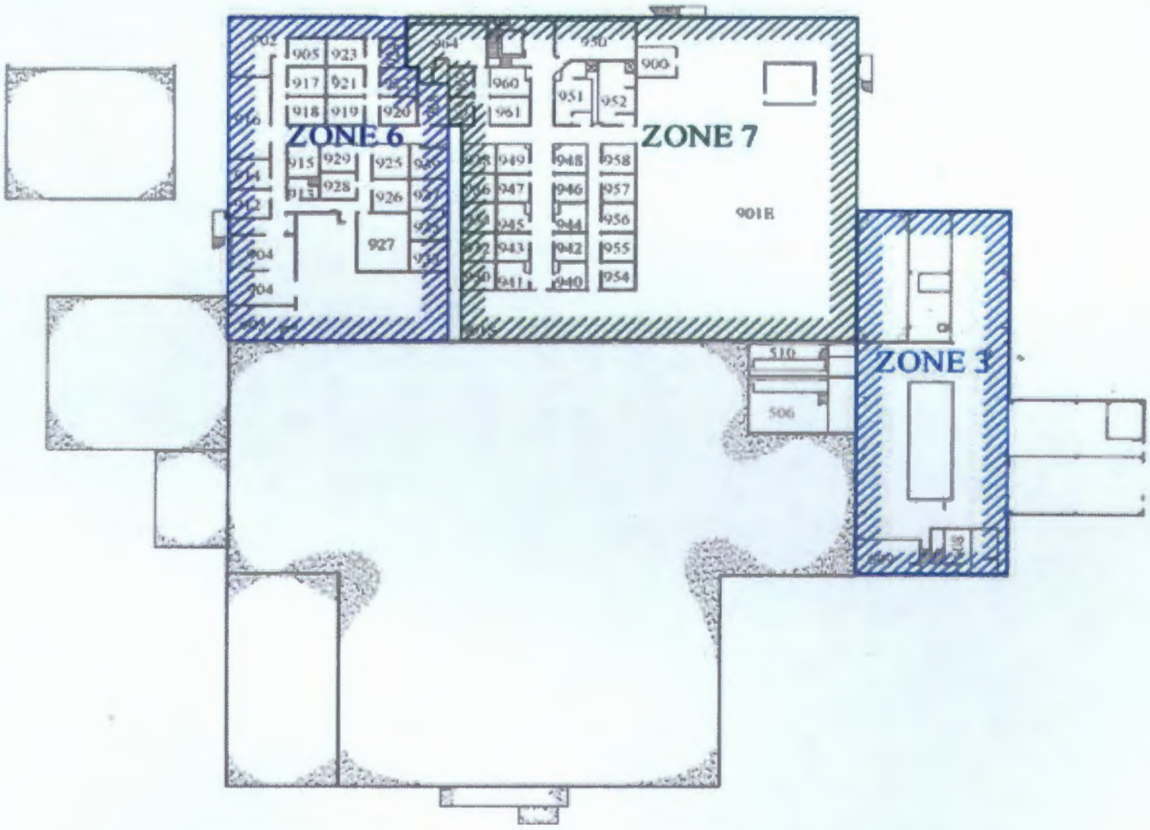


325 First Floor

ZONE WARDEN MAP

REV. 3/14

Attachment 5 — Zone Warden Areas
2nd and 3rd Floors

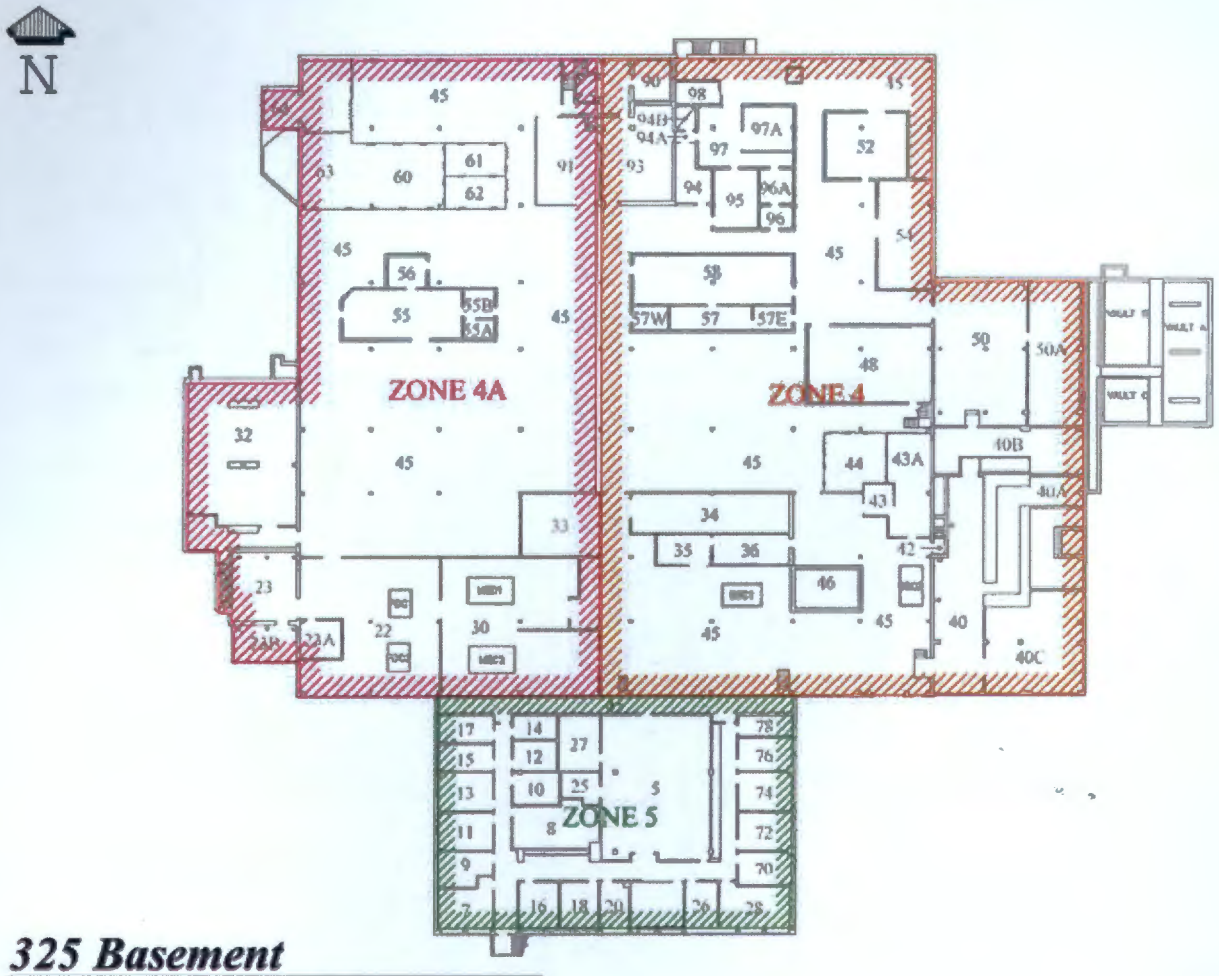


325 Second Floor

ZONE WARDEN MAP

REV. 3/14

Attachment 6 — Zone Warden Areas, Mezzanine and Basement

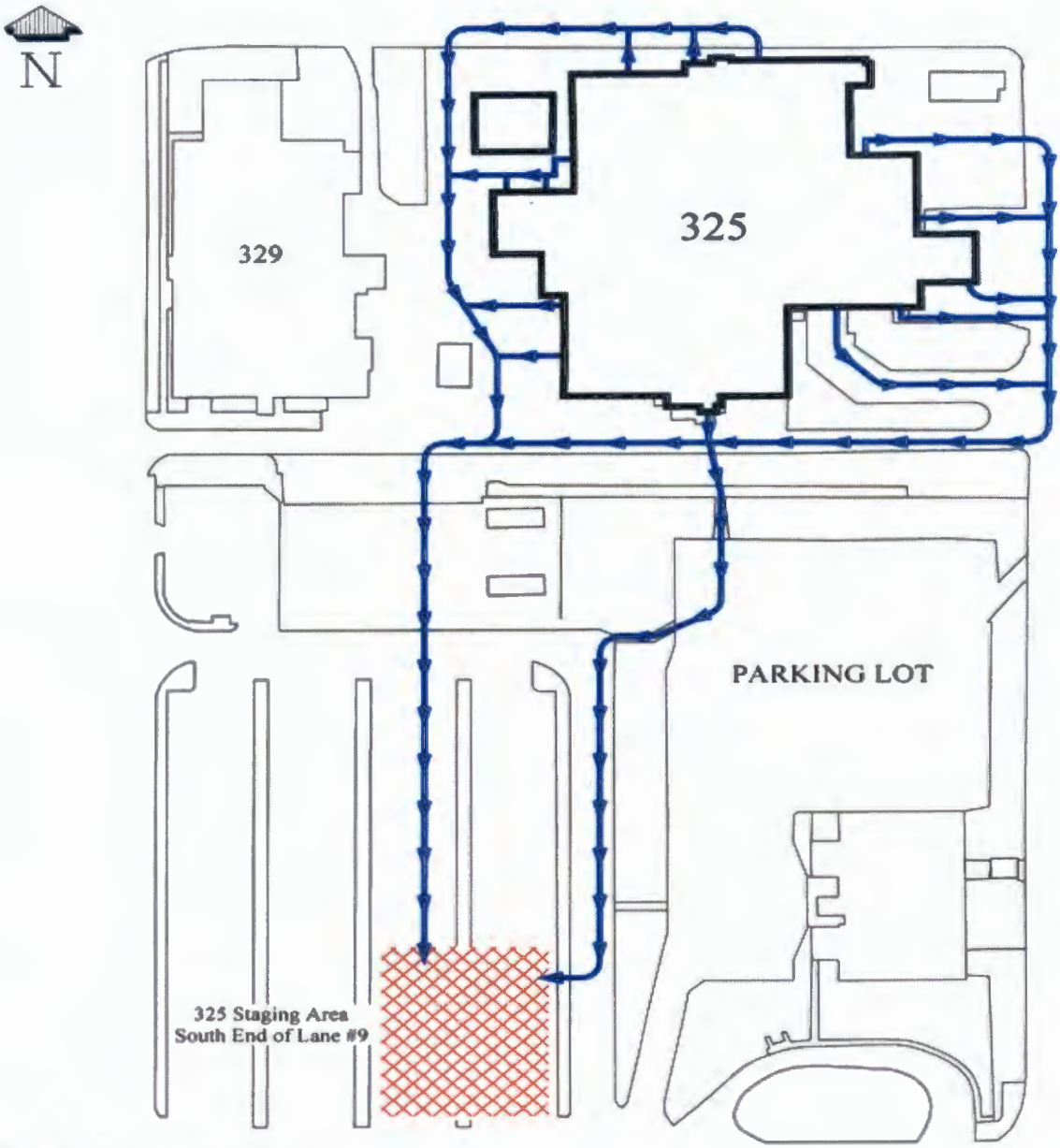


325 Basement

ZONE WARDEN MAP

REV. 3/14

Attachment 7 — 325RPL Staging Area Map[29]



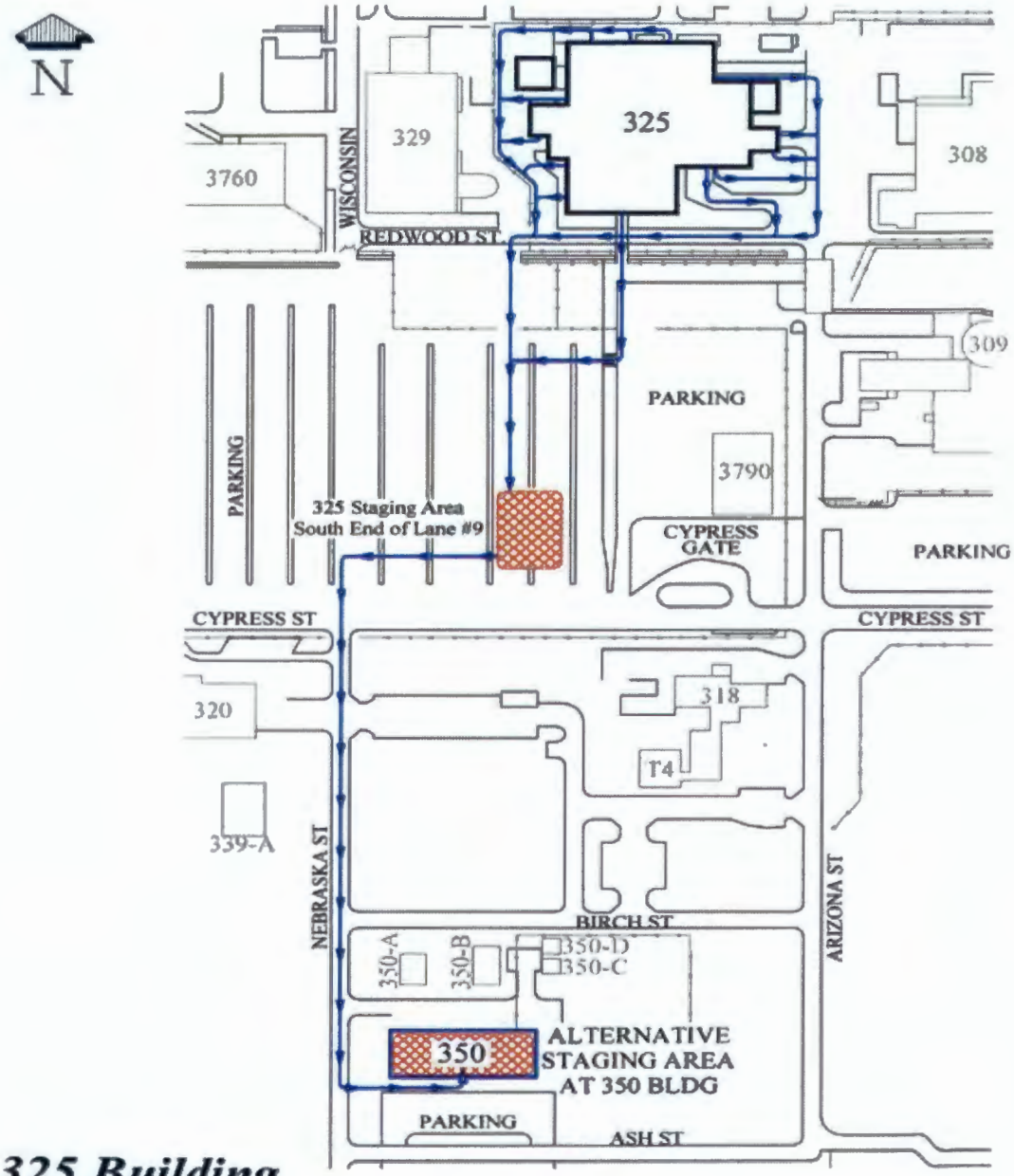
325 Building

EMERGENCY EVACUATION ROUTES & STAGING AREA

REV. 2/14

[29] Section 13.0, Attachment 7: Permit Requirement, Class 1 Modification 03/31/16

Attachment 8 — 325RPL Alternate Staging Area[30]



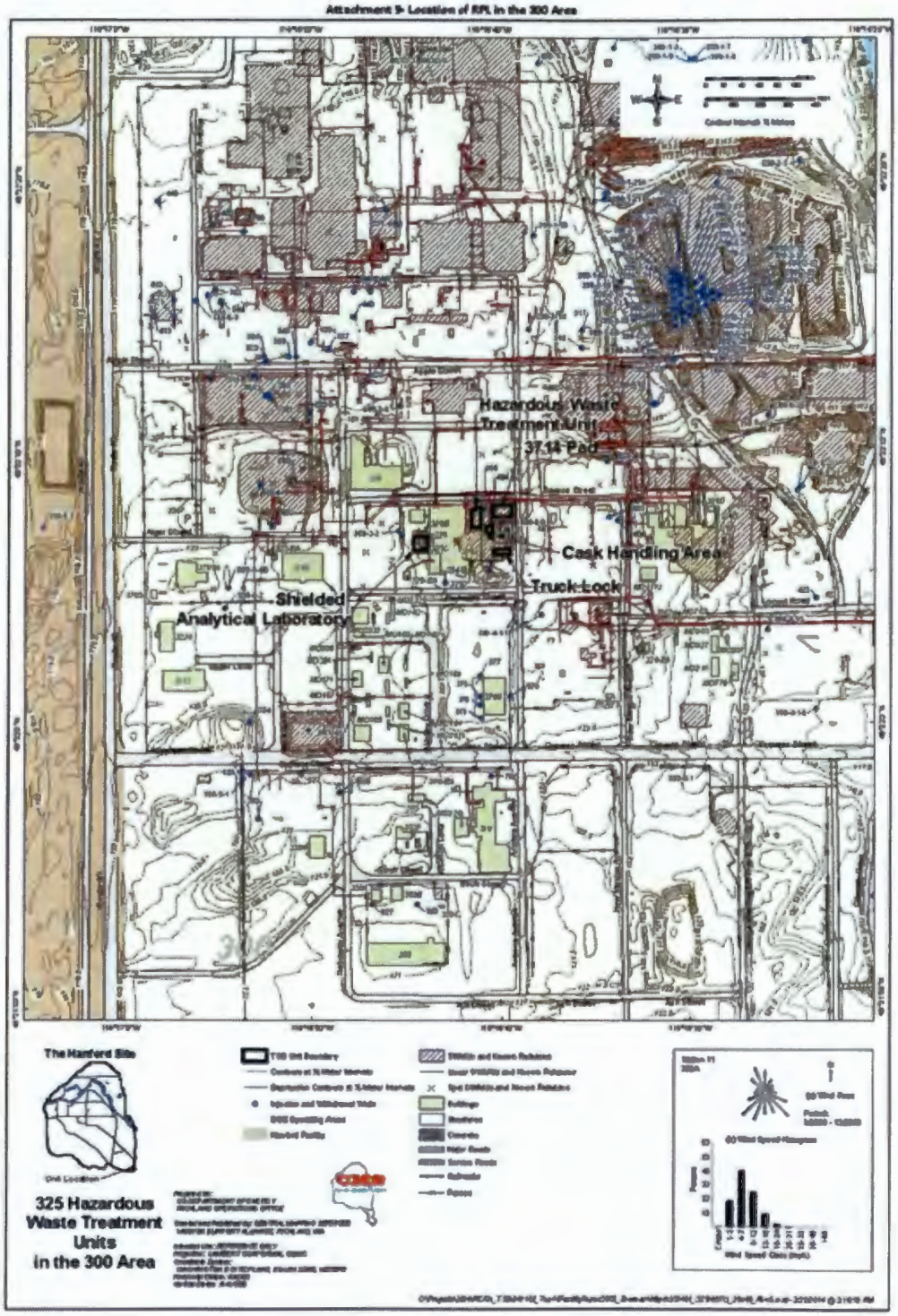
325 Building

EMERGENCY EVACUATION ROUTES & ALTERNATE STAGING AREA

REV. 2/14

[30] Section 13.0, Attachment 8: Permit Requirement, Class 1 Modification 03/31/16

Attachment 9 — Location of 325RPL in the 300 Area



14.0 References and Source Requirements

14.1 References (as revised)

ADM-001, *Document Production and Distribution*

ADM-EPIP-2.0, *Management Support Group Procedure*

ADM-EPIP-3.0, *Recovery Plan*

ADM-EPIP-7.0, *PNNL Active Shooter Response Procedure*

HDI Exhibit, *PNNL Workplace Substance Abuse Requirements and Protocol*

HDI Exhibit, *Respond to Spill or Adverse Chemical Condition*

HDI Work Control, *Basic Staff Practices*

HDI Workflow, *Report an Event or Occurrence*

PNNL Guides for Post-Natural Phenomena Hazard Building Inspection

PNNL-DSA-325, *Radiochemical Processing Laboratory Documented Safety Analysis*

PNNL-MA-110, *PNNL Emergency Management Plan*

RCP-8.1.02, *Quick Sort Survey of Personnel*

RPL-PLN-701, *RPL Business Continuity Plan*

SOP-325-003, *325 Building Heating, Ventilation and Air Conditioning Emergency Shutdown*

14.2 Source Requirements (as amended)

10 CFR 835, "Occupational Radiation Protection," *Code of Federal Regulations.*

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

DOE-0223, *RL Emergency Implementing Procedures – Applicable to PNNL-Managed Facilities on the Hanford Site*, U.S. Department of Energy Richland Office

RCRA Site-Wide Permit WA7890008967, *Hanford Facility Dangerous Waste Permit,* Resource Conservation and Recovery Act of 1976.

RLEP 1.0 – Appendix 1-PNNL.325

WAC-173-303-340, "Preparedness and Prevention," *Washington Administrative Code*, Olympia, Washington. http://apps.leg.wa.gov/WAC/default.aspx?cite=173-303-340.

WAC-173-303-350, "Contingency Plan and Emergency Procedures," *Washington Administrative Code*, Olympia, Washington. http://apps.leg.wa.gov/WAC/default.aspx?cite=173-303-350.

WAC-173-303-360, "Emergencies," *Washington Administrative Code*, Olympia, Washington. http://apps.leg.wa.gov/WAC/default.aspx?cite=173-303-360.

14.3 Emergency Preparedness Checklists (as revised)

EP-BED-325RPL, *Building Emergency Director Checklist*

EP-CHA, *Chemical Hazard Assessors Checklist*

EP_ECF, *Event Closeout Form*

EP-FOS, *Facility Operations Specialist (FOS) Checklist*

EP-HazCom, *Hazards Communicator Checklist*

EP-ICPC, *Incident Command Post Communicator Checklist for Hazardous Facilities*

EP_IM, *Incident Manager Checklist*

EP_EmerEvacReport, *PNNL Emergency Evacuation Report Form*

EP-RHA, *Radiological Hazard Assessors Checklist*

EP-SAS-325RPL, *325RPL Staging Area Supervisor Checklist*

Hanford Facility RCRA Permit Modification Notification Forms

Part III, Operating Unit 5

325 Hazardous Waste Treatment Units

Index

Page 2 of 2: Closure Plan (Addendum H)

Submitted by Co-Operator:

for 3/9/16

Cameron M. Andersen — Date

Reviewed by DOE Program Office:

3/18/16

Mark S. French — Date

Hanford Facility RCRA Permit Modification Form

Unit:	Permit Part
325 Hazardous Waste Treatment Units	***Part III, Operating Unit Group 5***

Description of Modification:

Revision of Closure Plan (Addendum H) to restore information requested by Ecology.

The information being restored was included in the Closure Plan prior to the Class 3 modification approved on August 10, 2015. The Class 3 modification approval letter (15-NWP-131, dated August 10, 2015) stated: "..... "*after issuance of the Class 3 Permit Modification, Ecology will work with the USDOE and Pacific Northwest National Laboratory (PNNL) to revise and update the Closure Plan .....*"

Ecology, USDOE, and PNNL have worked together to develop the permit changes herein. The changes are shown in redline/strikeout format on the following pages (there are too many to individually list in this form).

WAC 173-303-830 Modification Class	Class 1	Class 1	Class 2	Class 3
Please mark the Modification Class:		X		

Enter relevant WAC 173-303-830, Appendix I Modification citation number:
D.1.d. Changes in procedures for decontamination of facility equipment or structures, with prior approval of the director

Modification Approved: [X] Yes [ ] No (state reason for denial)

Reason for denial:

Reviewed by Ecology:

S. L. Dahl-Grumpler 3-24-1
Date

ADDENDUM H
CLOSURE PLAN

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ADDENDUM H
CLOSURE PLAN

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H.1.2 Closure Activities 5
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H.2.1 Removing Dangerous Waste 6
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H. CLOSURE PLAN

The 325 Hazardous Waste Treatment Units (HWTUs[A1]) will be clean closed in accordance with the requirements of WAC 173-303-610. No post closure activities currently are applicable or required because the 325 HWTUs will be clean closed.

Individual Dangerous Waste Management Units (DWMUs) ~~or portions of units~~ making up the 325 HWTUs Operating Unit Group ~~may~~ will be closed pursuant to this Closure Plan individually, ~~or more than one unit may be closed at the same time~~multiple units may be closed simultaneously[A2]. [WAC 173-303-610(1)(d)]

To clean close the 325 HWTUs, it will be demonstrated that dangerous waste has not been left onsite at levels above the closure performance standard for removal and decontamination. Regulations and laws will be reviewed periodically and the closure plan modified as necessary. If it is determined that clean closure is not possible or is environmentally impractical, the closure plan will be modified to address required post-closure activities[A3].

H.1 Closure Plan

H.1.1 Closure Performance Standard

The 325 HWTUs will be closed in a manner that:

- Minimizes the need for further maintenance.
- Controls, minimizes, or eliminates to the extent necessary to protect human health and the environment, post closure escape of dangerous waste, dangerous waste constituents, leachate, contaminated runoff, or dangerous waste decomposition products to the ground, surface water, ground water, or the atmosphere.
- Returns the land to the appearance and use of surrounding land areas to the degree possible, given the nature of the previous waste management activities. [WAC 173-303-610(2)(a)]

The 325 HWTUs operating record will be reviewed at the time of closure to determine whether there have been releases from the dangerous waste management unit(s) being closed to the soil, groundwater, surface water, or air. A physical walkdown of the unit(s) being closed will also be performed. If there is any evidence of spills or leaks from the unit(s) into the environment, removal of contamination will be integrated with the final disposition of the 325 Building and underlying soil contamination, as described in the 300-FF-2 final Record of Decision and the approved Remedial Action Work Plan. [WAC 173-303-610(1)(e), WAC 173-303-610(3)(a)(ix)].

Clean closure decontamination standards for structures, equipment, bases, liners, etc., are those specified for hazardous debris in 40 CFR 268.45, Table 1 per Ecology clean closure guidance (Ecology 1994). [WAC 173-303-610(2)(b)(ii)] The 'clean debris surface' is the performance standard for metal and concrete surfaces.

Attainment of a 'clean debris surface' will be verified by a visual inspection in accordance with the standard that states:

> *A clean debris surface means the surface, when viewed without magnification, shall be free of all visible contaminated soil and hazardous waste except residual staining from soil and waste consisting of light shadows, slight streaks, or minor discolorations and soil and waste in cracks, crevices, and pits may be present provided that such staining and waste and soil in cracks, crevices and pits shall be limited to no more than 5 percent of each square inch of surface area. (40 CFR 268.45, Table 1)*

H.1.2 Closure Activities

Closure activities will remove dangerous waste from each unit being closed, and relocate for continued use, decontaminate, or dispose associated structures and equipment. [WAC 173-303-610(3)(a)(i)]

~~Partial closure could involve closing a portion of a unit or an entire unit~~Closure of the DWMUs may occur on an individual basis, or multiple DWMUs may be closed simultaneously[A4]. Except for the timing of the closure activities, partial closure activities would be conducted in the same way as those described in this closure plan for closure of the entire 325 HWTUs Operable Unit Group (OUG), i.e. final closure.
[WAC 173-303-610(3)(a)(ii)]

The Shielded Analytical Laboratory (SAL)[A5] hot cells are connected to the SAL tank by means of the drains in the trough in the front of the hot cells. The only way to introduce waste into the SAL tank is via the hot cell drains[A6].
Similarly, the only way to retrieve waste from the SAL tank is to pump it into containers in Cell 6 (northernmost cell in the hot cell gallery) for storage and/or treatment. Decontamination in conjunction with closure is expected to introduce liquid waste into the SAL tank from the hot cells, and rinsate from the SAL tank closure will need to be treated and containerized in the hot cell. As a result, the SAL tank cannot begin closure until storage and treatment in the hot cells is concluded. Similarly, the hot cells cannot begin closure until the SAL tank is ready to close. Due to this mutual dependency, storage and treatment in the hot cells and in the SAL tank will begin closure only when the last of these two units begin closure. [WAC 173-303-610(3)(a)(i); WAC 173-303-610(4)(a)(i); WAC 173-303-610(4)(b)(i)]

H.1.3 Maximum Extent of Operation

The physical boundaries of the 325 HWTUs' individual units are shown in Addendum A.

H.2 Closure of Container Storage and Treatment Areas (Non-Hot Cell)

H.2.1 Removing Dangerous Waste

Closure activities at DWMUs being closed will be initiated by removal of the dangerous waste inventory present at the time of closure. Inventory removal procedures from the container storage/treatment unit(s) being closed will ~~be identical to the waste handling, treating, packaging, and manifesting activities given in Addendum B and C of this permit~~ include:

- Packaging of listed and characteristic waste to meet U.S. Department of Transportation (DOT) requirements [WAC 173-303-190(1)]
- Packaging of state-only dangerous waste (non-DOT hazardous material) in a nonleaking, nonsievable container or a package equivalent to DOT containers [WAC 173-303-190(5)(a)]
    - Packaging may include preparation of labpacks containing smaller containers of stored waste. [WAC 173-303-161]
    - Waste may also be "bulked" (combined) into appropriate containers. Containers emptied through bulking of their contents may be disposed of as solid (nondangerous) waste if they meet the definition of "empty" given in WAC 173-303-160(2). [WAC 173-303-160(3)]
- Labeling of waste containers with appropriate DOT labels [WAC 173-303-190(2)
- Marking of waste containers with appropriate DOT markings and the "Hazardous Waste" label [WAC 173-303-190(3)]

All containers of dangerous waste will be transferred to custody of a dangerous waste transporter having a proper dangerous waste identification number if transportation is required. During closure, wastes will ~~simply~~ be relocated to other, unclosed ~~portions of~~DWMUs in the 325 HWTUs (in the case of partial closure) or transferred to other Hanford Permit operating units for subsequent management. Offsite treatment and/or storage facilities may be used if appropriate.

H.2.2 Decontaminating Structures, Equipment, and Soil

At the time of ~~partial or final~~ closure of the ~~unit~~DWMU(s) being closed, equipment and structures in the unit(s) being closed will either be removed and disposed of, or be decontaminated. Decontamination activities will address equipment and structures known to have contacted dangerous waste. Equipment Equipment and structures that exhibit a 'clean debris surface' before starting closure activities will be considered decontaminated and receive no further decontamination.

Decontamination methods for equipment and structures will be selected from appropriate technologies (40 CFR 268.45, Table 1) such as water washing and spraying, high-pressure water jet scarifiers, abrasive blasting, aquablasting, or mechanical concrete scrubbers and scarifiers. Such technologies will be used until a clean debris surface is obtained or the effort to decontaminate is abandoned (i.e. the equipment or structure is removed for disposal.)

All equipment used for decontamination will be decontaminated or disposed of before closure is complete. All cleaning and decontamination waste will be collected and analyzed as described in Section H.2.4. Any disposable equipment will be placed in a container and properly disposed.

Waste-handling equipment will be decontaminated by washing with water or a solvent to a 'clean debris surface' as defined in Section H.1.1. If additional decontamination is necessary, a decontamination technique will be selected from appropriate technologies (40 CFR 268.45, Table 1) such as high-pressure water wash. If adequate cleaning is not possible, the equipment will be disposed of as dangerous waste. The decision to dispose or decontaminate equipment will be made at the time of closure. The option that is the most environmentally and economically feasible will be chosen. Adequate decontamination will be determined by a visual inspection for a 'clean debris surface' as described in Section H.1.1. All wastewater generated by decontamination activities will be collected in sumps or portable containers, pumped to chemically compatible, closed-top containers, and transported and managed as described in Section H.2.4.

The time required for decontamination of waste-handling equipment and the amount of wastewater generated by these methods will depend on the amount of equipment that needs to be decontaminated, but minimal time and effort are anticipated. The wastewater to be generated through decontamination is not anticipated to exceed approximately 378 liters. The volume of solid waste generated will depend on the extent of decontamination necessary.

If a 'clean debris surface' is present at the time that closure activities are started, the area will be considered clean closed. In this case, housekeeping measures may be undertaken and could include sweeping, dusting, vacuuming, and wiping with soap and water. Brushing or sweeping will be used to clean up coarse debris. Vacuuming will be performed using a commercial or industrial vacuum equipped with a high-efficiency particulate air (HEPA) filter. The vacuum cleaner bag containing captured particulates will be disposed appropriately. Dust wiping will be done with a damp cloth or wipe (soaked with water) to remove dust from surfaces that cannot be decontaminated with a vacuum. The cloth or wipe also will be disposed appropriately. HEPA filters from installed equipment and vacuum cleaners will be designated and managed as described in Section H.2.4. The volume of solid waste (e.g., personal protective clothing/equipment, wipes, HEPA filters, vacuum bags) generated will depend on the extent of decontamination necessary.

Minimal time will be required for setup of the decontamination equipment. Labor requirements for the process should be moderate. Minimal time also will be required for packaging debris, dismantling, and removing cleaning equipment. Small quantities of wastewater (only the contents of buckets used in the decontamination procedure) will be generated. However, if a clean debris surface is not present, more sophisticated decontamination methods will be implemented. The surfaces that do not have a 'clean debris surface' will be treated using an appropriate decontamination technology such as water washing and spraying (40 CFR 268.45, Table 1) until a clean debris surface is obtained. The contaminated surfaces will be decontaminated to remove all residues from the surfaces. The contaminated waste generated by this activity will be contained by the designed spill controls already in place for the unit or

by disposable absorbent pads that might be placed around the area to be water washed. Pumps or vacuums will be used to empty the wastewater from the containment area into chemically compatible, closed-top containers. Containers of wastewater will be managed as described in Section H.2.4.

Although this method will require more time than the dusting, vacuuming, and wiping procedures outlined previously, time requirements are still considered minimal for the water washing approach. Wastewater generated by this method is not anticipated to exceed 500 liters.

If necessary, further decontamination methods such as sandblasting or other appropriate technologies could be used effectively to clean contaminated structure surfaces. All residues from the decontamination effort will be collected for sampling and proper subsequent disposal as described in Section H.2.5.4. Following completion of decontamination, additional visual inspections will be performed to determine that the 'clean debris surface' standard has been achieved. In the unlikely event that structures cannot be cleaned using the methods described, these structures might be demolished, removed, and managed as dangerous waste.

The collection sumps and secondary containment system will be decontaminated by water washing. Wastewater collected from the cleaning process in each sump and containment system will be pumped into chemically compatible, closed-top containers and analyzed as described in Section H.2.4 to determine if the wastewater is a dangerous waste under WAC 173 303 070. If the wastewater is determined to be a dangerous waste, the wastewater will be managed and disposed at an appropriate permitted unit. If the wastewater is not a dangerous waste, the wastewater will be discharged to the sewer system or otherwise appropriately managed. The water washing of all sumps should take minimal time and should generate less than 500 liters of wastewater. Additional decontamination techniques such as grit blasting, scabbling, or chipping might be used if necessary. The volume of solid waste generated will depend on the extent of decontamination necessary.

If review of the operating record determines that releases to the firewater containment tank have not occurred during the operating life of the 325 HWTUs, the internal surface of the firewater containment tank will be visually inspected. If a 'clean debris surface' is present at the beginning of the closure process, the firewater containment tank will be considered clean closed. If the surface of the liner does not meet the 'clean debris surface' standard, the tank liner will be removed and disposed. If the underlying tank surface does not meet the clean debris surface standard, it will be decontaminated in accordance with this section or disposed.

H.2.3 Management of Decontamination Waste from Closing Container Units (Non-Hot Cell)

Decontamination waste from closing container ~~storage and treatment units~~DWMUs will be placed in containers and sampled to determine disposal requirements. Samples from each container will be analyzed as set forth in Table H.1 for the following:

- Corrosivity using the methods described in EPA SW-846 (Methods 9040/9045)
- Ignitability using methods described in EPA SW-846 (Methods 1010/1020)
- Toxicity characteristic using the Toxicity Characteristic Leaching Procedure (TCLP) described in EPA SW-846 (Method 1311) [including analysis for metals; volatile organics; and semivolatile organics, which includes chlorinated pesticides.]

Other analyses might be performed based on process knowledge to confirm the presence of a listed waste. The results of sample analyses along with appropriate process knowledge will be used to determine how to dispose of decontamination waste. (Background levels will be determined by analysis of the tap water used for makeup of the decontamination solutions.) The results of the ignitability, corrosivity, and toxicity characteristic analyses will be used to determine if the waste is characteristic dangerous waste (WAC 173 303 090) as set forth in Table H.1. **Decontamination waste will be managed at a permitted Treatment, Storage, and Disposal (TSD) unit or treated and disposed onsite.**

H.2.4 Inspection to Identify Extent of Decontamination/Removal and to Verify Achievement of Closure Standard

Attainment of a 'clean debris surface' will be verified by a visual inspection in accordance with the standard that states: A clean debris surface means the surface, when viewed without magnification, shall be free of all visible contaminated soil and hazardous waste except residual staining from soil and waste consisting of light shadows, slight streaks, or minor discolorations and soil and waste in cracks, crevices, and pits may be present provided that such staining and waste and soil in cracks, crevices and pits shall be limited to no more than 5 percent of each square inch of surface area. (40 CFR 268.45, Table 1).

Areas of degraded surface material, such as significant concrete cracking or heavily gouged steel, will be evaluated by non-destructive or destructive means to determine depth of significant surface defects, amount of contamination present in the defects, and to determine if environmental contamination has resulted from the material defect.

H.3 Closure of the Shielded Analytical Laboratory (SAL) Hot Cells and Tank

The activities required for the closure of the SAL hot cells and tank system are described in the following sections. As noted in Section H.1.2, these units will be closed at the same time as their operations are mutually interdependent.

H.3.1 Removing Dangerous Waste

Closure or partial closure activities will be initiated by removal of the dangerous waste inventory present in the hot cells and tank at the time of closure or partial closure. Inventory removal procedures for containers in the hot cells will be performed in accordance with the waste handling, treating, packaging, and manifesting requirements of ~~Addenda B and C of this Permit~~Section H.2.1.

The contents of the SAL tank will be transferred to Cell 6 and placed in containers. The contents of the SAL tank will be loaded into containers and managed in accordance with Section H.2.1. Any other suitable RCRA-permitted units that might exist when the SAL tank is closed could be used as a storage alternative[A12].

During closure, wastes will ~~simply~~ be relocated to other, unclosed ~~portions of~~DWMUs in the 325 HWTUs (in the case of partial closure) or transferred to other Hanford Permit operating units for subsequent management. Offsite treatment and/or storage facilities may be used if appropriate.

H.3.2 Decontaminating Equipment, Structures, and Soils

At the time of hot cell tank closure, all equipment and structures in dangerous waste storage and treatment areas will be either removed and disposed of, or decontaminated in accordance with this section. Decontamination activities will address piping, equipment and structures known to have contacted dangerous waste[A13]. Equipment and structures that exhibit a 'clean debris surface' before starting closure activities will be considered decontaminated and receive no further decontamination.

Decontamination methods for equipment and structures will be selected from appropriate technologies found in 40 CFR 268.45, Table 1, such as water washing and spraying, high-pressure water jet scarifiers, abrasive blasting, aquablasting, or mechanical concrete scrubbers and scarifiers. Other methods not included in 40 CFR 268.45, Table 1 may be utilized to address non-RCRA contaminants, but cannot be used alone to achieve a clean debris surface. These methods will be used until a clean debris surface is obtained, or the effort to decontaminate is abandoned (i.e. the equipment or structure is removed for disposal.)

All equipment used for decontamination will be decontaminated or disposed of before closure is complete. All cleaning and decontamination waste will be collected and managed as described in Section H.3.5. Any disposable equipment will be containerized and disposed of based on the status of the waste as dangerous, nondangerous, or mixed waste.

Initial gross decontamination of the hot cells will be necessary before entry of personnel into the hot cells for the visual inspection of the cell liners. ALARA concerns in the cells will preclude personnel entry into the cells, and configuration of the cells precludes thorough visual inspection of the interior surfaces of the cells. This decontamination will be accomplished using high-pressure water sprays or other appropriate decontamination techniques operated by means of the manipulators.

If a 'clean debris surface' is present at the time that closure activities are started, decontamination procedures will consist of sweeping, dusting, vacuuming, and wiping with soap and water. Brushing or sweeping will be used to clean up coarse debris. Vacuuming will be performed using a commercial or industrial vacuum equipped with a HEPA filter. The vacuum cleaner bag containing captured particulates will be appropriately disposed. Dust wiping will be done with a damp cloth or wipe (soaked with water) to remove dust from surfaces that cannot be decontaminated with a vacuum. The cloth or wipe also will be appropriately disposed. The volume of solid waste generated will depend on the extent of decontamination necessary.

Moderate time will be required for setup of the decontamination equipment. However, labor requirements for the process will be extensive for areas with ALARA concerns, and will, at least initially, require remote operations. Moderate time also will be required for packaging debris, dismantling, and removing cleaning equipment. Moderate quantities of wastewater will be generated by this procedure. However, if a 'clean debris surface' is not present, more sophisticated decontamination methods will be implemented. The hot cells will be treated extensively using an appropriate decontamination technique (40 CFR 268.45, Table 1). The ceiling, walls, and floor will be treated by applying the decontamination technique to remove all residues from the surfaces. The contaminated waste generated by this activity will be collected in the SAL and will be managed as described in Section H.3.6. The volume of waste generated by this procedure is anticipated to be on the order of 2,000 liters.

If necessary, more aggressive decontamination methods, such as sandblasting or other appropriate technologies, could be used effectively to clean contaminated structure surfaces. All residues from the decontamination effort will be collected for sampling and proper subsequent disposal as described in Section H.3.6. Following completion of decontamination, additional visual inspections will be performed to determine that the 'clean debris surface' standard has been achieved. In the unlikely event that structures cannot be cleaned using the methods described, these structures might be demolished, removed, and managed as dangerous waste.

The hot cells in the SAL also include two other areas that might require decontamination. These are the storage rooms 200, 202 and 203 in the backside of SAL, and the front face (Room 201). It is expected that the level of contamination will be minimal based on the operations performed. Accordingly, the level of the decontamination effort also is expected to be minimal. For example, decontamination efforts in the operating gallery might be limited to decontamination and removal of the fume hood. If a 'clean debris surface' is present at the time that closure activities are started, decontamination procedures will consist of sweeping, dusting, vacuuming, and wiping with soap and water.

All dangerous waste storage and treatment operations at the 325 HWTUs will be conducted indoors, which will minimize potential contamination of the soil and groundwater. Unit design and administrative controls minimize the possibility of loss of waste to the soil and contamination of the groundwater. The potential for degradation of surface water quality also is very low due to the building design and administrative controls employed.

If contaminated soil is found and if practical, it may be excavated, removed, and disposed as dangerous waste. Extensive soil contamination will be integrated with the closure of the 325 Building and the CERCLA Record of Decision for the 300 FF 2 operable unit.

No contaminated soil is expected to be removed in conjunction with the closure of the hot cells and SAL tank units at the 325 HWTUs OUG due to the construction of the building and the scope of operations. If it is necessary to remove soil, the closure plan will be amended via permit modification to include necessary details such as soil removal, sampling to verify adequacy of removal, and subsequent

management of the removed soil. ~~Soil removal may also be deferred to the 300-FF-2 cleanup in accordance with H.1.1~~[A16].

H.3.3 Decontamination of Hot Cell Trough

The collection trough in the interconnected SAL hot cells will be decontaminated using an appropriate decontamination technique (40 CFR 268.45, Table 1) until a clean debris surface is obtained. Any wastewater collected in each sump from the cleaning process will be collected in the SAL waste tank system and managed as dangerous waste. The decontamination of the hot cell collection trough should take moderate time and should generate less than 500 liters of waste. Additional decontamination techniques, such as grit blasting or chemical cleaning, could be used if necessary. The volume of solid waste generated will depend on the extent of decontamination necessary[A17].

H.3.4 Decontamination of the Shielded Analytical Laboratory (SAL) Tank System

At closure, the SAL tank and ancillary equipment, tank secondary containment pan, and associated tank piping will be decontaminated using water washing and spraying (40 CFR 268.45, Table 1). This may be followed by other appropriate techniques if necessary to obtain a clean debris surface. Run-off of decontamination solutions and wastewater will be prevented either by performing cleaning activities within existing containment structures or within portable containment pans or by surrounding the decontamination area with plastic and absorbent pads.

If water flushing is unsuccessful at removing dangerous waste and dangerous waste constituents, other decontamination processes will be selected from 40 CFR 268.45, Table 1, such as aquablasting, sandblasting, and high-pressure water jet scarifiers. The actual equipment used will be selected based on practicality and effectiveness to remove residual materials. Following the decontamination process, a visual inspection for a 'clean debris surface' will be conducted to monitor the effectiveness of the decontamination work.

Management of decontamination residues is provided in Section H.3.5. The time requirements for decontamination of the SAL tank system are expected to be moderate, and wastewater generated by this procedure is not expected to exceed 1,200 liters. The volume of solid waste generated will depend on the extent of decontamination necessary.

On completion of decontamination activities, the SAL tank either will remain in place for other uses within the 325 Building, will be moved for other uses on the Hanford Facility, or will be demolished and disposed (if its usefulness is determined to be complete[A18]).

H.3.5 Management of Decontamination Waste from SAL

Decontamination liquid from the SAL hot cells will be accumulated in cell or in the tank and sent to a permitted facility. All nonliquid waste generated during decontamination operations and the equipment used (e.g., sandblast grit, personnel protective equipment and clothing, disposable equipment) will be collected in containers and stored onsite. Samples of the waste could be collected and analyzed as described in Section H.2.43.

H.3.6 Inspection to Identify Extent of Decontamination/Removal and to Verify Achievement of Closure Standard

Attainment of a 'clean debris surface' will be verified by a visual inspection in accordance with the standard that states: A clean debris surface means the surface, when viewed without magnification, shall be free of all visible contaminated soil and hazardous waste except residual staining from soil and waste consisting of light shadows, slight streaks, or minor discolorations and soil and waste in cracks, crevices, and pits may be present provided that such staining and waste and soil in cracks, crevices and pits shall be limited to no more than 5 percent of each square inch of surface area. (40 CFR 268.45, Table 1).

Areas of degraded surface material, such as significant concrete cracking or heavily gouged steel, will be evaluated by non-destructive or destructive means to determine depth of significant surface defects,

amount of contamination present in the defects, and to determine if environmental contamination has resulted from the material defect.

The SAL tank and ancillary waste piping will be evaluated for meeting the clean debris standard by use of fiber-optic cameras or other nondestructive examination techniques.

H.4 Maximum Waste Inventory

The 325 HWTUs are used to store and treat a variety of different research-and-operations-related dangerous waste. The maximum inventory of waste that could be present at any one time in the 325 HWTUs Dangerous Waste Management Units (DWMU) is given in the following table.

Activity	HWTU	SAL Containers	SAL Tank	Cask Handling Area	Truck Lock	3714 Pad
Storage (liters)	9000	3000	1218	10370	10370	17620
Treatment (liters/day)	946	568	1218	10370	10370	17620

H.5 Schedule for Closure

At least forty-five days prior to the date on which closure of one or more DWMUs is expected to begin, the owner/operator of the 325 HWTUs will notify Ecology in writing. [WAC 173-303-610(3)(c)(i)] Completion of closure activities for ~~units~~ DWMUs at the 325 HWTUs OUG is expected to take up to two years from the date of receipt of the final volume of waste at the units. This extended time for closure is necessary due to as low as reasonably achievable (ALARA) concerns present in the facility, particularly the six interconnected hot cells. Closure activities are summarized in Table H.2, and a detailed schedule of closure activities is provided in Table H.3.

H.6 Extension for Closure Time

H.6.1 Extension for Inventory Removal

An extension of the time for removal of the inventory of dangerous waste from container treatment/storage unit(s) being closed designated for closure is requested for the 325 HWTUs. Acquiring disposal approvals and arranging shipping to receiving facilities for mixed waste requires longer than the 90 days anticipated under WAC 173-303-610(4)(a). The expected time needed to remove all waste from container treatment/storage units being closed is 180 days. For waste in the tank and hot cells, the expected time to complete inventory removal is two years.

The extended period for removal of the inventory of dangerous waste is needed to accomplish the procedures that are needed to safely work with the ALARA concerns that are present. All activities required to remove the inventory of dangerous waste will be conducted in accordance with applicable Permit conditions and all safety systems will continue to be operated. The removal of the inventory of dangerous waste will be conducted following procedures that are designed to be protective of the workers and the environment.

H.6.2 Extension for Closure Period

An extension of the closure time is requested for the 325 HWTUs units being closed. The ALARA concerns that are present necessitate this extension. The expected time needed to close the units is two years.

The extended closure period exceeding the 180 days given in WAC 173-303-610(4)(~~a~~b) is needed to accomplish the procedures that are needed to safely work with ALARA concerns that are present in the SAL. Decontamination of hot cells is a slow and labor-intensive operation, complicated by the fact that

most of the work must be done remotely using manipulators. Even after ALARA concerns have been reduced enough to allow personnel entry, work is hampered by the extensive personal protective equipment staff are required to wear, and the strict procedures that are enforced to protect both workers and the environment from contamination.

Most equipment located in the hot cells must be packaged in shielded containers. This may require extensive, remotely-operated size reduction of the equipment. Removal of hot cell equipment usually takes many months to complete[A20].

All closure activities will be conducted in accordance with applicable Permit conditions and all safety systems will continue to be operated. Closure activities will be conducted following procedures that are designed to be protective of the workers and the environment. [WAC 173-303-610(4)(b)(i)]

H.7 Closure Cost Estimate

An annual report outlining updated projections of anticipated closure costs for the Hanford Facility TSD units having final status is not required per Permit Condition II.H.

Table H.1. Analysis Parameters for Closure of the 325 Hazardous Waste Treatment Units

Parameter and EPA SW-846[a] Analytical Method	Equipment and Structures Wipe Samples	Decontamination Waste Water Samples	Soil Samples (if determined to be contaminated)
pH for corrosivity (Method 9040 or 9045)		X	
Ignitability (Method 1010 or 1020)		X	
TCLP (Extraction Method 1311) • Metals (Method 6000 and/or 7000 series) • Volatile organics (Method 8240) • Semivolatile organics (Method 8270) • Chlorinated pesticides (Method 8080)		X	
Total metals: antimony, arsenic, beryllium, boron, cadmium, chromium, lead, mercury, nickel, selenium, silver, and thallium (Method 6000 and/or 7000 series)	X		X
Volatile organics (Method 8240)	X		X
Semivolatile organics (Method 8270)	X		X

[a] SW-846 = EPA Test Methods for Evaluating Solid Wastes (Third Edition, latest update, 1986).

Table H.2. Summary of Closure Activities for the 325 Hazardous Waste Treatment Units

Closure Activity Description	Expected Duration (a)	
	Container Unit(s)	SAL Hot Cells/Tank
Receive final volume of dangerous waste	N/A	N/A
Notify Ecology that closure activities will commence (at least 45 days before final closure activities begin)	N/A	N/A
Remove waste inventory and package, manifest, and transport all dangerous waste for treatment, storage, and/or disposal	180 days	780 days
Initial decontamination	120 days	120 days
Remove equipment	270 days	270 days
Records review and visual inspection of structural surfaces, equipment, troughs, and tanks to identify areas of contamination and to determine levels and methods of decontamination required	30 days	30 days
Decontaminate structural surfaces, equipment, troughs, and tanks using methods determined after records review and visual inspection	180 days	180 days
Decontaminate front face and rear face of hot cells	N/A	120 days
Reinspect surfaces to verify clean debris standard is met	2 days	2 days
Evaluate best methods for treatment and disposal of waste resulting from decontamination	25 days	25 days
Dispose of waste resulting from decontamination	80 days	80 days
Submit certification of closure to Ecology (within 60 days of completion of final closure activities)	N/A	N/A

(a) Some activities are performed concurrently.

Table H.3. Closure Schedule for the 325 Hazardous Waste Treatment Units

Action	Schedule	
	Container Units	Hot Cells and Tank
Date of receipt of last volume of waste	Day 0	Day 0
Completion of waste inventory removal	Day 180	Day 780
Equipment decontamination or disposal and visual inspection of structural surfaces to identify areas of contamination and to determine level of decontamination needed	Day 530	Day 1210
Structural decontamination	Day 635	Day 1315
HWTU sump and fire water containment tank and SAL hot cells trough and tank decontamination	Day 650	Day 1330
Visual inspection to determine effectiveness of decontamination	Day 690	Day 1370
Further decontamination and visual inspection, if necessary, and disposal of all decontamination waste based on results of waste analyses	Day 720	Day 1400
Clean closure certification	Day 780	Day 1460

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Remove and Replace the Following Pages:

Addendum H, all pages

Hanford Facility RCRA Permit Modification Notification Forms

Part III, Operating Unit Group 11(OUG-11)

Integrated Disposal Facility

Index

Page 2 of 2: Addendum J.1 Pre-Active Life Contingency Plan
Addendum J.2 Active Life Contingency Plan

Submitted by Co-Operator:

Mesis Jaraysi — 3/14/2016

Co-Operator Name — Date

Reviewed by DOE Program Office:

3/16/16

DOE Program Office Name — Date

Hanford Facility RCRA Permit Modification Form

Unit:	Permit Part
Integrated Disposal Facility	***Part III, Operating Unit Group 11***

Description of Modification:

Addendum J.1

The contact information table in section J.7.1, Building Emergency Director/Building Warden, needs to be changed from "IDF Management/MO-720/373-1068" to "Shift Operations Manager/MO-720/373-7777."

The OUO marks on pages J.1.i through J.1.14 need to be removed. The evacuation route on page J.1.14 is not considered OUO anymore.

Addendum J.2

The contact information table in section J.7.1, Building Emergency Director, needs to be changed from "Operations Management/MO-720/373-1068" to "Shift Operations Manager/MO-720/373-7777."

The OUO marks on pages J.2.i through J.2.14 need to be removed. The evacuation route on page J.2.14 is not considered OUO anymore.

WAC 173-303-830 Modification Class	Class 1	Class 1	Class 2	Class 3
Please mark the Modification Class:	X			

Enter relevant WAC 173-303-830, Appendix I Modification citation number: *B.6.d. and A.1*

Contingency Plan: Changes in name, address, or phone number of coordinators or others persons or agencies identified in the plan.

General Permit Provisions: Administrative and informational changes . . . .

Modification Approved: ☒ Yes ☐ No (state reason for denial)

Reason for denial:

Reviewed by Ecology:

S. L. Dahl-Crumpler

3-18-16
Date

Remove and Replace the Following Pages:

Addendum J.1, Pages J.1.i through J.1.14

Addendum J.2, pages J.2.i through J.2.14

ADDENDUM J.1
PRE-ACTIVE LIFE CONTINGENCY PLAN

~~OFFICIAL USE ONLY~~
~~May be exempt from public release under the Freedom of Information Act (5 U.S.C. 552)Exemption number(s) and category: Exemption 7 Law Enforcement~~
~~Department of Energy review required before public release~~

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ADDENDUM J.1
PRE-ACTIVE LIFE CONTINGENCY PLAN

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Table J.1. Hanford Facility Documents Containing Contingency Plan Requirements of WAC 173-303-350(3) 5

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J.0 CONTINGENCY PLAN

The requirements in this Addendum that address activities involving the receipt and disposal of dangerous waste as defined in WAC 173-303-040 shall be applied during the "Active Life" of the IDF. Active Life of a facility means the period from the initial receipt of dangerous waste at the facility until the department receives certification of final closure (WAC 173-303-040). The requirements of this Addendum that do not apply to receipt and disposal of dangerous waste as defined in WAC-173-303-040, shall be implemented by the Permittees during the "Pre-Active Life" of IDF. Pre-Active Life is not defined in the regulations, but refers to the facility maintenance period between final construction and the start of active life. Once the IDF begins to receive dangerous waste, the requirements in Addendum J.1 are no longer applicable, and requirements in Addendum J.2 will be applicable.

The requirements for a contingency plan at IDF are satisfied in the following documents: portions of the Hanford Facility RCRA Permit (Permit) Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02) and this Addendum.

The unit-specific building emergency plan also serves to satisfy a broad range of other requirements [e.g., Occupational Safety and Health Administration standards (29 CFR 1910), *Toxic Substance Control Act of 1976* (40 CFR 761) and U.S. Department of Energy Orders]. Therefore, revisions made to portions of this unit-specific building emergency plan that are not governed by the requirements of WAC 173-303 will not be considered as a modification subject to WAC 173-303-830 or Permit Condition I.C.3.

Table J.1 identifies the sections of the unit-specific building emergency plan written to meet WAC 173-303-350(3) contingency plan requirements. Section 12.0 of the unit-specific building emergency plan is written to meet WAC 173-303 requirements identifying where copies of Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02) and the building emergency plan are located and maintained on the Hanford Facility. Therefore, revisions to Addendum J require a Permit modification subject to WAC 173-303-830 and/or Permit Condition I.C.3.

Table J.1. Hanford Facility Documents Containing Contingency Plan Requirements of WAC 173-303-350(3)

Requirement	Permit Attachment 4, Hanford Emergency Management Plan (DOE/RL-94-02):	Building Emergency Plan[1] *(HNF-39903)*	Addendum J
-350(3)(a) - A description of the actions which facility personnel must take to comply with this section and WAC 173-303-360.	X[2] Section 1.3.4	X[2] Sections 7.1, 7.2 through 7.2.5, and 7.3[3] Sections 4.0, 8.2, 8.3, 8.4, and 11.0	X[2] Sections J.3.1, J.3.2 through J.3.2.5, and J.3.3[3] Sections J.3, J.3.4, J.3.5, J.3.6, and J.5
-350(3)(b) - A description of the actions which shall be taken in the event that a dangerous waste shipment, which is damaged or otherwise presents a hazard to the public health and the environment, arrives at the facility, and is not acceptable to the owner or operator, but cannot be transported pursuant to the requirements of WAC 173-303-370(5), Manifest system, reasons for not accepting dangerous waste shipments.	X[2] Section 1.3.4	X[2,4] Section 7.2.5.1	X[2,4] Section J.3.2.5.1

Requirement	Permit Attachment 4, Hanford Emergency Management Plan (DOE/RL-94-02):	Building Emergency Plan[1] *(HNF-39903)*	Addendum J
-350 (3)(c)- A description of the arrangements agreed to by local police departments, fire departments, hospitals, contractors, and state and local emergency response teams to coordinate emergency services as required in WAC 173-303-340(4).	X Sections 3.2.3, 3.3.1, 3.3.2, 3.4, 3.4.1.1, 3.4.1.2, 3.4.1.3, 3.7, and Table 3-1		
-350 (3)(d)- A current list of names, addresses, and phone numbers (office and home) of all persons qualified to act as the emergency coordinator required under WAC 173-303-360(1). Where more than one person is listed, one must be named as primary emergency coordinator, and others must be listed in the order in which they will assume responsibility as alternates. For new facilities only, this list may be provided to the department at the time of facility certification (as required by WAC 173-303-810(14)(a)(I)), rather than as part of the permit application.		X[5] Sections 3.1and 13.0	X[5] Sections J.2 and J.7
-350(3)(e) - A list of all emergency equipment at the facility (such as fire extinguishing systems, spill control equipment, communications and alarm systems, and decontamination equipment), where this equipment is required. This list must be kept up to date. In addition, the plan must include the location and a physical description of each item on the list, and a brief outline of its capabilities.		X Section 9.0	X Section J.4
-350(3)(f) - An evacuation plan for facility personnel where there is a possibility that evacuation could be necessary. This plan must describe the signal(s) to be used to begin evacuation, evacuation routes, and alternate evacuation routes.	X[6] Figure 7-3 and Table 5-1	X[7] Section 1.5	X[7] Section J.1

An 'X' indicates requirement applies.

[1] Portions of Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02) not enforceable through Appendix A of that document are not made enforceable by reference in the building emergency plan.

[2] Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02) contains descriptions of actions relating to the Hanford Site Emergency Preparedness System. No additional description of actions is required at the site level. If other credible scenarios exist or if emergency procedures at the unit are different, the description of actions contained in the building emergency plan will be used during an event by a building emergency director.

[3] Sections 7.1, 7.2 through 7.2.5, and 7.3 of the building emergency plan are those sections subject to the Class 2 "Changes in emergency procedures (i.e., spill or release response procedures,)" described in WAC 173-303-830, Appendix I Section B.6.a.

[4] This requirement only applies to treatment, storage, and disposal (TSD) units that receive shipment of dangerous or mixed waste defined as offsite shipments in accordance with WAC 173-303.

[5] Emergency Coordinator names and home telephone numbers are maintained separate from any contingency plan document on file in accordance with Permit Condition II.A.4. and is updated, at a minimum, monthly.

[6] The Hanford Facility (Sitewide) signals are provided in this document. No unit/building signal information is required unless unique devices are used at the unit/building.

[7] An evacuation route for the TSD unit must be provided. Evacuation routes for occupied buildings surrounding the TSD unit are provided through information boards posted within buildings.

J.1 Building Evacuation Routing

Figure J.1 provides identification of the primary and secondary staging areas and a general layout of the IDF. Alternate evacuation routes will be used on a case-by-case basis based on meteorological conditions at the time of the event.

J.2 Building Emergency Director/Building Warden (BED/BW)

Emergency response will be directed by the BED/BW until the Incident Commander (IC) arrives. The Incident Command System (ICS) and staff with supporting on-call personnel fulfill the responsibilities of the Emergency Coordinator as discussed in WAC 173-303-360. During events, IDF personnel perform response duties under the direction of the BED/BW. The Incident Command Post (ICP) is managed by the senior Hanford Fire Department official, unless the event is determined to be primarily a security event, in which case the Hanford Fire Department and Hanford Patrol will operate under a unified command system with Hanford Patrol making all decisions pertaining to security. These individuals are designated as the IC, and as such, have the authority to request and obtain any resources necessary for protecting people and the environment.

The BED/BW becomes a member of the ICP and functions under the direction of the IC. In this role, the BED/BW continues to manage and direct IDF operations.

A listing of BED/BWs by title, work location, and work telephone number is contained in Section J.7.1 of this plan. The BED/BW is on the premises or is available through "on-call" list 24-hours a day. Names and home telephone numbers of the BED/BWs are available from the Patrol Operations Center (POC) in accordance with Permit Condition II.A.4.

J.3 Implementation of the Plan

In accordance with WAC 173-303-360(2)(b), the BED/BW ensures that trained personnel identify the character, source, amount, and areal extent of the release, fire, or explosion to the extent possible. Identification of waste can be made by activities that can include, but are not limited to, visual inspection of dangerous waste, sampling activities in the field, reference to inventory records, or by consulting with facility personnel. Samples of materials involved in an emergency might be taken by qualified personnel and analyzed as appropriate. These activities must be performed with a sense of immediacy and shall include available information.

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

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 IDF or 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/BW shall determine, in consultation with the site contractor environmental single point-of-contact, if notification to the Washington State Department of Ecology (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 Permit Attachment 4, *Hanford Emergency Management Plan* (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/BW is responsible for initiating any protective actions based on their best judgment of the incident.

The BED/BW 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 from site office phones/373-0911 from cellular phones) must be used to contact the POC and request the desired assistance. To request other resources or assistance from outside the IDF, the POC business number is used (373-3800).

J.3.1 Protective Actions Responses

Protective action responses are discussed in the following sections. The steps identified in the following description of actions do not have to be performed in sequence because of the unanticipated sequence of incident events.

J.3.1.1 Evacuation

If an evacuation is ordered or the evacuation siren sounds in the area of the IDF, personnel will proceed to the staging area.

The BED/BW or staging area manager directs the evacuation; however, to ensure that evacuations can be conducted promptly and safely, all personnel must be familiar with the evacuation procedure.

Area evacuations are rapid or controlled and the differences between them are pointed out in the following steps. When possible, these steps must be performed concurrently.

AREA EVACUATION PROCEDURE
Halt any operations or work and place equipment and structures in a safe condition. Use emergency shutdown procedures for rapid evacuation.
Use whatever means are available (portable radios, bullhorns, runners, etc.) to pass the evacuation information to personnel.
Evacuate personnel to the staging area; group personnel as follows: potentially contaminated protective clothing, keys immediately available for vehicles, and those needing rides. Assist personnel that are temporary/permanently disabled.
Conduct personnel accountability. If unable to account for personal, report personnel accountability results to the Hanford Emergency Operations Center (Hanford-EOC).
Inform IC of any potentially affected personnel (i.e., injured, contaminated, exposed, etc.) once the IC arrives at the ICP.
Relay pertinent evacuation information (routes, destination etc.) to drivers.
Dispatch vehicles as soon as the vehicles are loaded.
Report status to the Hanford-EOC, request additional transportation if required, and report if any personnel remain who are performing late shutdown duties.

J.3.1.2 Take Cover

When the Take Cover Alarm is activated, personnel will take cover in the nearest suitable building or trailer.

A message followed by the Take Cover siren is transmitted over the area emergency sirens. The following actions must be taken or considered:

- Shut doors and windows and wait for further instructions.
- Secure ventilation system.
- Follow normal exit procedures from radiological areas.
- Lock up classified documents and prepare for a possible evacuation.
- Report your location to the Accountability Aid or the BED/BW.
- Accountability Aides will provide accountability status to the Staging Area Manager for IDF personnel during an event.
- Inform IC of any potentially affected personnel (i.e., injured, contaminated, exposed, etc.) once the IC arrives at the ICP.

J.3.2 Response to Facility Operations Emergencies

Depending on the severity of the event, the BED/BW reviews the site-wide and IDF emergency response procedure(s) and, as required, categorizes and/or classifies the event. If necessary, the BED/BW initiates area protective actions and Hanford Site Emergency Response Organization activation. The steps identified in the following description of actions do not have to be performed in sequence because of the unanticipated sequence of incident events.

J.3.2.1 Loss of Utilities

The only loss of utilities is electrical. Loss of electricity does not constitute an emergency, but must be restored as soon as possible. Electricity supplies power to the sump pumps used to remove accumulated leachate from the primary and secondary liners. The loss of water, ventilation, steam, air, and vacuum are not applicable to the IDF.

J.3.2.2 Major Process Disruption/Loss of Plant Control

N/A

J.3.2.3 Pressure Release

N/A

J.3.2.4 Fire and/or Explosion

In the event of a fire, the discoverer activates a fire alarm (pull box); calls 911 from site office phones/373-0911 from cellular phones or verifies that the Hanford Emergency Response Number has been called.

- Unless otherwise instructed, personnel shall evacuate the area/building by the nearest safe exit and proceed to the designated staging area for accountability.
- On actuation of the fire alarm, ONLY if time permits, personnel should shut down equipment and secure waste. The alarm automatically signals the Hanford Fire Department.
- The BED/BW proceeds directly to the ICP, obtains all necessary information pertaining to the incident, and sends a representative to meet Hanford Fire Department.
- The BED/BW provides a formal turnover to the IC when the IC arrives at the ICP.

- The BED/BW informs the Hanford Site Emergency Response Organization as to the extent of the emergency (including estimates of dangerous waste and mixed waste quantities released to the environment).
- If operations are stopped in response to the fire, the BED/BW ensures that systems are monitored for leaks, pressure buildup, gas generation, and ruptures.
- Hanford Fire Department firefighters extinguish the fire as necessary.

J.3.2.5 Hazardous Material, Dangerous and/or Mixed Waste Spill

Spills can result from many sources including process leaks, container spills or leaks, damaged packages or shipments, or personnel error. Spills of mixed waste are complicated by the need to deal with the extra hazards posed by the presence of Atomic Energy Act materials.

- The discoverer notifies the BED/BW and initiates SWIMS response:
  - Stops work.
  - Warns others in the vicinity.
  - Isolates the area.
  - Minimizes the exposure to the hazards.
  - Requests the BED/BW Secure ventilation.
- The BED/BW determines if emergency conditions exist requiring response from the Hanford Fire Department based on classification of the spill and injured personnel, and evaluates need to perform additional protective actions.
- If the Hanford Fire Department resources are not needed, the spill is mitigated with resources identified in Section J.4.5 and proper notifications are made.
- If the Hanford Fire Department resources are needed, the BED/BW calls 911 from site office phones/373-0911 from cellular phones.
- The BED/BW sends a representative to meet the Hanford Fire Department.
- The BED/BW provides a formal turnover to the IC when the IC arrives at the ICP.
- The BED/BW informs the Hanford Site Emergency Response Organization as to the extent of the emergency (including estimates of dangerous waste and mixed waste quantities released to the environment).
- If operations are stopped in response to the spill, the BED ensures that systems are monitored for leaks, pressure buildup, gas generation, and ruptures.
- Hanford Fire Department stabilizes the spill.

J.3.2.6 Damaged or Unacceptable Shipments

The IDF does not receive onsite transfers or off-site shipments of dangerous and/or mixed waste.

J.3.3 Prevention of Recurrence or Spread of Fires, Explosions, or Releases

The BED/BW, as part of the ICP, takes the steps necessary to ensure that a secondary release, fire, or explosion does not occur. The BED/BW takes measures, where applicable, to stop processes and maintenance activities, collect and contain released waste, and remove or isolate containers. The BED/BW shall also monitor for leaks, pressure buildups, gas generation, or ruptures in valves, pipes or other equipment, whenever this is appropriate.

J.3.4 Termination of Event, Incident Recovery, Restart of Operations

Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02), Section 9.0, describes actions for event termination, incident recovery, and restart of operations. The extent by which these

actions are employed is based upon the incident classification of each event. In addition, Permit Attachment 4, *Hanford Emergency Management Plan (*DOE/RL-94-02), also contains actions for the management of incompatible waste that might apply.

J.3.4.1 Termination of Event

For events where the Hanford Emergency Operations Center (Hanford-EOC) is activated, the DOE-RL or DOE Office of River Protection Emergency Manager has the authority to declare event termination. This decision is based on input from the BED/BW, IC, and other emergency response organization members. For events where the Hanford-EOC is not activated, the ICS and staff will declare event termination.

J.3.4.2 Incident Recovery and Restart of Operations

A recovery plan is developed when necessary in accordance with Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02), Section 9.2. A recovery plan is needed following an event where further risk could be introduced to personnel, the IDF, or the environment through recovery action and/or to maximize the preservation of evidence.

If this plan was implemented according to Section J.3, Ecology is notified before operations can resume. Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02), Section 5.1, discusses different reports to outside agencies. This notification is in addition to those required reports and must include the following statements:

- There are no incompatibility issues with the waste and released materials from the incident.
- All the equipment has been cleaned, fit for its intended use, and placed back into service.

The notification required by WAC 173-303-360(2)(j) may be made via telephone conference. Additional information that Ecology requests regarding these restart conditions will be included in the required 15-day report identified in Section J.5.

For emergencies not involving activation of the Hanford-EOC, the BED/BW ensures that conditions are restored to normal before operations are resumed. If the Hanford Site Emergency Response Organization was activated and the emergency phase is complete, a special recovery organization could be appointed at the discretion of RL to restore conditions to normal. This process is detailed in RL and contractor emergency procedures. The makeup of this organization depends on the extent of the damage and the effects. The onsite recovery organization will be appointed by the appropriate contractor's management.

J.3.5 Incompatible Waste

After an event, the BED/BW or the onsite recovery organization ensures that no waste that might be incompatible with the released material is treated, stored, and/or disposed of until cleanup is completed. Clean up actions are taken by IDF personnel or other assigned personnel. Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02), Section 9.2.3, describes actions to be taken.

Waste from cleanup activities is designated and managed as newly generated waste. A field check for compatibility is performed before storage, as necessary. Incompatible wastes are not placed in the same container. Containers of waste are placed in approved storage areas appropriate for their compatibility class.

If incompatibility of waste was a factor in the incident, the BED/BW or the onsite recovery organization ensures that the cause is corrected.

J.3.6 Post Emergency Equipment Maintenance and Decontamination

All equipment used during an incident is decontaminated (if practicable) or disposed of as spill debris. Decontaminated equipment is checked for proper operation before storage for subsequent use. Consumables and disposed materials are restocked. Fire extinguishers are replaced.

The BED/BW ensures that all equipment is cleaned and fit for its intended use before operations are resumed. Depleted stocks of neutralizing and absorbing materials are replenished, and protective clothing is cleaned or disposed of and restocked, etc.

J.4 Emergency Equipment

Emergency resources and equipment for the IDF are presented in this section.

J.4.1 Fixed Emergency Equipment

FIXED EMERGENCY EQUIPMENT		
Type	**Location**	**Capability**
6 Inch Fire Hydrants	IDF	Fire suppression

J.4.2 Portable Emergency Equipment

PORTABLE EMERGENCY EQUIPMENT		
Type	**Location**	**Capability**
Fire extinguishers	In motorized equipment (e.g., trucks, etc.), nearby structures (e.g., change trailers, storage buildings, etc.).	Use on any Class A, B, or C fires. (Note: Some are only B and C.) Do NOT use on sodium.

J.4.3 Communications Equipment/Warning Systems

COMMUNICATIONS EQUIPMENT		
Type	**Location**	**Capability**
Cell phones	Portable	Communication

NOTE: Site-wide communications and warning systems are identified in Permit Attachment 4, Hanford Emergency Management Plan (DOE/RL-94-02), Table 5.1.

J.4.4 Personal Protective Equipment

PERSONAL PROTECTIVE EQUIPMENT		
Type	**Location**	**Capability**
N/A		

J.4.5 Spill Control and Containment Supplies

SPILL KITS AND SPILL CONTROL EQUIPMENT		
Type	**Location**	**Capability**
N/A		

J.4.6 Incident Command Post

The ICPs for the IDF are in MO-720 and MO-438. Emergency resource materials are stored at each location. The IC could activate the Hanford Fire Department Mobile Command Unit if necessary.

J.4.7 Coordination Agreements

RL has established a number of coordination agreements, or memoranda of understanding (MOU) with various agencies to ensure proper response resource availability for incidents involving the Hanford Site. A description of the agreements is contained in Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02), Section 3.0, Table 3-1.

J.5 Required Reports

Post incident written reports are required for certain incidents on the Hanford Site. The reports are described in Permit Attachment 4, *Hanford Emergency Management Plan*, (DOE/RL-94-02), Section 5.1.

Facility management must note in the TSD-unit operating record, the time, date, and details of any incident that requires implementation of the contingency plan (Section J.3). Within fifteen (15) days after the incident, a written report must be submitted to Ecology. The report must include the elements specified in WAC 173-303-360(2)(k).

J.6 Plan Location and Amendments

Copies of this plan are maintained at the following locations:

- MO-720
- MO-438

This plan is reviewed and immediately amended as necessary, in accordance with Permit Attachment 4, *Hanford Emergency Management Plan (*DOE/RL-94-02), Section 14.3.1.1.

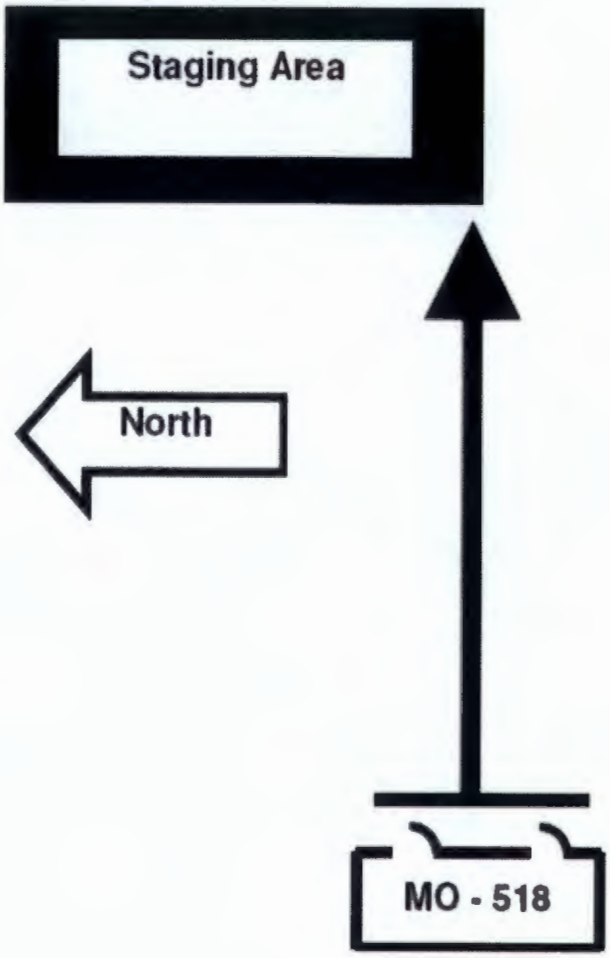
J.7 Facility/Building Emergency Response Organization

J.7.1 Building Emergency Director/Building Warden

TITLE	WORK LOCATION	WORK PHONE
~~IDF Management~~ Shift Operations Manager	MO-720	~~373-1068~~ 373-7777

Names and home telephone numbers of the BED/BWs are available from the POC (373-3800) in accordance with Permit Condition II.A.4.

Figure J.1. Evacuation Routes



ADDENDUM J.2
ACTIVE LIFE CONTINGENCY PLAN

~~OFFICIAL USE ONLY~~
~~May be exempt from public release under the Freedom of Information Act (5 U.S.C. 552)Exemption number(s) and category: Exemption 7 Law Enforcement~~
~~Department of Energy review required before public release~~

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ADDENDUM J.2
ACTIVE LIFE CONTINGENCY PLAN

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FIGURE

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J.0 CONTINGENCY PLAN

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The requirements for a contingency plan at IDF are satisfied in the following documents: portions of the Hanford Facility RCRA Permit (Permit) Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02) and this Addendum.

The unit-specific building emergency plan also serves to satisfy a broad range of other requirements [e.g., Occupational Safety and Health Administration standards (29 CFR 1910), *Toxic Substance Control Act of 1976* (40 CFR 761) and U.S. Department of Energy Orders]. Therefore, revisions made to portions of this unit-specific building emergency plan that are not governed by the requirements of WAC 173-303 will not be considered as a modification subject to WAC 173-303-830 or Permit Condition I.C.3.

Table J.1 identifies the sections of the unit-specific building emergency plan written to meet WAC 173-303-350(3) contingency plan requirements. Section 12.0 of the unit-specific building emergency plan is written to meet WAC 173-303 requirements identifying where copies of Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02) and the building emergency plan are located and maintained on the Hanford Facility. Therefore, revisions to Addendum J require a Permit modification subject to WAC 173-303-830 and/or Permit Condition I.C.3.

Table J.1. Hanford Facility Documents Containing Contingency Plan Requirements of WAC 173-303-350(3)

Requirement	Permit Attachment 4, Hanford Emergency Management Plan (DOE/RL-94-02):	Building Emergency Plan[1] *(HNF-39904)*	Addendum J
-350(3)(a) - A description of the actions which facility personnel must take to comply with this section and WAC 173-303-360.	X[2] Section 1.3.4	X[2] Sections 7.1, 7.2 through 7.2.5, and 7.3[3] Sections 4.0, 8.2, 8.3, 8.4, and 11.0	X[2] Sections J.3.1, J.3.2 through J.3.2.5, and J.3.3[3] Sections J.3, J.3.4, J.3.5, J.3.6, and J.5
-350(3)(b) - A description of the actions which shall be taken in the event that a dangerous waste shipment, which is damaged or otherwise presents a hazard to the public health and the environment, arrives at the facility, and is not acceptable to the owner or operator, but cannot be transported pursuant to the requirements of WAC 173-303-370(5), Manifest system, reasons for not accepting dangerous waste shipments	X[2] Section 1.3.4	X[2,4] Section 7.2.5.1	X[2,4] Section J.3.2.5.1

Requirement	Permit Attachment 4, Hanford Emergency Management Plan (DOE/RL-94-02):	Building Emergency Plan[1] *(HNF-39904)*	Addendum J
-350(3)(c) - A description of the arrangements agreed to by local police departments, fire departments, hospitals, contractors, and state and local emergency response teams to coordinate emergency services as required in WAC 173-303-340(4).	X Sections 3.2.3, 3.3.1, 3.3.2, 3.4, 3.4.1.1, 3.4.1.2, 3.4.1.3, 3.7, and Table 3-1		
-350(3)(d) - A current list of names, addresses, and phone numbers (office and home) of all persons qualified to act as the emergency coordinator required under WAC 173-303-360(1). Where more than one person is listed, one must be named as primary emergency coordinator, and others must be listed in the order in which they will assume responsibility as alternates. For new facilities only, this list may be provided to the department at the time of facility certification (as required by WAC 173-303-810(14)(a)(I)), rather than as part of the permit application.		X[5] Sections 3.1and 13.0	X[5] Sections J.2 and J.7
-350(3)(e) - A list of all emergency equipment at the facility (such as fire extinguishing systems, spill control equipment, communications and alarm systems, and decontamination equipment), where this equipment is required. This list must be kept up to date. In addition, the plan must include the location and a physical description of each item on the list, and a brief outline of its capabilities.		X Section 9.0	X Section J.4
-350(3)(f) - An evacuation plan for facility personnel where there is a possibility that evacuation could be necessary. This plan must describe the signal(s) to be used to begin evacuation, evacuation routes, and alternate evacuation routes.	X[6] Figure 7-3 and Table 5-1	X[7] Section 1.5	X[7] Section J.1

An 'X' indicates requirement applies.

[1] Portions of Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02) not enforceable through Appendix A of that document are not made enforceable by reference in the building emergency plan.

[2] Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02) contains descriptions of actions relating to the Hanford Site Emergency Preparedness System. No additional description of actions is required at the site level. If other credible scenarios exist or if emergency procedures at the unit are different, the description of actions contained in the building emergency plan will be used during an event by a building emergency director.

[3] Sections 7.1, 7.2 through 7.2.5, and 7.3 of the building emergency plan are those sections subject to the Class 2 "Changes in emergency procedures (i.e., spill or release response procedures,)" described in WAC 173-303-830, Appendix I Section B.6.a.

[4] This requirement only applies to treatment, storage, and disposal (TSD) units that receive shipment of dangerous or mixed waste defined as offsite shipments in accordance with WAC 173-303.

[5] Emergency Coordinator names and home telephone numbers are maintained separate from any contingency plan document on file in accordance with Permit Condition II.A.4 and are updated, at a minimum, monthly.

[6] The Hanford Facility (Sitewide) signals are provided in this document. No unit/building signal information is required unless unique devices are used at the unit/building.

[7] An evacuation route for the TSD unit must be provided. Evacuation routes for occupied buildings surrounding the TSD unit are provided through information boards posted within buildings.

J.1 Building Evacuation Routing

Figure J.1 provides identification of the primary and secondary staging areas and a general layout of the IDF. Alternate evacuation routes will be used on a case-by-case basis based on meteorological conditions at the time of the event.

J.2 Building Emergency Director

Emergency response is directed by the BED until the Incident Commander (IC) arrives. The Incident Command System (ICS) and staff with supporting on call personnel fulfill the responsibilities of the Emergency Coordinator as discussed in WAC 173-303-360. During events, IDF personnel perform response duties under the direction of the BED. The Incident Command Post (ICP) is managed by the senior Hanford Fire Department official, unless the event is determined to be primarily a security event, in which case the Hanford Fire Department and Hanford Patrol will operate under a unified command system with Hanford Patrol making all decisions pertaining to security. These individuals are designated as the IC, and as such, have the authority to request and obtain any resources necessary for protecting people and the environment.

The BED becomes a member of the ICP and functions under the direction of the IC. In this role, the BED continues to manage and direct IDF operations.

A listing of BEDs by title, work location, and work telephone numbers is contained in Section J.7.1. The BED is on the premises or is available through an 'on call' list 24 hours a day. Names and home telephone numbers of the BEDs are available from the Patrol Operations Center (POC) in accordance with Permit Condition II.A.4.

J.3 Implementation of the Plan

In accordance with WAC 173-303-360(2)(b), the BED ensures that trained personnel identify the character, source, amount, and areal extent of the release, fire, or explosion to the extent possible. Identification of waste can be made by activities that can include, but are not limited to, visual inspection of dangerous/mixed waste, sampling activities in the field, reference to inventory records, or by consulting with facility personnel. Samples of materials involved in an emergency might be taken by qualified personnel and analyzed as appropriate. These activities must be performed with a sense of immediacy and shall include available information.

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

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 IDF or 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 site contractor environmental single point-of-contact, if notification to the Washington State Department of Ecology (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 Permit Attachment 4, *Hanford Emergency Management Plan* (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 from site office phones/373-0911 from cellular phones) must be used to contact the POC and request the desired assistance. To request other resources or assistance from outside the IDF, the POC business number is used (373-3800).

J.3.1 Protective Actions Responses

Protective action responses are discussed in the following sections. The steps identified in the following description of actions do not have to be performed in sequence because of the unanticipated sequence of incident events.

J.3.1.1 Evacuation

If an evacuation is ordered or the evacuation siren sounds in the area of the IDF, personnel will proceed to the staging area.

The BED or staging area manager directs the evacuation; however, to ensure that evacuations can be conducted promptly and safely, all personnel must be familiar with the evacuation procedure.

Area evacuations are rapid or controlled and the differences between them are pointed out in the following steps. When possible, these steps must be performed concurrently.

AREA EVACUATION PROCEDURE
Halt any operations or work and place equipment and structures in a safe condition. Use emergency shutdown procedures for rapid evacuation.
Use whatever means are available (portable radios, bullhorns, runners, etc.) to pass the evacuation information to personnel.
Evacuate personnel to the staging area; group personnel as follows: potentially contaminated protective clothing, keys immediately available for vehicles, and those needing rides. Assist personnel that are temporary/permanently disabled.
Conduct personnel accountability. If unable to account for personal, report personnel accountability results to the Hanford Emergency Operations Center (Hanford-EOC).
Inform IC of any potentially affected personnel (i.e., injured, contaminated, exposed, etc.) once the IC arrives at the ICP.
Relay pertinent evacuation information (routes, destination etc.) to drivers.
Dispatch vehicles as soon as the vehicles are loaded.
Report status to the Hanford-EOC, request additional transportation if required, and report if any personnel remain who are performing late shutdown duties.

J.3.1.2 Take Cover

When the Take Cover Alarm is activated, personnel will take cover in the nearest suitable building or trailer.

A message followed by the Take Cover siren is transmitted over the area emergency sirens. The following actions must be taken or considered:

- Shut doors and windows and wait for further instructions.
- Secure ventilation system.

- Follow normal exit procedures from radiological areas.
- Lock up classified documents and prepare for a possible evacuation.
- Report your location to the Accountability Aid or the BED.
- Accountability Aides will provide accountability status to the Staging Area Manager for IDF personnel during an event.
- Inform IC of any potentially affected personnel (i.e., injured, contaminated, exposed, etc.) once the IC arrives at the ICP.

J.3.2 Response to Facility Operations Emergencies

Depending on the severity of the event, the BED reviews the site wide and IDF emergency response procedure(s) and, as required, categorizes and/or classifies the event. If necessary, the BED initiates area protective actions and Hanford Site Emergency Response Organization activation. The steps identified in the following description of actions do not have to be performed in sequence because of the unanticipated sequence of incident events.

J.3.2.1 Loss of Utilities

The only loss of utilities is electrical. Loss of electricity does not constitute an emergency, but must be restored as soon as possible. Electricity supplies power to the sump pumps used to remove accumulated leachate from the primary and secondary liners. The loss of water, ventilation, steam, air, and vacuum are not applicable to the IDF.

J.3.2.2 Major Process Disruption/Loss of Plant Control

N/A

J.3.2.3 Pressure Release

N/A

J.3.2.4 Fire and/or Explosion

In the event of a fire, the discoverer activates a fire alarm (pull box); calls 911 from site office phones/373-0911 from cellular phones or verifies that the Hanford Emergency Response Number has been called.

- Unless otherwise instructed, personnel shall evacuate the area/building by the nearest safe exit and proceed to the designated staging area for accountability.
- On actuation of the fire alarm, ONLY if time permits, personnel should shut down equipment and secure waste. The alarm automatically signals the Hanford Fire Department.
- The BED proceeds directly to the ICP, obtains all necessary information pertaining to the incident, and sends a representative to meet Hanford Fire Department.
- The BED provides a formal turnover to the IC when the IC arrives at the ICP.
- The BED informs the Hanford Site Emergency Response Organization as to the extent of the emergency (including estimates of dangerous waste and mixed waste quantities released to the environment).
- If operations are stopped in response to a fire, the BED ensures that systems are monitored for leaks, pressure buildup, gas generation, and ruptures.
- Hanford Fire Department firefighters extinguish the fire as necessary.

J.3.2.5 Hazardous Material, Dangerous and/or Mixed Waste Spill

Spills can result from many sources including process leaks, container spills or leaks, damaged packages or shipments, or personnel error. Spills of mixed waste are complicated by the need to deal with the extra hazards posed by the presence of radioactive materials.

- The discoverer notifies the BED and initiates SWIMS response:
  - Stops work.
  - Warns others in the vicinity.
  - Isolates the area.
  - Minimizes the exposure to the hazards.
  - Requests the BED Secure ventilation.
- The BED determines if emergency conditions exist requiring response from the Hanford Fire Department based on classification of the spill and injured personnel, and evaluates need to perform additional protective actions.
- If the Hanford Fire Department resources are not needed, the spill is mitigated with resources identified in Section J.4.5 and proper notifications are made.
- If the Hanford Fire Department resources are needed, the BED calls 911 from site office phones/373-0911 from cellular phones.
- The BED sends a representative to meet the Hanford Fire Department.
- The BED provides a formal turnover to the IC when the IC arrives at the ICP.
- The BED informs the Hanford Site Emergency Response Organization as to the extent of the emergency (including estimates of dangerous waste and mixed waste quantities released to the environment).
- If operations are stopped in response to the spill, the BED ensures that systems are monitored for leaks, pressure buildup, gas generation, and ruptures.
- Hanford Fire Department stabilizes the spill.

J.3.2.6 Damaged or Unacceptable Shipments

During the course of receiving dangerous and/or mixed waste at IDF, an unanticipated event could be discovered resulting in a conformance issue concerning the waste. Damaged or unacceptable shipments resulting from onsite transfers are not subject to WAC 173-303-370 however conformance issues must be resolved in order to maintain proper records.

The following actions are taken to resolve the conformance issue:

- Operations management is notified of the damaged or unacceptable waste to be received.
- If the conformance issue results in a spill or release, actions described in Section J.4.5 are taken.
- The generating organization is notified of the conformance issue.
- An operations representative, in conjunction with the generating organization, determines the course of action to resolve the conformance issue.

J.3.3 Prevention of Recurrence or Spread of Fires, Explosions, or Releases

The BED, as part of the ICP, takes the steps necessary to ensure that a secondary release, fire, or explosion does not occur. The BED takes measures, where applicable, to stop processes and operations, collect and contain released waste, and remove or isolate containers. The BED also monitors for leaks, pressure buildups, gas generation, or ruptures in valves, pipes or other equipment, whenever this is appropriate.

J.3.4 Termination of Event, Incident Recovery, Restart of Operations

Permit Attachment 4, *Hanford Emergency Management Plan*, (DOE/RL-94-02), Section 9.0, describes actions for event termination, incident recovery, and restart of operations. The extent by which these actions are employed is based upon the incident classification of each event. In addition, Permit Attachment 4, *Hanford Emergency Management Plan*, (DOE/RL-94-02) also contains actions for the management of incompatible waste that might apply.

J.3.4.1 Termination of Event

For events where the Hanford Emergency Operations Center (Hanford-EOC) is activated, the DOE/RL or DOE Office of River Protection Emergency Manager has the authority to declare event termination. This decision is based on input from the BED, IC, and other emergency response organization members. For events where the Hanford-EOC is not activated, the ICS and staff will declare event termination.

J.3.4.2 Incident Recovery and Restart of Operations

A recovery plan is developed when necessary in accordance with Permit Attachment 4, *Hanford Emergency Management Plan,* (DOE/RL-94-02), Section 9.2. A recovery plan is needed following an event where further risk could be introduced to personnel, the IDF, or the environment through recovery action and/or to maximize the preservation of evidence.

If this plan was implemented according to Section J.3, Ecology is notified before operations can resume. Permit Attachment 4, *Hanford Emergency Management Plan,* (DOE/RL-94-02), Section 5.1, discusses different reports to outside agencies. This notification is in addition to those required reports and must include the following statements:

- There are no incompatibility issues with the waste and released materials from the incident.
- All the equipment has been cleaned, fit for its intended use, and placed back into service.

The notification required by WAC 173-303-360(2)(j) may be made via telephone conference. Additional information that Ecology requests regarding these restart conditions is included in the required 15-day report identified in Section J.5.

For emergencies not involving activation of the Hanford-EOC, the BED ensures that conditions are restored to normal before operations are resumed. If the Hanford Site Emergency Response Organization was activated and the emergency phase is complete, a special recovery organization could be appointed at the discretion of RL to restore conditions to normal. This process is detailed in RL and contractor emergency procedures. The makeup of this organization depends on the extent of the damage and the effects. The onsite recovery organization is appointed by the appropriate contractor's management.

J.3.5 Incompatible Waste

After an event, the BED or the onsite recovery organization ensures that no waste that might be incompatible with the released material is treated, stored, and/or disposed of until cleanup is completed. Clean up actions are taken by IDF personnel or other assigned personnel. Permit Attachment 4, *Hanford Emergency Management Plan,* (DOE/RL-94-02), Section 9.2.3, describes actions to be taken.

Waste from cleanup activities is designated and managed as newly generated waste. A field check for compatibility is performed before storage, as necessary.
Incompatible wastes are not placed in the same container. Containers of waste are placed in approved storage areas appropriate for their compatibility class.

If incompatibility of waste was a factor in the incident, the BED or the onsite recovery organization ensures that the cause is corrected.

J.3.6 Post Emergency Equipment Maintenance and Decontamination

All equipment used during an incident is decontaminated (if practicable) or disposed as spill debris. Decontaminated equipment is checked for proper operation before storage for subsequent use. Consumables and disposed materials are restocked. Fire extinguishers are replaced.

The BED ensures that all equipment is cleaned and fit for its intended use before operations are resumed. Depleted stocks of neutralizing and absorbing materials are replenished, and protective clothing is cleaned or disposed and restocked, etc.

J.4 Emergency Equipment

Emergency resources and equipment for the IDF is presented in this section.

J.4.1 Fixed Emergency Equipment

FIXED EMERGENCY EQUIPMENT		
Type	**Location**	**Capability**
Three 6-inch fire hydrants	IDF	Fire suppression

J.4.2 Portable Emergency Equipment

PORTABLE EMERGENCY EQUIPMENT		
Type	**Location**	**Capability**
Fire extinguishers	In motorized equipment (e.g., trucks, etc.), nearby structures (e.g., change trailers, storage buildings, etc.).	Use on any Class A, B, or C fires. (Note: Some are only B and C.) Do NOT use on sodium.
Eye wash and safety shower	TBD. Use nearest equipment as directed by management.	Assists in flushing unwanted chemical and material from clothing and body.

J.4.3 Communications Equipment/Warning Systems

COMMUNICATIONS EQUIPMENT		
Type	**Location**	**Capability**
Cell phones	Portable	Communication

NOTE Site-wide communications and warning systems are identified in Permit Attachment 4, Hanford Emergency Management Plan (DOE/RL-94-02), Table 5.1.

J.4.4 Personal Protective Equipment

PERSONAL PROTECTIVE EQUIPMENT		
Type	**Location**	**Capability**
Respirator	TBD	Protection from airborne particulates
Personal protective equipment Clothing	TBD	Personnel protection against exposure

J.4.5 Spill Control and Containment Supplies

SPILL KITS AND SPILL CONTROL EQUIPMENT		
Type	**Location**	**Capability**
Absorbents Overpack containers Shovels Chemical transfer pumps Spill kit	TBD	Contain or clean up spills Provide containment for leaking or damaged containers Clean up hazardous material spills Move hazardous materials Clean up hazardous material spills

J.4.6 Incident Command Post

The ICPs for the IDF are in MO-720 and MO-438. Emergency resource materials are stored at each location. The IC could activate the Hanford Fire Department Mobile Command Unit if necessary.

J.4.7 Coordination Agreements

RL has established a number of coordination agreements, or memoranda of understanding (MOU), with various agencies to ensure proper response resource availability for incidents involving the Hanford Site. A description of the agreements is contained in Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02), Section 3.0, Table 3-1.

J.5 Required Reports

Post incident written reports are required for certain incidents on the Hanford Site. The reports are described in Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02), Section 5.1.

Facility management must note in the TSD unit operating record, the time, date, and details of any incident that requires implementation of the contingency plan (Section J.3). Within fifteen (15) days after the incident, a written report must be submitted to Ecology. The report must include the elements specified in WAC 173-303-360(2)(k).

J.6 Plan Location and Amendments

Copies of this plan are maintained at the following locations:

- MO-720
- MO-438

This plan is reviewed and immediately amended as necessary in accordance with Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02), Section 14.3.1.1.

J.7 Facility/Building Emergency Response Organization

J.7.1 Building Emergency Director

IDF BEDs		
Title	**Work Location**	**Work Phone**
~~Operations Management~~ Shift Operations Manager	MO-720	~~373-1068~~ 373-7777

Names and home telephone numbers of the BEDs are available from the POC (373-3800), in accordance with Permit Condition II.A.4.

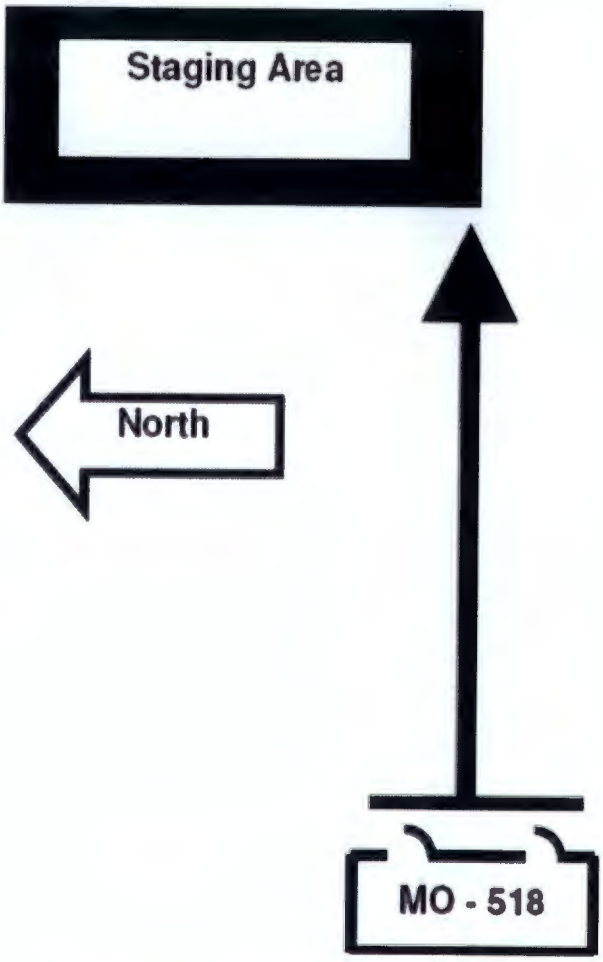

Figure J.1. Evacuation Routes

Hanford Facility RCRA Permit Modification Notification Forms

Part III, Operating Unit 16

400 Area Waste Management Unit

Index

Page 2 of 2: Hanford Facility RCRA Permit III. 16, Addendum J, Contingency Plan

Submitted by Co-Operator:

B H Ford for M. N. Jones 3/9/16

Co-Operator Name Date

Reviewed by DOE Program Office:

D A Faulk 3/9/16

DOE Program Office Name Date

Director, WMD

Hanford Facility RCRA Permit Modification Form

Unit:	Permit Part
400 Area Waste Management Unit	***Part III, Operating Unit Group 16***

Description of Modification:

Addendum J, Contingency Plan

First page footer after introduction page footers (J.i through J.iv) states "J.5" but should be "J.1". Subsequent footer pages need to be updated accordingly, i.e., J.5 through J.16 should be J.1 through J.12.

First page after introduction pages, the third paragraph, last sentence states that revisions to "Addendum E" (which is Preparedness and Prevention) require a permit modification but the reference should be to "Addendum J" "Contingency Plan". This wording has been submitted in a previous modification but want to make sure the correction does not get overwritten by this subsequent modification.

Table J.1. Hanford Facility Documents Containing Contingency Plan Requirements of WAC 173-303-350(3)

-350(3)(b), Column "Addendum J" states, "Section J.3.2.5.1", which does not exist in Addendum J. Wording should read as "Section J.3.2.6".

Section J.4.2 Portable Emergency Equipment

1. The "Fire Extinguisher", "Location" currently reads as:

   "A fire extinguisher is available at the ISA pad (inside the locked fenced area on the fence near the gate) and at the FSF building (adjacent to the entrance)."

   The more specific fire extinguisher location description should be:

   "A fire extinguisher is available at the ISA pad (inside the locked fenced area on the South side of the ISA pad fence near the only gate) and at the FSF building (adjacent to the East entrance)."

2. The "Emergency Response Kit", "Location" currently reads as:

   "An emergency response kit is maintained at the facility."

   The more specific fire extinguisher location description should be:

   "An emergency response kit is maintained at the facility. Kit is located on the North side of Building 4710."

WAC 173-303-830 Modification Class	Class 1	Class 1	Class 2	Class 3
Please mark the Modification Class:	X			

Enter relevant WAC 173-303-830, Appendix I Modification citation number: A.1 and A.2

Correction of typographical errors and informational changes of existing emergency equipment locations.

Modification Approved: [x] Yes [ ] No (state reason for denial)

Reason for denial:

Reviewed by Ecology:

S. L. Dahl-Crumpler 3-18-16 Date

Remove and Replace the Following Pages:

Part III, Operating Unit group 16, Addendum J., Contingency Plan

- Page "J.5" (currently J.5 but should be J.1) to address Table J.1 typo
- Page "J.12" (currently J.5 but should be J.8) to address emergency equipment location descriptions
- Replace all pages "J.5" through "J.16" with new footer page numbers J.1 through J.12.

ADDENDUM J
CONTINGENCY PLAN

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ADDENDUM J
CONTINGENCY PLAN

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FIGURES

Figure J.1. FFTF Primary Staging Area J.10
Figure J.2. FFTF Alternate Staging Area J.11

TABLES

Table J.1. Hanford Facility Documents Containing Contingency Plan Requirements of WAC 173 303-350(3) J.1

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J CONTINGENCY PLAN

The requirements for a contingency plan at the 400 Area WMU are satisfied in the following documents: Portions of the Hanford Facility RCRA Permit (Permit) Attachment 4 *Hanford Emergency Management Plan* (DOE/RL-94-02) and this section.

The unit-specific building emergency plan also serves to satisfy a broad range of other requirements [e.g., Occupational Safety and Health Administration standards (29 CFR 1910), *Toxic Substances Control Act of 1976* (40 CFR 761), and U.S. Department of Energy Orders]. Therefore, revisions made to portions of this unit-specific building emergency plan that are not governed by the requirements of WAC 173-303 will not be considered as a modification subject to WAC 173-303-830 or Permit Condition I.C.3.

Table J.1 identifies the sections of the unit-specific building emergency plan written to meet WAC 173-303-350(3) contingency plan requirements identified in this application. In addition, Section 12.0 of the unit-specific 400 Area WMU building emergency plan is written to meet WAC 173-303 requirements identifying where copies of Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02) and the building emergency plan are located and maintained on the Hanford Facility. Therefore, revisions to Addendum ~~E~~J require a permit modification subject to WAC 173-303-830 and/or Permit Condition I.C.3.

Table J.1. Hanford Facility Documents Containing Contingency Plan Requirements of WAC 173 303-350(3)

Requirement	Permit Attachment 4 *Hanford Emergency Management Plan* (DOE/RL-94-02)	Building Emergency Plan[1] (HNF-IP-0263-FFTF)	Addendum J
-350(3)(a) - A description of the actions which facility personnel must take to comply with this section and WAC 173-303-360	X[2] Section 1.3.4	X[2] Sections 7.1, 7.2 through 7.2.5, and 7.3[3] Sections 4.0, 8.2, 8.3, 8.4, and 11.0	X[2] Sections J.3.1, J.3.2 through J.3.2.5, and J.3.3[3] Sections J.3, J.3.4, J.3.5, J.3.6, and J.5
-350 (3)(b) - A description of the actions which shall be taken in the event that a dangerous waste shipment, which is damaged or otherwise presents a hazard to the public health and the environment, arrives at the facility, and is not acceptable to the owner or operator, but cannot be transported pursuant to the requirements of WAC 173-303-370(5), Manifest system, reasons for not accepting dangerous waste shipments	X[2] Section 1.3.4	X[2,4] Section 7.2.5.1	X[2,4] Section J.3.2.6~~5.1~~
-350(3)(c) - A description of the arrangements agreed to by local police departments, fire departments, hospitals, contractors, and state and local emergency response teams to coordinate emergency services as required in WAC 173-303-340(4).	X Sections 3.2.3, 3.3.1, 3.3.2, 3.4, 3.4.1.1, 3.4.1.2, 3.4.1.3, 3.7, and Table 3-1		

Commented [A1]: TO ECOLOGY:

Note that the pagination from this page to the last page has been updated but I could not get the redline strikeouts to remain.

The original pagination was J.5 to J.16 but has been corrected to J.1 to J.12.

Commented [A2]: This was submitted as an earlier permit modification to change "E" to "J".

Commented [A3]: Typo:

Change "Section J.3.2.5.1" which does not exist in this Addendum, to read as "Section J.3.2.6".

Requirement	Permit Attachment 4 *Hanford Emergency Management Plan* (DOE/RL-94-02)	Building Emergency Plan[1] (HNF-IP-0263-FFTF)	Addendum J
-350(3)(d) - A current list of names, addresses, and phone numbers (office and home) of all persons qualified to act as the emergency coordinator required under WAC 173-303-360(1). Where more than one person is listed, one must be named as primary emergency coordinator, and others must be listed in the order in which they will assume responsibility as alternates. For new facilities only, this list may be provided to the department at the time of facility certification (as required by WAC 173-303-810 (14)(a)(I)), rather than as part of the permit application.		X[5] Sections 3.1and 13.0	X[5] Sections J.2 and J.7
-350(3)(e) - A list of all emergency equipment at the facility (such as fire extinguishing systems, spill control equipment, communications and alarm systems, and decontamination equipment), where this equipment is required. This list must be kept up to date. In addition, the plan must include the location and a physical description of each item on the list, and a brief outline of its capabilities.		X Section 9.0	X Section J.4
-350(3)(f) - An evacuation plan for facility personnel where there is a possibility that evacuation could be necessary. This plan must describe the signal(s) to be used to begin evacuation, evacuation routes, and alternate evacuation routes.	X[6] Figure 7-3 and Table 5-1	X[7] Section 1.5	X[7] Section J.1

An 'X' indicates requirement applies.

[1] Portions of Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02) not enforceable through Appendix A of that document are not made enforceable by reference in the building emergency plan.

[2] Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02) contains descriptions of actions relating to the Hanford Site Emergency Preparedness System. No additional descriptions of actions are required at the site level. If other credible scenarios exist or if emergency procedures at the unit are different, the description of actions contained in the building emergency plan will be used during an event by a building emergency director.

[3] Sections 7.1, 7.2 through 7.2.5, and 7.3 of the building emergency plan are those sections subject to the Class 2 "Changes in emergency procedures (i.e., spill or release response procedures)" described in WAC 173-303-830, Appendix I, Section B.6.a.

[4] This requirement only applies to treatment, storage and disposal (TSD) units that receive shipment of dangerous or mixed waste defined as offsite shipments in accordance with WAC 173-303.

[5] Emergency Coordinator names and home telephone numbers are maintained separate from any contingency plan document on file in accordance with Permit Condition II.A.4 and is updated, at a minimum, monthly.

[6] The Hanford Facility (site wide) signals are provided in this document. No unit/building signal information is required unless unique devices are used at the unit/building.

[7] An evacuation route for the TSD unit must be provided. Evacuation routes for occupied buildings surrounding the TSD unit are provided through information boards posted within buildings.

J.1 Building Evacuation Routing (Building Layout)

Figures J.1 and J.2 provide identification of the primary and secondary staging areas and a general layout of the 400 Area WMU. Alternate evacuation routes will be used on a case-by-case basis based on meteorological conditions at the time of the event.

J.2 Building Emergency Director (BED)

Emergency response will be directed by the BED until the Incident Commander (IC) arrives. The incident command system (ICS) and staff, with supporting on-call personnel, fulfill the responsibilities of the Emergency Coordinator as discussed in WAC 173-303-360. During events, WMU personnel perform response duties under the direction of the BED. The Incident Command Post (ICP) is managed by either, the senior Hanford Fire Department member present or senior Hanford Patrol member present on the scene (security events only). These individuals are designated as the IC and as such, have the authority to request and obtain any resources necessary for protecting people and the environment.

The BED becomes a member of the ICP and functions under the direction of the IC. In this role, the BED continues to manage and direct 400 Area WMU operations.

A listing of the BEDs by title, work location, and work telephone number is contained in Section J.7. The BED is on the premises or is available through an "on-call" list 24-hours-a-day. Names and home telephone numbers of the BEDs are available from the Patrol Operations Center (POC) in accordance with Permit Condition II.A.4.

J.3 Implementation of the Plan

In accordance with WAC 173-303-360(2)(b), the BED ensures that trained personnel identify the character, source, amount, and areal extent of the release, fire, or explosion to the extent possible. Identification of waste can be made by activities that can include, but are not limited to, visual inspection of involved containers, sampling activities in the field, reference to inventory records, or by consulting with facility personnel. Samples of materials involved in an emergency might be taken by qualified personnel and analyzed as appropriate. These activities must be performed with a sense of immediacy and shall include available information.

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

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 400 Area WMU or 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 site contractor environmental single-point-of-contact, if notification to the Washington State Department of Ecology (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 Permit Attachment 4, *Hanford Emergency Management Plan* (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 from site office phones/373-0911 from cellular phones) must be used to contact the POC and request the desired assistance. To request other resources or assistance from outside the 400 Area WMU, the POC business number is used (373-3800).

J.3.1 Protective Action Responses

Protective action responses are discussed in the following sections. The steps identified in the following description of actions do not have to be performed in sequence because of the unanticipated sequence of incident events.

J.3.1.1 Evacuation

When a Fast Flux Test Facility (FFTF) evacuation is ordered or the evacuation siren sounds, non-essential employees will turn off office equipment, obtain car keys and proceed to the staging area. Essential personnel are those who have been previously designated as having an emergency response role, are assigned to the on-shift Operations crew, or are utilized by the Emergency Response Organization during the event (e.g., RCTs, Stationary Operating Engineers). Once at the staging area, personnel will report to their prescribed location to allow for accountability. Personnel with physical handicaps should have monitors assigned as necessary to assist them during an evacuation.

Personnel in protective clothing when an evacuation alarm sounds should make an effort to undress at the normal undress area if safe to do so. These personnel must remain separated from others, and report to the Contaminated Personnel staging sign located outside at the north end of 4713-B, next to the Tool Crib door. An RCT will be dispatched to that location to survey personnel. If directed to the alternate staging area, it is recommended that personnel remove and leave protective clothing in the parking lot prior to entering their vehicle and upon arrival at the alternate staging area remain segregated from others and notify staging area personnel of the situation.

Personnel performing significant plant operations when an evacuation is initiated shall place the equipment in a stable configuration if safe to do so and then respond as appropriate to the evacuation.

The locations of the staging areas are shown on the illustrations in Section J.1. Within each occupied building the exits are clearly marked and evacuation routes to the staging area are maintained clear of obstacles. The supervisor (or delegate) is responsible for ensuring accountability of personnel at the ISA or FSF.

The BED will normally contact the POC to inform them of the event and ensure that necessary onsite and offsite protective actions are initiated. If additional transportation is needed for personnel, the BED may coordinate for additional transportation through RL-EOC.

J.3.1.2 Take Cover

The site area siren will sound to notify personnel of the need to take cover. Personnel shall respond to the first take cover signal sounded. The BED will normally contact the POC to inform them of the event and ensure that necessary onsite and offsite protective actions are initiated.

When the "Take Cover" Alarm is activated, personnel shall take cover in the nearest suitable (consider water supply, bathroom facilities, size, etc.) building or trailer, halt work, and if able place equipment in a safe condition. Close windows, exterior doors, interior doors, and/or window blinds for offices with windows, and secure heating, ventilation, and air conditioning (HVAC). If possible, personnel should move to interior hallways, and follow normal exit procedures from radiologically controlled areas in preparation for evacuation.

J.3.2 Response to Facility Operations Emergencies

Depending on the severity of the event, the BED reviews the site-wide and FFTF emergency response procedure(s) and, as required, categorizes and/or classifies the event. If necessary, the BED initiates area protective actions and Hanford Site Emergency Response Organization activation. The steps identified in the following description of actions do not have to be performed in sequence because of the unanticipated sequence of incident events.

J.3.2.1 Loss of Utilities

A loss of utilities is not expected to lead to an emergency condition or require implementation of protective actions.

A case-by-case evaluation is required for each event to determine loss of utility impacts. When a BED determines a loss of utility impact, actions are taken to ensure dangerous and/or mixed waste is being properly managed, to the extent possible given event circumstances. As necessary, the BED will stop operations and take appropriate actions until the utility is restored.

J.3.2.2 Major Process Disruption/Loss of Plant Control

There are no process upsets or losses of plant control that can have any effect at FFTF (including the 400 Area WMU). The FFTF facility has been deactivated and is currently being operated in accordance with the approved Surveillance & Maintenance Plan.

J.3.2.3 Pressure Release

There are no pressure containing systems at FFTF that would result in a potential emergency condition.

J.3.2.4 Fire and/or Explosion

In the event of a fire, the discoverer activates a fire alarm (pull box); calls 911 from site office phones/373-0911 from cellar phones or verifies that the Hanford Emergency Response Number (911 or 373-0911) has been called. Automatic initiation of a fire alarm (through the smoke detectors) is also possible.

- Unless otherwise instructed, personnel shall evacuate the area/building by the nearest safe exit and proceed to the designated staging area for accountability.
- On actuation of the fire alarm, ONLY if time permits, personnel should shut down equipment, and secure waste. The alarm automatically signals the Hanford Fire Department.
- The BED proceeds directly to the ICP, obtains all necessary information pertaining to the incident, and sends a representative to meet Hanford Fire Department.
- The BED provides a formal turnover to the IC, when the IC arrives at the ICP.
- The BED informs the Hanford Site Emergency Response Organization as to the extent of the emergency (including estimates of dangerous waste, mixed waste or radioactive material quantities released to the environment).
- If operations are stopped in response to the fire, the BED ensures that systems are monitored for leaks, pressure buildup, gas generation, and ruptures.
- Hanford Fire Department firefighters extinguish the fire as necessary.

J.3.2.5 Hazardous Material, Dangerous and/or Mixed Waste Spill

Spills can result from many sources including container spills or leaks, damaged packages or shipments, or personnel error. Spills of mixed waste are complicated by the need to deal with the extra hazards posed by the presence of radioactive materials.

- The discoverer notifies the BED and initiates SWIMS response:
  - Stops work
  - Warns others in the vicinity
  - Isolates the area
  - Minimizes exposures to the hazards
  - Requests the BED Secure ventilation
- The BED determines if emergency conditions exist, requiring response from the Hanford Fire Department based on classification of the spill and injured personnel, and evaluates the need to perform additional protective actions.
- If the Hanford Fire Department resources are not needed, the spill is mitigated with resources identified in Section J.4 and proper notifications are made.
- If the Hanford Fire Department resources are needed, the BED calls 911 from the site phones/373-0911 from cellular phones.
- The BED sends a representative to meet the Hanford Fire Department.
- The BED provides a formal turnover to the IC when the IC arrives at the ICP.
- The BED informs the Hanford Site Emergency Response Organization as to the extent of the emergency (including estimates of dangerous waste, mixed waste, or radioactive material quantities released to the environment).
- If operations are stopped in response to the spill, the BED ensures that systems are monitored for leaks, pressure buildup, gas generation, and ruptures.
- Hanford Fire Department stabilizes the spill.

J.3.2.6 Damaged or Unacceptable Shipments

During the course of receiving an onsite transfer of mixed waste at the 400 Area WMU, an unanticipated event could be discovered resulting in a conformance issue concerning the waste. Damaged or unacceptable shipments resulting from onsite transfers are not subject to WAC 173-303-370; however, conformance issues must be resolved in order to maintain proper records.

The following actions are taken to resolve the conformance issue:

- Operations management is notified of the damaged or unacceptable waste to be received.
- If the conformance issue results in a spill or release, actions described in Section J.3.2.5 are taken.
- The generating organization is notified of the conformance issue.
- An operations representative, in conjunction with the generating organization, determines the course of action to resolve the conformance issue.

J.3.3 Prevention of Recurrence or Spread of Fires, Explosions, or Releases

The BED, as part of the ICP, takes the steps necessary to ensure that a secondary release, fire, or explosion does not occur. The BED will take measures, where applicable, to stop processes and operations; collect and contain released wastes and remove or isolate containers. The BED shall also monitor for leaks, pressure buildups, gas generation, or ruptures in valves, pipes, or other equipment, whenever this is appropriate.

J.3.4 Incident Recovery and Restart of Operations

A recovery plan is developed when necessary in accordance with Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02), Section 9.2. A recovery plan is needed following an event where further risk could be introduced to personnel, the FFTF (including the 400 Area WMU), or the environment through recovery action and/or to maximize the preservation of evidence.

If this plan was implemented according to Section J.3, Ecology must be notified before operations can resume. Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02), Section 5.1 discusses different reports to outside agencies. This notification is in addition to those required reports and must include the following statements:

- There are no incompatibility issues with the waste and released materials from the incident.
- All the equipment has been cleaned, fit for its intended use, and placed back into service.

The notification required by WAC 173-303-360(2)(j) may be made via telephone conference. Additional information that Ecology requests regarding these restart conditions will be included in the required 15-day report identified in Section J.5.

For emergencies not involving activation of the Hanford-EOC, the BED ensures that conditions are restored to normal before operations are resumed. If the Hanford Site Emergency Response Organization was activated and the emergency phase is complete, a special recovery organization could be appointed at the discretion of DOE to restore conditions to normal. This process is detailed in DOE and contractor emergency procedures. The makeup of this organization depends on the extent of the damage and its effects. The onsite recovery organization will be appointed by the appropriate contractor's management.

J.3.5 Incompatible Waste

After an event, the BED or the onsite recovery organization ensures that no waste that might be incompatible with the released material is treated, stored, and/or disposed of until cleanup is completed. Clean up actions are taken by 400 Area WMU personnel or other assigned personnel. Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02), Section 9.2.3, describes actions to be taken.

Waste from cleanup activities is designated and managed as newly generated waste. A field check for compatibility before storage is performed, as necessary. Incompatible wastes are not placed in the same container. Containers of waste are placed in approved storage areas appropriate for their compatibility class.

If incompatibility of waste was a factor in the incident, the BED or the onsite recovery organization ensures that the cause is corrected.

J.3.6 Post Emergency Equipment Maintenance and Decontamination

All equipment used during an incident is decontaminated (if practicable) or disposed of as spill debris. Decontaminated equipment is checked for proper operation before storage for subsequent use. Consumables and disposed materials are restocked. Fire extinguishers are replaced.

The BED ensures that all equipment is cleaned and fit for its intended use before operations are resumed. Depleted stocks of neutralizing and absorbing materials are replenished; protective clothing is cleaned or disposed of and restocked, etc.

J.4 Emergency Equipment

Emergency resources and equipment for the FFTF (including the 400 Area WMU) are presented in this section.

J.4.1 Fixed Emergency Equipment

None, refer to Section J.4.2.

J.4.2 Portable Emergency Equipment

Portable Emergency Equipment		
Type	**Location**	**Capability**
Fire Extinguisher	A fire extinguisher is available at the ISA pad (inside the locked fenced area on the South side of the ISA pad fence near the only gate) and at the FSF building (adjacent to the East entrance).	Portable Class D fire extinguishers are available for use to respond to fires at the FSF and the ISA.
Emergency Response Kit	An emergency response kit is maintained at the facility. Kit is located on the North side of Building 4710. All personnel entering the noted areas, regardless of the type of work being performed, must be made aware of the emergency kit location prior to entering the areas.	Boundary control, personal protective equipment (PPE) for response, first aid kit, and emergency lights.

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J.4.3 Communications Equipment/Warning Systems

Communications Equipment		
Type	**Location**	**Capability**
Fire Alarm Continuously Ringing Bell Or Electronic Gong And Strobe or Area Siren	Fire alarm – at or near building exits in buildings 405; 491E, S, & W; 4621E & W; and 4703. Siren alert – The siren can be clearly heard by personnel at the ISA and by support personnel at the FSF when staff are in the building. When appropriate, personnel at the FSF and ISA will be notified of fire alarms at the 400 Area.	Alerts personnel of a potential fire or other emergency notifications in their area.
2-Way Radio/Cell Phone	At least one with personnel while in the TSD unit location.	Notify personnel to summon emergency assistance.
Argon pressure monitoring system	FFTF argon dewar pad located on a pad west of the main FFTF Plant.	Notify personnel of over or under pressure in the inert cover gas for piping and components containing sodium residuals.

Note: Site wide communications and warning systems are identified in Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02), Table 5.1.

J.4.4 Personal Protective Equipment

Personal Protective Equipment		
Type	**Location**	**Capability**
Personal Protective Equipment	Personal Protective Equipment is available and will be staged when work is performed at the 400 Area WMU location.	Protection from various hazards (e.g. smoke, fumes, oxygen deficient atmosphere, chemicals, high airborne radioactivity, radiological contamination, insufficient lighting). PPE clothing can be based on specific job requirements.

J.4.5 Spill Control and Containment Supplies

Spill Kits And Spill Control Equipment		
Type	**Location**	**Capability**
Spill Control Materials • Absorbent materials • Bags • Step-off pads • Barrier tape • Rags • Scissors	One spill kit will be located at the 400 Area WMU and will be clearly identified. All personnel entering either the ISA or FSF will be made aware of the location of the spill kit.	Control and mitigation of radioactive and chemical spills.

J.4.6 Incident Command Post

The ICPs can be identified in a fixed location or the IC can determine a location appropriate for the event. Emergency resource materials are stored at each location. The IC could activate the Hanford Fire Department Mobile Command Unit if necessary.

J.5 Required Reports

Post-incident written reports are required for certain incidents on the Hanford Site. The reports are described in Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02), Section 5.1.

Facility management must note in the TSD-unit operating record, the time, date, and details of any incident, which requires implementation of the contingency plan. Within 15 days after the incident, a written report must be submitted to Ecology. The report must, at a minimum, include the elements specified in WAC 173-303-360(2)(k).

J.6 Plan Location and Amendments

Copies of this plan are maintained in following locations:

- MO-294

This plan will be reviewed and immediately amended as necessary, in accordance with Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02), Section 14.3.1.1.

J.7 Building Emergency Organization Building Emergency Director

FFTF BEDs		
Title	**Work Location**	**Work Phone**
Facility Operations	MO 294	373-1355

Names and home telephone numbers of the BEDs are available from the POC (373-3800) in accordance with Permit Condition II.A.4.

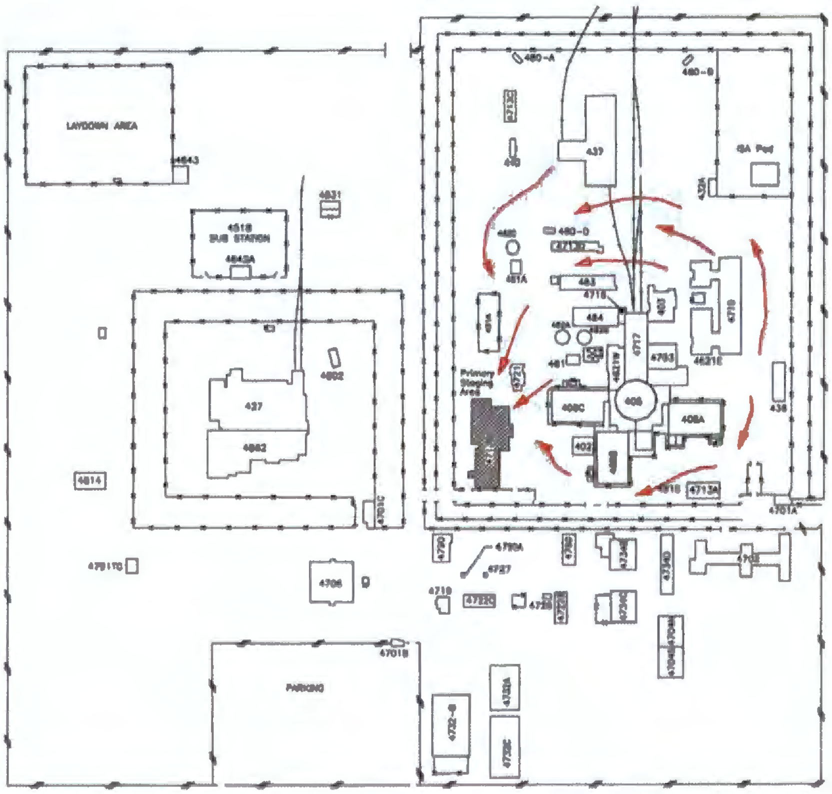

Figure J.1. FFTF Primary Staging Area

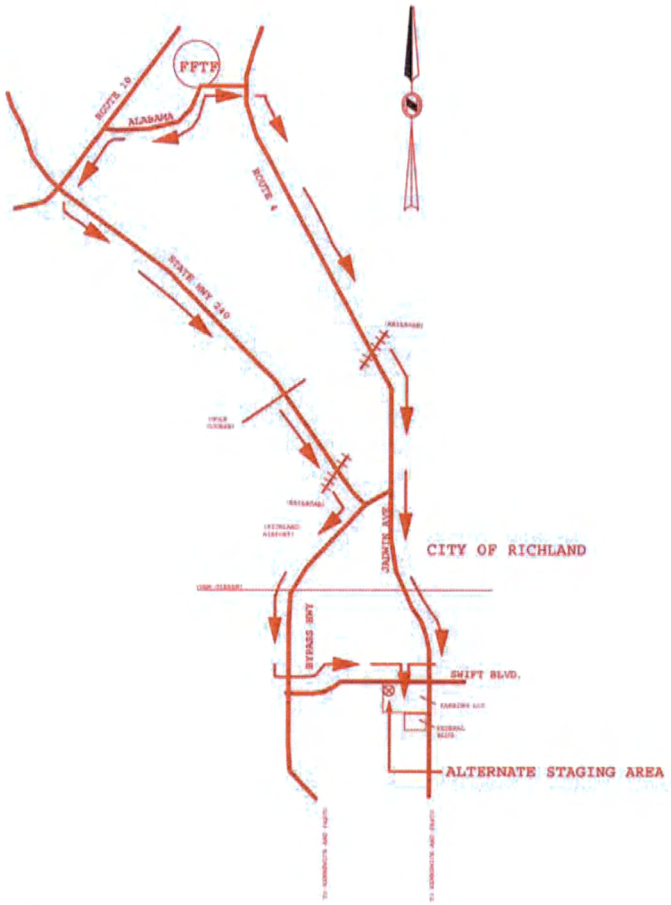

Figure J.2. FFTF Alternate Staging Area

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Quarter Ending Dec. 31, 2015 24590-LAW-PCN-ENV-14-005

Hanford Facility RCRA Permit Modification Notification Form
Part III, Operating Unit 10
Waste Treatment and Immobilization Plant

Index

Page 2 of 3: Hanford Facility RCRA Permit, Part III, Operating Unit 10, Waste Treatment and Immobilization Plant

Replace Piping and Instrumentation Diagrams (P&IDs) for the LAW Secondary Offgas/Vessel Vent Process System (LVP) in Appendix 9.2 of the Dangerous Waste Permit (DWP).

Submitted by Co-Operator:

Roger J Landon 10/8/15
Roger J. Landon Date

Reviewed by ORP Program Office:

Joanne Grindstaff 11/9/15
J. F. Grindstaff Date

Quarter Ending Dec. 31, 2015 24590-LAW-PCN-ENV-14-005

Hanford Facility RCRA Permit Modification Notification Form	
Unit:	Permit Part:
Waste Treatment and Immobilization Plant	**Part III, Operating Unit 10**

Description of Modification:

The purpose of this Class 1 prime modification is to update and replace the following P&IDs in Appendix 9.2 of the DWP:

Appendix 9.2			
Replace:	24590-LAW-M6-LVP-00002006, Rev. 0	With:	24590-LAW-M6-LVP-00002006, Rev. 1 24590-LAW-M6-LVP-00002007, Rev. 0
	24590-LAW-M6-LVP-00004001, Rev. 0		24590-LAW-M6-LVP-00004001, Rev. 1
	24590-LAW-M6-LVP-00004002, Rev. 0		24590-LAW-M6-LVP-00004002, Rev. 1
	24590-LAW-M6-LVP-00004003, Rev. 0		24590-LAW-M6-LVP-00004003, Rev. 1

This modification requests Ecology approval and incorporation into the permit the specific changes to the P&IDs indicated by revision notes and clouds. These documents include changes provided in applicable document change forms (e.g., DCN, SCN, SDDR, FCN, FCR, etc.). In addition, the P&IDs include changes associated with the resolution to comments on change documents since the issuance of the last revision of the permitted documents.

Significant changes common to all P&IDs are summarized below:

- Modified, added, and deleted notes.
- Incorporated changes from change documentation identified in the Notes section on each drawing.

Significant changes specific to:
24590-LAW-M6-LVP-00002006, Rev. 1 and 24590-LAW-M6-LVP-00002007, Rev. 0

- Converted drawing 24590-LAW-M6-LVP-00002006, Rev. 0, from a single sheet to multi-sheet drawings to provide a clearer representation of the system, including additional details for instrumentation and control logic. 24590-LAW-M6-LVP-00002007, Rev. 0, is a new drawing. No revision clouds were used.
- Added nozzles (Grids B3 through B7) and a Nozzle Schedule (Grids H7 and H8; 24590-LAW-M6-LVP-00002006, Rev. 1).
- Added Continuous Emissions Monitoring System (CEMS) Panels SDJ-PNL-00125 and SDJ-PNL-00126 and revised SDJ-PNL-00062 and SDJ-PNL-00124 (Grids C3, C4, C6 and C7; 24590-LAW-M6-LVP-00002006, Rev. 1).
- Provided additional details of the Stack Discharge Monitoring System (SDJ) (24590-LAW-M6-LVP-00002007, Rev. 0).
- Updated information on heat trace instrumentation for AW 2112 and AW 2121 (Grids B5, C5, B7 and C7; 24590-LAW-M6-LVP-00002007, Rev. 0).
- Updated mass flow controllers FK 2121A and FK 2121B (Grids F7 and G7; 24590-LAW-M6-LVP-00002007, Rev. 0).
- Corrected tag number SDJ-YI-2112X to SDJ-YA-2112X (Grid H5; 24590-LAW-M6-LVP-00002007, Rev. 0).
- Updated or removed holds on references to off-sheet P&IDs (Grid B2; both drawings).

24590-LAW-M6-LVP-00004001, Rev. 1

- Changed valves LVP-V-01647 and LVP-V-01648 from normally open (NO) to locked open (LO) (Grids C6 and D5).
- Removed AW 0027 (Grids D7 and E7).
- Revised tubing size from 3/8 inch to 1/4 inch (Grids E3, E4, F6 and F7).

24590-LAW-M6-LVP-00004002, Rev. 1

- Added alarms to AI 0439A and AI 0439B (Grids E3 and E4).
- Revised line numbers containing SS as the pipe class to S11N pipe class (multiple grids).
- Rearranged LVP-SKID-00001, reconfigured sample connections to the skid, deleted the N18 sample connection, and changed sample connection plug valves to ball valves (multiple grids).
- Added S11N 1/2 inch stainless steel tubing breaks (multiple grids).
- Modified nozzles as 1/2 inch blind flanged spare nozzles (multiple grids).
- Added nozzles and lines with diameters of 1 inch and 3 inches (multiple grids).
- Modified depiction of process gas analyzer systems associated with LVP-SKID-00001 by adding sample probe tags, system controllers and instrument service air nozzles (multiple grids).
- Updated references to off-sheet P&IDs (multiple grids).

24590-LAW-M6-LVP-00004003, Rev. 1

- Added S11N 1/2 inch stainless steel tubing breaks and LVP 1/2 inch stainless steel designations on instrument tubing (multiple grids).
- Reconfigured nozzles and added new nozzles N66 and N67 to LVP-ADBR-00001A/B (multiple grids).
- Added 16 inch manways to LVP-ADBR-00001A/B (Grids C5 and F5).
- Modified depiction of the mercury monitor by adding sample probe tags LVP-AW-0423A/0423B and LVP-AE-0423, the analyzer enclosure, and system controller LVP-UC-0423.
- Labeled cross-connection header from LVP-ADBR-00001B to LVP-ADBR-00001A as LVP 18 inch stainless steel (Grid B4).
- Added expansion joint bellows LVP-BLWS-00063 through LVP-BLWS-00065 (Grids D7, F4 and F7).
- Updated references to off-sheet P&IDs (multiple grids).

This PCN updates information in Appendix 9.2 to reflect current design. This DWP component may be re-evaluated to confirm design adequacy. If the re-evaluation results in future design changes, the changes will be reviewed by Ecology in subsequent permit modifications.

The following outstanding change documents have been submitted to Ecology pursuant to Permit Condition III.10.C.9.h and are maintained in the WTP Operating Record:

24590-LAW-M6-LVP-00002006, Rev. 1

- 24590-LAW-M6N-LVP-00125 - provided to Ecology in milk run (CCN 261759)

24590-LAW-M6-LVP-00002007, Rev. 0

- 24590-LAW-M6N-LVP-00119 – provided to Ecology in milk run (CCN 275836)

24590-LAW-M6-LVP-00004002, Rev. 1

- 24590-WTP-SDDR-J-14-00112 – provided to Ecology in milk run (CCN 267884)

In accordance with Permit Condition III.10.C.2.e, this permit modification sent to Ecology may include page changes to the Permit, attachments, and permit application supporting documentation.

WAC 173-303-830 Modification Class:	Class 1	Class [1]1	Class 2	Class 3
Please mark the Modification Class:		X		

Enter relevant WAC 173-303-830, Appendix I Modification citation number: N/A

Enter wording of WAC 173-303-830, Appendix I Modification citation:

In accordance with WAC 173-303-830(4)(d)(i), this modification notification is requested to be reviewed and approved as a Class [1]1 modification. WAC 173-303-830(4)(d)(ii)(A) states, "Class 1 modifications apply to minor changes that keep the permit current with routine changes to the facility or its operation. These changes do not substantially alter the permit conditions or reduce the capacity of the facility to protect human health or the environment. In the case of Class 1 modifications, the director may require prior approval."

Quarter Ending Dec. 31, 2015 24590-LAW-PCN-ENV-14-005

Modification Approved/Concur: ☑ Yes ☐ Denied (state reason below) Reason for denial:	Reviewed by Ecology: S. Dahl — Date: 01/28/16

Table III.10.H.A - LAW Plant Miscellaneous Unit System Description

Sub-system Description	Sub-system Designation	Engineering Description (Drawing Nos., Specification Nos., etc.)	Narrative Description, Tables and Figures
LVP-SCR-00001 (NOx Selective Catalytic Reduction Unit – located on LVP-SKID-00002) LVP-HX-00001 (Catalytic Oxidizer Heat Exchanger – located on LVP-SKID-00002) LVP-HTR-00002 (Catalytic Oxidizer Electric Heater – located on LVP-SKID-00002)			Addendum C of this Permit.
LAW Secondary Offgas/Vessel Vent Process System (Cont.) LVP-ADBR-00001A (Offgas Mercury Adsorber – located on LVP-SKID-00001) LVP-ADBR-00001B (Offgas Mercury Adsorber – located on LVP-SKID-00001)	LVP	**24590-LAW** -M5-V17T-00011, Rev 5 -M6-LVP-00004001, Rev. ~~0~~1 -M6-LVP-00004002, Rev. ~~0~~1 -M6-LVP-00004003, Rev ~~0~~1	Section 4.1.3.3, Table C-8, and Figures C1-1 and C1-3 in Operating Unit Group 10, Addendum C of this Permit.

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Table III.10.H.A - LAW Plant Miscellaneous Unit System Description

Sub-system Description	Sub-system Designation	Engineering Description (Drawing Nos., Specification Nos., etc.)	Narrative Description, Tables and Figures
		-P1-P01T-00005, Rev 4	
LAW Secondary Offgas/Vessel Vent Process System (Cont.) LVP-SCB-00001 (Melter Offgas Caustic Scrubber)	LVP	**24590-LAW** -P1-P01T-00005, Rev 4 -M6-LVP-00002002, Rev 0 -M6-LVP-00002006, Rev. ~~0~~1 -M6-LVP-00002007, Rev. 0	Section 4.1.3.3, Table C-8, and Figures C1-1 and C1-3 in Operating Unit Group 10, Addendum C of this Permit.
LAW Secondary Offgas/Vessel Vent Process System (Cont.) LVP-HTR-00001A (Melter Offgas HEPA Preheater) LVP-HTR-00001B (Melter Offgas HEPA Preheater)	LVP	**24590-LAW** -M5-V17T-00010, Rev 4 -M6-LVP-00001002, Rev 0 -P1-P01T-00005, Rev. 4	Section 4.1.3.3, Table C-8, and Figures C1-1 and C1-3 in Operating Unit Group 10, Addendum C of this Permit.

NOZZLE SCHEDULE

NOZZLE NUMBER	FLANGE SIZE	NOZZLE DESCRIPTION
N01	4"	TEST/INJECTION PORT
N02	4"	TEST/INJECTION PORT
N03	4"	CO CEMS SAMPLE PORT
N04	2"	CO CEMS RETURN PORT
N05	4"	TEST/INJECTION PORT
N06	4"	TEST/INJECTION PORT
N07	4"	THC CEMS SAMPLE PORT
N08	2"	THC CEMS RETURN PORT
N09	4"	SIMULANT INJECTION PORT
N10	4"	SIMULANT INJECTION PORT
N11	4"	ANALYZER TEST PORT
N12	4"	ANALYZER TEST PORT
N13	4"	NOX-CO CEMS SAMPLE PORT
N14	2"	NOX-CO CEMS RETURN PORT
N15	4"	THC CEMS SAMPLE PORT
N16	2"	THC CEMS RETURN PORT
N17	4"	POST OFFGAS TEST PORT (POTP) 1
N18	4"	POST OFFGAS TEST PORT (POTP) 2
N19	4"	POST OFFGAS TEST PORT (POTP) 3
N20	4"	POST OFFGAS TEST PORT (POTP) 4
N21	4"	POST OFFGAS TEST PORT (POTP) 5
N22	4"	POST OFFGAS TEST PORT (POTP) 6
N23	4"	POST OFFGAS TEST PORT (POTP) 7
N24	4"	POST OFFGAS TEST PORT (POTP) 8
N25	4"	POST OFFGAS TEST PORT (POTP) 9
N26	4"	POST OFFGAS TEST PORT (POTP) 10
N27	6"	POST OFFGAS TEST PORT (POTP) 11
N28	6"	POST OFFGAS TEST PORT (POTP) 12
N29	4"	RADIATION SAMPLER TEST PORT
N30	4"	RADIATION SAMPLER TEST PORT

NOTES:

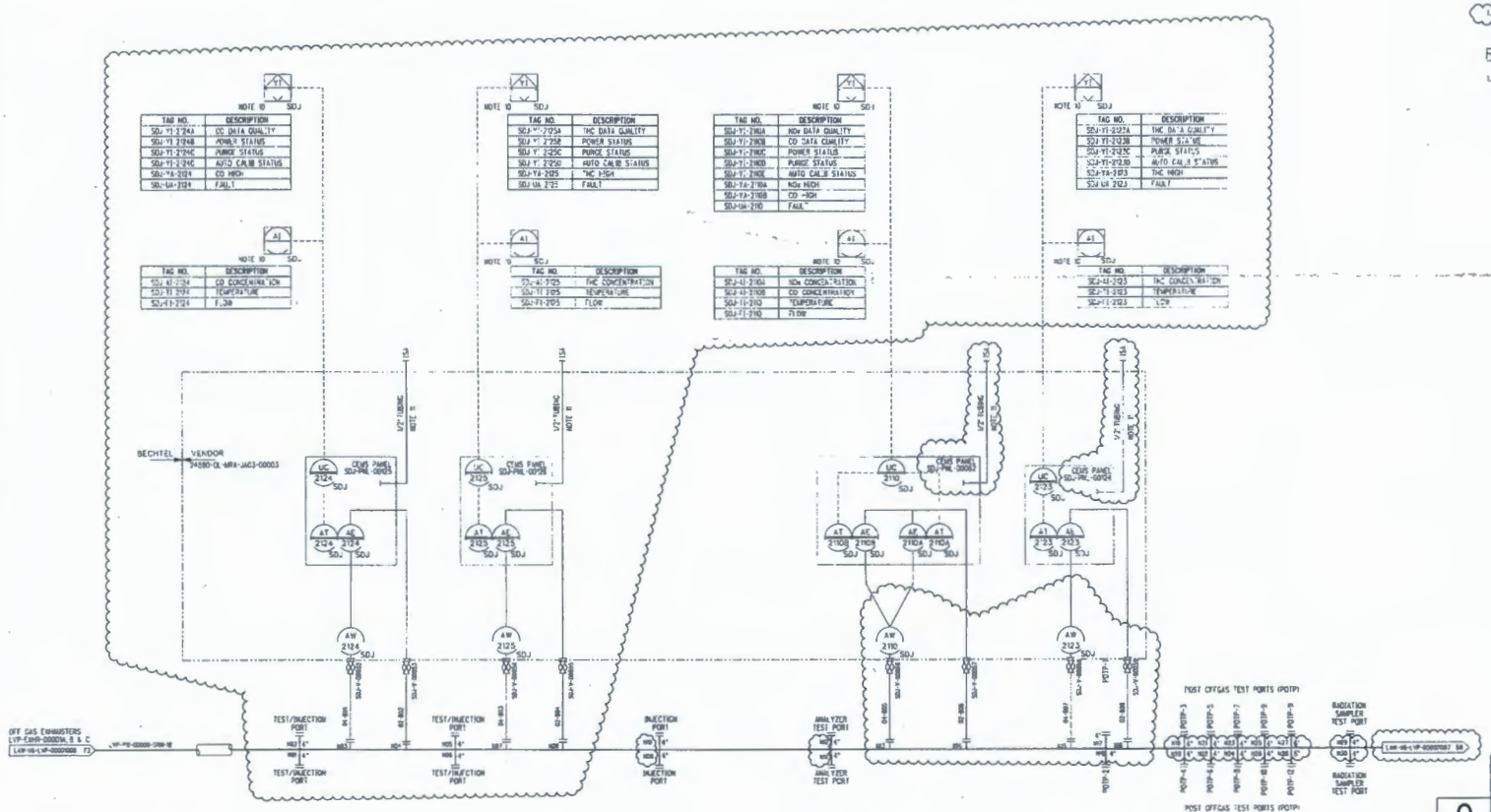
1. SEE DRAWINGS 24590-WTP-M6-50-00001 THROUGH 24590-WTP-M6-50-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SLOPE REQUIREMENTS.
2. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
3. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING IS QUALITY LEVEL 0 AND SEISMIC CATEGORY SC-III, UNLESS OTHERWISE NOTED.
4. ALL LINES SHOWN ON THIS DRAWING SHALL BE FREE DRAINING, UNLESS OTHERWISE NOTED.
5. DELETED
6. DELETED
7. DELETED
8. DELETED
9. THIS DRAWING IS CONVERTED FROM A SINGLE SHEET TO MULTI-SHEET DRAWINGS AND IN PART SUPERSEDES 24590-LAW-M6-LVP-00002 REV 4. THIS DRAWING INCLUDES INFORMATION FROM 24590-LAW-M6N-LVP-00041, -00045, AND -00064.
10. OUTPUT SIGNALS FROM CEMS SAMPLERS ARE INDIVIDUALLY WIRED TO ICN.
11. CONNECTIONS TO ISA TO BE CONFIRMED BY VENDOR DESIGN.
12. INTEGRAL O2 SENSOR PROVIDED WITH CEMS.
13. REVISION 9 PORTIONS OF 24590-LAW-M6-LVP-00002006 REV 0 WERE TRANSFERRED TO DRAWING 24590-LAW-M6-LVP-00002007 REV 0. ADDED/REVISED/DELETED NOTES, HOLD, INSTRUMENT SERVICE AIR LINES, NOZZLES, NOZZLE NUMBERS, AND NOZZLE SCHEDULE. ADDED CO AND THC DWP CEMS SDJ-AE/AT-2124 AND SDJ-AE/AT-2125 RESPECTIVELY. INCORPORATED 24590-LAW-M6N-LVP-00082, 00090, AND 00098.

HOLD OPEN ITEMS:

1. DELETED

REFERENCES:

1. 24590-LAW-3YD-LOP-00001, SYSTEM DESCRIPTION FOR THE LAW PRIMARY OFFGAS (LOP) AND SECONDARY OFFGAS/VESSEL VENT (LVP) SYSTEMS.



Please note that source, special nuclear, and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA) are regulated at the U.S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts that pursuant to AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.

REV	DESCRIPTION	ORG	CHKD	RVWD	APVD	DATE
1	REVISED PER NOTE 13					
0	ISSUED FOR CONSTRUCTION, SEE NOTE 9	MD	JK	TS		06/06/14

REVISION HISTORY

RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No DE-AC27-01RV14136

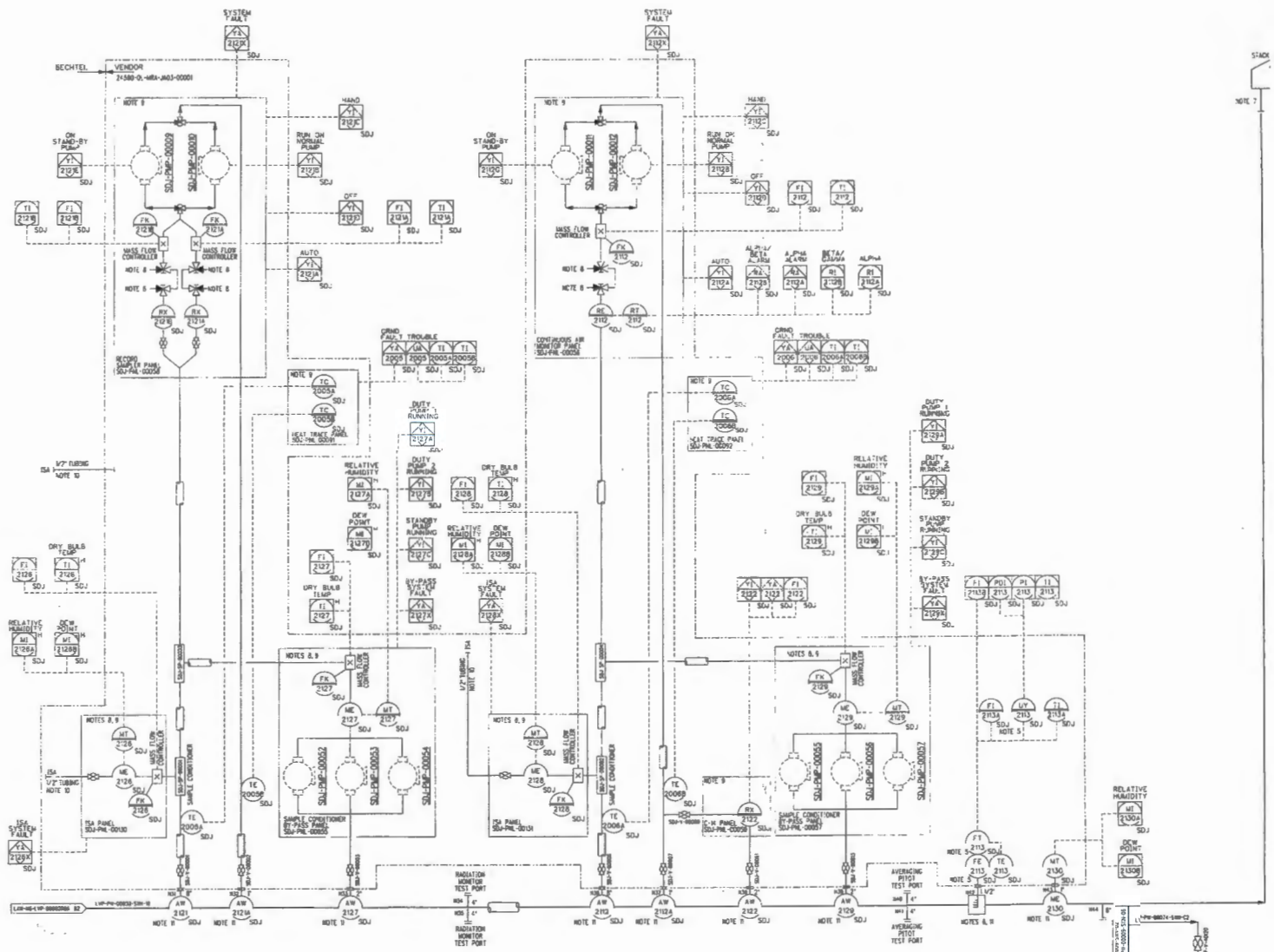
P&ID - LAW
LAW SECONDARY OFFGAS/ VESSEL VENT PROCESS SYSTEM STACK DISCHARGE MONITORING SYSTEM

24590-LAW-M6-LVP-00002006 REV 1

SCALE: NONE

ORIGINATOR: LYNSLL, MICHAEL 01/30/14
CHECKER: MAHANNAH, LAURA 01/30/14
APPROVER: BRUSH, M. 01/30/14
REVIEWER: STRAUB, STEVEN 01/30/14

CONTENT APPLICABLE TO ALARA? YES NO
JOB NO. 24590-LAW-GPP-W-00-033 REV. 4
CMS TOPICAL REQUIRED? YES CMS TOPICAL INITIAL IF YES
SCREENING IS REQUIRED FOR DRAWING TYPES IDENTIFIED IN 24590-WTP-GPP-ENG-000



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-S0-00001 THROUGH 24590-WTP-M6-S0-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SLOPE REQUIREMENTS.
2. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
3. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING IS QUALITY LEVEL C AND SEISMIC CATEGORY SC-III, UNLESS OTHERWISE NOTED.
4. ALL LINES SHOWN ON THIS DRAWING SHALL BE FREE DRAINING, UNLESS OTHERWISE NOTED.
5. INSTRUMENT PERFORMS AN AIR PERMIT FUNCTION. INDICATION DISPLAYED AT PCJ.
6. DRILLED HOLE FOR PITOT ELEMENT SHALL BE 1 INCH NOMINAL AND FLANGE SIZE SHALL BE 1 1/2 INCH.
7. INSULATION SHALL TERMINATE APPROXIMATELY 7 FEET ABOVE ROOF ELEVATION.
8. EQUIPMENT SHALL BE SUPPLIED WITH VALVES FOR TRANSPORT SYSTEM PURGING AND/OR FOR CALIBRATION CHECKS OF MASS FLOW CONTROLLERS.
9. FINAL DETAIL DESIGN TO BE PROVIDED BY 24590-CL-MRA-JA03-UC001 VENDOR PACKAGE.
10. CONNECTIONS TO ISA TO BE CONFIRMED BY VENDOR DESIGN.
11. INSTRUMENTATION BY VENDOR.
12. THIS DRAWING DEPICTS PORTIONS OF THE SYSTEM THAT WERE TRANSFERRED FROM 24590-LAW-M6-LVP-00002006 REV 0 THIS DRAWING INCLUDES INFORMATION FROM 24590-LAW-M6M-LVP-00082, -00090, AND -00098. ADDED DETAILS OF SDJ SYSTEM.

HOLD OPEN ITEMS:

NONE

REFERENCES:

- 24590-LAW-3YD-LOP-00001, SYSTEM DESCRIPTION FOR THE LAW PRIMARY OFFGAS (LOP) AND SECONDARY OFFGAS/VESSEL VENT (LVP) SYSTEMS.

NOZZLE SCHEDULE		
NOZZLE NUMBER	FLANGE SIZE	NOZZLE DESCRIPTION
N31	8"	RECORD SAMPLER SAMPLE PORT
N32	1"	RECORD SAMPLER RETURN PORT
N33	2"	RECORD SAMPLER CONDITIONED AIR RETURN PORT
N34	4"	RADIATION MONITOR TEST PORT
N35	4"	RADIATION MONITOR TEST PORT
N36	8"	CAM SAMPLE PORT
N37	1"	CAM RETURN PORT
N38	2"	CARBON-14 SAMPLER RETURN PORT
N39	2"	CAM CONDITIONED AIR RETURN PORT
N40	4"	AVERAGING PITOT TEST PORT
N41	4"	AVERAGING PITOT TEST PORT
N42	1.5"	AVERAGING PITOT PORT
N43	1"	MOISTURE SENSOR PORT
N44	8"	SIX INCH POT

Please note that source, special nuclear, and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA) are regulated at the U.S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts that pursuant to AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.

REV	DESCRIPTION	ORG	CHKD	RVWD	APVD	DATE
0	ISSUED FOR CONSTRUCTION SET NOW 0					

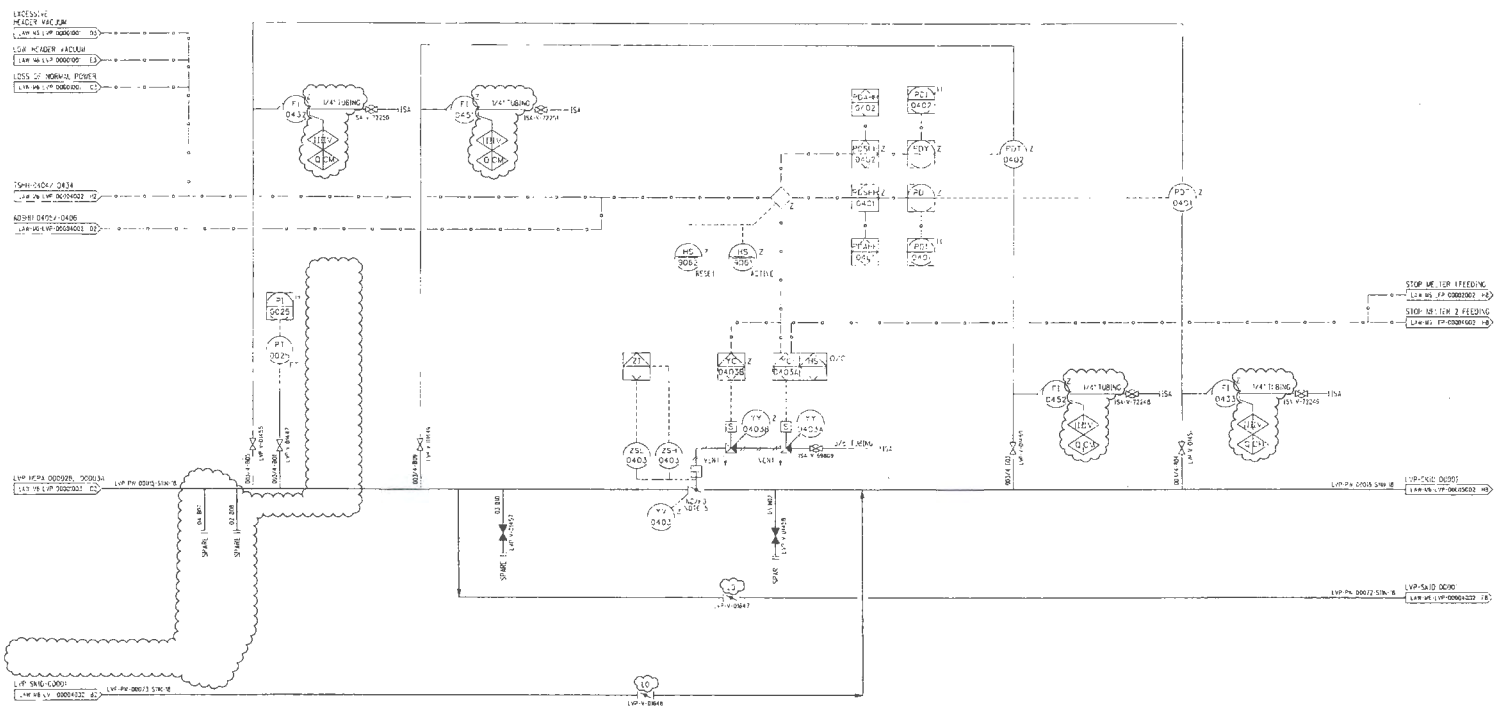
REVISION HISTORY

RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No. DE-AC27-01RV14136

P&ID - LAW
LAW SECONDARY OFFGAS/ VESSEL VENT PROCESS SYSTEM STACK DISCHARGE MONITORING SYSTEM

24590-LAW-M6-LVP-00002007 REV 0



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-S0-00001 THROUGH 24590-WTP-M6-S0-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SLOPE REQUIREMENTS.
2. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
3. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING IS QUALITY LEVEL Q AND SEISMIC CATEGORY SC-III, UNLESS OTHERWISE NOTED.
4. ALL LINES SHOWN ON THIS DRAWING SHALL BE FREE DRAINING, UNLESS OTHERWISE NOTED.
5. THE BYPASS VALVE, YV-0403, SHALL OPEN FIRST BEFORE CLOSING THE INLET AND/OR OUTLET ISOLATION VALVES.
6. THIS DRAWING IS CONVERTED FROM A SINGLE SHEET TO MULTI-SHEET DRAWINGS AND IN PART SUPERSEDES 24590-LAW-M6-LVP-00004 REV 2. THIS DRAWING INCLUDES INFORMATION FROM 24590-LAW-M6N-LVP-00015, AND -00085.
7. REVISION 1 INCORPORATED 24590-LAW-M6N-LVP-00084, -00089, -00110, AND -00125. ADDED/REVISED/DELETED NOTES, VALVES, TUBING SIZES, QUALITY BREAKS, AND INSTRUMENTS.

HOLD/OPEN ITEMS:

NONE

REFERENCES:

1. 24590-LAW-3YD-LOP-00001, SYSTEM DESCRIPTION FOR THE LAW PRIMARY OFFGAS (LOP) AND SECONDARY OFFGAS/VESSEL VENT (LVP) SYSTEMS

DRAWING INDEX

DWG NO	TITLE
24590-LAW-M6-LVP-00004001	LVP SYS Hg MITIGATION EQUIPMENT BYPASS
24590-LAW-M6-LVP-00004002	LVP SYS Hg MITIGATION EQUIP LVP-SKID-00001
24590-LAW-M6-LVP-00004003	LVP SYS Hg MITIGATION EQIP LVP-ADBR-00001A/B

REVISION HISTORY

REV	DESCRIPTION	ORIG	CHKD	RVWD	APVD	DATE
1	REVISED PER NOTE 7					
0	ISSUED FOR CONSTRUCTION SEE NOTE 6	MD	SJ	SS	TN/DM	7-22-11

Q

Please note that source, special nuclear, and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA) are regulated in the U.S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts that pursuant to AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.

ISSUED BY RPP-WTP PDC

DWG STAMP

PROJECT No	24590	
SITE	HANFORD	
AREA	222	
BUILDING No	20	
	BY	DATE
ORIGINATOR	SIEGEL, MICHAEL	11-19-11
CHECKER	ALIA, SATISH	11-19-11
APPROVER	MCMILLIN J. WILLIAM E	11-22-11
REVIEWER	HOWARD, STEVEN	11-18-11

CONTAINS APPLICABLE TO NUMBER ☐ YES ☐ NO
ADR NO 24590-LAW-ADP-W-02-013 REV 4
EMS SCREENING REQUIRED ☒ YES ☐ NO ITEMS IN ITEM # YES

RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No DE-AC27-01RV14136

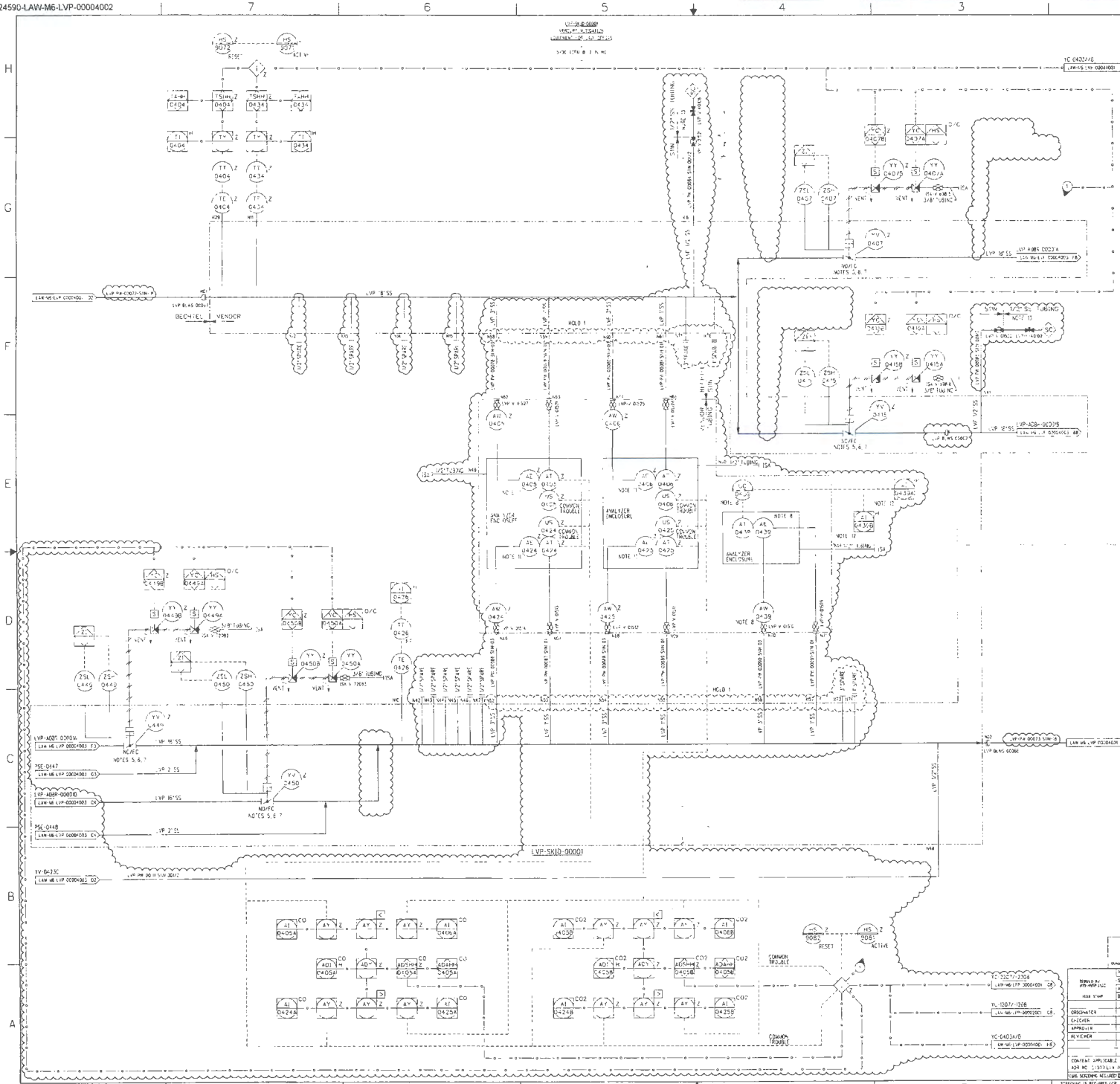
P&ID - LAW
LAW SECONDARY OFFGAS/VESSEL VENT PROCESS SYSTEM MERCURY MITIGATION EQUIPMENT BYPASS

SCALE NONE | 24590-LAW-M6-LVP-00004001 | REV 1

SCREENING IS REQUIRED FOR DRAWING TYPES ISSUED IN 24590-WTP-SPEC-002

F-5252 / 64434
COMPUTER GENERATED DRAWING. DESIGN CHANGES NOT PERMITTED

SOLOMON


LVP-SKID-00001
LVP-ADBR-00001A
LVP-ADBR-00001B
LVP-ADBR-00001C
LVP-ADBR-00001D
LVP-ADBR-00001E
LVP-ADBR-00001F
LVP-ADBR-00001G
LVP-ADBR-00001H
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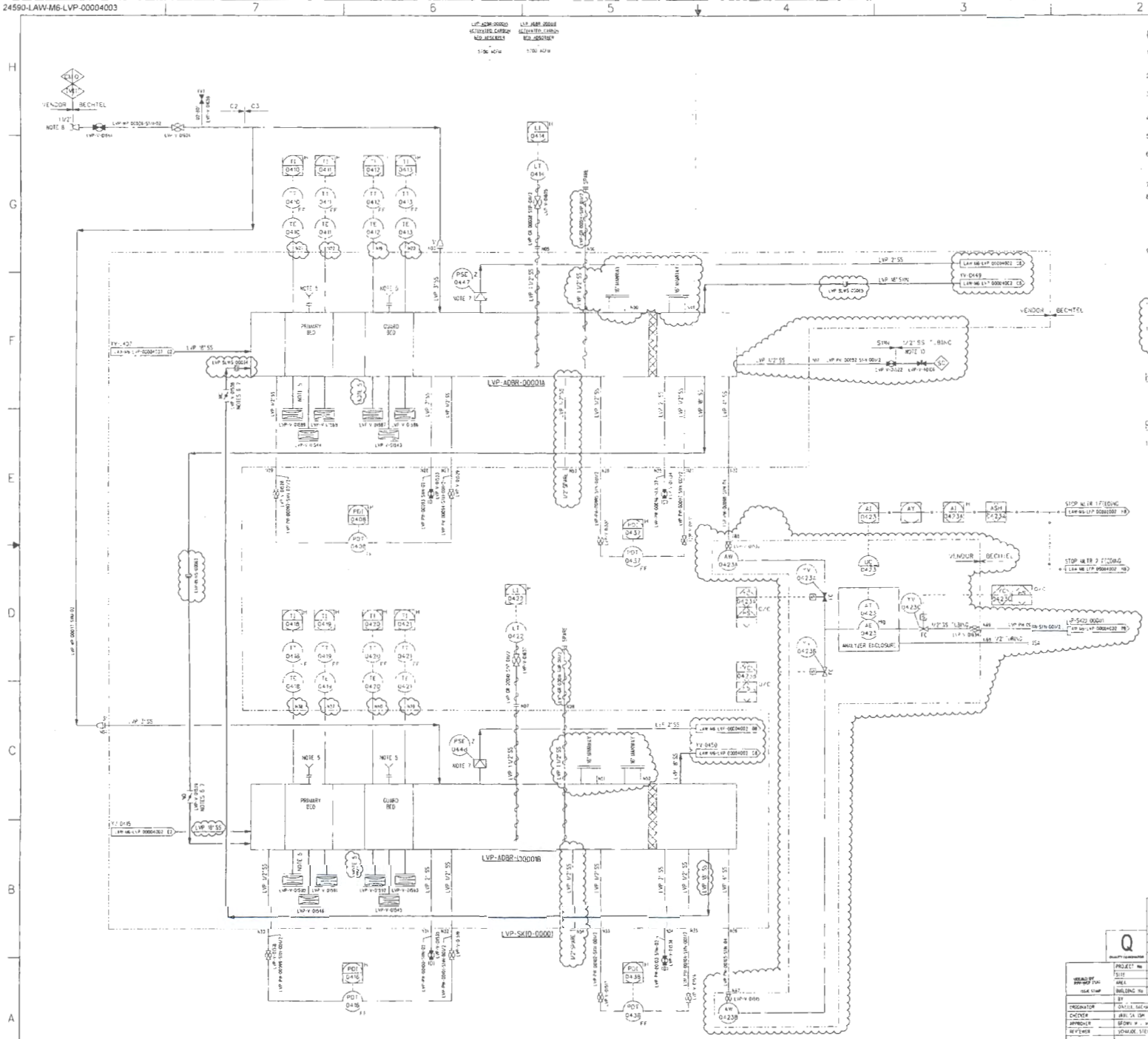

NOTES:

1. SEE DRAWINGS 24590-WTP-VE-S0-00001 THROUGH 24590-WTP-M6-SC-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SLOPE REQUIREMENTS
2. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING
3. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING IS QUALITY LEVEL 0 AND SEISMIC CATEGORY SC-IIC, UNLESS OTHERWISE NOTED
4. ALL LINES SHOWN ON THIS DRAWING SHALL BE FREE DRAINING, UNLESS OTHERWISE NOTED
5. FIVE (5) FILL PORTS PER BED, ONE SHOWN, 3 WITHDRAWAL PORTS PER BED, ALL SHOWN 8 INCH NPS
6. ADSORBERS ARE NORMALLY RUN IN LEAD/LAG MODE, BUTTERFLY VALVES ARE SHOWN NO/NC FOR LVP-ADBR-00001A IN LEAD MODE, VALVES WOULD BE REVERSED TO PUT LVP-ADBR-00001B INTO LEAD MODE.
7. SUPPLIED BY BECHTEL
8. 1 1/2 INCH FIRE HOSE FITTING WILL BE PROVIDED BY SUBCONTRACTOR PATRIOT UNDER SERVICE REQUISITION 24590 CM-SRA-PY21-00003. A FIRE PROTECTION WATER SOURCE IS TO BE LOCATED NO FARTHER THAN 50 FEET FROM THIS CONNECTION POINT. A 1 1/2 INCH FITTING SERVICES AN A RESTRICTION DEVICE PREVENTING FILLING CARBON BED ABSORBING WITH WATER IN LESS THAN 2 HOURS AND IS A SAFETY CREDITED DESIGN FEATURE.
9. THIS DRAWING IS CONVERTED FROM A SINGLE SHEET TO MULTI-SHEET DRAWINGS AND IN PART SUPERSEDES 24590-LAW M6-LVP-00004, REV 2. THIS DRAWING INCLUDES INFORMATION FROM 24590-LAW-M6N-LVP-00002, 24590-LAW-M6N-LVP-00026, -00044, -00048, -00052, -00055, -00065, AND -00058. ADDED/REVISED/DELETED VALVES, INSTRUMENTS AND LINE NUMBERS. THIS DRAWING DELETES CARBON ADSORBER HIGH LEVEL SAFETY INTERLOCK

'0' CONSTRUCTION SHALL FIELD ROUTE TUBING FROM ISOLATION VALVE TO SAMPLE CONNECTION. SEE DRAWING 24590-WTP-MO-S0 00072 (FUTURE) FOR ROUTING DETAILS.

'1' REVISION 1 INCORPORATED 24590-LAW-M6N LVP-00101. ADDED/REVISED/DELETED NOTES, VALVES, INSTRUMENTS, EQUIPMENT AND IN-LINE COMPONENTS. THIS DRAWING ALSO INCLUDES CHANGES TO ALIGN THE BECHTEL P&IDS WITH THE VENDOR P&IDS

HOLD/OPEN ITEMS:

NONE

REFERENCES:

1. 24590-LAW-3YD-LOP-30001 SYSTEM DESCRIPTION FOR THE LAW PRIMARY OFFGAS (LO3) AND SECONDARY OFFGAS/VESSEL VENT (LVP) SYSTEMS

Please note that source, special nuclear, and byproduct materials as defined in the Atomic Energy Act of 1954 (AEA) are regulated at the U.S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts that pursuant to AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.

REV	DESCRIPTION	ORG	CHKD	REVWD	APVD	DATE
1	REVISED PER NOTE '1'					
0	ISSUED FOR CONSTRUCTION, SEE NOTE 9	SJ	KSS			10/22/14

REVISION HISTORY

PROJECT No. 24590
SITE HANFORD
AREA LAW
BUILDING No. N/A

RIVER PROTECTION PROJECT WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 98354

CONTRACT No. DE-AC27-01RV14136

	BY	DATE
ORIGINATOR	ONTIUS, MICHAEL	10/18/14
CHECKER	[illegible]	10/18/14
APPROVER	BROWN, [illegible]	10/22/14
REVIEWER	SCHAUER, STEVEN	10/18/14

CONTENT APPLICABLE TO HLW/LAW? YES NO
ICDR NO. 24590-LAW-ICDR-LP-00 001
SWS SEISMIC REVIEW REQUIRED? YES NO SWS SI TITLE II REVIEW?

P&ID - LAW SECONDARY OFFGAS/VESSEL VENT PROCESS SYSTEM MERCURY MITIGATION EQUIPMENT LVP-ADBR-00001A/B

SIZE N/A
NOR
24590-LAW-M6-LVP-00004003
REV 1

SCREENING IS REQUIRED FOR DRAWING TYPES DEFINED IN 24590-WTP-GPP-SEQ-002

10/29/2014 2:32:10 PM

Quarter Ending December 31, 2015

24590-WTP-PCN-ENV-12-006

Hanford Facility RCRA Permit Modification Notification Form
Part III, Operating Unit 10
Waste Treatment and Immobilization Plant

Index

Page 2 of 2: Hanford Facility RCRA Permit, Part III, Operating Unit 10, Waste Treatment and Immobilization Plant
Replace existing WTP Dangerous Waste Permit Chapter 11 Closure Plan with updated Closure Plan per Permit Condition III.10.C.8 and Appendix 1.0 WTP Interim Compliance Schedule item 8.

Submitted by Co-Operator:

Roger J Landon 9/10/15

Roger J. Landon Date

Reviewed by ORP Program Office:

Joanne Sutter 10/26/15

~~D. L. Noyes~~ J.F. Grindstaff Date

Quarter Ending December 31, 2015

24590-WTP-PCN-ENV-12-006

Hanford Facility RCRA Permit Modification Notification Form	
Unit:	Permit Part:
Waste Treatment and Immobilization Plant	**Part III, Operating Unit 10**

Description of Modification:

The purpose of this Class [1]1 modification is to update the Closure Plan for the WTP in Chapter 11 of the DWP and incorporate into the RCRA Sitewide Permit as Addendum H.

Chapter 11			
Replace:	WTP Dangerous Waste Permit, Chapter 11 Closure Plan	With:	WTP Dangerous Waste Permit, Addendum H Closure Plan

This modification requests Ecology approval and incorporation into the permit the specific changes to the above DWP documents.

The revision to the current Chapter 11 Closure Plan, which will be incorporated into the RCRA Sitewide Permit, is the result of compliance with the Appendix 1.0 WTP Interim Compliance Schedule, Permit Condition III.10.C.8, Compliance Schedule Item 8 (Update and resubmit the Closure Plan for approval).

A summary of updates to the WTP DWP Closure Plan are as follows:

- Inclusion of the AEA statement regarding the regulation of radiation hazards
- Clarification of references to radiation requirements
- Revision to the Closure Schedule
- Revisions for consistency based on the following documents:
  a. *Guidance for Clean Closure of Dangerous Waste Units and Facilities* (Ecology, 2005)
  b. *Guidance on Sampling and Data Analysis Methods* (Ecology, 1995)
  c. *Training Module Introduction to Closure/Post-Closure* (40 CFR Parts 264/265, Subpart G) (EPA, 2003)
  d. *Model Toxics Control Act Regulation and Statute* (Ecology 2013)
  e. *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (EPA SW 846) (EPA, 1986)
  f. *EPA Guidance for Data Quality Assessment: Practical Methods for Data Analysis* (EPA, 2000)
  g. *EPA Requirements for Quality Assurance Project Plans* (EPA, 2001)
  h. *EPA Guidance on Environmental Data Verification and Data Validation* (EPA, 2002)
- Other formatting, consistency, and editorial changes
- Addition of Sampling and Analysis Plan as an Appendix to the Closure Plan

WAC 173-303-830 Modification Class:	Class 1	Class [1]1	Class 2	Class 3
Please mark the Modification Class:		X		

Enter relevant WAC 173-303-830, Appendix I Modification citation number: NA

Enter wording of WAC 173-303-830, Appendix I Modification citation:
In accordance with WAC 173-303-830(4)(d)(i), this modification notification is requested to be reviewed and approved as a Class [1]1 modification. WAC 173-303-830(4)(d)(ii)(A) states, "Class 1 modifications apply to minor changes that keep the permit current with routine changes to the facility or its operation. These changes do not substantially alter the permit

Quarter Ending December 31, 2015

24590-WTP-PCN-ENV-12-006

conditions or reduce the capacity of the facility to protect human health or the environment. In the case of Class 1 modifications, the director may require prior approval."	
Modification Approved/Concur: ☒ Yes ☐ Denied (state reason below) Reason for denial:	Reviewed by Ecology: S. Dahl for 3/3/16 S. Dahl Date

Addendum H

Closure Plan

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ADDENDUM H
CLOSURE PLAN

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Appendix A

ADDENDUM H CLOSURE PLAN

Note: Where information regarding treatment, management, and disposal of the radioactive source byproduct material and/or special nuclear components of mixed waste (as defined by the Atomic Energy Act of 1954 as amended) has been incorporated into this document, it is not incorporated for the purpose of regulating the radiation hazards of such components under the authority of this permit or chapter 70.105 RCW and its implementing regulations but is provided for information purposes only.

This addendum is the Resource Conservation and Recovery Act (RCRA) closure plan for the River Protection Project Waste Treatment Plant (WTP) permitted mixed waste management units, as required per the *Washington Administrative Code* (WAC) 173-303-806(4)(a)(xiii). This closure plan describes the activities that are necessary to close the WTP permitted mixed waste management units. The procedures and estimated times to complete these activities are discussed in this plan. Submittal of this closure plan completes the requirement of III.10.C.8.b and Compliance Schedule Item 8.

This closure plan is provided in compliance with the applicable requirements of the WAC 173-303-610, -620, and -806. This plan is also intended to demonstrate compliance with Conditions II.J and III.10.C.8 of the Hanford Facility Dangerous Waste Permit (Ecology 2009).

With several exceptions, this plan follows the format of a typical closure plan as outlined in the *Dangerous Waste Permit Application Requirements for Facilities Which Store and/or Treat Dangerous Wastes in Tank Systems and/or Containers* (Ecology 1996). The exceptions are the exclusion of sections that do not apply to the WTP (financial assurance, liability, "already closed disposal unit," and post-closure requirements), and the addition of new sections not addressed in the guidance (closure of tank, miscellaneous unit, container storage, and containment building units).

H.1.0 INTRODUCTION

This closure plan identifies the steps and procedures necessary to close any WTP permitted mixed waste management unit at any point in its active life. This includes the removal of dangerous and mixed waste and the decontamination of the permitted mixed waste management units, ancillary equipment, and the associated secondary containment systems. The RCRA closure activities will be consistent with the requirements of the WTP deactivation, decontamination, and decommissioning plan to be prepared under separate authorities. They will be revised as necessary to maintain consistency between the plans. Deactivation of the WTP is discussed further in Sections H.3.2 and H.7.0.

H.1.1 Closure Plan Overview

Mixed waste will be handled and stored in the following areas of the WTP, as identified in DWP and Addendum C:

- Pretreatment plant building
- WTP portion of the waste transfer lines from the double-shell tank (DST) system

- Intra-facility transfer lines between WTP buildings
- WTP portion of the effluent transfer lines from the WTP to the Liquid Effluent Retention Facility (LERF)
- Low Activity Waste (LAW) vitrification building
- High-Level Waste (HLW) vitrification building
- Laboratory
- Failed Melter Storage

The permitted mixed waste management units in the WTP are identified in Addendum C. The WTP mixed waste management units, including ancillary equipment, secondary containment areas, supporting structures and underlying soil, are addressed in this closure plan. Closure of the pipelines connecting the WTP with the DST system unit and the LERF/ETF will be integrated with those respective facilities. Closure criteria will be developed jointly by DOE, its contractors, and Ecology prior to initiating closure activities. DOE will be responsible for implementing the cleanup standards.

The closure plan indicates several potential Hanford treatment, storage, and disposal (TSD) units that may be used to manage dangerous and mixed wastes generated during closure of the WTP permitted mixed waste management units. These identifications are preliminary and are subject to change as the Hanford facility is developed, and as the Hanford Facility Dangerous Waste Permit (Ecology 2009) is modified in the future.

The remainder of the closure plan provides the following information:

- Section H.2.0 of the closure plan identifies the regulatory standards that apply to closure, and the processes to be used for developing specific cleanup standards that may be achieved during closure.
- Section H.3.0 describes the overall approach for removing the mixed waste inventory, flushing and decontamination operations, removing and disposing of contaminated equipment and residues, and inspections and sampling to verify clean closure.
- Section H.4.0 describes other activities, including certification of completion of closure, control of run-on and runoff during closure, and equipment reuse.
- Section H.5.0 provides the maximum possible mixed waste inventory.
- Section H.6.0 describes the closure procedures for each type of permitted mixed waste management unit.
- Section H.7.0 provides the schedule for closure.
- Section H.8.0 describes the demonstration required to support a request to extend the standard 90- and 180-day mixed waste removal and closure completion time limits, as specified in WAC 173-303-610(4)(a) and (b).

H.1.2 Closure Plan Revisions

Clean closure is the goal for the WTP permitted mixed waste management units. The closure plan will be revised if efforts to achieve the clean closure standards are unsuccessful. The WTP may also be closed as a landfill, as provided in WAC 173-303-610, if the clean closure standards cannot be achieved through the removal of radiological contamination levels and the closure performance standards cannot be achieved. The revised closure plan will be accompanied by a written request for modification of the permit.

The design life of the WTP is 40 years after the initiation of waste treatment operations. The actual operating life of the plant may change depending on expansion in treatment capacity, improvements in treatment technology, or many other factors. The closure plan will be revised and submitted for approval under WAC 173-303-830 (Permit Changes) to incorporate future advances in decontamination technology, changes in plant capacity, newly designated dangerous waste, or other factors that may affect the closure of the WTP permitted mixed waste management units.

The closure plan may also be revised before the start of closure work, based on relevant information from the operational history of the WTP and the permitted mixed waste management units, and when information such as decontamination and access of high rad areas becomes available. The final revised closure plan will provide the necessary final detailed decontamination schedule and procedures, sampling and analysis plan, health and safety plan, interface with DST system unit and LERF/ETF closure plans, and additional information dependent on future conditions, as indicated in the following pages. Also, if necessary, a post-closure plan presenting details of any post-closure processes and activities will be submitted to Ecology in accordance with WAC 173-303-610(8).

H.2.0 CLOSURE PERFORMANCE STANDARD

The WTP permitted mixed waste management units will be closed in accordance with the requirements of Conditions II.J and III.10.C.8 of the Hanford Facility Dangerous Waste Permit (Ecology 2009).

Clean closure requires decontamination or removal and disposal of dangerous/mixed waste, waste residues, contaminated equipment, soil, or other material, in accordance with the clean closure performance standards of WAC 173-303-610(2). Clean closure as described in this closure plan will accomplish the following:

- Minimize the need for future maintenance
- Control, minimize, or eliminate, to the extent necessary to protect human health and the environment, post-closure escape of dangerous waste, dangerous constituents, leachate, contaminated runoff, or dangerous waste decomposition products, to the ground, surface water, groundwater, or the atmosphere
- Return the land to the appearance and use of the surrounding land areas to the degree possible given the nature of the previous dangerous waste activity

Activities beyond that point will be decided and documented in the revised plan prior to closure. The WTP buildings will not be used for RCRA-regulated TSD activities following clean closure, unless a new permit is issued.

The appearance of the land where the WTP buildings are located will be consistent with the appearance and future use of the surrounding processing land areas, after completion of clean closure activities. The WTP buildings will remain at the site until final disposition is determined and implemented. The WTP buildings may be demolished, if the buildings will have no future mission. Future land use decisions may be considered during the WTP decommissioning process. The final decision on building disposition and the appearance and use of the plant area will be integrated with the decisions on disposition of the buildings in the adjacent 200 East Area.

The long-term future use of the WTP site and the adjacent 200 Areas was addressed in the *Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement* (DOE 1999). The Central Plateau as defined in that document includes the United States Ecology commercial waste disposal facility, the DOE Environmental Restoration and Disposal Facility (ERDF), and the 200 West and 200 East Areas, as well as the WTP site.

Permitted units where mixed or dangerous wastes have been treated or stored will undergo closure activities. Contaminated equipment, debris, and solid decontamination residues generated during the closure of the WTP permitted mixed waste management units will be designated and packaged in accordance with the appropriate regulatory requirements (expected to be the WAC dangerous waste regulations in effect at the time of closure). The dangerous and mixed waste will then be transferred to a permitted TSD unit either on or off the Hanford Site. Equipment and debris that are not adequately decontaminated will be treated to comply with land disposal restriction requirements. Liquid decontamination solutions or agents generated during closure activities will be collected, designated, and disposed of at an appropriate TSD unit.

If a product, residual waste, or decontamination fluid is spilled or released to the environment during closure activities, spill response will be initiated as described in Addendum F and Addendum F1 (*River Protection Project – Waste Treatment Plant Emergency Response Plan*), and in accordance with WAC 173-303-145(2) and 173-303-360(2)(d) reporting requirements. The residual waste will be collected, designated, and managed appropriately. The waste will be managed in accordance with the appropriate regulatory requirements.

Clean Debris Surface

This closure plan proposes use of a "clean debris surface," defined in the following paragraph, as the clean closure performance standard for the WTP metal structures and equipment and concrete structures that will remain after closure, as well as all of the DWP equipment used for waste management; Attainment of a clean debris surface can be verified visually in accordance with the standard in WAC 173-303-610(2)(b)(ii), incorporating 40 CFR 268.45, Table 1, footnote 3, which states:

> "Clean debris surface" means that the surface, when viewed without magnification, will be free of all visible contaminated soil and hazardous (dangerous) waste except that residual staining from soil and waste consisting of

> light shadows, slight streaks, or minor discolorations, and soil and waste in cracks, crevices, and pits may be present provided that such staining and waste and soil in cracks, crevices, and pits will be limited to no more than 5 % of each square inch of surface area."

The clean debris surface standard will be achieved by using the physical and chemical extraction techniques identified in 40 CFR 268.45, Table 1, incorporated by reference WAC 173-303-140. The primary method of decontamination may be water washing, followed by a choice of using chemical decontamination solutions, ultrahigh-pressure water technologies, impact technologies such as sand blasting and CO_2 blasting, or other new technologies that may be developed prior to closure. Physical extraction methods that remove up to 0.6 cm of concrete will be used only after the previous technologies have failed to result in a clean-debris surface, or if there has been a failure of the coated concrete surface. Visual verification may be performed by direct worker observation with written inspection documentation (Figure H-1, Sample Clean Debris Surface Checklist), or by other means such as remote-operated closed circuit television and videotape.

Concrete surfaces may be protected with a contamination-resistant protective coating. Protective coatings in good condition may be decontaminated using one of the technologies described above, then inspected to determine if a clean debris surface is present in the same manner as steel or other metal surfaces. If there is evidence that a dangerous/mixed waste release has occurred, such as confirmation of contamination behind a stainless-steel lined breach or identification of damaged or deteriorated protective coating on a concrete floor where a dangerous/mixed waste release has occurred, and if the concrete is adjacent to soil, a contamination investigation may be performed.

If the concrete protective coating exhibits more damage than hairline cracks and has lost integrity, the concrete surface under the deteriorated coating will be treated with aggressive physical extraction technologies, such as high pressure water or scabbling, to remove at least 0.6 cm of material below the original surface. This approach also applies to uncoated concrete behind or beneath stainless-steel lined breaches. The exposed concrete will again be inspected to verify that the clean debris surface standard is met. The treatment will be repeated until the clean debris surface standard is met. Closure standards for soil underlying the WTP are addressed in Section H.2.1.

If the clean debris surface standard as described cannot be performed or cannot not be achieved, an alternative method will be proposed in the revised Closure Plan as required by DWP Conditions III.10.C.8.c and III.10.C.8.d.

<u>Designation Limit</u>

Some waste handling equipment metal surfaces cannot be visually inspected (for example, internal pipe, pump, and tank surfaces). A component or portions of a component may be flushed with decontamination solutions if it cannot be decontaminated to meet the clean debris surface standard, or if it cannot be inspected to verify that it meets the standard. The decontamination solution, or rinsate, will be sampled and analyzed using methods complying with *Test Methods for Evaluating Solid Waste, Physical Chemical Methods* (EPA 1986) for indicator constituents. Analytical data that meet the criteria defined in WAC 173-303-610(2)(b)

will indicate successful decontamination and attainment of the clean closure performance standard. The rinsate analysis criterion is hereafter referred to as the designation limit standard.

Closure Strategy for Tank Systems

The general closure strategy for tank systems is outlined in flowcharts in Figures H-2 and H-3. Triple-rinsing followed by visual inspections is an accepted method of decontaminating tanks. However, modification of this technique may be necessary, if determined at a later date.

Figure H-2 shows that internal flushing and decontamination of tanks and ancillary equipment, inspection of the secondary containment area, and sealing of observed stainless-steel lined breaches will be performed prior to final decontamination efforts. Disposition of solid and liquid treatment residuals is shown only at the initial flushing step (below "flush tanks, piping"), to avoid unnecessary complexity in Figure H-2. The residuals from the following internal and external decontamination steps are expected to follow the same paths.

The two "more decon?" decision boxes in Figure H-2 (following determinations that decontamination efforts so far have been inadequate) are the symbols for the key decisions the future closure managers may have to make:

1 Perform additional decontamination to meet the clean closure standard
2 Stop decontamination and designate that tank or ancillary equipment as mixed waste debris to be removed, reduced in size, encapsulated, packaged, and disposed

Figure H-2 does not show that additional decontamination of external tank or other surfaces may be required to continue on the disposal path (after "remove, dispose of as mixed waste") because such additional decontamination, if required, will be due to radiological dose concerns, not dangerous/mixed waste requirements. Figure H-2 also illustrates the assumption that internal surfaces of tanks and ancillary equipment cannot be adequately or efficiently decontaminated and/or inspected to demonstrate that the clean debris surface standard is met, and that the decontamination solution or rinsate designation limit standard will apply to all internal tank system surfaces.

Closure Strategy for Secondary Containment Areas

Figure H-3 shows the strategy for closure of secondary containment areas. These steps illustrate the approach for decontaminating stainless steel liners and coated concrete surfaces. Secondary containment area liner breaches may need to be sealed prior to decontamination or removal of equipment. The general procedure for investigating liner breaches or breaks, and decontaminating the concrete behind or below such breaches, is shown in Figure H-3.

The closure strategy for concrete with intact protective coatings is straightforward. If a release of dangerous or mixed waste in the permitted unit has not been documented in the facility operating record, and no evidence of a release is found during the initial closure inspection, the assumption will be made that the concrete floor surface meets the clean debris surface standard.

If a release has been documented, and the concrete does not meet the clean debris standard, decontamination technologies, as described in Section H.2.0, will be performed until the clean debris standard can be met and documented.

If evidence is found that a release has occurred on a concrete floor where the protective coating has even minor cracking, physical extraction will be required. Physical extraction of the concrete surface may also be required if sampling of the area determines there is dangerous waste contamination in areas where the protective coating is substantially damaged or deteriorated; for example, if it is broken or peeling. The extraction will be followed by an inspection and sampling to verify and document the presence of a clean debris surface. If a release is documented at such a location and the concrete at that location is resting on or against soil, a soil investigation may be required. These steps are illustrated in the last two boxes before the final decision box, "Visible Crack or Decomposed Concrete?" in Figure H-3.

Closure Strategy for Soil

The criteria for determining whether additional soil investigation is required are shown in the final decision box in Figure H-4. Contaminated soil will be removed to meet risk-based concentration limits, referred to as the soil cleanup limits (see Section H.2.1). Soil sampling and analyses will be performed after removal to verify compliance with the soil cleanup standard. Figure H-4 shows the strategy for addressing potential impacts to soil and groundwater.

Compliance with this plan and attainment of the closure standards will be documented by videotape or written inspection records, such as those shown in the sample checklist in Figure H-1, the example Closure Certification Statement in Figure H-5, and other supporting records as discussed in Section H.4.1.

H.2.1 Closure Standards for Soils, Groundwater, Surface Water, and Air

The design of the WTP mixed waste management units is intended to prevent the release of dangerous/mixed waste to the soil, groundwater, surface water, or air. Clean closure of the soil beneath the WTP mixed waste management units will be accomplished by demonstrating that the stainless-steel process cell liners, and the coated concrete walls and floors in the secondary containments, have not lost integrity and have therefore prevented contaminants from reaching the soil. If loss of secondary containment integrity has occurred, the potential for soil contamination will be investigated. The demonstrations will consist of performing and documenting inspections and decontamination work, and soil sampling and removal, if necessary.

The need for sampling of soil will be determined on a unit-specific basis per WAC 173-303-610(2)(b)(i), and will take into consideration the mixed waste management unit operating history.

Where a dangerous/mixed waste release is known or suspected to have occurred, the following conditions indicate probable secondary containment failure and potential soil contamination: the observation of potential through-thickness cracks or crumbling concrete at a liner breach location or in a secondary containment area with deteriorated concrete floor coating. Potential soil contamination will be investigated through coring and sampling of both the concrete and the soil.

Biased sampling will be focused in the vicinity of the liner defect or coating defect, concrete cracks, or in the known or suspected release location. Samples will be analyzed for constituents of concern (COCs). The proposed COCs will be submitted to Ecology with the revised closure plan submitted before the start of closure. The COCs to be used will be developed using process knowledge, operating record, and waste characterization analyses, whenever possible.

The appropriate risk-based cleanup standard will be consistent with the future land-use classification. The standard will be reviewed prior to initiating closure to ensure it is still appropriate. Clean closure concentration limits for soils will be established in accordance with WAC 173-303-610 (2)(b)(i). Given the long operating life of the WTP and the current state of assumptions for toxicity data, and regulatory guidance, calculation of specific limits is not appropriate at this time.

In establishing soil clean closure concentration limits, consideration will also be given to "area background", as defined in Ecology's *Guidance on Sampling and Data Analysis Methods* (Ecology 1995) and in accordance with WAC 173-303-610(3)(a)(v). The *TWRS Phase 1 Privatization Site Preconstruction Characterization Report* (HNF 1998), the *Hanford Site Background Part 1, Soil Background for Nonradioactive Analytes* (DOE/RL 1995), or other site-specific soil background information will be used to assist in determining background levels in the soil. If the closure soil sample data are at or below the calculated soil cleanup levels, or the site-specific background concentrations, whichever is greater for each constituent, the soil will be considered clean-closed.

Due to the level of secondary containment provided at the WTP, non-permitted releases of dangerous/mixed wastes to soil, groundwater, surface water, or air are not anticipated.

Areas in which soil could have become contaminated will be mapped during the liner or concrete secondary containment area inspection and decontamination process. Soil sampling is addressed in Appendix A, Sampling and Analysis for Closure of WTP Facility (SAP). As necessary, a more detailed sampling and analysis plan may be included in a future revision to the closure plan in accordance with DWP Conditions III.10.C.8.c and III.10.C.8.d.that is required under permit condition III.10.C.8.d. The revised closure plan will be submitted to Ecology for review and approval prior to closure. The current SAP is consistent with the Guidance for Clean Closure of Dangerous Waste Units and Facilities (Ecology 2005), as incorporated by reference at WAC 173-303-140 (2)(a).

H.2.2 Closure Standards for Decontamination of Structures and Equipment

Some of the dangerous/mixed waste-contaminated structures and ancillary equipment that will undergo decontamination during the closure of the WTP consist of equipment with smooth metal surfaces. Concrete and protective coating surfaces in secondary containment areas will also be decontaminated as part of closure. The types of structures and associated equipment that may be decontaminated to meet the clean debris surface standard include, but are not limited to:

- Interior and exterior tank and pipe surfaces
- Secondary containment area stainless steel liners
- Uncoated concrete floors and walls behind stainless-steel liners

- Coated concrete walls and ceilings above stainless-steel lined secondary containment, as necessary
- Coated concrete floors in secondary containment areas

Decontamination of interior surfaces of tanks and pipes and documentation that they meet the clean debris surface standard may or may not be possible, given the current state of decontamination and inspection technologies. At present, the available miniature equipment may not be adequate to remove hardened waste or contaminated corrosion coatings from relatively inaccessible interior tank and pipe surfaces. Similarly, available video equipment may not provide the inspection capability necessary to demonstrate attainment of the clean debris surface standard on interior surfaces. The criteria for whether or not decontamination is possible will be developed and submitted for approval prior to initiating closure activities. In addition, for areas such as the PT and HLW Facility Black Cells and Hot Cells, they are currently provided with spare penetrations that can be used for spray wands if needed during closure activities to facilitate dangerous waste decontamination. If, after decontamination, safe physical access in black cells is not available during the closure period to enable the use of the clean debris surface standard, which requires visual verification, other technologies such as remote operated CCTVs may be used.

Decontamination of equipment and stainless-steel lined secondary containment or liners will be conducted by using water washing and spraying or ultrahigh-pressure water jetting, or other technologies listed in Section H.3.0. Residues from these extraction operations will be collected, sampled as necessary, designated in accordance with WAC 173-303, and transferred to a TSD facility such as the LERF/ETF or the Central Waste Complex (CWC) for treatment, storage, and/or disposal.

Decontamination of intact secondary containment protective coating surfaces on concrete to meet the clean debris surface standard will also be performed primarily through water washing and spraying. Additional technologies that may be used include chemical decontamination solutions, ultrahigh-pressure water technologies, impact technologies such as sand blasting and CO_2 blasting, or other new technologies that may be developed prior to closure. The secondary containment protective coating on concrete is designed and applied to provide a durable, non-porous surface. If decontamination of the impermeable protective coating surface in secondary containment areas cannot be completed through chemical extraction, or if the protective coating has broken, cracked, or peeled away from the concrete, then at least 0.6 cm (0.24 inches) of the underlying concrete will be removed using one or more of the physical extraction technologies. The physical extraction performance standard for concrete is removal of 0.6 cm of the surface layer and treatment to a clean debris surface, as noted in the *Guidance for Clean Closure of Dangerous Waste Units and Facilities* (Ecology 2005), Section 5.6, and as noted in 40 CFR 268.45, Table 1, as incorporated by reference at WAC 173-303-140 (2)(a).

Metal surface areas of equipment that cannot be documented to meet the clean debris surface standard may be decontaminated using water washing, followed by a choice of chemical decontamination solutions, ultrahigh-pressure water technologies, impact technologies such as sand blasting, or other new technologies that may be developed prior to closure. Rinsate may be sampled and analyzed, using methods complying with *Test Methods for Evaluating Solid Waste,*

Physical Chemical Methods (EPA 1986) for Ecology-approved indicator constituents. If other analytical methods are developed and chosen for use, the closure plan will be revised and submitted for approval. Indicators will be determined on the basis of process knowledge, operating record, and waste characterization analyses, whenever possible.

Analytical data less than designation limits will indicate successful decontamination and attainment of the clean closure performance standard for the tank, piping, or other metal structures and equipment. Documentation of the representative character of the sample and laboratory quality control and quality assurance data will be entered into the closure record as specified in Sections H.3.4 and H.4.1. Concrete and protective coated concrete surfaces will not be addressed using designation limits.

If the metal structure or equipment cannot be considered decontaminated using the clean debris surface or designation limit criteria, or if further decontamination is determined to be impractical due to high radiation levels, waste minimization, cost considerations, or other reasons, it will be packaged using the debris treatment standard for immobilization by encapsulation. The waste will be designated on the basis of process knowledge and transported to a permitted dangerous or mixed waste disposal facility such as Hanford LLBG mixed waste trenches. Examples of equipment that may undergo encapsulation and disposal include, but are not limited to:

- Tanks and pipe
- Melter off-gas duct work, scrubber, condenser, precipitator, and washout holding vessels
- Pumps, agitators, wash rings, and ejectors

Contaminated items and solid decontamination residues removed from the WTP permitted mixed waste management units will be designated, packaged, and treated as necessary to meet the waste acceptance criteria of the receiving facility. Sampling of items and solid residues known to be contaminated and intended for disposal is not necessary if process knowledge is adequate to accurately designate the wastes with the proper dangerous waste identification codes. The closure plan will be revised prior to start of closure and will address treatment and disposal plans in more detail.

H.2.3 Closure Standards for Tank Systems

At closure of a tank system, the owner or operator is required by WAC 173-303-640(8)(a) to remove or decontaminate dangerous/mixed waste residues, contaminated secondary containment system components (such as liners), contaminated soils, and structures and equipment contaminated with dangerous/mixed waste, and manage them as dangerous/mixed waste, with few exceptions.

For the purposes of the WTP RCRA closure, the standard is interpreted to mean that each tank and associated ancillary equipment, including the secondary containment area, will meet the clean debris surface standard and/or designation limit criteria for rinsate. Indicator constituents or COCs to be used for rinsate evaluation will be determined using process knowledge, including consideration of the available waste characterization data, and other relevant information in the facility operating record.

Inspectable surfaces may be declared clean if they meet the definition of a clean debris surface, including portions of concrete secondary containment with intact protective coating surfaces, and physically-extracted concrete surfaces behind stainless-steel lined breaches, or under abraded or loose protective coating that have had at least 0.6 cm of material removed from the original surface. Rough or inaccessible metal surfaces such as corroded tank secondary containment area liner surfaces, or tank and pipe interior surfaces, may be declared clean when the decontamination solution sample is analyzed, with appropriate quality control and quality assurance as noted in Section H.3.4, and the indicator parameter or COC data are determined to be less than or equal to the designation limits.

If decontaminating a tank system in place is not feasible or is ineffective, an alternative method is to remove the tanks, disassemble them, and decontaminate the tank parts using extraction technologies described under alternative treatment standards for hazardous debris (40 CFR 268.45), as incorporated by reference at WAC 173-303-140 (2)(a). With Ecology's concurrence, the decontaminated debris can then be disposed of as non-dangerous (but possibly controlled as radioactive) waste, as indicated in Section 5 of *Guidance for Clean Closure of Dangerous Waste Units and Facilities* (Ecology 2005).

Tank systems will be inspected for compliance with the clean debris surface standard by observing the external and internal metal surfaces. Portions of a tank system that cannot be fully inspected (such as interior surfaces of tanks and attached piping, pumps, ejectors, and welded pipe connections or penetrations) or that may pose as low as reasonably achievable (ALARA) compliance problems, may be decontaminated with chemical or physical extraction technologies. The decontamination solutions from these portions of the system will be sampled and analyzed for indicator parameters, and the results will be compared to waste designation limits. Solid residues will be removed, containerized, designated, and disposed of at a permitted disposal facility as required. The tank or ancillary equipment, if not decontaminated to meet clean debris standard, will be removed, treated as necessary, and disposed of in a permitted landfill. Treatment may include macro-encapsulation or micro-encapsulation, or other processes that comply with land disposal restrictions.

Standards for clean closure of tank system secondary containment are identical to standards for decontamination of secondary containment areas for the container storage, containment building, and miscellaneous units; that is, clean debris surface standard and/or designation limits.

The proposed COCs will be submitted to Ecology and finalized in the revised closure plan to be submitted before the start of closure.

H.2.4 Closure Standards for Container Storage Areas

In addition to the requirements of WAC 173-303-610, WAC 173-303-630(10) requires that at closure, dangerous/mixed waste and residues will be removed from the secondary containment system. Remaining containers, liners, bases, and soil contaminated with dangerous/mixed waste or residues will be decontaminated or removed.
Standards for clean closure of clad container storage secondary containment are identical to standards for decontamination of secondary containment areas for the tank system, containment

building, and miscellaneous units (that is, clean debris surface standard and/or designation limits). Special requirements for clean closure of several secondary containment areas with coated concrete floors were explained in Section H.2.2.

H.2.5 Closure Standards for Containment Buildings

At closure of a containment building system, the owner or operator is required by WAC 173-303-695 (incorporating 40 CFR 264.1102(a)) to remove or decontaminate dangerous/mixed waste residues, contaminated secondary containment system components (such as liners), contaminated soils, and structures and equipment contaminated with waste and leachate, and manage them as dangerous waste, unless WAC 173-303-070(2)(a)(ii) applies.

Standards for clean closure of containment building units are identical to standards for decontamination of secondary containment areas for the tank system, container storage, and miscellaneous units (that is, clean debris surface standard and/or designation limits).

H.2.6 Closure Standards for Miscellaneous Units

The owner or operator is required by WAC 173-303-680 (2) to close miscellaneous units in a manner that will ensure protection of human health and the environment. Miscellaneous units at WTP include, but are not limited to, melters, scrubbers, condensers, precipitators, reboilers, oxidizers, adsorbers, and filters. The LAW and HLW melters will be removed and replaced several times during the operational life of the WTP. Removal and replacement are not considered closure or partial closure activities. Melters may be replaced according to the schedule based on the design life of the melter components, or replaced when unplanned failure of a component occurs. In either case, ancillary equipment will be removed or disconnected from the melter after molten glass has been removed to the maximum practical extent.

Openings to the LAW locally shielded melter (LSM) will be sealed and the melter will be removed from the LAW vitrification building, after surface decontamination, as a single container.

Spent HLW melters will be placed in a specially designed shield overpack and then removed from the HLW vitrification building to a disposal facility. Failed melters will be placed in the WTP failed melter storage building (container storage area). During closure of the WTP, the failed HLW melters will be dispositioned to meet disposal site waste acceptance criteria.

Spent LAW and HLW melters may also be stored in the WTP failed melter storage building (container storage areas) if necessary to accommodate scheduling of treatment and disposal operations, or for other reasons. The melters will be shipped to permitted treatment and disposal facilities. The WTP miscellaneous units that treat liquid mixed waste will be housed in containment building units, caves, and process/hot cells that provide secondary containment.

Standards for clean closure of the miscellaneous unit secondary containment areas are the standards for decontamination of containment building units (that is, the clean debris surface standard and/or designation limits).

H.3.0 CLOSURE ACTIVITIES

This section describes closure activities that will be conducted to meet the clean closure performance standards. Details provided here may change, and if necessary, the plan will be revised to reflect those changes. The facility is scheduled to close at the end of its operating life. If the WTP is shut down prior to this time, an updated closure plan will be submitted prior to start of closure activities. If partial closures of the WTP mixed waste management units are necessary, updates to the closure plan will be submitted prior to initiating closure activities.

Section H.3.1 describes the maximum extent of operations. Section H.3.2 describes the process for removing dangerous (mixed) wastes from permitted units. Section H.3.3 identifies several chemical and physical extraction technologies that may be used to achieve the clean debris surface standard. Section H.3.4 describes the approach for verification sampling and analysis to confirm that decontamination and/or removal activities have attained the designation limit standard. Section H.4.0 describes the procedures to be followed in order to comply with closure certification requirements, to control run-on and runoff during closure, and to reuse equipment from the plant. Section H.5.0 provides the estimated maximum mixed-waste inventory for each type of dangerous/mixed waste management unit. Section H.6.0 describes how each of the four types of permitted units will be closed. The goal for closure of the WTP permitted mixed waste management units is clean closure, which is contingent on achievement of the clean debris surface standard or verification that indicator constituents in decontamination solutions from the permitted mixed waste management units are not present in concentrations above designation limits.

Partial closure may be considered for some of the mixed waste management units; that is, one or more treatment processes or tank systems may be closed prior to the start of closure of the entire plant. Closure of a single mixed waste management unit or group of units could be necessary if a process were to be redesigned, eliminating the previous functions of the permitted mixed waste management units. Abnormal occurrences could also force partial closure, such as plugging of a tank or piping. Partial closures of the plant are not planned but could result from unforeseen circumstances. The closure plan will be revised to address the specific details for the permitted mixed waste management units if partial closure is necessary, and the revised plan will be submitted to Ecology for review, approval, and incorporation into the permit prior to start of closure activities.

The following assumptions were made in developing the closure plan:

- The maximum inventory will be present approximately nine months or more before the start of the closure period. This is the case because of the batch nature of the entire WTP treatment scheme. The treatment systems within the WTP will operate normally until the last portions of this final transfer are treated.
- The pretreatment building and the HLW melter will treat mixed waste and may be fully operational at the start of the closure period. These portions of the WTP will continue to operate during the closure period until the tank system flush solutions and residues are removed from each system to the maximum practical extent and treated before final decontamination begins.

- Operating records documenting the constituents and volumes of the mixed wastes in the storage and treatment areas, and of the mixed wastes previously processed through the facility, will be available. The operating record also will include detailed information on historical releases of dangerous/mixed wastes into secondary containment areas, previous decontamination work, and equipment that is present in secondary containment areas. This information will be directly relevant to final detailed planning of decontamination steps and procedures, especially treatment and disposal of the decontamination solutions and residues that will be generated.
- A release of dangerous/mixed wastes outside permitted mixed waste management unit secondary containment areas will not occur.
- Equipment necessary for dangerous/mixed waste removal and equipment decontamination will be functional or will be repaired or replaced.
- Permitted TSD facilities will be available to receive dangerous and mixed wastes that will be generated during closure.

Overall Closure Approach

After the final waste feed shipment or inventory is processed, the LAW LSM units will be closed and removed from the site. Tanks and piping will be flushed. The flush solutions will be treated in the pretreatment building by filtration and evaporation, and concentrated solids will be immobilized in glass produced in the HLW melter. Immobilized waste may or may not be acceptable at the facilities that accepted standard immobilized low-activity waste (ILAW) and immobilized high-level waste (IHLW) during the operating life of the WTP. Specific disposal plans for this type of waste may not be finalized until submittal of the final revised closure plan prior to start of closure.

The next step in the overall closure approach is to decontaminate the WTP mixed waste management units' components to the maximum feasible extent and remove components that cannot be decontaminated to meet the clean debris performance standards. Contaminated components will be disposed of, and the residues and decontamination fluids remaining after treatment operations at the WTP mixed waste management units have ceased will be transferred to the CWC, LERF/ETF or another Hanford Site permitted TSD facility. Other Hanford Site TSD facilities that may be considered for treatment or disposal of closure wastes in addition to the CWC and LERF/ETF include the LLBG, the Waste Receiving and Processing (WRAP) facility, and the Integrated Disposal Facility (IDF).

Vitrification treatment will not be available after the last melter is shut down, near the completion of WTP deactivation work. Small quantities of feed waste or flushing residues may remain in tanks after the last melter is shut down, in addition to insoluble adhered coatings in piping and tanks. The remaining aqueous residues may have to be transferred to the LERF/ETF or the CWC for evaporation, precipitation, filtration, solidification or other treatment.

General Sequence of Closure Activities

The general sequence of activities necessary to close permitted mixed waste management units within the WTP, and the basis for establishing the order of performing these activities, is summarized in the following discussion:

Dangerous/Mixed Waste Inventory Removal

- Dangerous/mixed waste removal: The nonradioactive dangerous waste, if present, will be removed from the WTP to minimize the possibility of release. Note: dangerous wastes may be generated at the WTP throughout the closure period from maintenance activities.
- Inventory removal: The mixed waste inventory present in the WTP mixed waste management units at the beginning of the closure (primarily heels in the bottoms of tanks) will be removed and processed (pretreated and vitrified) to the maximum practical extent. This removal will minimize the possibility for release and allow decontamination of the equipment to proceed. Tank systems, miscellaneous units, and ancillary equipment will undergo flushing as part of closure activities.

Decontamination

- Liner inspection: After removal of mixed wastes (flushing), but before final decontamination of tanks and other permitted mixed waste management units begins, each secondary containment area will be inspected to identify potential or apparent breaks, cracks, or separation of the liner or protective coating from the concrete floors and walls. These locations (if any) will be mapped and documented, and sealed by welding or by application of patching or protective coating material, to prevent entry of contaminants during decontamination activities.
- Decontamination: Tank systems and other equipment in the permitted mixed waste management units will be decontaminated. Additional chemical or physical extraction may be performed before tank systems, piping, or the equipment and equipment support structures in the permitted mixed waste management units are removed. Extraction will be performed not only to meet clean debris standards detailed in Section H.2.0, but also to minimize the amount of mixed waste constituents that could be readily available for migration or release during equipment removal.
- Equipment may be left in place as clean-closed if it can be successfully decontaminated.

Inspection

- Equipment inspection: Tank/miscellaneous units systems and ancillary equipment will be inspected to ensure that the clean debris surface standard and/or rinsate analyses designation limits are met. If necessary, the equipment will be identified as requiring removal, encapsulation, and disposal.

Removal

- Equipment removal: If the permitted equipment cannot be decontaminated to meet the closure performance standard, it will be removed, treated by encapsulation, and disposed at a permitted facility. Size reduction treatment may also be performed.
- Permitted equipment decontamination: After the last batch of waste feed has been fully processed through the WTP, the LAW LSMs will be shut down and removed. Pretreatment process vessels and lines will be flushed with water or other solutions. Flushing liquids will be determined prior to initiation of closure activities, and if a liquid other than water is identified for use, the closure plan will be revised and submitted for approval prior to initiating closure activities. Flushing wastes will be treated in the pretreatment evaporation,

cesium removal, and ultrafiltration processes. The concentrates will be transferred to a HLW melter. Water condensate will be routed to the LERF/ETF. One HLW melter may be operated after shutdown of the LAW LSMs to provide treatment for the solid flushing residues and evaporator concentrates. At the completion of treatment operations, the HLW melter will be shutdown by procedure for melter change out. The HLW failed melters will be disposed of in accordance with LDR requirements and to the degree necessary to meet disposal facility waste acceptance criteria (Section H.3.3). LAW LSMs are not expected to require decontamination or size reduction treatment, other than surface decontamination after the operating equipment openings are closed. Spent HLW melters will be overpacked, and shipped to a permitted disposal facility.

Structure Decontamination

- Building structure decontamination, stainless steel-lined secondary containment areas: Liners in the permitted mixed waste management unit secondary containment areas will be decontaminated using chemical or physical extraction technologies, or both. Most of the secondary containment areas in the mixed waste management units will be lined with stainless steel. Coated concrete floors in secondary containment areas will be decontaminated using only chemical extraction technologies, unless the protective coating is damaged or deteriorated. Damaged protective coating in secondary containment areas, and contaminated concrete under or behind liner breaches, will be decontaminated using physical extraction technologies. Decontamination solutions may be sampled to determine treatment requirements and transferred via existing pipelines to the LERF/ETF if they meet the LERF/ETF acceptance criteria or to another permitted Hanford TSD unit. Structure decontamination activities are described in Section H.3.3.
- Building structure decontamination, concrete secondary containment areas: Examples of mixed waste management units that have coated concrete secondary containment without stainless steel include the condensate tank system, the LAW LSM gallery containment building, ILAW container finishing containment building, and several secondary waste container storage areas. At the time of closure, the facility operating record will be reviewed and each mixed waste management unit will be inspected to determine if releases of dangerous/mixed wastes have occurred in these areas. If a release of dangerous/mixed waste has occurred on a secondary containment concrete floor where the protective coating is even slightly damaged or deteriorated, the concrete in that secondary containment area will be physically extracted to remove at least 0.6 cm of concrete from the original surface. This effort will demonstrate compliance with the clean debris surface standard. If a release is not documented or suspected, minor or hairline cracks may still be accepted in determining that the clean debris surface standard is met. If the secondary containment protective coating is intact, the surface may be decontaminated by chemical extraction. If chemical extraction is unsuccessful, or if the coating is damaged by the chemical extraction, physical extraction will be performed.
- Building examination to verify decontamination: After each mixed waste management unit in each building has been decontaminated, the mixed waste management units will be inspected and closure documentation will be examined to verify that the clean closure standards have been met.

Soil Investigation, Removal, and Verification

- Potentially contaminated soil identification: Areas in which soil could have become contaminated will be mapped during the liner or concrete secondary containment area inspection and decontamination process. Soil sampling protocols will be established and implemented if potentially contaminated areas are identified.
- Soil decontamination: Soil removal will be performed if necessary. A revised closure plan and a post-closure plan per WAC 173-303-610(3) and WAC 173-303-610(7) will be submitted if removal to the established risk-based standards is not feasible.
- Soil sampling to verify decontamination for indicator constituents: The soil will be sampled and analyzed for indicator constituents after the contaminated soil has been removed.

  NOTE: Sampling of soil to verify decontamination will be addressed per the SAP and is included as Appendix A of the Closure Plan.

Disposition of Decontamination Wastes

- Disposition of decontamination fluids: Wastewater or chemical extraction solutions from decontamination activities will enter an existing collection system for waste characterization and verification against LERF/ETF waste acceptance criteria. At the final stage of closure, when the transfer pipeline to the LERF/ETF is taken out of service, decontamination solutions may be containerized and transported to the LERF/ETF by truck. Characterization of the closure residues in the permitted mixed waste management units will be documented based on process knowledge or analysis of the mixed waste treated in the units. If the wastewater cannot be accepted by LERF/ETF, it may be solidified and transferred to the CWC or another available permitted unit.
- Disposition of the building air emission control equipment (i.e., HVAC): Building air emission control equipment will remain in place until decontamination of other WTP components meets the clean closure performance standards. The HVAC equipment will be decontaminated to meet the clean closure performance standard, or will be removed, designated, and packaged to meet the waste acceptance criteria of a permitted disposal facility.
- Disposition of decontamination equipment: Equipment or materials used in performing closure activities will be decontaminated or disposed of at a permitted disposal facility. Personal protective equipment will be disposed of as appropriate.

The general order of closure activities was selected to minimize the potential for release of mixed waste constituents by removing the bulk of the mixed waste constituents early in the closure process. This order of closure also minimizes waste generation by reducing the possibility that decontaminated areas will become contaminated again by ongoing closure efforts.

Detailed scheduling of closure activities depends on the necessary facility functions required to be maintained during the closure period and the degree of contamination in each permitted mixed waste management unit, especially after the mixed waste inventory is removed and decontamination activities start. The large number of tank systems increases the potential for a highly complex schedule. Similar tank systems and other types of permitted mixed waste management units may be grouped for the purpose of minimizing the bulk and complexity of plans for closure activities. The detailed decontamination operations schedule will be included

in the revised closure plan to be submitted before the start of closure activities (see Section H.7.0).

Work will be performed in a manner that minimizes worker exposure to dangerous and/or mixed waste or other workplace hazards and will meet the ALARA principles.

Additional detail will be provided describing waste removal, equipment decontamination, and closure-generated dangerous/mixed waste disposal activities in the revised closure plans to be submitted prior to start of closure.

H.3.1 Maximum Extent of Operations

The maximum extent of operations during the active life of the WTP corresponds to the maximum mixed waste inventory with full feed tanks, the melters operating at design capacity, and full storage areas.

The general arrangement drawings in Addendum C show the locations of tanks, melters, miscellaneous units, containment buildings, and container storage areas. The dimensions of the permitted dangerous/mixed waste management units are included in Addendum C tables.

H.3.2 Removing Dangerous/Mixed Waste

The mixed waste feed inventory present in the WTP after the final receipt of waste feed from the DST system unit will be processed before the start of the first phase of closure. The mixed waste will be removed from tank systems to the maximum practical extent. Removal will be continued by processing the last bulk volumes of waste feed through the applicable pretreatment and vitrification systems, and transferring treated ILAW and IHLW to other TSD units or facilities from the container and canister shipping docks. These activities will follow normal operating procedures.

The following description of mixed waste removal is intended to provide a brief overview of the WTP permitted mixed waste management units closure activities.

At the completion of mixed waste treatment operations, DOE and its contractor will close the permitted mixed waste management units and deactivate the WTP facilities. Deactivation, when completed, will leave the facilities in a safe, stable, and passive state that can be monitored with minimal cost and minimal requirements for service support from either personnel or active equipment.

The WTP deactivation operations will comprise a large portion of the RCRA closure activities of the permitted mixed waste management units that will occur between the start of the closure period, as defined in WAC 173-303-610(3)(c)(ii), and the final shutdown of the HLW vitrification system. Closure operations for some permitted mixed waste management units may begin before the completion of treatment of the final batch of waste feed from the DST system unit.

Overlaps between dangerous/mixed waste management unit closure and the WTP facilities' deactivation activities, and the overall TSD facility permitting process, as defined in the *Hanford*

Federal Facility Agreement and Consent Order (Ecology, EPA and DOE 2011) and the implementing attachment known as the *Tri-Party Agreement Action Plan*, Section 6.3, are illustrated in Figure H-6. The full extent of necessary interfaces, and detailed definition of the intermediate points in this timeline, will not be determined until deactivation and closure planning are finalized before the start of closure.

Vitrified waste in storage at the WTP at the start of the closure period will be shipped to disposal units on the Hanford Site or to other appropriate facilities. If the inventory of untreated waste feed cannot be treated at the WTP, it will be transferred to a permitted TSD facility. Circumstances under which the waste feed inventory would not be treated through vitrification are not accounted for in this closure plan and would require revision of the plan. Properly completed shipping papers and certifications, as applicable, will accompany waste shipments.

Once the final batch of waste feed has been processed, residual heels will be flushed from the tank systems in accordance with deactivation procedures. Wastewater from flushing and decontamination solutions will be filtered, evaporated, and further treated as necessary in the WTP pretreatment building. The removed solids will be sent to the HLW melter. Wastewater will be sent to the LERF/ETF for treatment if acceptance criteria is met, or it will be transported to the CWC or another permitted TSD unit for storage, treatment, and disposal. Treatment in containers could be performed at the WTP if necessary or preferable, and if the resulting waste will meet the CWC or another TSD unit's waste acceptance criteria. The treatment in containers alternative is not likely to be used, due to the relatively large volumes of flush solutions that will be generated.

If non-radioactive is present as inventory at the start of the closure period at the dangerous/mixed waste container storage unit, it will be transferred to a permitted off-site facility for treatment or disposal. Non-radioactive dangerous waste generated during the closure or deactivation work will be managed similarly.

The TSD units available at the time of closure, and their waste acceptance criteria, may include additional units that are not available today.

Complete records will be kept as to the date of shipment, waste characterization, waste quantity, destination facility, land disposal restriction certifications and notifications, and other appropriate information for removed dangerous/mixed waste. Specific documentation requirements are discussed in Addendum B1. This information will be included in the closure documentation supporting certification, which is described in Section H.4.1.

The specific types of off-site treatment and disposal units for dangerous wastes generated during closure will be determined and provided in the revised closure plan to be submitted before closure begins. Interfaces with the DST system unit and LERF/ETF will be specified in the revised plan to be submitted before the start of closure.

H.3.3 Decontaminating Structures, Equipment, and Soils

The only structures and equipment that may be contaminated at the start of the closure period are within the permitted mixed waste management unit secondary containment areas. Some of the

types of waste handling equipment that may be located in each permitted mixed waste management unit can be determined by review of the design drawings and operating plans. Examples include, but are not limited to, cranes, power manipulators, and welding machines. Many other types of hand tools, instruments, lights and cameras, radiation monitors, buckets, and other equipment may be present in one or more permitted mixed waste management unit secondary containment areas. If contaminated with dangerous/mixed waste, these structures, tools, and equipment will be decontaminated, if feasible, using one or more of the following technologies to achieve the clean closure performance standard:

- Ultrahigh-pressure water jet
- Rotating cavitation water jet
- Soap scrubbing and wet vacuuming
- Steam vacuuming
- Vacuum abrasive blasting
- Soda blasting
- Shot blasting
- Ice blasting
- Hydroblasting
- Grit blasting
- Cryogenic CO_2 pellet blasting
- Sponge blasting
- Etching
- Rotating brushes/honing

More aggressive decontamination methods may be used on concrete if it becomes necessary to remove mixed waste accumulations that extend into the concrete:

- Needle scaler
- Paving breaker or chipping hammer
- Piston scabbler

These decontamination technologies were chosen based upon demonstrated effectiveness in a radioactive environment and the ability to successfully achieve the RCRA closure performance standard. These technologies are covered under the generic physical or chemical extraction technology categories listed in 40 CFR 268.45, Table 1. This approach is consistent with Ecology guidance (Ecology 2005) to achieve clean closure.

Specific methods of decontamination (and removal and disposal if required) of the permitted mixed waste management unit components and equipment will be determined at the time of closure. These methods will be based on information in the operating record, including historical mixed waste releases, and DOE plans for future use of the buildings. The feasibility, or practicality, of decontamination depends on many factors that cannot be fully defined until the

closure plan is finalized. Decision criteria may include, but are not limited to, radiation hazards, secondary mixed waste volumes, schedule and budget restrictions, and availability of TSD facilities to receive secondary mixed wastes. Equipment and debris that are not decontaminated will be disposed of as mixed waste.

Decontamination solutions from interiors of tanks, attached piping, and other equipment will be collected in tank drain piping and collection tanks. Decontamination solutions from tank and pipe exterior surfaces, and from decontamination of other free-standing ancillary equipment and secondary containment walls and floors in the four types of permitted mixed waste management units will be collected in secondary containment area sumps, then transferred by pumping or gravity drainage to plant wash collection tanks. Exceptions to this process may include decontamination of small surface areas where drainage may be captured in portable collection basins or buckets. Transfers of decontamination solutions to the LERF/ETF, CWC or another on-site TSD unit, or if the waste is non-mixed, to an off-site TSD facility, are addressed in Section H.3.2.

The decontamination solutions and residues will be designated on the basis of process knowledge, or sampling and analysis if necessary, and transferred by existing hard piping to the LERF/ETF. The pipe connection to the LERF/ETF will be one of the last WTP components to be taken out of service, after decontamination activities are complete. The last few decontamination activities may require the collection of wastewater in a temporary sump and container, and will be transported by truck to the LERF/ETF.

Solid residues will be collected into containers by vacuuming or mechanical means (such as sweeping or shoveling), treated, if necessary, at the WTP, CWC, or WRAP to stabilize or solidify the residues, and disposed in the LLBG or a permitted disposal unit on the Hanford Site. Off-site mixed-waste landfill disposal facilities may be considered if an appropriate Hanford Site unit is not available.

Contaminated debris and solid decontamination residues removed from the WTP will be designated and packaged to meet the waste acceptance criteria of the receiving facility. Sampling of equipment and solid residues that are known to be contaminated and are intended for disposal is not necessary, if process knowledge is adequate to accurately designate the waste with the proper dangerous waste identification codes. Process knowledge includes the operating record, which should provide adequate waste analyses and waste processing histories for each permitted mixed waste management unit in the WTP.
Information to support disposal of melters and other debris will be provided in a revised closure plan to be submitted before the start of closure.

H.3.3.1 Secondary Containment Structures and Associated Equipment

Within most of the process areas, stainless steel liners supported by steel reinforced concrete structures provide secondary containment for the process tanks, miscellaneous units, HLW melters, LAW melters, and ancillary equipment. Coated concrete surfaces (the walls and ceilings above the liners) in lined mixed waste management areas are not part of the required dangerous waste secondary containment structure, although additional controls may be provided for splashes and airborne contamination. Concrete in stainless-steel lined permitted secondary

containment areas, where control of splashes, washdown sprays, or airborne contamination is necessary, will be coated during construction with a durable chemical-resistant impermeable protective coating. Top edges of the liner plates in these secondary containment areas will be sealed to the concrete surface.

Steel liners and coated concrete surfaces will be inspected visually. The visual inspection may be conducted remotely using CCTV. The purpose of the inspections will be twofold: to identify and map cracks that might provide a migration pathway for contaminants and to identify areas that are potentially contaminated with mixed waste or waste residues.

Identified cracks in secondary containment areas will be sealed to prevent infiltration of decontamination solutions between the stainless steel liner and the concrete, or migration into cracks in concrete. Coated concrete and liner surfaces will be decontaminated to achieve the clean debris surface standard using chemical extraction, or if necessary, through physical extraction as described in Section H.2.0.

Secondary containment areas with concrete surfaces are eligible for decontamination by chemical extraction only if the protective coating is intact. Minor cracking in the protective coating will not disqualify the concrete surface from being eligible for classification as a clean debris surface, if that surface has not been directly exposed to dangerous waste as a result of a container leak or some other release mechanism. The facility operating record will be consulted before decontamination work begins to identify those permitted mixed waste management units where leaks or other dangerous/mixed waste releases have occurred. These permitted secondary containment areas will also be physically inspected to determine whether the protective coating is intact, and whether undocumented evidence of a mixed waste release is present.

Secondary containment areas with intact protective coatings may be decontaminated with water washing if necessary. If additional decontamination is necessary, other technologies will be used, such as chemical decontamination solutions, ultrahigh-pressure water technologies, impact technologies such as sand blasting and CO_2 blasting, or other new technologies that may be developed prior to closure. Physical extraction methods that remove up to 0.6 cm of concrete will be necessary on concrete surfaces where the protective coating has peeled, bubbled, or is broken (before or after decontamination), exposing bare concrete. Stainless-steel liners may also require physical extraction treatment to remove mixed waste residues or corrosion. Inspections of the concrete and liner surfaces for a clean debris surface will be documented in an inspection record. Details of the decontamination methods to be used will be developed and submitted for approval prior to initiating closure activities.

Concrete and steel grinding, scaling, or scabbling residues will be collected, placed in containers, and sampled and analyzed for indicator constituents.. The parameters, or the residues, will be designated based on knowledge of the process or the waste that contaminated the concrete or steel.

The operating record will be reviewed prior to closure to determine if decontamination procedures should be performed in any areas outside the permitted unit secondary containment areas. These areas may include equipment decontamination bays or secondary containment

sumps in transfer tunnels, or other locations where mixed wastes may have been generated or transferred during the operating life of the WTP and accidentally released. A final revised closure plan that includes areas identified as a result of the operating record review will be submitted to Ecology for review and approval before closure starts. Floors and walls in non-permitted areas of the building (such as offices, lunch rooms, or bulk storage areas for non-hazardous materials) that do not have documented releases of dangerous or mixed waste are not included in this closure plan.

H.3.3.2 Building Air Emission Control Equipment

Building air emission control (i.e., heating, ventilation, and air conditioning, HVAC) equipment will remain in place and in operation as necessary to facilitate deactivation and decontamination of the WTP. HVAC equipment will be taken out of service in stages as radiological contamination is progressively removed or reduced. Compliance with applicable air emission standards and permits will be maintained. Air permits for operations will be evaluated to determine if they will support closure activities. The permits will be modified if necessary.

After completion of decontamination operations that may generate fumes, vapors, or dust that will be controlled by the building ventilation system, the HVAC equipment will be decontaminated, then dismantled, and reduced in size to the extent necessary to facilitate preparation for disposal. DOE may determine that the HVAC equipment will remain in place after closure.

Modifications to air emission standards or other appropriate standards to prevent or minimize the release of dangerous waste or dangerous waste constituents to the air or surrounding environment during closure will be specified in the revised closure plan to be submitted before the start of closure.

H.3.3.3 Soil

Discovery of an apparent or potential breach in a cell liner or in the protective coating in unlined permitted secondary containment areas, on an exterior wall, or bottom floor adjacent to soil will require further investigation. The presence of soil contamination will be a unit-specific determination based on WTP records and direct visual or CCTV inspection of the stainless-steel liners and concrete surfaces as described in Section H.2.0. The liner will be removed to allow access for additional investigation and decontamination if this inspection reveals areas of poor liner integrity such as severe corrosion, weld breaks, or other damage to the steel. Coring and soil sampling will be performed if a liner breach or damaged protective coating is found on a wall or floor adjacent to external soil and if the concrete has lost integrity at that location. If the concrete is not cracked, deteriorated, or porous, and a clean debris surface can be obtained by physical extraction treatment, no further investigation or soil removal may be necessary. If soil is sampled, it will be analyzed for indicator constituents of concern identified on the basis of the mixed wastes contained in that permitted mixed waste management unit during the operating life of the plant.

If soil having levels of contamination that exceed the risk-based soil cleanup levels is found, it will be removed and managed as media containing dangerous waste, and will be designated and disposed of accordingly at a permitted disposal facility. Soil at the limits of excavation will be

sampled and analyzed after removals are completed to confirm that the concentrations of dangerous waste constituents are below the risk-based exposure limits. The appropriate risk-based cleanup standard will be consistent with the future land-use classification from the *Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement* (DOE 1999). Risk assessment principles will be used to establish clean closure concentration limits for soils in accordance with WAC 173-303-610(2)(b)(i).

H.3.4 Sampling and Analysis to Identify Extent of Decontamination/Removal and to Verify Achievement of Closure Performance Standard

If there are stainless-steel lined secondary containment breaches or concrete that has lost integrity, efforts to define the extent of contamination will use a graded approach using field screening and survey followed by verification sampling if needed. This section is an outline for a SAP that describes the approach that will be followed for verification sampling. The SAP will also assist in confirming that decontamination and/or removal activities have attained the closure performance standard. Sampling may be employed where the clean debris surface standard cannot be met, such as interior tank and pipe surfaces, or where evidence is found indicating apparent failure of permitted mixed waste management unit secondary containment such as liner cracks.

However, the SAP cannot be finalized at this time because the dangerous waste COCs at each permitted dangerous/mixed waste management unit and restrictions on sampling and analysis activities due to high radiation levels are not adequately defined. Prior to closure, this closure plan will be revised to specify sampling and analysis techniques in a site-specific SAP that may include: sampling to determine the extent of dangerous/mixed waste contamination, sampling objectives, analytical parameters, sampling methods and locations, identification of sampling preservation, sampling and data quality control, the evaluation and reporting of data, and the chain-of-custody record.

Additional information, as follows, may be provided in the revised closure plan to be submitted prior to closure:

- Health and safety plan
- Details on sampling equipment
- COC indicator parameters for decontamination solution analyses
- Analytical methods that deviate from *Test Methods for Evaluating Solid Waste, Physical Chemical Methods* (EPA 1986), if any

H.3.4.1 Sampling to Confirm Decontamination of Structures and Soil

Sampling of decontamination solutions may be conducted for equipment, structures, and debris that do not meet the clean debris surface standard following the decontamination process. This sampling will serve to define the extent of remaining contamination or confirm adequate decontamination of equipment, structures, or debris. The sampling process will be repeated after each subsequent round of decontamination effort until the decontamination effort is either

determined to be successful, or is terminated, and the contaminated component is removed and disposed of as dangerous or mixed waste.

Soil found to be contaminated will be removed as part of the closure activities, and sampling will be performed to confirm that levels of contamination in the remaining soil do not exceed Ecology-approved risk-based soil cleanup levels. The Sampling and Analysis Plan for WTP is referenced in Appendix A.

H.4.0 OTHER ACTIVITIES

This section describes the procedures to be followed in order to comply with closure certification requirements, to control run-on and runoff during closure, and to reuse equipment from the plant.

H.4.1 Certification of Closure

WAC 173-303-610(6) requires that within 60 days of completion of closure activities of the permitted dangerous/mixed waste management units, a closure certification will be submitted to Ecology. Following completion of closure, DOE (or the DOE-selected contractor) and an Independent Qualified Registered Professional Engineer will submit certifications that the permitted mixed waste management units have been closed in accordance with the approved closure plan. The certifications will be submitted in accordance with the Hanford Facility Dangerous Waste Permit (Ecology 2009) Condition I.I.1 to the following address:

Program Manager, Nuclear Waste Program
Washington State Department of Ecology
3100 Port of Benton Boulevard
Richland, Washington 99354

The following documentation will be prepared to support the closure certification, and will be provided or accessible to Ecology on request:

- Field notes related to closure activities
- A description of deviations from the approved closure plan and justifications for these deviations
- Documentation of the final disposition of dangerous wastes and dangerous waste residues, including contaminated media, debris, and treatment residuals
- Laboratory and field data (including quality assurance and quality control data) for samples and measurements, including those taken to determine background conditions or to determine or confirm clean closure
- A summary report that itemizes the data reviewed by the independent registered professional engineer and tabulates the analytical results of samples taken to determine or confirm clean closure

A draft decontamination documentation checklist and an example of RCRA closure certification statement are provided in Figure H-1 and Figure H-5, respectively.

Ecology will verify that the requirements for closure certification are properly completed per WAC 173-303-610(6). If the closure certification is accepted, Ecology will inform DOE of the acceptance in writing.

H.4.2 Run-on and Runoff Control

No runoff or run-on resulting from precipitation or surface water flows is anticipated in the areas undergoing closure. The WTP permitted dangerous/mixed waste management units are enclosed within highly secure reinforced concrete and steel frame buildings, with the exceptions noted below. Wash water or other liquids resulting from decontamination activities will be contained by WTP containment structures - floors, walls, ceilings, sumps, and catch tanks.

The only permitted mixed waste management units that may be exposed to direct precipitation are the two process condensate vessels outside the pretreatment building. The failed melter storage building will be a separate freestanding unit, and run-on or runoff control will be assured for this unit before and during operation of the WTP, as well as during the closure period. There will be no changes in the secondary containment capacities or runoff control design for this unit during closure activities.

Activities such as groundwater monitoring and run-on and runoff control will be described in a revision to the closure plan prior to closure.

H.4.3 Equipment Reuse

Equipment may be decontaminated and reused during or after closure, if practicable. For example, contaminated (radiological) material and handling equipment such as shield doors, cranes, and power manipulators may be decontaminated in order to reduce radiation dose rates. This will allow initial or repeated personnel entry to areas where additional decontamination, debris size reduction, or packaging and encapsulation activities will be conducted. Equipment described in Sections H.3.0 and H.6.0 will be decontaminated using methods selected from those specified under 40 CFR 268.45, or equivalent technologies.

Criteria for determining whether equipment will be reused or disposed of include the following:

- Degree of contamination (radiological)
- The need to minimize potential worker radiation and dangerous/mixed waste exposures during decontamination; the amount of decontamination residues that would be generated
- The value of the equipment
- Compliance with the approved schedule and budget

Equipment that could be used by DOE in future operations at the WTP site, in other Hanford projects, or at different DOE facilities, may be decontaminated first.

H.5.0 MAXIMUM WASTE INVENTORY

The estimated maximum mixed waste inventory for each type of permitted mixed waste management unit is listed in Table H-1. These are total storage capacity volumes from the WTP Part A form in Addendum A.

The actual volumes present at the start of the closure period will be much less than values shown in the table. For example, the containment buildings and container storage areas may be empty or nearly empty on the date of completion of treatment of the final volume of waste feed, and the tank systems are not likely to contain more than a few percent of the maximum capacity.

H.6.0 CLOSURE OF TANKS, CONTAINER STORAGE, CONTAINMENT BUILDINGS, AND MISCELLANEOUS UNITS

This section of the closure plan identifies specific closure requirements for each type of permitted mixed waste management unit at the WTP, and describes the removal of wastes and equipment, decontamination of the unit, and disposition of decontamination residues. A summary of the closure standards and activities for each type of permitted mixed waste management unit is provided in Table H-2.

The performance standards and closure activities for many of the mixed waste management unit components are similar or identical for the four types of units, as indicated in the table. Differences in the detailed closure procedures will be due in part to variations in permitted mixed waste management unit design, and different ancillary equipment present in various units, even in units of the same type. In the process cells/caves secondary containment areas for tanks or miscellaneous units, initial decontamination activities will be performed remotely, while the same types of activities may be performed by personnel in most of the other mixed waste management units, such as container storage units.

An overall estimate of the volume of closure wastes to be generated has not been prepared, due to the uncertainties regarding final disposition of the WTP equipment and structures. The estimate of the volume of closure wastes will be provided in an amended closure plan and submitted for approval prior to initiating closure activities. The volume of decontamination wastes that will be generated may be relatively large if most of the tanks, piping and related equipment, and major portions of the concrete and steel structures are removed and disposed of as waste. Volume of wastes may also be large if the same equipment and structures are completely decontaminated, resulting in large amounts of secondary residues, personnel protective equipment, and decontamination solutions. The volume of immobilized waste that will be generated during the closure period depends in part on the composition of the final batch of waste feed, which cannot be predicted at this time.

H.6.1 Closure of Tank Systems

Tank systems will be decontaminated using chemical and/or physical extraction technologies. Types of tank systems that will be decontaminated include, but are not limited to, the following:

- LAW and HLW feed and storage tank systems
- Evaporators and condensers

- Waste filtration tanks
- Ion exchange tanks
- PTF condensate tanks

Types of ancillary equipment that may be decontaminated include, but are not limited to, the following:

- Waste transport, rinse, and washdown piping
- Pumps, agitators, wash rings, and ejectors
- Air, steam, and water lines in secondary containment areas
- Intra-facility pipelines

Decontamination of tank systems including tanks, piping, and other ancillary equipment will be conducted using chemical extraction technology and water washing and spraying. High-pressure steam or other physical extraction technologies identified in Section H.3.3 will also be used to remove contamination if necessary. The decontamination procedures for closure of tanks will include, but may not be limited to, the following:

- Tank systems will be flushed after the final batch of bulk waste has been processed through that tank system. Large-volume flush solutions will remove as much waste as possible before smaller scale decontamination work begins. Flush water will be transferred to the pretreatment evaporation and ultrafiltration systems, and the concentrates will be sent to the HLW melter for vitrification, if the HLW vitrification system is operating. (If either or both vitrification systems will not be operating during the first phase of the closure period, this closure plan will be revised to account for changes in treatment and disposal of waste feed and flushing wastes, as necessary.) Water condensate from the evaporator will be routed to the LERF/ETF. The HLW melter will be shut down after flushing wastes are treated. Tank decontamination activities to be performed after completion of flushing may involve any of the chemical or physical extraction technologies identified in Section H.3.3. Used decontamination solutions will be transferred to the LERF/ETF or another permitted TSD facility.
- Physical evidence of mixed waste contamination in the secondary containment systems may be used, in addition to the operating record, to determine whether decontamination of the exterior of a tank system is needed. Before using decontamination solutions on the outside of a tank, the floor and wall liners will be inspected for cracks or other breaches. The cracks will be sealed before beginning decontamination treatment, or other engineered containment devices (such as collection basins) will be used to collect and contain solutions. The outer tank surface then will be cleaned with water or detergents, or other technologies as necessary, and rinsed. Decontamination of secondary containment for permitted mixed waste management units will be similar or identical to the procedures used for mixed waste container storage and containment building units.
- After the tanks are decontaminated, the tank interiors may be inspected using CCTV cameras to determine compliance with the clean debris surface standard. Because of possible radiation exposure, visual inspection of the process cells may be performed remotely using a

camera with a zoom lens, or using another device that allows verification that the standard is met. Inspections will be documented in an inspection record.

- The outside of the tanks also will be inspected for compliance with the clean debris surface standard, and inspections will be documented in an inspection record.
- If tanks or ancillary equipment cannot be determined by visual inspection to meet the clean debris surface standard, the tanks may undergo further decontamination, or rinsate samples may be obtained to determine if the decontaminated tank meets the designation limit performance standard for clean closure. Before or after decontamination efforts, a tank system may be designated as mixed waste debris, removed, reduced in size, packaged, treated by encapsulation, and sent to a permitted disposal facility.
- Decontamination residues will be collected, designated, and transferred to a permitted disposal facility.

The decontamination procedures for piping and ancillary equipment will include, but will not be limited to, the following activities:

- The facility design and process information, in combination with operating records, will be used to identify the equipment associated with treatment of mixed waste. Piping that may have carried mixed waste or may have become externally contaminated with mixed or dangerous waste will undergo decontamination. Contaminated piping may include waste transfer piping, sump contents transfer piping, nitric acid transfer piping, and other piping associated with waste treatment and secondary waste transfer.
- The piping will undergo bulk flushing at the same time the tanks are flushed. Flushing of the pipes and other ancillary equipment will remove the waste in order to meet the clean debris surface standard. Chemical and/or physical extraction technologies may be used to attempt to remove the remaining waste from piping and other ancillary equipment. Where it is not possible to visually verify that the clean debris surface standard has been met, verification may be attempted by rinsate sampling, analysis, and comparison of analyses with designation limits.
- If it is not possible to meet the clean debris surface standard or designation limits, contaminated portions of the piping and ancillary equipment will be removed, designated as dangerous/mixed waste, packaged in waste containers, transferred to the CWC or another permitted unit, encapsulated, and disposed of at a permitted landfill disposal unit on the Hanford Site. Encapsulation may be performed at the CWC or elsewhere.

H.6.2 Closure of Container Storage Areas

Each permitted mixed waste container storage unit will be evaluated for historical spills or other releases of dangerous or mixed wastes by review of the facility operating records and by visual inspection. The Visual inspections will determine if the container storage unit can be declared clean using the clean debris surface standard by checking for signs of any spills and/or releases of waste and loss of integrity, breaks, cracks, gaps, and other signs of deterioration of container storage area floors. If the record review and inspection support the conclusion that no releases of dangerous/mixed waste to the floor occurred, no further decontamination or sampling work will be required for that permitted mixed waste container storage unit. If either the inspection or

record review indicate that dangerous/mixed waste releases to the floor of a mixed waste container storage occurred, decontamination will be required. If the protective coating is intact, physical extraction treatment will not be performed. If the coating is cracked or more severely damaged, physical extraction treatment will be required to remove at least 0.6 cm from the original surface. If the extent of the historical releases (the actual location on the floor) cannot be determined, the entire floor surface of the container storage area will be treated. If the resulting surface cannot be documented as a clean debris surface, the treatment may be repeated or the full thickness of the floor may be removed. The solid residues or rubble produced by treatment or removal will be disposed of as dangerous/mixed waste, unless sampling and analyses are performed to support a request for an Ecology determination that the rubble is not dangerous/mixed waste.

The presence of through-thickness cracks or other loss of integrity, if found in concrete floors that rest directly on soil, in secondary containment areas where dangerous/mixed waste releases are documented or suspected, may require a soil contamination investigation. Examples of adequate evidence that a release may have occurred include discoloration or staining of the concrete, odor, or elevated radiation readings observed during the initial closure inspection. Soil and possibly concrete samples will be obtained by coring in the vicinity of known or suspected mixed waste releases. Soil contaminated at concentrations above the risk-based soil cleanup levels will be removed, and confirmation samples will be taken at the limits of the excavation to confirm adequate removal. If analytical results are less than the Hanford soil background levels but greater than the risk-based soil cleanup concentrations, a request for approval of a clean closure-determination will be submitted to Ecology. The request will be supported with the analytical and other pertinent data for that mixed waste container storage unit.

If soil contamination is so extensive that the zone of contamination cannot be practically removed, or if groundwater contamination could result, the closure plan will be revised to provide for additional investigation and measures to address corrective action requirements.

Decontamination documentation will be prepared as described in Sections H.3.4 and H.4.1.

H.6.3 Closure of Containment Building Units

One containment building unit, the pretreatment plant hot cell maintenance area containment building unit, will be used for secondary waste (mostly debris) decontamination, size reduction, and packaging operations throughout the operating life of the WTP. It may be used for these same functions during the closure period. The HLW melter (cave) containment building may be used for similar operations during closure, after the normal melter operations have been completed. In particular, the HLW melter containment building may be used to partially decontaminate and overpack failed HLW melters that were stored in the failed melter storage building (container storage area) during the operating life of the plant.

After completion of operations to facilitate closure of other permitted mixed waste management units, the melters and associated spent parts, feed apparatus, and off-gas control equipment will be removed. The containment buildings will be closed in the same manner, following the same inspection, decontamination, and documentation requirements identified in Sections H.6.1 and H.6.2 for tank system secondary containment areas and mixed waste container storage units.

Several significant differences in design and mixed waste types may result in substantially longer time requirements for closure of the permitted containment building units, as compared to mixed waste container storage units. For example, most operations in the HLW melter cave will be conducted with remotely operated equipment until the final decontamination stages are reached. Complex remote operations are necessarily slow, and the full extent of necessary decontamination, size reduction, and packaging work will not be known until the final stages of closure. The ILAW container finishing line and container fixative containment building units are also larger and contain more equipment than most of the mixed waste container storage units.

Other containment building units are more similar to mixed waste container storage units, including coated concrete rather than cladded floors and walls. These containment buildings will be closed in the same manner as the mixed waste container storage units (Section H.6.2), with the added complications of various types of waste handling equipment such as power manipulators, cranes, and the LAW LSMs.

H.6.4 Closure of Miscellaneous Units

The HLW and LAW melters are miscellaneous units. Several times during the life of the WTP, spent melters will be removed from the HLW melter cave and LAW LSM gallery containment buildings. Removal and replacement of spent melters is not considered closure. One or more of the LAW melters may actually be removed and not replaced before the start of the closure period. The HLW melter is planned to be operating during the deactivation period (the first part of the closure period). If necessary, the HLW melter may be removed and replaced during the closure period to provide treatment for the residues from tank system flushing operations. Such removal and replacement would not be considered closure, although it may occur during the closure period.

LAW melter operating equipment openings will be closed and the exterior surfaces decontaminated. The melters will be removed from the LAW melter gallery as intact assemblies, encapsulated, if required, and shipped to the LLBG or another permitted treatment/disposal unit. Failed HLW melters may be stored during the closure period, while treatment, transport, and disposal operations are arranged. HLW melters may be partially decontaminated and packaged in an overpack in the HLW melter cave during the final phases of closure activities. HLW melters in the failed melter storage building (container storage area) may be returned to the HLW melter cave for partial decontamination and packaging. Both types of melters will be treated in accordance with the immobilization treatment standard and disposed of at permitted mixed waste disposal facilities.
Removal of melter components will be accomplished according to standard procedures for the operational period of the plant. Special HLW melter closure activities, such as size reduction, decontamination of components, or packaging of components and decontamination residues, may require the development of new procedures or the installation of new equipment.

Other miscellaneous units such as offgas scrubbers, condensers, precipitators, reboilers, oxidizers, and adsorbers will be closed in the same manner, following the same inspection, decontamination, and documentation requirements identified in Sections H.6.1 and H.6.2 for tank systems and container storage areas.

H.7.0 SCHEDULE FOR CLOSURE

For the purposes of this closure plan, the design life of the WTP is estimated at 40 years of operations. The estimated three-year schedule for closure is provided in Figure H-7.

As required by WAC 173-303-610(3)(c), WTP will notify Ecology at least 45 days before the date on which the closure period is expected to start. In addition, WAC 173-303-610(3)(c) requires that the closure period begin no later than 30 days after the date on which WTP receives the final volume of dangerous waste. Due to the complexity of the WTP operations, the 30-day requirement to start closure activities will likely be unable to be met. Processing of the final batch of waste feed may require approximately nine months after receiving the final waste feed transfer from the DST system unit. Additional evaluation of the schedule will be conducted prior to closure.

The date of receipt of the final volume of bulk waste feed in the melters and various other specific individual permitted mixed waste management units within the WTP will be at the end of the processing of that final batch of waste feed. This date will roughly correspond to the date of the start of deactivation operations. The pretreatment and HLW feed preparation and melter systems may continue to operate for several months after the start of the closure period. These systems will be processing the tank system flush solutions and producing immobilized waste glass containing most of the residual waste constituents left in the tanks at the start of the closure period.

The year the WTP permitted mixed waste management units close will depend on the time required for the initial portion of the tank waste inventory to be processed, the degree of success in this mission, and whether the WTP will be used to continue to process the remaining Hanford tank waste inventory. Other factors that could affect the year of closure include changes in operational requirements, lifetime extension upgrades, a different operating contractor, and other unforeseen factors.

This estimated three-year closure schedule is necessarily general and is not meant to be definitive. For example, completion of decontamination of the pretreatment building and residue removal is shown at approximately 21 months after the start of the closure period. However, decontamination of the LAW and HLW vitrification plant tanks and other permitted mixed waste management units is expected to require use of pipelines through the pretreatment building to transfer decontamination solutions and rinsates to the LERF/ETF. Therefore, the final decontamination of piping and collection tanks in the pretreatment building may not be completed until after the LAW and HLW vitrification plant tanks and other permitted mixed waste management units are decontaminated.

A more specific schedule will be provided in the revision of this closure plan prior to the start of closure activities. The revised schedule will take advantage of final design and operating procedure information that is not available at this time. The schedule for closure will include a breakdown of activities to be performed after the date of completion of vitrification processing of the last batch of waste feed from the DST system.

H.8.0 EXTENSION FOR CLOSURE TIME

The following discussion addresses the extension of the dangerous/mixed waste removal and closure time periods as specified in WAC 173-303-610(4)(a) and (b), respectively. The first citation requires that within 90 days after receiving the final volume of dangerous waste (the DST waste), the owner or operator will treat, remove from the dangerous/mixed waste management unit, or dispose of all dangerous wastes in accordance with the approved closure plan. The second requirement is that all closure activities will be completed within 180 days after receiving the final volume of dangerous waste.

The need for more than 90 days to remove dangerous/mixed wastes and more than 180 days to complete closure activities is anticipated. This need is due in part to the high radiation fields in many of the mixed waste management units, even after the entire bulk waste inventory has been processed and the residues (the inventory present at the start of the closure period) are removed by flushing. Processing of the final batch of waste feed may require approximately nine months of operation at or near design capacity of the plant, prior to the start of deactivation and closure work. As explained in Section H.7.0, these processing operations will be completed, or nearly completed, at the start of the closure period.

The large number of mixed waste management units and extensive integrated ancillary equipment such as piping, valves, filters (mostly welded together), and the need to coordinate closure activities with other TSD units both at Hanford and offsite, means that more time will be required for closure than would be necessary for a typical dangerous waste management facility.

The decontamination operations described in this closure plan are intended to avoid excessive secondary waste generation and to provide for the recycling of some pieces of equipment. The decontamination operations will include extensive use of chemical and physical decontamination treatment technologies. Incineration is not considered as an option for dangerous/mixed wastes to be generated during closure. Solidification, encapsulation, and landfilling of dangerous and mixed wastes will be deliberately minimized. The volumes of wastes that will be disposed of will also be minimized to the extent practical by physical size reduction. Size reduction will allow packaging of large tanks, pipe, and support structures in relatively small, densely packed drums or waste boxes. These waste management priorities are emphasized to support this request for extension of the waste removal and closure periods, as suggested in Section 8.3 of the Ecology *Guidance for Clean Closure of Dangerous Waste Units and Facilities* (Ecology 2005).

The WTP operator will take the actions necessary to prevent threats to human health and the environment from the unclosed but not operating WTP, including compliance with applicable permit requirements. During the first several months of the closure period, a large portion of the plant will be operating to remove waste residues from the tank systems to the maximum practical extent. Flushing, vitrification, and other deactivation activities will require continued security and monitoring of the other non-operating portions of the plant, and no part of the plant will be unsecured or abandoned during the closure period.

If necessary, an extension of the three-year closure schedule will be requested and the need for the extension demonstrated in accordance with WAC 173-303-610(4)(a) and (b). The request would be determined prior to initiating closure activities, or during closure activities should

closure conditions necessitate. A revised closure plan will be submitted for approval if an extension is necessary.

Condition II.R.1 Hanford Facility Dangerous Waste Permit (Ecology 2009) requires the Permittees to notify Ecology in writing, as soon as possible, of deviations or expected deviations from the schedules of the permit. The Permittees will include with the notification information supporting their claim that they have used best efforts to meet the required schedules. If Ecology determines that the Permittees have made best efforts to meet the schedules of the permit, Ecology will notify the Permittees in writing by certified mail that the Permittees have been granted an extension. Such an extension will not require a permit modification under Condition I.C.3. Should Ecology determine that the Permittees have not made best efforts to meet the schedules of the permit, Ecology may take such action as is deemed necessary. Copies of correspondence regarding schedule extensions will be kept in the operating record.

Condition II.R.1 Hanford Facility Dangerous Waste Permit (Ecology 2009) provides that any schedule extension granted through the approved change control process identified in the *Hanford Federal Facility Agreement and Consent Order* (Ecology, EPA, and DOE 1998) will be incorporated into the permit. Such a revision will not require a permit modification under Condition I.C.3.

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Table H-1 Maximum Waste Inventory

Mixed Waste Management Unit	Maximum Inventory [a]
Total container storage	1,089,000 gal
Total tank storage	5,276,000 gal

[a] Miscellaneous (e.g., melter and offgas equipment) and containment building units are not counted, as they will be processing the volumes previously stored in tanks, and producing treated and secondary wastes that are included in the container storage total.

Table H-2 Clean Closure Performance Standards and Activities[a]

Mixed Waste Management Unit Type	Components	Performance Standards	Closure Activities
Tank system	Exterior surfaces Interior surfaces Ancillary equipment Secondary containment	Clean debris surface, designation limits, or removal	Extraction technologies or removal of tanks Liner and concrete decontamination and/or removal
Container storage area	Floor, walls, and ancillary equipment	Clean debris surface, designation limits, or removal	Extraction technologies Liner and concrete decontamination and/or removal
Containment building	Floor, walls, and ancillary equipment	Clean debris surface, designation limits, or removal	Extraction technologies Liner and concrete decontamination and/or removal
Miscellaneous units (melter)	Melters and ancillary equipment	Removal	Removal
Miscellaneous units (others)	Exterior surfaces Interior surfaces Ancillary equipment Secondary containment, as applicable	Clean debris surface, designation limits, or removal	Extraction technologies or removal of miscellaneous units Liner and concrete decontamination and/or removal

a Refers to WAC 173-303-610 and 40 CFR 268.45, Table 1, as incorporated by reference at WAC 173-303-140 (2)(a).

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1 **Figure H-1 Sample Clean Debris Surface Checklist**

DECONTAMINATION CHECKLIST

This checklist is intended to document decontamination work and the attainment of a clean debris surface for the following components, structures, and materials.

1 Building or location:
2 Component or Area:
3 Material (such as concrete, metal):
4 Decontamination treatment method[1]:
5 Decontamination treatment parameters:
- Temperature
- Propellant
- Solid media (such as shot, grit, beads)
- Pressure
- Residence time
- Surfactants
- Detergents
- Grinding or striking media (such as wheels, piston heads)
- Depth of surface layer removal in cm (in concrete, for example)
- Other

The decontamination of the building, component, or material identified in steps 1 through 3 was completed as specified at steps 4 and 5.

_____	_____ /	_____
Title	Signature	Date

6 Performance Standard:

I have visually inspected the above-identified material before / after (circle one) decontamination or treatment in accordance with the closure plan. Dangerous waste residues have / have not (circle one) been removed to attain a clean debris surface[2].

_____	_____ /	_____
Authorized Representative	Signature	Date

Notes:

1 Decontamination treatment will use a chemical or physical extraction method as listed in Table 1, Alternative Treatment Standards for Hazardous Debris (40 CFR 268.45).

2 Clean debris surface as defined in Table 1, Alternative Treatment Standards for Hazardous Debris (40 CFR 268.45): "'Clean debris surface' means the surface, when viewed without magnification, will be free of all visible contaminated soil and hazardous waste except that residual staining from soil and waste consisting of light shadows, slight streaks, or minor discolorations, and soil and waste in cracks, crevices, and pits may be present provided that such staining and waste and soil in cracks, crevices, and pits will be limited to no more than 5 % of each square inch of surface area."

2

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Figure H-2 Closure Strategy Flowchart for Tank Systems

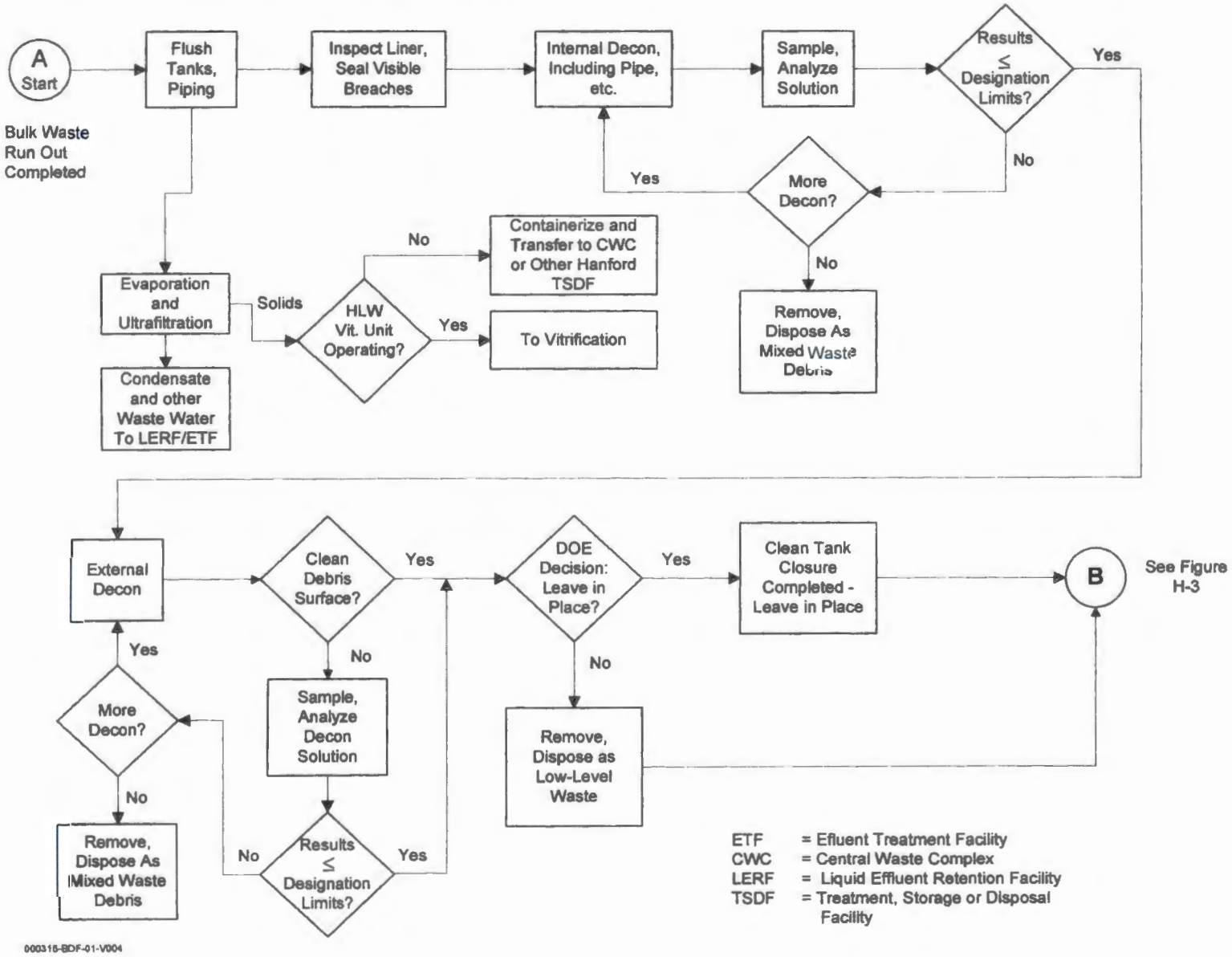

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Figure H-3 Closure Strategy for Container Storage, Containment Building, Miscellaneous Unit, and Tank System Secondary Containment Areas

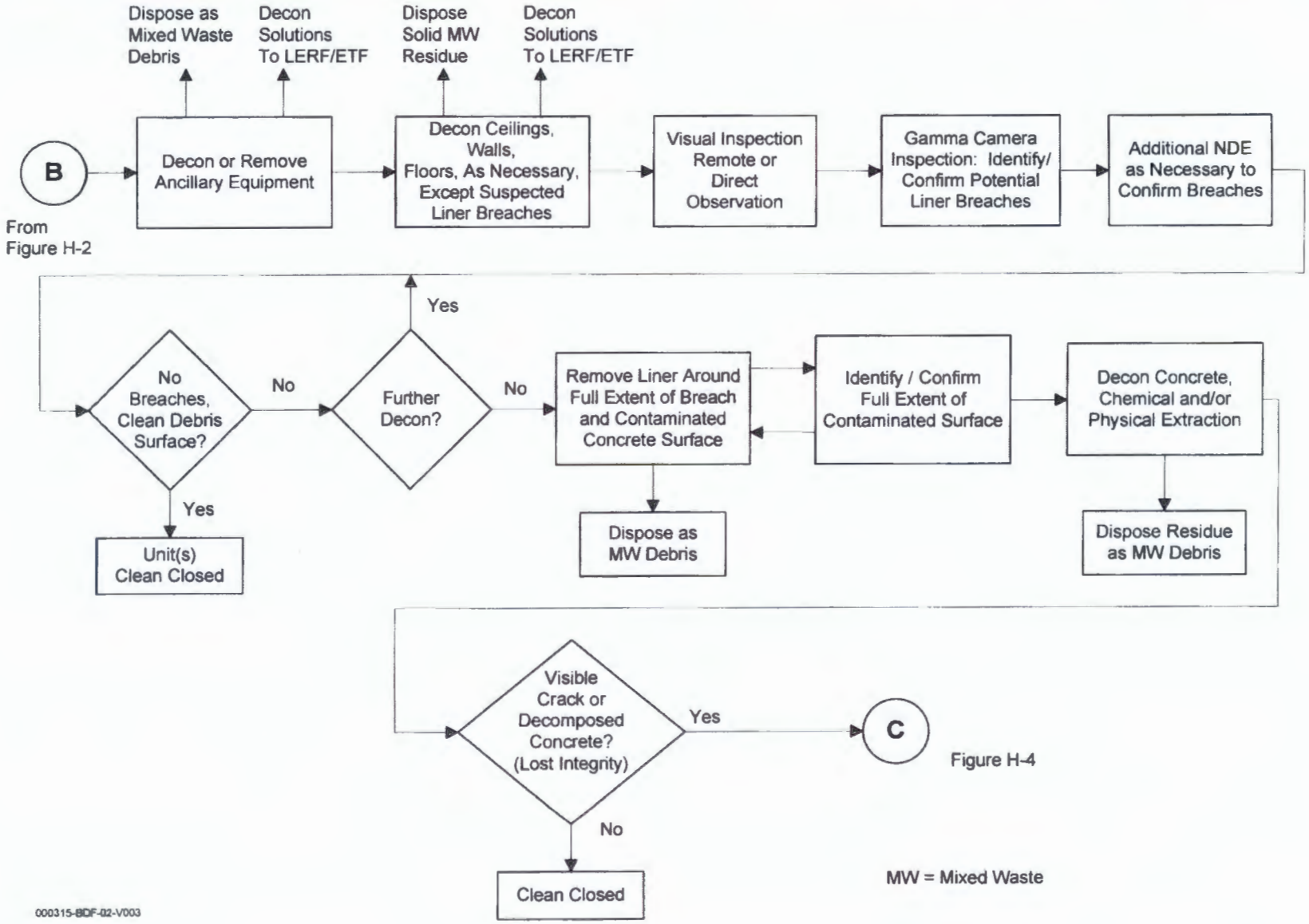

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Figure H-4 Closure Strategy Flowchart for Soils and Groundwater

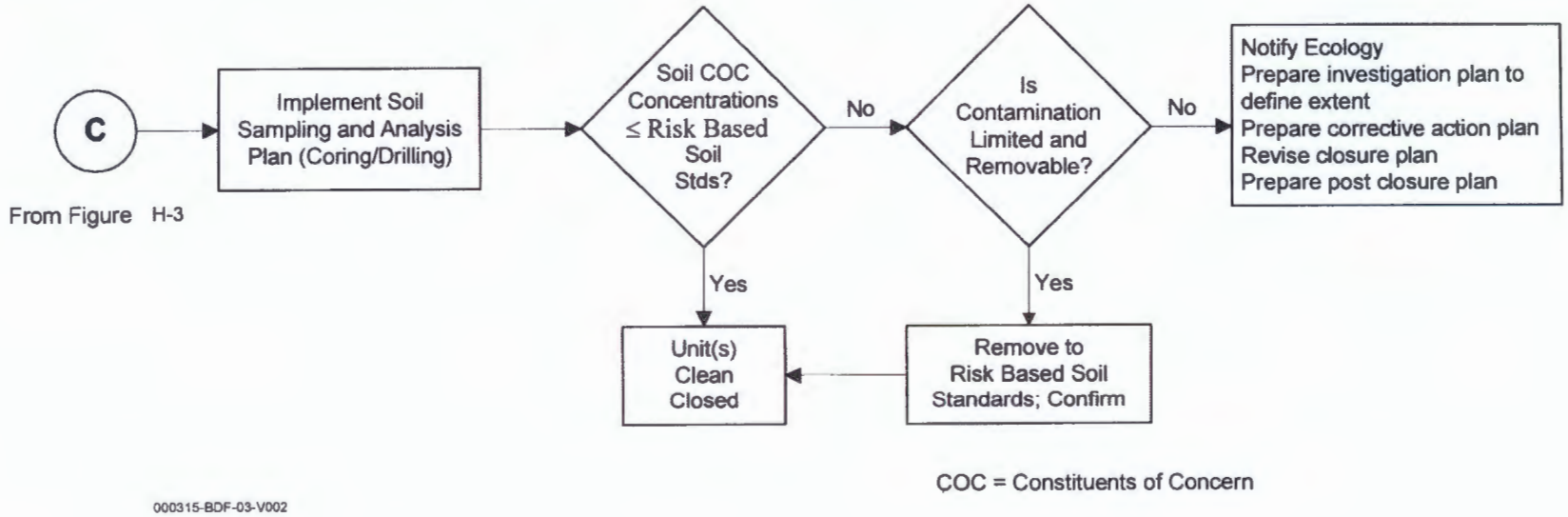

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Figure H-5 Example Closure Certification Statement

RCRA CLOSURE CERTIFICATION
FOR

River Protection Project – Waste Treatment Plant
Hanford Site
US Department of Energy, Richland Operations Office

We, the undersigned, hereby certify that _____ closure activities were performed in accordance with the specifications in the approved closure plan.

_____	_____ /	_____
Owner/Operator	Signature	Date
_____	_____ /	_____
Contractor Representative	Signature	Date
_____	_____ /	_____
Independent Registered Professional Engineer	Signature	Date

Washington State PE # _____

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Figure H-6 WTP Permitting, Deactivation, and Closure

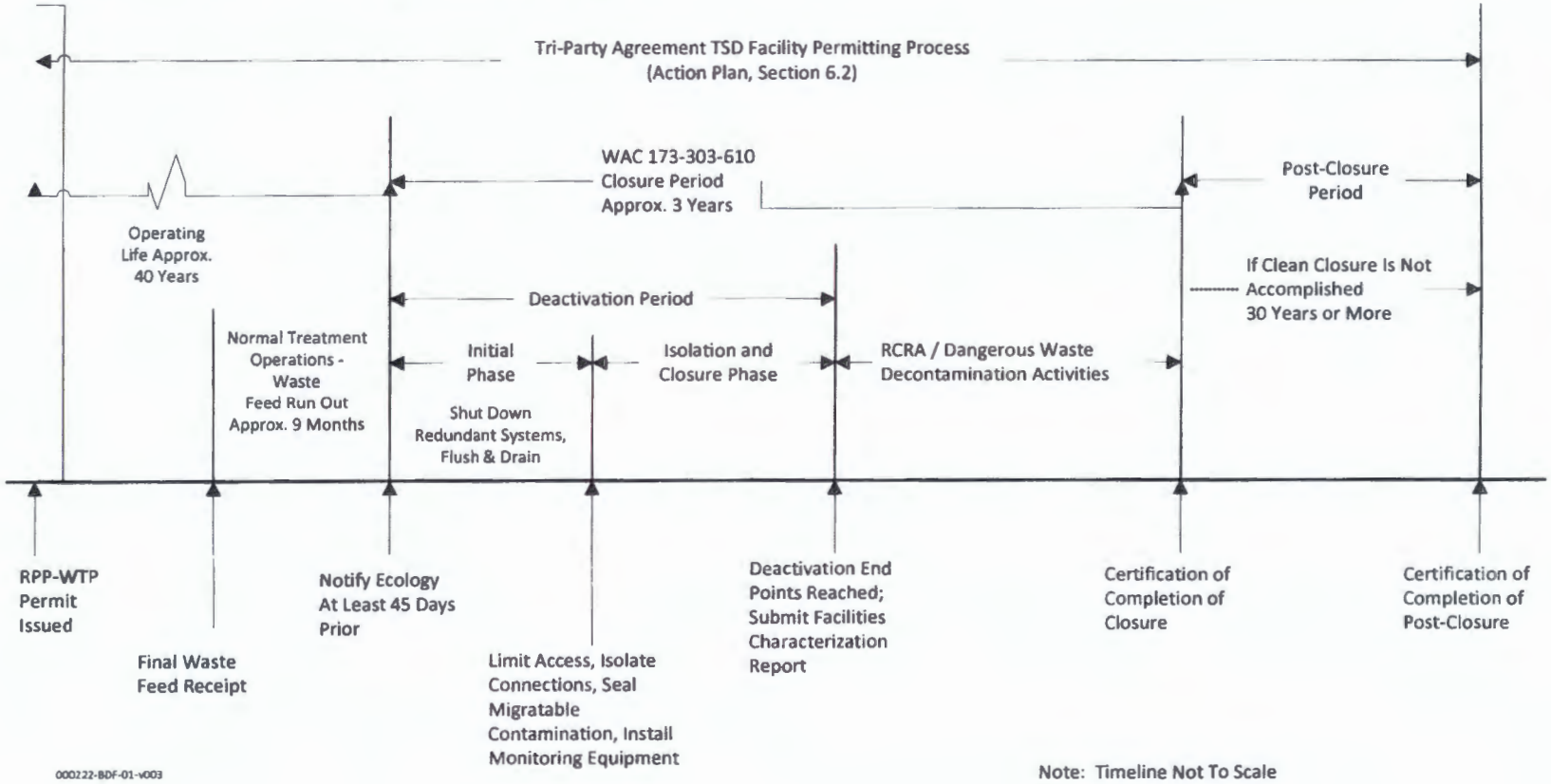

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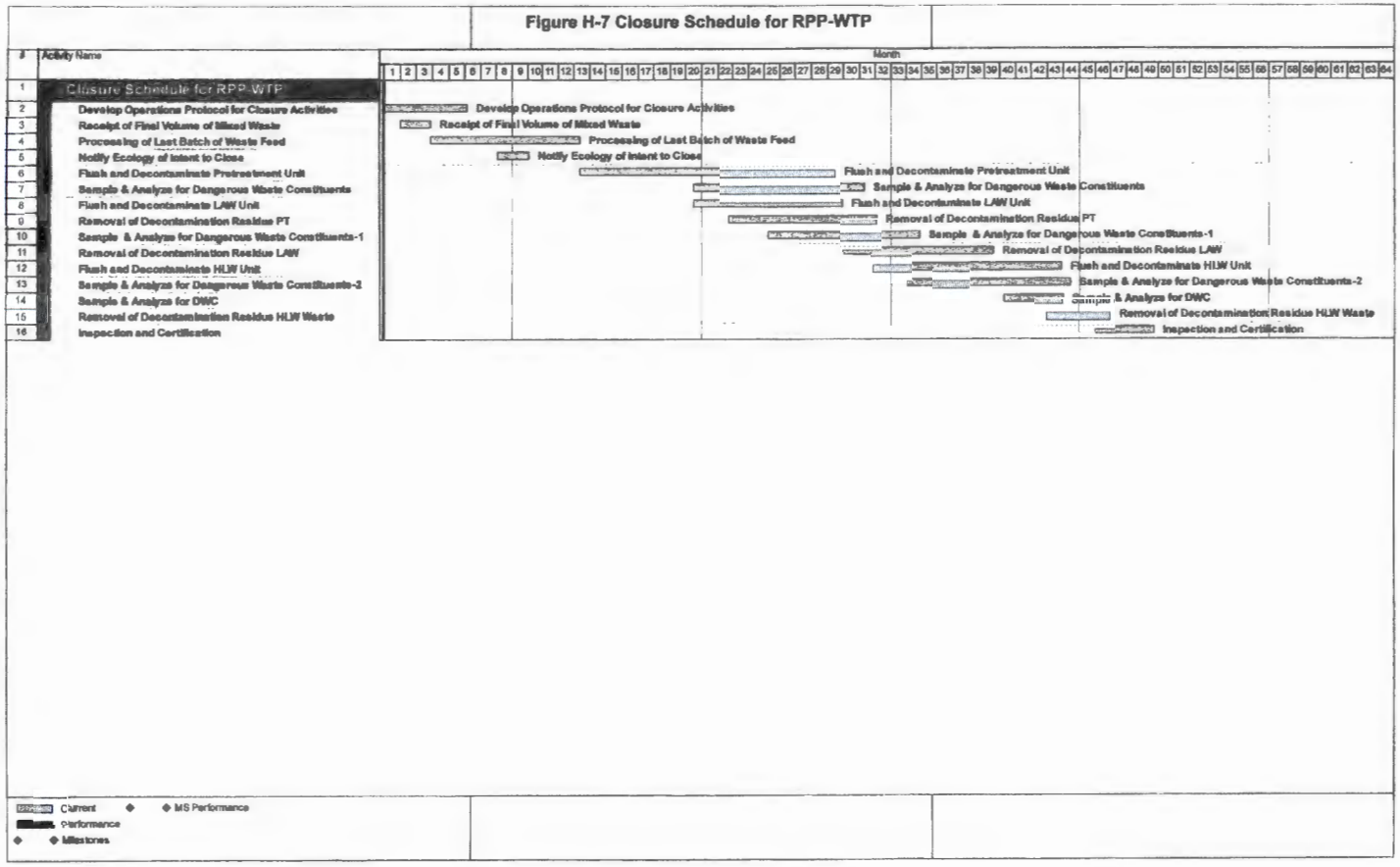
Figure H-7 Closure Schedule for WTP



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Appendix A

Sampling and Analysis Plan for Closure of WTP Facility

Crosswalk Table of the QAPP Elements to the SAP Sections

QAPP Element in *EPA Guidance for Quality Assurance Project Plans*, EPA/240/R-02/009, EPA QA/G-5, Table 1	SAP Section Number and Title	
Group A Project Management		
A1 Title and Approval Sheet	--	Approval Cover Page
A2 Table of Contents	--	Table of Contents
A3 Distribution List	--	Distribution List
A4 Project/Task Organization	A.3.1	Project/Task Organization
A5 Problem Definition and Background	A.1 A.4.1	Purpose of Sampling for Closure at WTP Step 1: State the Problem
A6 Project/Task Description	A.2	Sampling Objectives
A7 Quality Objectives and Criteria	A.4	Data Quality Objectives
A8 Special Training/Certifications	A.3.2	Special Training and Certification Requirements
A9 Documentation and Records	A.8	Documentation and Data Management
Group B Data Generation and Acquisition		
B1 Sampling Process Design (Experimental Design)	A.5.1	Sampling Process Design
B2 Sampling Methods	A.5.3	Sampling Methods, Containers and Preservation
B3 Sample Handling and Custody	A.5.4	Sample Handling and Custody
B4 Analytical Methods	A.5.3 A.6.3	Sampling Methods, Containers and Preservation Analytical Methods
B5 Quality Control	A.5.5 A.6.4	Field Quality Control Laboratory Quality Control
B6 Instrument/Equipment Testing, Inspection, and Maintenance	A.5.7 A.6.6	Field Instrument/Equipment Testing, Inspection and Preventative Maintenance Procedures and Frequency Laboratory Instrument/Equipment Testing, Inspection and Preventative Maintenance Procedures and Frequency
B7 Instrument/Equipment Calibration and Frequency	A.5.6 A.6.5	Field Instrument Calibration and Frequency Laboratory Instrument Calibration and Frequency
B8 Inspection/Acceptance of Supplies and Consumables	A.5.8 A.6.7	Inspection/Acceptance of Field Supplies and Consumables Inspection/Acceptance of Laboratory Supplies and Consumables
B9 Non-Direct Measurements	A.7.4	Non-Direct Measurements
B10 Data Management	A.8	Documentation and Data Management
Group C Assessment and Oversight		
C1 Assessments and Response Actions	A.10	Assessments and Corrective Actions
C2 Reports to Management	A.11	Reports to Management
Group D Data Validation and Usability		
D1 Data Review, Verification, and Validation	A.7.1	Data Review and Reduction
D2 Verification and Validation Methods	A.7.2	Data Verification and Validation
D3 Reconciliation with User Requirements	A.7.3	Data Quality Assessment

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Acronyms

BNI	Bechtel National, Inc.
CFR	Code of Federal Regulations
°C	degree Celsius
CL	control limit
COC	constituent of concern
CVAA	cold vapor atomic absorption
DOE	US Department of Energy
DQO	data quality objective
DRO	diesel range organics
DWMU	dangerous waste management unit
Ecology	State of Washington, Department of Ecology
EPA	US Environmental Protection Agency
GC	gas chromatography
GC/MS	GC/mass spectrometry
GC-ECD	GC-electron capture detector
GFAA	graphite furnace atomic absorption spectrometry
GRO	gasoline range organics
HCl	hydrochloric acid
HLW	high-level waste
HPLC	high-performance liquid chromatography
HRGC/HRMS	high-resolution GC/high-resolution MS
ICP-AES	inductively coupled plasma-atomic emission spectrometry
ICP-MS	inductively coupled plasma-mass spectrometry
L	liter
LAW	low-activity waste
LOQ	level of quantitation
mL	milliliter
MS	mass spectrometry
MS/MSD	matrix spike/matrix spike duplicate
MTCA	Model Toxics Control Act
ORP	Office of River Protection
oz	ounce
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PTFE	polytetrafluoroethylene
QA	quality assurance
QC	quality control

RCRA	Resource Conservation and Recovery Act
SAP	sampling and analysis plan
SIM	selective ion monitoring
SOP	standard operating procedure
SVOC	semi-volatile organic compound
TPH	total petroleum hydrocarbons
TPH-DRO	total petroleum hydrocarbons-diesel range organics
TPH-GRO	total petroleum hydrocarbons-gasoline range organics
US	United States
VOA	volatile organic analyte
VOC	volatile organic compound
WAC	Washington Administrative Code
WTP	Hanford Tank Waste Treatment and Immobilization Plant

A.1 Purpose of Sampling and Analysis for Closure of WTP

This sampling and analysis plan (SAP) describes the sampling, analysis, and quality assurance (QA) and quality control (QC) procedures to be used during closure of the Hanford Tank Waste Treatment and Immobilization Plant (WTP) permitted dangerous waste management units (DWMUs). The DWMUs include container storage areas, containment buildings, tanks, and miscellaneous unit systems with the associated ancillary equipment and secondary containment. The DWMUs may include areas of suspected releases of dangerous wastes, such as concrete floors and underlying soil, when evidence is found indicating apparent failure of secondary containment systems.

This SAP presents closure activities in accordance with US Environmental Protection Agency (EPA) guides *EPA Requirements for Quality Assurance Project Plans*, EPA/240/B-01/003, EPA QA/R-5 (EPA 2001), *EPA Guidance for Quality Assurance Project Plans*, EPA/240/R-02/009, EPA QA/G-5 (EPA 2002a) and Washington Administrative Code (WAC) 173-303, *Dangerous Waste Regulations*, closure regulations. The elements of this SAP present the activities, organization, and QA/QC protocols to achieve the data quality objectives (DQOs) of the sampling and analysis effort.

This SAP will be updated as necessary in accordance with WAC 173-303-610 and the *Hanford Facility Resource Conservation and Recovery Act (RCRA) Permit, Dangerous Waste Portion, Revision 8C, for the Treatment, Storage, and Disposal of Dangerous Waste, Part III, Operating Unit Group 10 (Waste Treatment and Immobilization Plant), WA7890008967* (Ecology 2007), Permit Condition III.10.C.8, and will serve as the governing document for all activities conducted in support of closure, decontamination, and post-decontamination sampling of WTP.

Clean closure is the goal for the DWMUs. Clean closure requires decontamination or removal and disposal of dangerous/mixed waste, waste residues, and contaminated equipment, soil, or other material, in accordance with the clean closure performance standards of WAC 173-303-610. As presented in Section H.2.0 of the closure plan, the use of a "clean debris surface" standard is proposed as the clean closure performance standard for the WTP metal structures and equipment and concrete structures that will remain after closure, as well as DWP equipment used for waste management. If the clean debris surface standard cannot be achieved or verified visually (e.g., interior surfaces of a pipe, pump, or tank), the equipment, structure, or portions thereof, may be washed and flushed with decontamination solutions. The post-decontamination solution or rinsate will be sampled and analyzed to determine whether the criteria defined in WAC 173-303-610(2)(b) have been achieved, which indicates successful decontamination and attainment of the clean closure performance standard (referred to as the rinsate "designation limit standard" in Section H.2.0 of the closure plan).

Due to the level of secondary containment provided at the WTP, releases of dangerous wastes to the environment are not anticipated. However, when evidence is found indicating apparent failure of secondary containment systems (e.g., stainless steel liners and coated concrete surfaces), potential soil contamination will be investigated. When contaminated soil is removed, soil samples will be collected and analyzed to verify compliance with risk-based concentration limits (referred to as the "soil cleanup standard" in Section H.2.0 of the closure plan).

The overall purposes of the sampling and analysis activities during closure of the DWMUs are to:

- Confirm that dangerous wastes (i.e., either characterized by toxicity or by corrosivity as defined in WAC 173-303-070 and 40 Code of Federal Regulations [CFR] 261, *Identification and Listing of Hazardous Waste*) are not left in any of the DWMUs.

- For a DWMU where the clean debris surface standard cannot be achieved or verified visually, confirm that the DWMU was successfully decontaminated and can be declared to have achieved clean closure by collecting post-decontamination rinsate samples and demonstrating that the analytical data are below the rinsate designation limit standard.
- For releases of dangerous wastes to soil, confirm that contaminated soil have been successfully removed and the DWMU can be declared to have achieved clean closure by collecting samples of the remaining soil and demonstrating that the analytical data are below the soil cleanup standard.

A.2 Sampling Objectives

Sampling will be conducted to verify the decontamination of equipment and structures and removal of contaminated soil at the DWMUs. Media anticipated to be sampled during closure of the DWMUs include decontamination rinsates and soil at suspected release locations.

Investigation of potential soil contamination may involve coring and sampling of the concrete floor when evidence indicates apparent failure of secondary containment systems. Concrete, if it is left in place, may also be sampled by collecting wipe or chip samples to determine if it is a clean and acceptable risk to remain. Sampling may be conducted following decontamination of the interior surfaces of the permitted secondary containment areas. If there is required sampling under the secondary containment structures, it will be conducted in a manner that minimizes disturbance of underlying soil.

Sampling and analysis tasks in which clean closure demonstrations may be needed are as follows:

- Collect samples from select biased, or *focused*, sample locations, based on reviews of the DWMU operating record; stainless steel liner breach investigations and underlying concrete decontamination work and evaluations; or based on interior inspection data (e.g., from video, closed circuit television, or radiation surveys) for container storage areas, containment buildings, tanks, piping, or other ancillary equipment.
- Collect rinsate, soil, concrete wipe or chip samples from select biased sample locations, focusing on the locations of apparent highest concentrations. For tanks, piping, or other permitted equipment, the locations to be sampled will include apparent or likely waste accumulations in crevices, connections, or other rough or restricted flow locations such as inlets or outlets. The rinsate sample will be taken from the first rinse, obtained within a reasonably short time after the completion of decontamination efforts. For concrete, wipe or chip samples will be collected from locations immediately adjacent to or below stainless steel liner breaches. For soil, samples will be collected from locations immediately adjacent to or below cladding breaches or cracked or deteriorated concrete. The sample locations may expand extensively, as necessary, to determine the areal and vertical boundaries of contaminated soil at concentrations above the soil cleanup standard.
- Conduct analyses of samples.

A list of indicator constituents will be developed based on the media, potential constituents of concern (COCs) and clean closure performance standard (rinsate designation limit standard or soil cleanup standard) for the DWMUs. Collected samples (rinsate, soil, concrete wipe or chip) will be analyzed for these indicator constituents. In addition, the analytical results will be compiled, evaluated, and summarized in the following manner:

- Review the QC data of the sample handling and analyses to assess the reliability of the analytical data. Examine sample results for comparison with clean closure performance standard on an indicator constituent by indicator constituent basis.
- Conduct the statistical evaluation of the analytical data reported for the indicator constituents.
- Prepare summary statistics of the analytical data reported for indicator constituents.
- For each indicator constituent, compare the statistical results with the selected clean closure performance standard (rinsate designation limit standard or soil cleanup standard) and, for soil, with the established background levels. Sample concentrations below the background level, but above the clean closure performance standard, may be proposed as adequate demonstrations of clean closure, pending State of Washington, Department of Ecology (Ecology) approval.
- Prepare a report that includes data analysis and assessments that evaluate whether the levels of various indicator constituents present a health or environmental concern, and whether they meet the clean closure performance standards. The report will include sample locations, number of samples, specific methods used for sample collection and analyses, data quality assessment, and differences in procedures or sample locations from those provided in the revised closure plan and the SAP, as applicable. The report will provide clean closure evaluations.
- A DWMU may require several sampling campaigns and therefore iterative reports, while other units may require no sampling and single short letter reports.

A.3 Project Management

A.3.1 Project/Task Organization

A generalized organizational chart for the implementation of this SAP during closure is included as Figure A-1.

The WTP Closure Manager will be responsible for the activities associated with the closure, and will report directly to the WTP Project Director. His staff will be responsible for the collection and analyses of sampling data of known quality, representative of actual site conditions, and are adequate and appropriate for making informed environmental decisions regarding closure of DWMUs at WTP.

The WTP Environmental Protection Manager and WTP Safety and Health Manager will report directly to the WTP Project Director. Their staff will provide environmental permitting, regulatory compliance, waste management, and safety support to the WTP Closure Manager's staff. The WTP Environmental Protection Manager (or his designee) is responsible for revising and updating this SAP.

The WTP QA Manager will report directly to the WTP Project Director, and his staff will provide independent QA oversight to ensure that onsite and subcontracted sampling and analytical laboratory activities are performed in accordance with this SAP, WTP QA Manual and other applicable project QA procedures. The WTP QA Manager (or his designee) is responsible for reviewing revisions and updates to this SAP.

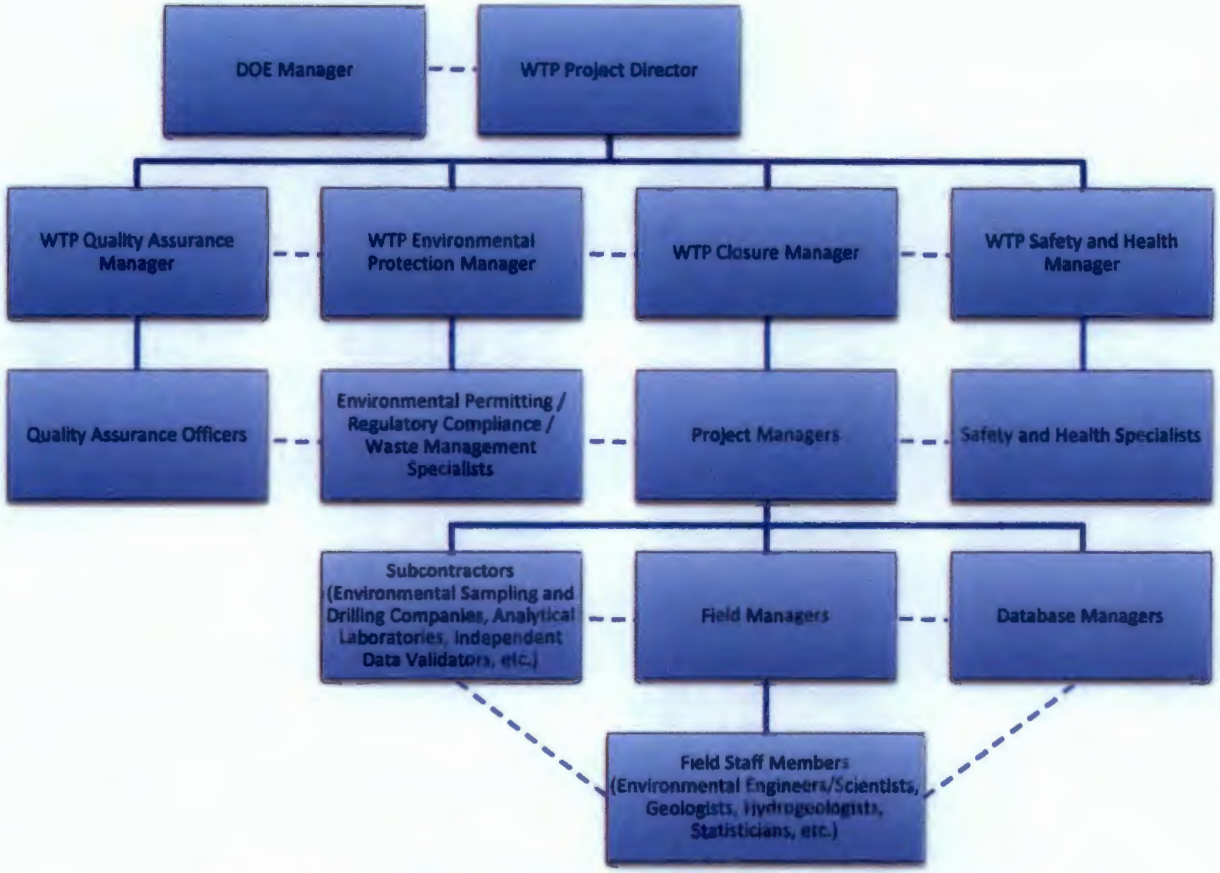

Figure A–1 Generalized WTP Closure Organizational Chart[1]

Notes:
Solid line = line of authority
Dashed line = line of communication

[1] As stated in the closure plan, the design life of the WTP is 40 years after the initiation of waste treatment operations. The actual operating life of the plant may change depending on expansion in treatment capacity, improvements in treatment technology, or many other factors. Consequently, implementation of this SAP may not occur for at least 40 years. The organizational chart will be completed and finalized with specific names and titles in the revised closure plan SAP to be submitted 180 days before closure at WTP commences (Permit Condition III.10.C.8, *Hanford Facility Resource Conservation and Recovery Act [RCRA] Permit, Dangerous Waste Portion, Revision 8C, for the Treatment, Storage, and Disposal of Dangerous Waste, Part III, Operating Unit Group 10 [Waste Treatment and Immobilization Plant], WA7890008967*).

A.3.2 Special Training and Certification Requirements

Individuals involved in sampling, analysis, or data review will be trained and qualified to safely implement the activities addressed in this SAP. Training will conform to the training requirements specified in the WAC 173-303-330 (Personnel Training), WTP QA Manual, and Chapter 8.0 of the *Hanford Facility Resource Conservation and Recovery Act (RCRA) Permit, Dangerous Waste Portion, Revision 8C, for the Treatment, Storage, and Disposal of Dangerous Waste, Part III, Operating Unit Group 10 (Waste Treatment and Immobilization Plant), WA7890008967*. Training records will be maintained in accordance with Section A.8 of this document.

A.4 Data Quality Objectives

The DQOs are qualitative and quantitative statements that define data quality requirements based on identified end uses. The DQOs define the performance criteria that limit the probability of making decision errors by considering the purpose of collecting data, defining the appropriate types of data needed, and specifying acceptable probabilities of making decision errors. The EPA's seven-step process for DQO development is presented below to communicate the quality objectives for closure sampling at WTP (*EPA Guidance on Systematic Planning Using the Data Quality Objectives Process*, EPA/240/B-06/001, QA/G-4 [EPA 2006]). These steps may be reviewed and refined for each DWMU before its closure commences.

A.4.1 Step 1: State the Problem

The problem is sampling data are needed to confirm that the clean closure performance standards (discussed in Section A.1 of this SAP and Section H.2.0 of the closure clan) have been met to demonstrate clean closure of the DWMUs. To accomplish this, five primary activities have to be conducted during Step 1. These are:

- Identify DWMUs to be closed at WTP;
- Identify potential sample locations at each DWMU based on review of operating records (e.g., spills and releases to the environment);
- Identify the list of COCs for each DWMU based on review of operating records (e.g., types and quantities of wastes received and stored in vessels, tanks, miscellaneous equipment, and ancillary equipment during operations);
- Identify the list of indicator constituents to be analyzed based on the media to be sampled and COCs for each DWMU;
- Identify the key decision-makers involved in the closure of the DWMU; and
- Identify the resources and organization/management issues needing resolution to successfully implement the sampling and analysis activities.

A.4.2 Step 2: Identify the Goals of the Study

The primary goal is to verify that the clean closure performance standards have been met. Possible logic decisions are as follows:

- DWMU will be administratively closed with no sampling, decontamination or remediation needed based on review of operating records and consideration of the future use of the DWMU;
- DWMU will be sampled to confirm that clean closure performance standards have already been met without the need of decontamination or remediation; or

- DWMU will be decontaminated or remediated and sampled until clean closure performance standards have been achieved.

A.4.3 Step 3: Identify Information Inputs

The inputs to the decision include dangerous waste generation and disposal practices, hazardous substances associated with the DWMU operating records, physical attributes of the unit, anticipated variability of the COCs, and critical sample locations that can be identified prior to sampling design consideration. The WTP Closure Plan identifies the COCs and clean closure performance standards.

A.4.4 Step 4: Define the Boundaries of the Study

The boundaries include the physical characteristics of the DWMU planned for closure, spatial boundaries (the specific locations, depths, and media to be sampled), temporal boundaries (the operations to be assessed and the sampling and analysis time frame), and project constraints (the items that may impede or prevent the sampling and analysis activities from being implemented successfully).

A.4.5 Step 5: Develop a Decision Rule

The general decision-making is the comparison of the sampling dataset for the indicator constituents to the clean closure performance standards, which will be negotiated with Ecology before closure of the DWMU commences. After achieving agreements on the closure performance standards, specific decision rules for the DWMU will be developed. In general, if the sampling dataset for an indicator constituent is less than or equal to the closure performance standard, the closure performance standard is achieved. If the sampling dataset is greater than the closure performance standard, Ecology will be notified and interim measures will be discussed which may include resampling, decontamination activities, interim corrective action measures, and/or performance of an incremental human-health risk assessment.

A.4.6 Step 6: Specify Performance or Acceptance Criteria

Before closure of the DWMU, the project will decide whether statistical hypothesis tests will be applied to the collected sampling dataset to determine if the clean closure performance standards have been achieved. For example, for a DWMU planned for closure, statistical tests of the analytical results reported for concrete wipe samples or soil samples collected from multiple locations may be performed to determine if the closure performance standards have been met. However, a sample taken from the first rinse of a decontaminated tank may only require a direct comparison of the analytical results to the closure performance standards without performing statistical tests.

Due to the inherent uncertainty associated with all sample datasets (EPA 2002a), the result of any statistical hypothesis test performed on a dataset carries some uncertainty and risk whether the correct decision will be made. Quantification of the probabilities of making decision errors will be performed based on the DWMU to be closed, media sampled, and closure performance standards. For statistical hypothesis tests applied to the sampling dataset for each indicator constituent of a DWMU, there are two types of decision errors associated with the determination whether the closure performance standards have been met: Type I (false rejection of the null hypothesis) and Type II (false acceptance of the null hypothesis) (Myers 1997).

- Type I, False Rejection – This error is the belief that the sample result is less than or equal to the closure performance standard, when in reality it is not. The consequence of this type of error is that an unacceptable concentration of a COC is still present at the DWMU (i.e., the unit was concluded to be clean, when in reality it remains contaminated).

- Type II, False Acceptance – This error is the belief that the sample result exceeds the closure performance standard, when in reality it meets the closure performance standard. The consequence of this type of error is that resources will be spent unnecessarily to decontaminate or perform removals/remediations at the DWMU (i.e., the unit was concluded to be contaminated, when in reality it is clean).

The consequences of such errors depend upon the null hypothesis used when assessing the DWMU in question. The primary purpose for sampling (i.e., the working hypothesis) is to determine if the sampling dataset exceed the closure performance standards. Table A-1 shows how these errors relate to unbiased level of confidence and power related to the sample dataset.

Table A–1 Summary of Potential Decision Errors

Reality	Decision/Conclusion		Result of Decision Error
	Site Is Contaminated	Site Is Not Contaminated	
Site Is Contaminated	Correct Decision Probability $\geq 1 - \alpha =$ Level of Confidence	Type I Error False Rejection Probability $< \alpha$	Failure to decontaminate or perform removals/remediations and unacceptable contamination remains at the DWMU
Site Is Clean	Type II Error False Acceptance Probability $< \beta$	Correct Decision Probability $\geq 1 - \beta =$ Power	Unnecessary allocations of resources to decontaminate or perform removals/remediations at the DWMU

There are no prescriptive limits on decision errors; the EPA has no set policy that encourages the use of any particular decision error limit (EPA 2006). However, some EPA programs (e.g., Superfund) may provide alternative guidance on starting points for setting decision error limits. For example, the EPA guidance document, *Soil Screening Guidance: User's Guide*, EPA/540/R-96/018 (EPA 1996), recommends starting values of 5% for the Type I error rate (α) and 20% for the Type II error rate (β). For WTP, the specific Type I error and Type II error for each DWMU will be defined based on the specific characteristics of the problem being investigated.

A.4.6.1 Impact of Decision Errors on Sample Size

Statistical methods generally are used to calculate the minimum number of samples needed to estimate the population parameters based on predefined values for the Type I and Type II decision errors and other factors. The null hypothesis is set up so that the consequences of a Type I error are more serious than a Type II error because the consequences of the Type I error are that actions are not taken when they should (i.e., the DWMU is concluded to be clean, when in reality it remains contaminated). Therefore, more stringent limits are placed on the Type I error rate (α), while less stringent limits are placed on the Type II error rate (β). The probabilistic targeting approach establishes the grid size according to the Type I/Type II error constraints. The number of samples then becomes a function of the size of the unit. In general, the more stringent the limits (i.e., the lower the limits) placed on the probability of making a Type I error, the larger the number of samples required to be collected.

A.4.6.2 Derivation of Sampling Size Requirements

The number of samples to be collected per unit is computed in accordance with the DQO process using either statistical methods or professional judgment. In general, statistical methods will be used to determine the appropriate number of samples. However, a number of DWMUs are quite small or are associated with

tanks or miscellaneous units. For these DWMUs, statistical methods provide impractical large estimates for the number of samples, especially when the limits of decision errors are stringent. In these cases, professional judgment after reviewing operating records will be used to identify sample locations (e.g., where leaks/spills may have occurred and/or previous decontamination work may have been performed), thereby determining the number of samples needed.

A.4.7 Step 7: Develop and Optimize the Design for Obtaining Data

The first six steps of the DQO process presented above will be revisited for each DWMU to develop and optimize an appropriate sample collection and analysis design before its closure commences. Groupings of units with similar characteristics and operational histories may implement the same design based on the DQO process. Section A.5 provides a general overview of the design for collecting and analyzing samples.

A.5 Sampling Management

A.5.1 Sampling Process Design

This section describes the general approach that will be followed for sampling and analysis during closure of the DWMUs. The sampling and analysis processes will assist in confirming that decontamination or removal/remediation activities, when implemented, have been successful and the DWMU has attained the clean closure performance standard. Sampling may be employed where the clean debris surface standard cannot be met or verified visually, such as interior pipe, pump, or tank surfaces, or where evidence is found indicating apparent failure of the DWMU secondary containment systems.

Sampling of decontamination solutions (rinsate) may be conducted for DWMUs that do not meet or could not be inspected to verify attainment of the clean debris surface standard following the decontamination process. This sampling process will serve to define the extent of remaining contamination or confirm adequate decontamination. The sampling process will be repeated after each subsequent round of decontamination effort until the decontamination effort is either determined to be successful, or is terminated, and the contaminated component is removed and disposed of as dangerous or mixed waste.

Concrete found to be contaminated may be decontaminated or removed as part of the closure activities, and concrete wipe or chip sampling will be performed to confirm that levels of dangerous wastes in the remaining concrete do not exceed the clean closure performance standards. Soil found to be contaminated above background levels and clean closure performance standards will be removed as part of the closure activities, and sampling will be performed to confirm that levels of dangerous wastes in the remaining soil do not exceed the clean closure performance standards.

This sampling and analysis protocol will also be prepared to evaluate the extent of soil contamination and the effectiveness of decontamination at specific permitted mixed waste management units in the WTP, if needed because of breach in the secondary containment structures. This section discusses the design and outline of the sampling program. Subjects addressed in this section will be detailed in the revised closure plan and the SAP prior to commencement of closure. Additional information concerning investigation tools (e.g., the gamma camera, closed circuit television, and other analytical or survey equipment) will also be included in the final closure plan. The subjects addressed in this section include analytical parameters, sampling activities, and data quality.

A.5.2 Sampling Locations

Surfaces of the DWMUs will be visually inspected, if feasible, to determine if the clean debris surface standard has been attained. When sampling of a DWMU is needed, sample locations will be selected based on reviews of the operating record; stainless steel liner breach investigations and underlying concrete decontamination work and evaluations; or based on interior inspection data (e.g., from video, closed circuit television, or radiation surveys). For areas that do not meet or could not be inspected to verify attainment of the clean debris surface standard, decontamination activities may be performed. Post-decontamination solution or rinsate samples will be collected from select biased sample locations, focusing on the locations of apparent highest concentrations. For pipes, pumps, tanks, or other permitted equipment, the locations to be sampled will include apparent or likely waste accumulations in crevices, connections, or other rough or restricted flow locations such as inlets or outlets. The rinsate sample will be taken from the first rinse, obtained within a reasonably short time after the completion of decontamination efforts. When the analytical data are below the closure performance standards, the DWMU was successfully decontaminated and can be declared to have achieved clean closure.

Surfaces of the secondary containment systems (e.g., stainless steel liners, coated concrete floors) will be visually inspected, if feasible, to determine if the clean debris surface standard has been attained. If evidence is found indicating apparent failure of the secondary containment systems, the extent of concrete or soil contamination will be determined by collecting concrete wipe or chip samples or soil samples from locations of apparent highest concentrations. Biased sample locations will be selected by reviews of the operating record; stainless steel liner breach investigations and underlying concrete decontamination work and evaluations; or based on results of previous inspections of cracks or areas where concrete has lost its integrity. After decontamination or removal, the remaining concrete or soil will be sampled to confirm that levels of dangerous wastes in the remaining concrete or soil are below the closure performance standards.

In lieu of biased or focused sampling, area-wide sampling may be conducted in larger areas of suspected contamination. The area-wide sampling will be performed in accordance with *Guidance for Clean Closure of Dangerous Waste Units and Facilities* (Ecology 2005).

Proposed sample locations, and the number of samples collected at each location, will be chosen ahead of time and described in the revised closure plan and SAP prior to commencement of closure of the DWMU. Since the sample locations may be moved or number of samples may be revised based on actual field conditions during the time of sample collection, final sample locations and numbers will be documented in the final report as part of the closure record.

A.5.3 Sampling Methods, Containers and Preservation

The appropriate sampling methods, containers, supplies and preservation will be used, depending on the type of media to be sampled and analytical method to be used by the laboratory. The list of criteria used for determining appropriate sampling methods will be developed using federal and state guidance (e.g., WAC 173-303-110) and industry codes, standards, practices (e.g., ASTM International), and submitted to Ecology for approval prior to initiating sampling activities during closure. Sampling and analysis of samples will be performed in a manner consistent with EPA and Ecology guidelines (EPA 1986 and Ecology 1995).

Rinsate samples may be collected from the outlet of a pipe, pump, or tank and transferred directly into laboratory-supplied sample containers. Concrete samples may be collected by breaking small chips using a rock hammer and placed into laboratory-supplied sample containers. Alternatively, a small cylindrical section of the concrete can be removed using a concrete corer and sent to the analytical laboratory, where chip samples can be collected. Wipe samples may be collected using a uniform sample template and wipes

pre-wetted with preservatives supplied by the analytical laboratory. Soil samples may be collected using soil probes, augers, or core samplers. Since closure activities and implementation of this SAP may not occur for at least 40 years, sample collection methods and equipment will be specified in the revised closure plan and SAP prior to the start of closure activities to incorporate future advances in sampling technology.

The analytical laboratory will furnish new sample containers with required preservatives. Sample containers will be selected based on their compatibility with the waste sampled, types of analyses to be performed, resistance to leaking or breakage, ability to seal tightly, and the required volume for an optimum sample, in accordance with protocols described in *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (EPA SW-846)* (EPA 1986). Sample containers and preservations are listed in Table A-2.

Any deviations will be proposed in cases where compliance is impractical or would conflict with other requirements (e.g., *As Low as Reasonably Achievable* requirements). Deviations from this SAP will be proposed in the revised closure plan and SAP to be submitted to Ecology prior to the start of closure activities. Deviations made in the field during sampling and analysis activities will be recorded in a field logbook and discussed in the final report.

Table A–2 Sample Containers, Preservation and Holding Times

Analyte	Method[1]	Sample Containers[2]	Preservation	Holding Time
Solid Samples[3]				
Glycols	SW8015	4 oz amber glass jar with PTFE-lined lid	Cool, ≤6°C	14 days
VOCs	SW8260	EnCore™ or equivalent	Cool ≤6°C, freeze at lab within 48 hours	14 days
		1x 5-25[1,2] grams collected using coring device and extruded into 40 milliliter (mL) VOA vial with PTFE-lined septum cap	Cool ≤6°C, methanol preserved within 48 hours	14 days
TPH-GRO	NWTPH-Gx	EnCore™ or equivalent	Cool, ≤6°C, freeze at lab within 48 hours	14 days
		1 x 5-25[4] grams collected using coring device and extruded into 40 mL VOA vial with PTFE-lined septum cap	Cool, ≤6°C, methanol preserved within 48 hours	14 days
		40 mL VOA vial with PTFE-lined septum cap	Cool, ≤6°C	14 days
TPH-DRO	NWTPH-Dx	8 oz amber glass jar with PTFE-lined lid	Cool, ≤6°C	14 days until extraction; 40 days after extraction
SVOCs	SW8270, SW8270 SIM	8 oz amber glass jar with PTFE-lined lid	Cool, ≤6°C	14 days until extraction; 40 days after extraction
Dioxins/Furans	SW8290	8 oz amber glass jar with PTFE-lined lid	Cool, ≤6°C	30 days until extraction; 45 days after extraction
PCBs	SW8082	8 oz amber glass jar with PTFE-lined lid	Cool, ≤6°C	14 days until extraction; 40 days after extraction
PCB Congeners	EPA1668	8 oz amber glass jar with PTFE-lined lid	Cool, ≤6°C	1 year until extraction; 1 year after extraction[5]
Explosives	SW8095, SW8330, SW8332	8 oz amber glass jar with PTFE-lined lid	Cool, ≤6°C	14 days until extraction; 40 days after extraction
Metals	SW6010, SW6020	8 oz glass or plastic (high density polyethylene) jar[6]	Cool, ≤6°C	180 days
	SW7471		Cool, ≤6°C	28 days

Table A–2 Sample Containers, Preservation and Holding Times

Analyte	Method[1]	Sample Containers[2]	Preservation	Holding Time
Wipe Samples				
VOCs	SW8260	4 oz amber glass jar with PTFE-lined lid containing pre-wetted wipe	Cool, ≤6°C	14 days
Glycols	SW8015	4 oz amber glass jar with PTFE-lined lid containing pre-wetted wipe	Cool, ≤6°C	14 days
SVOCs	SW8270, SW8270 SIM	4 oz amber glass jar with PTFE-lined lid containing pre-wetted wipe	Cool, ≤6°C	14 days until extraction; 40 days after extraction
Dioxins/Furans	SW8290	1 L amber glass bottle with PTFE-lined lid	Cool, ≤6°C	30 days until extraction; 45 days after extraction
PCBs	SW8082	2 x 1 L amber glass bottle with PTFE-lined lid	Cool, ≤6°C	7 days until extraction; 40 days after extraction
PCB Congeners	EPA1668	1 L amber glass bottle with PTFE-lined lid	Cool, ≤6°C	1 year until extraction; 1 year after extraction[5]
Explosives	SW8095, SW8330, SW8332	4 oz amber glass jar with PTFE-lined lid containing pre-wetted wipe	Cool, ≤6°C	14 days until extraction; 40 days after extraction
Metals	SW6010, SW6020	4 oz amber glass jar with PTFE-lined lid containing pre-wetted wipe	Cool, ≤6°C	180 days
	SW7471	4 oz amber glass jar with PTFE-lined lid containing pre-wetted wipe	Cool, ≤6°C	28 days
Aqueous Samples				
VOCs	SW8260	3 x 40 mL VOA vial with PTFE-lined septum cap	HCl to pH<2, Cool, ≤6°C, no headspace	14 days
Glycols	SW8015	1 L amber glass bottle with PTFE-lined lid	Cool, ≤6°C	7 days until extraction; 40 days after extraction
TPH-GRO	NWTPH-Gx	3 x 40 mL VOA vial with PTFE-lined septum cap	HCl to pH<2, Cool, ≤6°C, no headspace	14 days
TPH-DRO	NWTPH-Dx	1 L amber glass bottle with PTFE-lined lid	HCl to pH<2, Cool, ≤6°C	14 days; 7 days for unpreserved water
SVOCs	SW8270, SW8270 SIM	2 x 1 L amber glass bottle with PTFE-lined lid	Cool, ≤6°C	7 days until extraction; 40 days after extraction
Dioxins/Furans	SW8290	1 L amber glass bottle with PTFE-lined lid	Cool, ≤6°C	30 days until extraction; 45 days after extraction
PCBs	SW8082	2 x 1 L amber glass bottle with PTFE-lined lid	Cool, ≤6°C	7 days until extraction; 40 days after extraction
PCB Congeners	EPA1668	1 L amber glass bottle with PTFE-lined lid	Cool, ≤6°C	1 year until extraction; 1 year after extraction[5]
Explosives	SW8095, SW8330, SW8332	1 L amber glass bottle with PTFE-lined lid	Cool, ≤6°C	7 days until extraction; 40 days after extraction
Metals	SW6010, SW6020	1 L plastic (high density polyethylene) bottle	HNO_3 to pH<2, Cool, ≤6°C	180 days
	SW7470		HNO_3 to pH<2, Cool, ≤6°C	28 days

Acronyms:

°C	degree Celsius	SIM	selective ion monitoring
HCl	hydrochloric acid	SVOC	semi-volatile organic compound
L	liter	TPH-DRO	total petroleum hydrocarbons-diesel range organics
mL	milliliter	TPH-GRO	total petroleum hydrocarbons-gasoline range organics
oz	ounce		
PCB	polychlorinated biphenyl	VOA	volatile organic analyte

Table A–2 Sample Containers, Preservation and Holding Times

Analyte	Method[1]	Sample Containers[2]	Preservation	Holding Time
PTFE	polytetrafluoroethylene	VOC	volatile organic compound	

Notes:
[1] Alternate analytical methods may be acceptable. The laboratory must submit any changes to the analytical methods listed, along with proposed QC acceptance criteria, prior to substitution.
[2] Alternate numbers and sizes of containers may be used to provide adequate sample volume required by the laboratory.
[3] Solid samples may include soil, concrete chip or other solid material.
[4] If 25 grams of sample are collected, additional methanol will be required.
[5] Extended holding times only apply when samples and extracts are stored in the dark at less than -10°C at the laboratory.
[6] High density polyethylene containers are preferred where boron is a COC.

A.5.4 Sample Handling and Custody

All samples will be uniquely identified, labeled, and documented in the field at the time of collection. A sample label will be completed and securely affixed to each container. Sample labels convey information unique to each sample and thus serve to prevent misidentification of samples. Labels may be adhesive or tags, made of weatherproof paper or plastic with gummed backs. Labels will be completed with indelible ink before or at the time of collection and protected from water with clear tape. Information will be completed as close as possible to the time of collection. Each label will contain at least the following information:

- Project identification and sample location
- Unique sample identification number
- Sample collection date and time, using a 24-hour clock notation
- Site contractor
- Name or initials of field sampler (not preprinted)
- Analysis to be performed and required sample preservation (if applicable)

In accordance with the chain-of-custody protocols, signed and dated custody seals will be affixed on the sample containers and on the sample shipment coolers to prevent or detect tampering with the samples between the time of collection and the beginning of analysis. Seals will be applied to the sample containers and coolers before leaving the sample location. The seals will be attached in such a manner that the seal will be broken to open the container or cooler.

Samples collected in the field will be transported to the laboratory as expeditiously as possible. When cooling to a temperature of less than or equal to 6 degrees Celsius (°C) immediately after sample collection is required, the samples will be packed in ice to keep them cool during collection and transportation. A temperature blank will be included in every cooler and used to determine the internal temperature of the cooler upon receipt of the cooler at the laboratory. If the temperature of the samples upon receipt exceeds the temperature requirements, the exceedance will be recorded on laboratory records. The decision regarding the potentially affected samples will also be documented in laboratory records.

Chain-of-custody forms will be used to document the integrity of all samples and to physically trace sample possession from the time of collection to ultimate disposition. To maintain a record of sample collection, transfer of samples between personnel, shipment of samples and receipt of samples at the laboratory, chain-of-custody forms will be completed. At a minimum, information recorded on the form will include:

- Project identification and sample location
- Unique sample identification number for each container

- Sample collection date and time, using a 24-hour clock notation
- Site contractor
- Name or initials of field sampler
- Type of sample (e.g., solid, wipe, aqueous)
- Designation of matrix spike / matrix spike duplicate (if predetermined)
- Analysis to be performed and required sample preservation (if applicable)
- Serial numbers of custody seals and shipment coolers (if any)
- Custody transfer signatures as well as dates and times of sample transfers from the field to transporters and to the laboratory
- Bill of lading or transporter tracking number (if applicable)

The chain-of-custody forms will be signed as relinquished or received each time the sample changes possession. A sample is in the custody of a field sampler, shipping agent, or analytical laboratory employee/sample custodian if:

- In a person's physical possession;
- In view, after having been in a person's physical possession;
- Secured and locked so that it cannot be tampered with, after having been in a person's physical custody; or
- Placed in a designated secure area restricted to authorized personnel.

Samples will be shipped to the laboratory via overnight air courier. Bills of lading will be used as custody documentation during this time and will be retained as part of the permanent sample custody documentation. In some cases, samples may be hand delivered to the laboratory; hand delivery will be noted on the chain-of-custody form. The laboratory is responsible for sample custody once samples are received.

In the event that multiple analytical laboratories are used, a separate chain-of-custody form will be completed for each laboratory. Each form will indicate the number of sample containers and coolers transmitted to that particular laboratory. A copy of the form shall be placed in the cooler and accompany the sample containers to the laboratory.

Once the samples are accepted by the laboratory, they will be checked against information on the chain-of-custody form for anomalies. The condition, temperature, and appropriate preservation of samples will be checked and documented. Checking an aliquot of the sample using pH paper or meter is an acceptable procedure except for volatile organic compounds where an additional sample is required to check preservation. The occurrence of any anomalies in the received samples and their resolutions will be documented in laboratory records. All sample information will then be entered into a laboratory information management tracking system and unique analytical sample identifiers will be assigned by the laboratory.

Samples will be stored in limited- or controlled-access, temperature-controlled areas while in the laboratory. Refrigerators, coolers, and freezers will be monitored for temperature seven days a week. Acceptance criterion for the temperatures of the refrigerators and coolers for all samples will be 6°C. Acceptance criterion for the temperatures of the freezers will be less than or equal to 7°C. All of the cold storage areas will be monitored by thermometers calibrated with a National Institute of Standards and Technology traceable thermometer. Records of refrigerator, cooler and freezer temperatures will be maintained. These

records will include acceptance criteria. Samples for volatile organic analysis will be stored separately from other samples, standards, and sample extracts.

Sample holding time tracking begins with the collection of samples and continues until the analysis is completed. Samples will not be held in excess of specified analytical holding times listed in Table A-2. Procedures ensuring internal laboratory sample control and custody will be implemented and documented by the laboratory. Specific instructions concerning the analysis specified for each sample on the chain-of-custody form will be communicated to the analysts. Preparation batches will be created and laboratory QC samples will be introduced into each batch. Samples will be stored after analysis until disposed of in accordance with applicable local, state, and federal regulations. Disposal records will be maintained by the laboratory.

A.5.5 Field Quality Control

Sample QC procedures will be followed, including proper implementation of the sample collection, labeling, handling, and chain-of-custody form completion described in the preceding sections. Field QC sampling described in this section will also be followed.

Field QC will be accomplished through the collection and analysis of trip blanks, field duplicates, equipment rinsate blanks, and field blanks. Definitions of each type of field QC samples are listed below.

Trip blanks. These samples are used to verify that no contamination has occurred during sampling and shipping of VOC samples due to environmental conditions. They consist of a series of cleaned sample containers filled with analyte-free water and precertified by analysis at the laboratory as clean. The trip blanks are prepared by the laboratory in sample containers identical to those used in the actual sampling activities. Trip blanks will be included for each sample cooler containing samples for VOC analysis. The trip blanks will be analyzed for VOCs only.

Field duplicates. These samples are used to evaluate sampling quality and to check the precision and accuracy of the sampling technique for collecting samples. A field duplicate sample is one of two samples collected at a single sample location in the field during a single act of sampling. Field duplicate samples are collected in a manner identical to that of routine samples, transferred to separate sample containers, and analyzed for the same parameters. One field duplicate will be collected for every 10 aqueous samples or each sampling event when less than 10 samples were collected. Due to soil heterogeneity, soil duplicates will not be collected. The variability between soil samples nullifies the ability of duplicate samples to confirm analytical results.

Equipment rinsate blanks. These samples are used to verify that samples collected in the field were not contaminated by the equipment. They will be prepared by passing deionized or distilled water through decontaminated, non-dedicated sampling equipment. The water is collected, transferred to a sample container and handled in the same manner as other samples. Equipment rinsate blanks will be collected daily and analyzed for the same analytes as the samples collected that day.

Field blanks. These samples are used to verify that the water used for decontamination of the equipment was not contaminated. They will be prepared by collecting the deionized or distilled water used for decontamination of sampling equipment into a sample container and handled in the same manner as other samples. Field blanks will be collected daily and analyzed for the same analytes as the samples collected that day.

A.5.6 Field Instrument Calibration and Frequency

Any field instrumentation or monitoring equipment used to support sampling will be calibrated at prescribed intervals and/or as part of daily use in accordance with the manufacturer's specifications to ensure sampling activities obtain the most accurate and precise information possible. Equipment will be calibrated, whenever possible, using reference standards having known relationships to nationally recognized standards or accepted values of physical constants. If national standards do not exist, the basis for calibration will be documented. Calibrations of equipment will be recorded in a field logbook and records will be included in the final report.

A.5.7 Field Instrument/Equipment Testing, Inspection and Preventative Maintenance Procedures and Frequency

All new sample equipment, consumable materials, parts, and supplies of current manufacture that are free from defects affecting performance will be used as required to perform necessary sampling. These items will be inspected for quality by the appropriate sampling personnel before use and stored in a clean, uncontaminated condition throughout the course of the sampling activities. When feasible, disposable and/or dedicated sampling equipment, materials, parts, and supplies will be used to collect samples to avoid the need to decontaminate them after use. Non-disposable and non-dedicated items will be decontaminated and inspected between uses and sample locations in accordance with the manufacturer's specifications and approved project procedures. Inspection and preventive maintenance of field equipment will be conducted in accordance with the manufacturer's specifications. Maintenance of equipment will be recorded in a field logbook and records will be included in the final report.

A.5.8 Inspection/Acceptance of Field Supplies and Consumables

Consumable materials, parts, and supplies will be inspected by the appropriate sampling personnel before use to ensure it is clean, free from defects, and made of materials appropriate for the media being sampled and analytes being analyzed. Inspection and acceptance of these items will be documented or, when certifications are provided by the manufacturer, maintained in project files to ensure availability of these records for review when needed.

A.6 Laboratory Analysis Management

A.6.1 Analytical Laboratory

The laboratory chosen for conducting the analyses will have the appropriate level of qualified personnel, appropriate instrumentation, approved QA plans and standard operating procedures (SOPs), approved analytical methods, and appropriate internal procedures and requirements to perform the required analyses. Laboratory accreditations (e.g., National Environmental Laboratory Accreditation Program) will be used for selection of the commercial laboratory that may be retained for sample analyses. When requested, the QA plans and SOPs will be made available for review by WTP project personnel.

A.6.2 Analytical Parameters

Analytical parameters will be based on knowledge of the operations and wastes processed (process knowledge) in the DWMUs. A list of indicator constituents will be developed based on potential COCs and the clean closure performance standard (rinsate designation limit standard or soil cleanup standard) selected for the DWMU. These indicator constituents and their associated analytical methods will be provided in the revised closure plan and SAP prior to the start of closure activities.

A.6.3 Analytical Methods

A listing of analytical and preparation methods that may be used by a future contract laboratory for organic and inorganic analyses can be found in Tables A-2 and A-3. To ensure that data of acceptable quality are obtained, standard EPA laboratory methods described in *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, (EPA SW-846)* (EPA 1986) or technically appropriate methods for radioanalytical determinations will be used to obtain laboratory data. Sample analysis and laboratory results will be requested only for the indicator constituents specified in the approved closure plan and SAP. Method detection limits, estimated quantitation limits and reporting limits will be established based on the media to be analyzed, selected indicator constituents and analytical methods in conformance with *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, (EPA SW-846)* (EPA 1986) or other guidance. Since closure activities and implementation of this SAP may not occur for at least 40 years, analytical methods will be specified in the revised closure plan and SAP prior to the start of closure activities to incorporate future advances in analytical testing technology.

A.6.4 Laboratory Quality Control

Laboratory QC is addressed through the analysis of laboratory QC samples, documented internal and external laboratory QC practices, and laboratory audits. Three types of laboratory QC samples will be used: laboratory blank samples, matrix spike/matrix spike duplicate (MS/MSD) samples, and laboratory control samples. Definitions of each type of laboratory QC samples are listed below.

Laboratory blank samples. These samples are designed to detect contamination of routine samples that occurs in the laboratory. Laboratory blanks verify that method interference caused by contaminants in solvents, reagents, glassware, and other sample processing hardware are known and minimized. Laboratory blanks are deionized water for water samples or a purified solid matrix for soil samples. A minimum of one laboratory blank will be analyzed each day that routine samples are analyzed. The concentration of the target compounds in the laboratory blank sample must be less than or equal to the reporting limit. If the blank is not under the specified limit, the source contamination is to be identified and corrective actions taken.

Table A–3 Analytical and Preparation Methods

Analytical Method[1]	Parameter	Preparation Methods	
		Water/Aqueous	Solid[2]/Wipe
GC			
SW8015	Glycols	—	See analytical method
SW8081	Chlorinated Pesticides	SW3510, SW3520, SW3535	SW3540, SW3541, SW3545, SW3550
SW8082	PCBs	SW3510, SW3520, SW3535	SW3540, SW3541, SW3545, SW3550
NWTPH-Gx	TPH-GRO	NWTPH-Gx	NWTPH-Gx
NWTPH-Dx	TPH-DRO	NWTPH-Dx	NWTPH-Dx
GC/MS			
SW8260	VOCs	SW5030	SW5035, SW5035A
SW8270	SVOCs	SW3510, SW3520, SW3535	SW3540, SW3541, SW3545, SW3550
SW8270 SIM	SVOCs/PAHs	SW3510, SW3520, SW3535	SW3540, SW3541, SW3545, SW3550
NWTPH-Gx	TPH-GRO	NWTPH-Gx	NWTPH-Gx
GC/ECD			
SW8095	Explosives	SW3535	See analytical method
HRGC/HRMS			

Table A–3 Analytical and Preparation Methods

Analytical Method[1]	Parameter	Preparation Methods	
		Water/Aqueous	Solid[2]/Wipe
SW8290	Dioxins/Furans	See analytical method	See analytical method
EPA1668	PCB Congeners	See analytical method	See analytical method
HPLC			
SW8330	Explosives	See analytical method	See analytical method
SW8332	Explosives	See analytical method	See analytical method
ICP-AES/ICP-MS/GFAA/CVAA			
SW6010	Trace metals by ICP-AES	SW3005, SW3010, SW3015, SW3020	SW3050, SW3051
SW6020	Trace metals by ICP-MS	SW3005, SW3010, SW3015, SW3020	SW3050, SW3051
SW7470	Mercury (water)	See analytical method	—
SW7471	Mercury (solid)	—	See analytical method

Acronyms:

—	not applicable
CVAA	cold vapor atomic absorption
GC	gas chromatography
GC/MS	GC/mass spectrometry
GC-ECD	GC-electron capture detector
GFAA	graphite furnace atomic absorption spectrometry
HPLC	high-performance liquid chromatography
HRGC/HRMS	high-resolution GC/ high resolution MS
ICP-AES	inductively coupled plasma-atomic emission spectrometry
ICP-MS	inductively coupled plasma-mass spectrometry
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
SIM	selective ion monitoring
SVOC	semi-volatile organic compound
TPH-DRO	total petroleum hydrocarbons-diesel range organics
TPH-GRO	total petroleum hydrocarbons-gasoline range organics
VOC	volatile organic compound

Notes:
1 Alternate analytical methods may be acceptable. The laboratory must submit any changes to the analytical methods listed, along with proposed QC acceptance criteria, prior to substitution.
2 Solid samples may include soil, concrete chip or other solid material.

MS/MSD samples. These samples are designed to check the precision and accuracy of the analytical methods through the analysis of a normal sample with a known amount of analyte added. Soil samples to be used for MS/MSD samples will be collected and identified in the field; water MS/MSD samples will be collected in the same manner as field duplicate samples. In the lab, two portions of the sample are spiked with a standard solution. MS/MSD samples are to be analyzed for the same parameters as the routine samples, and analytical results compared to evaluate the precision and accuracy of the analytical method and effects of the sample matrix. The MS/MSD samples will be collected at one for every 20 routine samples for each sample matrix.

Laboratory control samples. These samples include blank spikes and blank spike duplicates. Blank spike samples are designed to check the accuracy of the analytical method by measuring a known concentration of an analyte in the blank spike samples. Blank spike duplicate samples are designed to check the accuracy and precision of the analytical method by measuring a known concentration of an analyte in the blank spike duplicate sample. Blank spike and blank spike duplicate samples are prepared by the laboratory using clean laboratory matrices spiked with the same spiking compounds used for matrix spikes at levels no greater than 10 times the method detection limit.

A.6.5 Laboratory Instrument Calibration and Frequency

Laboratory equipment and instrumentation will be operated and calibrated according to both the manufacturer's specifications and the analytical method specifications as appropriate to ensure laboratory analysis activities obtain the most accurate and precise information possible. The laboratory QA plan will

include requirements for calibrations when specifications are not listed in analytical methods. Calibrations that are typically not called out in analytical methods include ancillary laboratory equipment (e.g., analytical balances, pipettes, and pH meters) and verification of reference standards used for calibration and standard preparation.

Analytical methods prescribed must have specifications for equipment checks and instrument calibrations. The laboratory will comply with method-specific calibration requirements for requested parameters. If an instrument calibration or equipment fails, the instrument will be recalibrated and all affected samples will be analyzed using an acceptable calibration.

Laboratory equipment and instrumentation will be calibrated at prescribed intervals and/or as part of daily use. Frequency will be based upon the type of equipment, inherent stability, and manufacturer's recommendations. Calibration will be conducted, whenever possible, using reference standards having known relationships to nationally recognized standards or accepted values of physical constants. If national standards do not exist, the basis for calibration will be documented. Laboratory documentation will include calibration techniques and sequential calibration actions, performance tolerances provided by the specific analytical method, and calibration dates and frequency.

In addition, records for laboratory-prepared standards will be maintained and provided at an agreed upon time or as requested with each data deliverable. Instrument responses for gas chromatography (GC) / mass spectrometry (MS), GC retention time window definitions, and documentation of calibration check precision for GC and GC/MS systems will be reported in each deliverable. Standard reference materials used to perform calibration checks associated with both inorganic target analytes and radiochemical parameters will be prepared using an independent source for the standard materials from that used to prepare the calibration standards. The results of these calibration checks will be reported with each data deliverable.

A.6.6 Laboratory Instrument/Equipment Testing, Inspection and Preventative Maintenance Procedures and Frequency

Laboratory equipment and instrumentation will be tested, inspected and maintained to a level such that each piece of equipment and instrumentation can meet method-specific QA/QC tolerances and are in proper working order. Testing, inspection, and maintenance will be performed under the supervision of qualified personnel in accordance with the manufacturer's specifications, laboratory QA plan, and procedures and requirements.

EPA Requirements for Quality Assurance Project Plans, EPA/240/B-01/003, EPA QA/R-5 (EPA 2001) requires that all activities not governed by specific analytical procedures be completed under approved procedures and requirements. If procedures and requirements governing the inspection and maintenance of equipment and instrumentation do not presently exist, they will be developed to ensure that activities are conducted using equipment and instrumentation that are performing within the manufacturer's or design specifications.

A.6.7 Inspection/Acceptance of Laboratory Supplies and Consumables

Laboratory consumable materials, parts, and supplies will be inspected for quality by the appropriate personnel before use to ensure it is clean, free from defects, and made of materials appropriate for the media and analytes being analyzed. Inspection and acceptance of these items will be documented or, when certifications are provided by the manufacturer, maintained in laboratory files to ensure availability of these records for review when needed.

A.6.8 Laboratory Data Reporting Requirements

An important part of the laboratory documentation is the case narrative. The case narrative contains essential information that allows an informed evaluation of data usability. The case narrative will include, but not be limited to, the following:

- A table summarizing samples received, correlating field sample identification numbers, laboratory sample identification numbers, and laboratory analyses completed.
- Discussion of sample appearance and integrity issues that may affect data usability (e.g., temperature, preservation, pH, sample containers, air bubbles, and multi-phases).
- Samples received but not analyzed and the reason for it.
- Discussion of holding time excursions for sample preparation and analyses.
- Discussion on all out-of-control analyses or discrepancies of calibrations, continuing calibrations or QC sample results (e.g., surrogates, laboratory blank samples, laboratory control samples, MS/MSD samples, and post-digestion spikes) and corrective actions taken.
- Discussion of all qualified data and definition of qualifying flags.
- Discussion of and recommendations for potential data usability of qualified data.

Reporting of analytical results will follow the guidelines listed below:

- Reported data will identify the concentration units (e.g., milligrams per kilogram, milligrams per liter) and appropriate laboratory qualifiers.
- Data reported as non-detected will be referenced against a stated method detection limit or instrument detection limit value.
- Method detection limits and sample results will be reported to one decimal place more than the corresponding level of quantitation (LOQ), unless the appropriate number of significant figures for the measurement dictates otherwise.
- Soil samples will have results reported on a dry-weight basis.
- If possible, samples will be analyzed undiluted and non-detects reported to the specified LOQs; LOQs for minority constituents in highly contaminated samples may have to be adjusted for dilutions.

A.6.9 Laboratory Data Review Requirements

All analytical data generated will be verified for completeness and technical accuracy by the laboratory performing the work prior to submittal to WTP. This internal data review process, which is multi-tiered, will include all aspects of data generation, reduction, and QC assessment. In each laboratory analytical section, the analyst performing the tests will review 100% of the definitive data. After the review by the analyst has been completed, 100% of the data will be reviewed independently by a senior analyst or by the supervisor of the respective analytical section using the same criteria.

The elements of the laboratory data review at each level will include, but are not limited to:

- Sample receipt procedures and conditions
- Sample preparation
- Accuracy and completeness of analytical results
- Correct interpretation of all raw data, including all manual integrations

- Appropriate application of QC samples and compliance with established CLs
- Verification of data transfers
- Documentation completeness (e.g., all anomalies in the preparation and analysis have been identified; appropriate corrective actions have been taken and have been documented in the case narratives; associated data have been appropriately qualified; and anomaly forms have been completed)
- Accuracy and completeness of data deliverables (hardcopy and electronic)

A.6.10 Laboratory Data Deliverable Requirements

The laboratory data package will be prepared after completion of analyses and submitted to WTP. It will contain adequate information for data review and validation. A complete data deliverable will consist of a complete analytical report, chain-of-custody documentation and electronic deliverable. The following information may be part of the laboratory data package:

- Cover letter that identifies the project
- Table of contents
- Case narrative that summarizes samples and analyses and discusses any issues that may affect data usability
- Analytical results to include the field sample identification numbers, laboratory sample identification numbers, date sampled, date extracted, date analyzed, dilution factors, extraction and analytical methods, units and sample quantitation limits
- Laboratory method detection limits, estimated detection limits, and LOQs
- Laboratory qualifiers
- Sample management records including original signed chain-of-custody and cooler receipt forms
- Internal laboratory QA/QC information

A.7 Data Validation and Reporting

The data collection in the field and by the laboratory is the first of several steps in evaluating conditions at a DWMU. After the data are collected, a series of evaluations and data reduction steps must be conducted to ensure that the data are acceptable and that the information is in a form practical for the data users.

A.7.1 Data Review and Reduction

Data review is the in-house examination to ensure that the collected data have been recorded, transmitted, and processed correctly. Data review includes checking for data entry, transcription, calculation, reduction, and transformation errors. It is also a completeness check to determine whether there are any deficiencies such as data missing or integrity lost (e.g., due to corruption or loss in storage or processing). Data reduction is the process of converting raw data or instrument data into a usable form for evaluation by data users. Review and reduction of environmental data will take place at the laboratory and project offices. The data review and reduction activities convert the data into a form more usable for interpretive purposes of environmental risk and verification of clean closure.

Field data reduction involves tabulating data obtained in the field and calculating summary statistics (e.g., average, maximum, minimum) on the data. Laboratory data reduction involves converting the outputs of the analytical instruments into sample and QC results. Laboratory data reduction will be performed as defined in the analytical method. Laboratory deliverables will include raw data and reduced data. This

form of laboratory reporting will: (a) ensure complete documentation of all aspects of laboratory analysis, (b) permit independent verification of reported results, (c) provide a form of data that is technically and legally defensible, and (d) ensure that data users can be completely confident in the results they deem usable.

Scientists, engineers and regulators within EPA, Office of River Protection (ORP), and Ecology may review the data to ensure compliance with applicable WACs and DOE closure requirements. Individual regulators will submit their requests to the WTP Closure Manager for any datasets required to evaluate the post-decontamination sampling effort and declaration of clean closure. The WTP Closure Manager will provide requested information to regulators in an agreed upon form.

A.7.2 Data Verification and Validation

The *EPA Guidance on Environmental Data Verification and Data Validation*, EPA/240/R-02/004, EPA QA/G 8 (EPA 2002b) will be used as a guide to perform data verification and validation. Data verification is the process of evaluating the completeness, correctness, and conformance/compliance of a specific dataset against the method, procedural, or contractual requirements. Data verification is performed on analytical results to ensure that they are complete and in order. It involves ensuring that deficiencies are identified, documented and corrected. Data verification is generally done by the laboratory generating the data or by others independent of the laboratory.

Data validation is the comparison of analytical results versus the requirements established by the analytical method. Validation involves evaluation of all sample-specific information generated from sample collection in the field to sample analysis in the laboratory. It involves ensuring that the holding times, precision, accuracy, laboratory blanks, and detection limits are within the acceptance criteria. Data validation is used to determine whether the analytical data are technically and legally defensible and reliable. The applicable analytical method QC guidelines will be used to validate the data with the exception of radioanalytical data. Data validation is one step of the data quality assessment (DQA) process that will be used to determine whether the data meet the DQOs.

Data validation is generally performed by others independent of the laboratory performing sample analysis. The analytical data generated by the laboratory will be sent to an independent, third-party company for data validation. The data validation strategy may be 90% Level III and 10% Level IV. The Level III data validation assumes that reported data values are correct as reported by the laboratory. Data quality is assessed by verifying that the requirements have been achieved for each compound class. The Level IV data validation is based on the assessment of laboratory raw data packages, which include all data required for a full review of compound selection, integration, interference assessment, and requantification (e.g., spectra and chromatograms). Supporting records are also included in this package (e.g., calibration standards, instrument sequence files, and dilution factors). If necessary, Level IV data validation includes requantification of reported QC and field sample values using the raw data files. In addition, instrument performance, calibration methods, and calibration standards are reviewed to ensure that the detection limits and data values are accurate and appropriate.

The final product of the validation process is the validation report. The validation report communicates the quality and usability of the data to the data users and decision-makers. The validation report will contain an itemized discussion of the validation process and results. The validation report, along with the other data obtained during the sampling and analysis activities, will be reviewed to make a determination whether the overall dataset met the DQOs and the closure performance standards have been attained.

A.7.3 Data Quality Assessment

The sampling and analytical data will be evaluated to determine whether they are of the appropriate type, quality, and quantity to support their intended use. A data quality assessment will be performed on data obtained in the field and by the laboratory in accordance with *EPA Guidance for Data Quality Assessment: Practical Methods for Data Analysis*, EPA/600/R-96/084, EPA QA/G-9 (EPA 2000).

A.7.4 Non-Direct Measurements

In addition to the data obtained during sampling and analysis activities, decision-makers will use data obtained from other existing sources such as operating records from project files and databases, photographs taken during operations, information on background soil levels from published scientific literature and environmental investigation reports from other facilities, and cleanup standards from local, state, and federal regulations. These data will be used to assist in designing the sampling and analysis program. For example, operating records will be used to identify potential sample locations and COCs while soil background levels and regulatory cleanup standards will be used to establish clean closure performance standards for the DWMU. In addition, operating records will be reviewed to determine whether the DWMU may be administratively closed with no sampling, decontamination or remediation.

A.8 Documentation and Data Management

To ensure all sampling, analysis, and data reporting activities are conducted in accordance with this SAP, WTP QA Manual and all appropriate project procedures, adequate documentation of each event must be completed. Therefore, all field activities related to sample collection and sample custody must be recorded. A designated professional engineer will observe sampling activities and will be given the documentation generated during closure activities that is required to certify closures.

The laboratory will perform all functions required for analyses of the samples and reporting of analytical results in accordance with an approved laboratory QA plan. Laboratory activities relating to sample custody, sample preparation, sample analysis, and data reporting must be recorded to ensure that laboratory data can be confidently used by the data users. As designated by the WTP Closure Manager, key project staff may contact the laboratory personnel and obtain a copy of the laboratory QA plan for review and/or visit the facility to ensure laboratory procedures meet the project-specific goals.

Records generated to support activities described in this SAP will be legible, identifiable, and retrievable, and will be protected against damage, deterioration, or loss. Requirements and responsibilities for record transmission, distribution, retention, maintenance, and disposal will be established and documented. Personnel that generate or use data in an electronic format are responsible for complying with applicable software quality requirements to ensure that data input (and changes to data input) is complete and accurate, and that security and integrity of the data are maintained.

A.8.1 Field Operations Records

The following subsections provide a summary of requirements for adequate field documentation. All field documentation will be the responsibility of the designated sampling personnel.

A.8.1.1 Sample Container Labels

At the point of sample collection, samples will be collected in pre-labeled containers to obtain sufficient volumes for the required analyses. Each sample may require multiple containers and each sample set of

containers from a specific sample location and depth will be assigned a unique identification number to prevent misidentification of samples.

At a minimum, the sample location, identification number, collection date and time will be recorded on the sample label, in the field logbook and/or on the chain-of-custody form. Samples will be labeled, recorded, and tracked according to the requirements of this SAP.

A.8.1.2 Field Sampling Logbooks

Field logbooks are legal documents; they are the written record for all field data gathered, field observations, field equipment calibrations, samples collected for laboratory analysis, and sample custody. The logbooks are maintained to ensure that field activities are properly documented. Field logbooks will be bound and will contain consecutively numbered pages. All entries in field logbooks will be made using permanent ink pens or markers. All mistakes made as entries will be amended by drawing a single line through the entry. The person making the correction will initial and date it. At a minimum, the following entries will be made to the field logbook:

- Identification of project
- Name of site contractor
- Identification of all sampling team members
- References to field methods used to obtain samples, field data, etc.
- Location, depth and description of each sample location
- Matrix of samples (e.g., rinsate, soil, concrete wipe, concrete chip)
- Types, numbers, and volumes of sample containers
- Unique sample identification numbers
- Dates and times of sample collection, using a 24-hour clock notation
- Dates and times of sample shipping or transfer of sample custody
- Observed weather conditions
- All field equipment, instruments and measurements
- Any deviations from this SAP
- The chain-of-custody form numbers

A.8.1.3 Chain-of-Custody Forms

The ability to demonstrate that samples were collected from the designated sample locations and that they reached the laboratory without alteration is important for the accuracy and integrity of the data resulting from laboratory analysis. Evidence of sample collection, transfers between personnel, shipment, and laboratory receipt will be documented using chain-of-custody forms. The chain-of-custody form will, as a minimum, provide the sample location, identification number, type, collection date and time, preservation, and analyses to be performed.

A.8.2 Laboratory Records

Laboratory records are required to document all activities involved in sample receipt, processing, analysis, and data reporting. The following subsections describe the laboratory records that will be generated for WTP closure activities.

A.8.2.1 Sample Data Records

These records contain the times samples were analyzed to verify the holding times were the same as those prescribed by the analytical methods. Sample data records will include information on the total number of samples analyzed in a given day, location of sample analysis (i.e., instrument identification number), any deviations from analytical procedures and requirements and/or methods, and time and date of analysis. Corrective action steps taken to rectify situations that did not conform to laboratory procedures and requirements and/or analytical methods (including steps taken to seek additional sample material, if required) will also be noted in these records.

A.8.2.2 Sample Management Records

Sample management records document sample receipt, handling and storage, and date of analyses. The records verify that the chain-of-custody was maintained and the sample was properly preserved. The record will reflect any anomalies in the samples (such as receipt of damaged samples), note proper log in of samples into the laboratory, and address procedures used to prioritize received samples to ensure holding time requirements will be met.

A.8.2.3 Test Methods

This documentation describes any deviation from the analytical methods or laboratory procedures and requirements. Items to be documented include sample preparation and analysis, instrument standardization, detection and reporting limits, and test-specific QC criteria. Documentation demonstrating laboratory proficiency with each method used will also be included in this category.

A.8.2.4 Quality Assurance/Quality Control Reports

The QA/QC reports will include general QC records, such as initial demonstration of the capability of individual analysts to conduct specific analyses, instrument calibration, routine monitoring of analytical performance (e.g., control charts), and calibration verification. Project-specific information from the QA/QC checks, such as blanks (e.g., field, reagent, and method), spikes (e.g., MS/MSD and surrogate), calibration check samples (e.g., zero check, span check, and mid-range check), replicates, and splits will be included in the QA/QC reports to facilitate data quality analysis. Specific requirements for the quantity and types of QA/QC monitoring and associated reporting formats will be specified in the analytical SOPs to the laboratory.

A.8.3 Document Control

Document control consists of the clear identification of all project-specific documents in an orderly form, secure storage of all project information, and controlled distribution of all project information. Document control ensures controlled documents of all types related to the project will receive appropriate levels of review, comment, and revision as necessary.

Hardcopy and/or electronic data of records generated to support activities described in this SAP will be stored in project files. The laboratory will maintain electronic and hardcopy records sufficient to recreate each analytical event. Records will be stored by the laboratory for the duration of the WTP Project or once closure certification has been completed, whichever is longer, or as dictated by project requirements. Data will be made available for retrieval by authorized WTP personnel upon request. In the event of laboratory closure, all applicable documents and electronic media must be immediately transferred to the WTP facility operator at the time of closure and/or ORP.

A.8.4 Project Data Flow and Transfer

The data flow from the laboratory and field to the project staff/data users will be sufficiently documented to ensure that the data are properly tracked, reviewed, validated for use and retrievable.

A.9 Assessments and Corrective Actions

Periodic assessments to verify that field sampling and laboratory analytical activities meet the requirements of this SAP, WTP QA Manual, and laboratory QA plan will be conducted. If necessary, corrective action procedures will be implemented whenever field sampling or laboratory analysis results do not meet the required QA/QC standards. Implemented corrective actions will be documented according to approved procedures.

A.10 Reports to Management

Conditions identified as having an adverse effect on quality, the significance of such conditions, and corrective actions will be documented, reported to the appropriate level of management, and resolved according to approved procedures.

The assessment reports may include the following items, as appropriate:

- Deviations from the requirements specified in this SAP, WTP QA Manual, or laboratory QA plan
- Limitations or constraints on the applicability of the resulting field and analytical data
- Results of assessments
- Corrective actions taken

A.11 References

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Attachment 4 to CCN 280015

ADDENDUM H
CLOSURE PLAN/RED-LINE

WA7890008967, Part III, OPERATING UNIT GROUP 10
WASTE TREATEMENT AND IMMOBILIZATION PLANT

55 Pages

(excluding coversheet)

Addendum H

Closure Plan

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ADDENDUM H
CLOSURE PLAN

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Appendix A

ADDENDUM H CLOSURE PLAN

Note: Where information regarding treatment, management, and disposal of the radioactive source byproduct material and/or special nuclear components of mixed waste (as defined by the Atomic Energy Act of 1954 as amended) has been incorporated into this document, it is not incorporated for the purpose of regulating the radiation hazards of such components under the authority of this permit or chapter 70.105 RCW and its implementing regulations but is provided for information purposes only.

This addendum is the Resource Conservation and Recovery Act (RCRA) closure plan for the River Protection Project Waste Treatment Plant (WTP) permitted mixed waste management units, as required per the *Washington Administrative Code* (WAC) 173-303-806(4)(a)(xiii). This closure plan describes the activities that are necessary to close the WTP permitted mixed waste management units. The procedures and estimated times to complete these activities are discussed in this plan. Submittal of this closure plan completes the requirement of III.10.C.8.b and Compliance Schedule Item 8.

This closure plan is provided in compliance with the applicable requirements of the WAC 173-303-610, -620, and -806. This plan is also intended to demonstrate compliance with Conditions II.J and III.10.C.8 of the Hanford Facility Dangerous Waste Permit (Ecology 2009).

With several exceptions, this plan follows the format of a typical closure plan as outlined in the *Dangerous Waste Permit Application Requirements for Facilities Which Store and/or Treat Dangerous Wastes in Tank Systems and/or Containers* (Ecology 1996). The exceptions are the exclusion of sections that do not apply to the WTP (financial assurance, liability, "already closed disposal unit," and post-closure requirements), and the addition of new sections not addressed in the guidance (closure of tank, miscellaneous unit, container storage, and containment building units).

H.1.0 INTRODUCTION

This closure plan identifies the steps and procedures necessary to close any WTP permitted mixed waste management unit at any point in its active life. This includes the removal of dangerous and mixed waste and the decontamination of the permitted mixed waste management units, ancillary equipment, and the associated secondary containment systems. The RCRA closure activities will be consistent with the requirements of the WTP deactivation, decontamination, and decommissioning plan to be prepared under separate authorities. They will be revised as necessary to maintain consistency between the plans. Deactivation of the WTP is discussed further in Sections H.3.2 and H.7.0.

H.1.1 Closure Plan Overview

Mixed waste will be handled and stored in the following areas of the WTP, as identified in DWP and Addendum C:

- Pretreatment plant building
- WTP portion of the waste transfer lines from the double-shell tank (DST) system

- Intra-facility transfer lines between WTP buildings
- WTP portion of the effluent transfer lines from the WTP to the Liquid Effluent Retention Facility (LERF)
- Low Activity Waste (LAW) vitrification building
- High-Level Waste (HLW) vitrification building
- Laboratory
- Failed Melter Storage

The permitted mixed waste management units in the WTP are identified in Addendum C. The WTP mixed waste management units, including ancillary equipment, secondary containment areas, supporting structures and underlying soil, are addressed in this closure plan. Closure of the pipelines connecting the WTP with the DST system unit and the LERF/ETF will be integrated with those respective facilities. Closure criteria will be developed jointly by DOE, its contractors, and Ecology prior to initiating closure activities. DOE will be responsible for implementing the cleanup standards.

The closure plan indicates several potential Hanford treatment, storage, and disposal (TSD) units that may be used to manage dangerous and mixed wastes generated during closure of the WTP permitted mixed waste management units. These identifications are preliminary and are subject to change as the Hanford facility is developed, and as the Hanford Facility Dangerous Waste Permit (Ecology 2009) is modified in the future.

The remainder of the closure plan provides the following information:

- Section H.2.0 of the closure plan identifies the regulatory standards that apply to closure, and the processes to be used for developing specific cleanup standards that may be achieved during closure.
- Section H.3.0 describes the overall approach for removing the mixed waste inventory, flushing and decontamination operations, removing and disposing of contaminated equipment and residues, and inspections and sampling to verify clean closure.
- Section H.4.0 describes other activities, including certification of completion of closure, control of run-on and runoff during closure, and equipment reuse.
- Section H.5.0 provides the maximum possible mixed waste inventory.
- Section H.6.0 describes the closure procedures for each type of permitted mixed waste management unit.
- Section H.7.0 provides the schedule for closure.
- Section H.8.0 describes the demonstration required to support a request to extend the standard 90- and 180-day mixed waste removal and closure completion time limits, as specified in WAC 173-303-610(4)(a) and (b).

H.1.2 Closure Plan Revisions

Clean closure is the goal for the WTP permitted mixed waste management units. The closure plan will be revised if efforts to achieve the clean closure standards are unsuccessful. The WTP may also be closed as a landfill, as provided in WAC 173-303-610, if the clean closure standards cannot be achieved through the removal of radiological contamination levels and the closure performance standards cannot be achieved. The revised closure plan will be accompanied by a written request for modification of the permit.

The design life of the WTP is 40 years after the initiation of waste treatment operations. The actual operating life of the plant may change depending on expansion in treatment capacity, improvements in treatment technology, or many other factors. The closure plan will be revised and submitted for approval under WAC 173-303-830 (Permit Changes) to incorporate future advances in decontamination technology, changes in plant capacity, newly designated dangerous waste, or other factors that may affect the closure of the WTP permitted mixed waste management units.

The closure plan may also be revised before the start of closure work, based on relevant information from the operational history of the WTP and the permitted mixed waste management units, and when information such as decontamination and access of high rad areas becomes available. The final revised closure plan will provide the necessary final detailed decontamination schedule and procedures, sampling and analysis plan, health and safety plan, interface with DST system unit and LERF/ETF closure plans, and additional information dependent on future conditions, as indicated in the following pages. Also, if necessary, a post-closure plan presenting details of any post-closure processes and activities will be submitted to Ecology in accordance with WAC 173-303-610(8).

H.2.0 CLOSURE PERFORMANCE STANDARD

The WTP permitted mixed waste management units will be closed in accordance with the requirements of Conditions II.J and III.10.C.8 of the Hanford Facility Dangerous Waste Permit (Ecology 2009).

Clean closure requires decontamination or removal and disposal of dangerous/mixed waste, waste residues, contaminated equipment, soil, or other material, in accordance with the clean closure performance standards of WAC 173-303-610(2). Clean closure as described in this closure plan will accomplish the following:

- Minimize the need for future maintenance
- Control, minimize, or eliminate, to the extent necessary to protect human health and the environment, post-closure escape of dangerous waste, dangerous constituents, leachate, contaminated runoff, or dangerous waste decomposition products, to the ground, surface water, groundwater, or the atmosphere
- Return the land to the appearance and use of the surrounding land areas to the degree possible given the nature of the previous dangerous waste activity

Activities beyond that point will be decided and documented in the revised plan prior to closure. The WTP buildings will not be used for RCRA-regulated TSD activities following clean closure, unless a new permit is issued.

The appearance of the land where the WTP buildings are located will be consistent with the appearance and future use of the surrounding processing land areas, after completion of clean closure activities. The WTP buildings will remain at the site until final disposition is determined and implemented. The WTP buildings may be demolished, if the buildings will have no future mission. Future land use decisions may be considered during the WTP decommissioning process. The final decision on building disposition and the appearance and use of the plant area will be integrated with the decisions on disposition of the buildings in the adjacent 200 East Area.

The long-term future use of the WTP site and the adjacent 200 Areas was addressed in the *Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement* (DOE 1999). The Central Plateau as defined in that document includes the United States Ecology commercial waste disposal facility, the DOE Environmental Restoration and Disposal Facility (ERDF), and the 200 West and 200 East Areas, as well as the WTP site.

Permitted units where mixed or dangerous wastes have been treated or stored will undergo closure activities. Contaminated equipment, debris, and solid decontamination residues generated during the closure of the WTP permitted mixed waste management units will be designated and packaged in accordance with the appropriate regulatory requirements (expected to be the WAC dangerous waste regulations in effect at the time of closure). The dangerous and mixed waste will then be transferred to a permitted TSD unit either on or off the Hanford Site. Equipment and debris that are not adequately decontaminated will be treated to comply with land disposal restriction requirements. Liquid decontamination solutions or agents generated during closure activities will be collected, designated, and disposed of at an appropriate TSD unit.

If a product, residual waste, or decontamination fluid is spilled or released to the environment during closure activities, spill response will be initiated as described in Addendum F and Addendum F1 (*River Protection Project - Waste Treatment Plant Emergency Response Plan*), and in accordance with WAC 173-303-145(2) and 173-303-360(2)(d) reporting requirements. The residual waste will be collected, designated, and managed appropriately. The waste will be managed in accordance with the appropriate regulatory requirements.

Clean Debris Surface

This closure plan proposes use of a "clean debris surface," defined in the following paragraph, as the clean closure performance standard for the WTP metal structures and equipment and concrete structures that will remain after closure, as well as all of the DWP equipment used for waste management; Attainment of a clean debris surface can be verified visually in accordance with the standard in WAC 173-303-610(2)(b)(ii), incorporating 40 CFR 268.45, Table 1, footnote 3, which states:

> "Clean debris surface" means that the surface, when viewed without magnification, will be free of all visible contaminated soil and hazardous (dangerous) waste except that residual staining from soil and waste consisting of

> light shadows, slight streaks, or minor discolorations, and soil and waste in cracks, crevices, and pits may be present provided that such staining and waste and soil in cracks, crevices, and pits will be limited to no more than 5 % of each square inch of surface area."

The clean debris surface standard will be achieved by using the physical and chemical extraction techniques identified in 40 CFR 268.45, Table 1, incorporated by reference WAC 173-303-140. The primary method of decontamination may be water washing, followed by a choice of using chemical decontamination solutions, ultrahigh-pressure water technologies, impact technologies such as sand blasting and CO_2 blasting, or other new technologies that may be developed prior to closure. Physical extraction methods that remove up to 0.6 cm of concrete will be used only after the previous technologies have failed to result in a clean-debris surface, or if there has been a failure of the coated concrete surface. Visual verification may be performed by direct worker observation with written inspection documentation (Figure H-1, Sample Clean Debris Surface Checklist), or by other means such as remote-operated closed circuit television and videotape.

Concrete surfaces may be protected with a contamination-resistant protective coating. Protective coatings in good condition may be decontaminated using one of the technologies described above, then inspected to determine if a clean debris surface is present in the same manner as steel or other metal surfaces. If there is evidence that a dangerous/mixed waste release has occurred, such as confirmation of contamination behind a stainless-steel lined breach or identification of damaged or deteriorated protective coating on a concrete floor where a dangerous/mixed waste release has occurred, and if the concrete is adjacent to soil, a contamination investigation may be performed.

If the concrete protective coating exhibits more damage than hairline cracks and has lost integrity, the concrete surface under the deteriorated coating will be treated with aggressive physical extraction technologies, such as high pressure water or scabbling, to remove at least 0.6 cm of material below the original surface. This approach also applies to uncoated concrete behind or beneath stainless-steel lined breaches. The exposed concrete will again be inspected to verify that the clean debris surface standard is met. The treatment will be repeated until the clean debris surface standard is met. Closure standards for soil underlying the WTP are addressed in Section H.2.1.

If the clean debris surface standard as described cannot be performed or cannot not be achieved, an alternative method will be proposed in the revised Closure Plan as required by DWP Conditions III.10.C.8.c and III.10.C.8.d.

Designation Limit

Some waste handling equipment metal surfaces cannot be visually inspected (for example, internal pipe, pump, and tank surfaces). A component or portions of a component may be flushed with decontamination solutions if it cannot be decontaminated to meet the clean debris surface standard, or if it cannot be inspected to verify that it meets the standard. The decontamination solution, or rinsate, will be sampled and analyzed using methods complying with *Test Methods for Evaluating Solid Waste, Physical Chemical Methods* (EPA 1986) for indicator constituents. Analytical data that meet the criteria defined in WAC 173-303-610(2)(b)

will indicate successful decontamination and attainment of the clean closure performance standard. The rinsate analysis criterion is hereafter referred to as the designation limit standard.

Closure Strategy for Tank Systems

The general closure strategy for tank systems is outlined in flowcharts in Figures H-2 and H-3. Triple-rinsing followed by visual inspections is an accepted method of decontaminating tanks. However, modification of this technique may be necessary, if determined at a later date.

Figure H-2 shows that internal flushing and decontamination of tanks and ancillary equipment, inspection of the secondary containment area, and sealing of observed stainless-steel lined breaches will be performed prior to final decontamination efforts. Disposition of solid and liquid treatment residuals is shown only at the initial flushing step (below "flush tanks, piping"), to avoid unnecessary complexity in Figure H-2. The residuals from the following internal and external decontamination steps are expected to follow the same paths.

The two "more decon?" decision boxes in Figure H-2 (following determinations that decontamination efforts so far have been inadequate) are the symbols for the key decisions the future closure managers may have to make:

1 Perform additional decontamination to meet the clean closure standard
2 Stop decontamination and designate that tank or ancillary equipment as mixed waste debris to be removed, reduced in size, encapsulated, packaged, and disposed

Figure H-2 does not show that additional decontamination of external tank or other surfaces may be required to continue on the disposal path (after "remove, dispose of as mixed waste") because such additional decontamination, if required, will be due to radiological dose concerns, not dangerous/mixed waste requirements. Figure H-2 also illustrates the assumption that internal surfaces of tanks and ancillary equipment cannot be adequately or efficiently decontaminated and/or inspected to demonstrate that the clean debris surface standard is met, and that the decontamination solution or rinsate designation limit standard will apply to all internal tank system surfaces.

Closure Strategy for Secondary Containment Areas

Figure H-3 shows the strategy for closure of secondary containment areas. These steps illustrate the approach for decontaminating stainless steel liners and coated concrete surfaces. Secondary containment area liner breaches may need to be sealed prior to decontamination or removal of equipment. The general procedure for investigating liner breaches or breaks, and decontaminating the concrete behind or below such breaches, is shown in Figure H-3.

The closure strategy for concrete with intact protective coatings is straightforward. If a release of dangerous or mixed waste in the permitted unit has not been documented in the facility operating record, and no evidence of a release is found during the initial closure inspection, the assumption will be made that the concrete floor surface meets the clean debris surface standard.

If a release has been documented, and the concrete does not meet the clean debris standard, decontamination technologies, as described in Section H.2.0, will be performed until the clean debris standard can be met and documented.

If evidence is found that a release has occurred on a concrete floor where the protective coating has even minor cracking, physical extraction will be required. Physical extraction of the concrete surface may also be required if sampling of the area determines there is dangerous waste contamination in areas where the protective coating is substantially damaged or deteriorated; for example, if it is broken or peeling. The extraction will be followed by an inspection and sampling to verify and document the presence of a clean debris surface. If a release is documented at such a location and the concrete at that location is resting on or against soil, a soil investigation may be required. These steps are illustrated in the last two boxes before the final decision box, "Visible Crack or Decomposed Concrete?" in Figure H-3.

Closure Strategy for Soil

The criteria for determining whether additional soil investigation is required are shown in the final decision box in Figure H-4. Contaminated soil will be removed to meet risk-based concentration limits, referred to as the soil cleanup limits (see Section H.2.1). Soil sampling and analyses will be performed after removal to verify compliance with the soil cleanup standard. Figure H-4 shows the strategy for addressing potential impacts to soil and groundwater.

Compliance with this plan and attainment of the closure standards will be documented by videotape or written inspection records, such as those shown in the sample checklist in Figure H-1, the example Closure Certification Statement in Figure H-5, and other supporting records as discussed in Section H.4.1.

H.2.1 Closure Standards for Soils, Groundwater, Surface Water, and Air

The design of the WTP mixed waste management units is intended to prevent the release of dangerous/mixed waste to the soil, groundwater, surface water, or air. Clean closure of the soil beneath the WTP mixed waste management units will be accomplished by demonstrating that the stainless-steel process cell liners, and the coated concrete walls and floors in the secondary containments, have not lost integrity and have therefore prevented contaminants from reaching the soil. If loss of secondary containment integrity has occurred, the potential for soil contamination will be investigated. The demonstrations will consist of performing and documenting inspections and decontamination work, and soil sampling and removal, if necessary.

The need for sampling of soil will be determined on a unit-specific basis per WAC 173-303-610(2)(b)(i), and will take into consideration the mixed waste management unit operating history.

Where a dangerous/mixed waste release is known or suspected to have occurred, the following conditions indicate probable secondary containment failure and potential soil contamination: the observation of potential through-thickness cracks or crumbling concrete at a liner breach location or in a secondary containment area with deteriorated concrete floor coating. Potential soil contamination will be investigated through coring and sampling of both the concrete and the soil.

Biased sampling will be focused in the vicinity of the liner defect or coating defect, concrete cracks, or in the known or suspected release location. Samples will be analyzed for constituents of concern (COCs). The proposed COCs will be submitted to Ecology with the revised closure plan submitted before the start of closure. The COCs to be used will be developed using process knowledge, operating record, and waste characterization analyses, whenever possible.

~~Industrial exposure assumptions will be incorporated in the calculation of soil concentration limits. These exposure assumptions are justified based on the anticipated long-term use of the WTP site and surrounding land, as addressed in the *Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement*, (DOE 1999), as noted in Section H.2.0.~~ The appropriate risk-based cleanup standard will be consistent with the future land-use classification. The standard will be reviewed prior to initiating closure to ensure it is still appropriate. Clean closure concentration limits for soils will be established in accordance with WAC 173-303-610 (2)(b)(i). Given the long operating life of the WTP and the current state of assumptions for toxicity data, and regulatory guidance, calculation of specific limits is not appropriate at this time.

In establishing soil clean closure concentration limits, consideration will also be given to "area background", as defined in Ecology's *Guidance on Sampling and Data Analysis Methods* (Ecology 1995) and in accordance with WAC 173-303-610(3)(a)(v). The *TWRS Phase 1 Privatization Site Preconstruction Characterization Report* (HNF 1998), the *Hanford Site Background Part 1, Soil Background for Nonradioactive Analytes* (DOE/RL 1995), or other site-specific soil background information will be used to assist in determining background levels in the soil. If the closure soil sample data are at or below the calculated soil cleanup levels, or the site-specific background concentrations, whichever is greater for each constituent, the soil will be considered clean-closed.

Due to the level of secondary containment provided at the WTP, non-permitted releases of dangerous/mixed wastes to soil, groundwater, surface water, or air are not anticipated.

Areas in which soil could have become contaminated will be mapped during the liner or concrete secondary containment area inspection and decontamination process. Soil sampling is addressed in Appendix A, Sampling and Analysis for Closure of WTP Facility (SAP). As necessary, a more detailed sampling and analysis plan may be included in a future revision to the closure plan in accordance with DWP Conditions III.10.C.8.c and III.10.C.8.d.that is required under permit condition III.10.C.8.d. The revised closure plan will be submitted to Ecology for review and approval prior to closure. The current SAP is consistent with the Guidance for Clean Closure of Dangerous Waste Units and Facilities (Ecology 2005), as incorporated by reference at WAC 173-303-140 (2)(a).

H.2.2 Closure Standards for Decontamination of Structures and Equipment

Some of the dangerous/mixed waste-contaminated structures and ancillary equipment that will undergo decontamination during the closure of the WTP consist of equipment with smooth metal surfaces. Concrete and protective coating surfaces in secondary containment areas will also be decontaminated as part of closure. The types of structures and associated equipment that may be decontaminated to meet the clean debris surface standard include, but are not limited to:

- Interior and exterior tank and pipe surfaces

- Secondary containment area stainless steel liners
- Uncoated concrete floors and walls behind stainless-steel liners
- Coated concrete walls and ceilings above stainless-steel lined secondary containment, as necessary
- Coated concrete floors in secondary containment areas

Decontamination of interior surfaces of tanks and pipes and documentation that they meet the clean debris surface standard may or may not be possible, given the current state of decontamination and inspection technologies. At present, the available miniature equipment may not be adequate to remove hardened waste or contaminated corrosion coatings from relatively inaccessible interior tank and pipe surfaces. Similarly, available video equipment may not provide the inspection capability necessary to demonstrate attainment of the clean debris surface standard on interior surfaces. The criteria for whether or not decontamination is possible will be developed and submitted for approval prior to initiating closure activities. In addition, for areas such as the PT and HLW Facility Black Cells and Hot Cells, they are currently provided with spare penetrations that can be used for spray wands if needed during closure activities to facilitate dangerous waste decontamination. If, after decontamination, safe physical access in black cells is not available during the closure period to enable the use of the clean debris surface standard, which requires visual verification, other technologies such as remote operated CCTVs may be used.

Decontamination of equipment and stainless-steel lined secondary containment or liners will be conducted by using water washing and spraying or ultrahigh-pressure water jetting, or other technologies listed in Section H.3.0. Residues from these extraction operations will be collected, sampled as necessary, designated in accordance with WAC 173-303, and transferred to a TSD facility such as the LERF/ETF or the Central Waste Complex (CWC) for treatment, storage, and/or disposal.

Decontamination of intact secondary containment protective coating surfaces on concrete to meet the clean debris surface standard will also be performed primarily through water washing and spraying. Additional technologies that may be used include chemical decontamination solutions, ultrahigh-pressure water technologies, impact technologies such as sand blasting and CO_2 blasting, or other new technologies that may be developed prior to closure. The secondary containment protective coating on concrete is designed and applied to provide a durable, non-porous surface. If decontamination of the impermeable protective coating surface in secondary containment areas cannot be completed through chemical extraction, or if the protective coating has broken, cracked, or peeled away from the concrete, then at least 0.6 cm (0.24 inches) of the underlying concrete will be removed using one or more of the physical extraction technologies. The physical extraction performance standard for concrete is removal of 0.6 cm of the surface layer and treatment to a clean debris surface, as noted in the *Guidance for Clean Closure of Dangerous Waste Units and Facilities* (Ecology 2005), Section 5.6, and as noted in 40 CFR 268.45, Table 1, as incorporated by reference at WAC 173-303-140 (2)(a).

Metal surface areas of equipment that cannot be documented to meet the clean debris surface standard may be decontaminated using water washing, followed by a choice of chemical

decontamination solutions, ultrahigh-pressure water technologies, impact technologies such as sand blasting, or other new technologies that may be developed prior to closure. Rinsate may be sampled and analyzed, using methods complying with *Test Methods for Evaluating Solid Waste, Physical Chemical Methods* (EPA 1986) for Ecology-approved indicator constituents. If other analytical methods are developed and chosen for use, the closure plan will be revised and submitted for approval. Indicators will be determined on the basis of process knowledge, operating record, and waste characterization analyses, whenever possible.

Analytical data less than designation limits will indicate successful decontamination and attainment of the clean closure performance standard for the tank, piping, or other metal structures and equipment. Documentation of the representative character of the sample and laboratory quality control and quality assurance data will be entered into the closure record as specified in Sections H.3.4 and H.4.1. Concrete and protective coated concrete surfaces will not be addressed using designation limits.

If the metal structure or equipment cannot be considered decontaminated using the clean debris surface or designation limit criteria, or if further decontamination is determined to be impractical due to high radiation levels, waste minimization, cost considerations, or other reasons, it will be packaged using the debris treatment standard for immobilization by encapsulation. The waste will be designated on the basis of process knowledge and transported to a permitted dangerous or mixed waste disposal facility such as Hanford LLBG mixed waste trenches. Examples of equipment that may undergo encapsulation and disposal include, but are not limited to:

- Tanks and pipe
- Melter off-gas duct work, scrubber, condenser, precipitator, and washout holding vessels
- Pumps, agitators, wash rings, and ejectors

Contaminated items and solid decontamination residues removed from the WTP permitted mixed waste management units will be designated, packaged, and treated as necessary to meet the waste acceptance criteria of the receiving facility. Sampling of items and solid residues known to be contaminated and intended for disposal is not necessary if process knowledge is adequate to accurately designate the wastes with the proper dangerous waste identification codes. The closure plan will be revised prior to start of closure and will address treatment and disposal plans in more detail.

H.2.3 Closure Standards for Tank Systems

At closure of a tank system, the owner or operator is required by WAC 173-303-640(8)(a) to remove or decontaminate dangerous/mixed waste residues, contaminated secondary containment system components (such as liners), contaminated soils, and structures and equipment contaminated with dangerous/mixed waste, and manage them as dangerous/mixed waste, with few exceptions.

For the purposes of the WTP RCRA closure, the standard is interpreted to mean that each tank and associated ancillary equipment, including the secondary containment area, will meet the clean debris surface standard and/or designation limit criteria for rinsate. Indicator constituents

or COCs to be used for rinsate evaluation will be determined using process knowledge, including consideration of the available waste characterization data, and other relevant information in the facility operating record.

Inspectable surfaces may be declared clean if they meet the definition of a clean debris surface, including portions of concrete secondary containment with intact protective coating surfaces, and physically-extracted concrete surfaces behind stainless-steel lined breaches, or under abraded or loose protective coating that have had at least 0.6 cm of material removed from the original surface. Rough or inaccessible metal surfaces such as corroded tank secondary containment area liner surfaces, or tank and pipe interior surfaces, may be declared clean when the decontamination solution sample is analyzed, with appropriate quality control and quality assurance as noted in Section H.3.4, and the indicator parameter or COC data are determined to be less than or equal to the designation limits.

If decontaminating a tank system in place is not feasible or is ineffective, an alternative method is to remove the tanks, disassemble them, and decontaminate the tank parts using extraction technologies described under alternative treatment standards for hazardous debris (40 CFR 268.45), as incorporated by reference at WAC 173-303-140 (2)(a). With Ecology's concurrence, the decontaminated debris can then be disposed of as non-dangerous (but possibly controlled as radioactive) waste, as indicated in Section 5 of *Guidance for Clean Closure of Dangerous Waste Units and Facilities* (Ecology 2005).

Tank systems will be inspected for compliance with the clean debris surface standard by observing the external and internal metal surfaces. Portions of a tank system that cannot be fully inspected (such as interior surfaces of tanks and attached piping, pumps, ejectors, and welded pipe connections or penetrations) or that may pose as low as reasonably achievable (ALARA) compliance problems, may be decontaminated with chemical or physical extraction technologies. The decontamination solutions from these portions of the system will be sampled and analyzed for indicator parameters, and the results will be compared to waste designation limits. Solid residues will be removed, containerized, designated, and disposed of at a permitted disposal facility as required. The tank or ancillary equipment, if not decontaminated to meet clean debris standard, will be removed, treated as necessary, and disposed of in a permitted landfill. Treatment may include macro-encapsulation or micro-encapsulation, or other processes that comply with land disposal restrictions.

Standards for clean closure of tank system secondary containment are identical to standards for decontamination of secondary containment areas for the container storage, containment building, and miscellaneous units; that is, clean debris surface standard and/or designation limits.

The proposed COCs will be submitted to Ecology and finalized in the revised closure plan to be submitted before the start of closure.

H.2.4 Closure Standards for Container Storage Areas

In addition to the requirements of WAC 173-303-610, WAC 173-303-630(10) requires that at closure, dangerous/mixed waste and residues will be removed from the secondary containment

system. Remaining containers, liners, bases, and soil contaminated with dangerous/mixed waste or residues will be decontaminated or removed.
Standards for clean closure of clad container storage secondary containment are identical to standards for decontamination of secondary containment areas for the tank system, containment building, and miscellaneous units (that is, clean debris surface standard and/or designation limits). Special requirements for clean closure of several secondary containment areas with coated concrete floors were explained in Section H.2.2.

H.2.5 Closure Standards for Containment Buildings

At closure of a containment building system, the owner or operator is required by WAC 173-303-695 (incorporating 40 CFR 264.1102(a)) to remove or decontaminate dangerous/mixed waste residues, contaminated secondary containment system components (such as liners), contaminated soils, and structures and equipment contaminated with waste and leachate, and manage them as dangerous waste, unless WAC 173-303-070(2)(a)(ii) applies.

Standards for clean closure of containment building units are identical to standards for decontamination of secondary containment areas for the tank system, container storage, and miscellaneous units (that is, clean debris surface standard and/or designation limits).

H.2.6 Closure Standards for Miscellaneous Units

The owner or operator is required by WAC 173-303-680 (2) to close miscellaneous units in a manner that will ensure protection of human health and the environment. Miscellaneous units at WTP include, but are not limited to, melters, scrubbers, condensers, precipitators, reboilers, oxidizers, adsorbers, and filters. The LAW and HLW melters will be removed and replaced several times during the operational life of the WTP. Removal and replacement are not considered closure or partial closure activities. Melters may be replaced according to the schedule based on the design life of the melter components, or replaced when unplanned failure of a component occurs. In either case, ancillary equipment will be removed or disconnected from the melter after molten glass has been removed to the maximum practical extent.

Openings to the LAW locally shielded melter (LSM) will be sealed and the melter will be removed from the LAW vitrification building, after surface decontamination, as a single container.

Spent HLW melters will be placed in a specially designed shield overpack and then removed from the HLW vitrification building to a disposal facility. Failed melters will be placed in the WTP failed melter storage building (container storage area). During closure of the WTP, the failed HLW melters will be dispositioned to meet disposal site waste acceptance criteria.

Spent LAW and HLW melters may also be stored in the WTP failed melter storage building (container storage areas) if necessary to accommodate scheduling of treatment and disposal operations, or for other reasons. The melters will be shipped to permitted treatment and disposal facilities. The WTP miscellaneous units that treat liquid mixed waste will be housed in containment building units, caves, and process/hot cells that provide secondary containment.

Standards for clean closure of the miscellaneous unit secondary containment areas are the standards for decontamination of containment building units (that is, the clean debris surface standard and/or designation limits).

H.3.0 CLOSURE ACTIVITIES

This section describes closure activities that will be conducted to meet the clean closure performance standards. Details provided here may change, and if necessary, the plan will be revised to reflect those changes. The facility is scheduled to close at the end of its operating life. If the WTP is shut down prior to this time, an updated closure plan will be submitted prior to start of closure activities. If partial closures of the WTP mixed waste management units are necessary, updates to the closure plan will be submitted prior to initiating closure activities.

Section H.3.1 describes the maximum extent of operations. Section H.3.2 describes the process for removing dangerous (mixed) wastes from permitted units. Section H.3.3 identifies several chemical and physical extraction technologies that may be used to achieve the clean debris surface standard. Section H.3.4 describes the approach for verification sampling and analysis to confirm that decontamination and/or removal activities have attained the designation limit standard. Section H.4.0 describes the procedures to be followed in order to comply with closure certification requirements, to control run-on and runoff during closure, and to reuse equipment from the plant. Section H.5.0 provides the estimated maximum mixed-waste inventory for each type of dangerous/mixed waste management unit. Section H.6.0 describes how each of the four types of permitted units will be closed. The goal for closure of the WTP permitted mixed waste management units is clean closure, which is contingent on achievement of the clean debris surface standard or verification that indicator constituents in decontamination solutions from the permitted mixed waste management units are not present in concentrations above designation limits.

Partial closure may be considered for some of the mixed waste management units; that is, one or more treatment processes or tank systems may be closed prior to the start of closure of the entire plant. Closure of a single mixed waste management unit or group of units could be necessary if a process were to be redesigned, eliminating the previous functions of the permitted mixed waste management units. Abnormal occurrences could also force partial closure, such as plugging of a tank or piping. Partial closures of the plant are not planned but could result from unforeseen circumstances. The closure plan will be revised to address the specific details for the permitted mixed waste management units if partial closure is necessary, and the revised plan will be submitted to Ecology for review, approval, and incorporation into the permit prior to start of closure activities.

The following assumptions were made in developing the closure plan:

- The maximum inventory will be present approximately nine months or more before the start of the closure period. This is the case because of the batch nature of the entire WTP treatment scheme. The treatment systems within the WTP will operate normally until the last portions of this final transfer are treated.
- The pretreatment building and the HLW melter will treat mixed waste and may be fully operational at the start of the closure period. These portions of the WTP will continue to operate during the closure period until the tank system flush solutions and residues are

removed from each system to the maximum practical extent and treated before final decontamination begins.

- Operating records documenting the constituents and volumes of the mixed wastes in the storage and treatment areas, and of the mixed wastes previously processed through the facility, will be available. The operating record also will include detailed information on historical releases of dangerous/mixed wastes into secondary containment areas, previous decontamination work, and equipment that is present in secondary containment areas. This information will be directly relevant to final detailed planning of decontamination steps and procedures, especially treatment and disposal of the decontamination solutions and residues that will be generated.
- A release of dangerous/mixed wastes outside permitted mixed waste management unit secondary containment areas will not occur.
- Equipment necessary for dangerous/mixed waste removal and equipment decontamination will be functional or will be repaired or replaced.
- Permitted TSD facilities will be available to receive dangerous and mixed wastes that will be generated during closure.

Overall Closure Approach

After the final waste feed shipment or inventory is processed, the LAW LSM units will be closed and removed from the site. Tanks and piping will be flushed. The flush solutions will be treated in the pretreatment building by filtration and evaporation, and concentrated solids will be immobilized in glass produced in the HLW melter. Immobilized waste may or may not be acceptable at the facilities that accepted standard immobilized low-activity waste (ILAW) and immobilized high-level waste (IHLW) during the operating life of the WTP. Specific disposal plans for this type of waste may not be finalized until submittal of the final revised closure plan prior to start of closure.

The next step in the overall closure approach is to decontaminate the WTP mixed waste management units' components to the maximum feasible extent and remove components that cannot be decontaminated to meet the clean debris performance standards. Contaminated components will be disposed of, and the residues and decontamination fluids remaining after treatment operations at the WTP mixed waste management units have ceased will be transferred to the CWC, LERF/ETF or another Hanford Site permitted TSD facility. Other Hanford Site TSD facilities that may be considered for treatment or disposal of closure wastes in addition to the CWC and LERF/ETF include the LLBG, the Waste Receiving and Processing (WRAP) facility, and the Integrated Disposal Facility (IDF).

Vitrification treatment will not be available after the last melter is shut down, near the completion of WTP deactivation work. Small quantities of feed waste or flushing residues may remain in tanks after the last melter is shut down, in addition to insoluble adhered coatings in piping and tanks. The remaining aqueous residues may have to be transferred to the LERF/ETF or the CWC for evaporation, precipitation, filtration, solidification or other treatment.

General Sequence of Closure Activities

The general sequence of activities necessary to close permitted mixed waste management units within the WTP, and the basis for establishing the order of performing these activities, is summarized in the following discussion:

Dangerous/Mixed Waste Inventory Removal

- Dangerous/mixed waste removal: The nonradioactive dangerous waste, if present, will be removed from the WTP to minimize the possibility of release. Note: dangerous wastes may be generated at the WTP throughout the closure period from maintenance activities.
- Inventory removal: The mixed waste inventory present in the WTP mixed waste management units at the beginning of the closure (primarily heels in the bottoms of tanks) will be removed and processed (pretreated and vitrified) to the maximum practical extent. This removal will minimize the possibility for release and allow decontamination of the equipment to proceed. Tank systems, miscellaneous units, and ancillary equipment will undergo flushing as part of closure activities.

Decontamination

- Liner inspection: After removal of mixed wastes (flushing), but before final decontamination of tanks and other permitted mixed waste management units begins, each secondary containment area will be inspected to identify potential or apparent breaks, cracks, or separation of the liner or protective coating from the concrete floors and walls. These locations (if any) will be mapped and documented, and sealed by welding or by application of patching or protective coating material, to prevent entry of contaminants during decontamination activities.
- Decontamination: Tank systems and other equipment in the permitted mixed waste management units will be decontaminated. Additional chemical or physical extraction may be performed before tank systems, piping, or the equipment and equipment support structures in the permitted mixed waste management units are removed. Extraction will be performed not only to meet clean debris standards detailed in Section H.2.0, but also to minimize the amount of mixed waste constituents that could be readily available for migration or release during equipment removal.
- Equipment may be left in place as clean-closed if it can be successfully decontaminated.

Inspection

- Equipment inspection: Tank/miscellaneous units systems and ancillary equipment will be inspected to ensure that the clean debris surface standard and/or rinsate analyses designation limits are met. If necessary, the equipment will be identified as requiring removal, encapsulation, and disposal.

Removal

- Equipment removal: If the permitted equipment cannot be decontaminated to meet the closure performance standard, it will be removed, treated by encapsulation, and disposed at a permitted facility. Size reduction treatment may also be performed.
- Permitted equipment decontamination: After the last batch of waste feed has been fully processed through the WTP, the LAW LSMs will be shut down and removed. Pretreatment process vessels and lines will be flushed with water or other solutions. Flushing liquids will

be determined prior to initiation of closure activities, and if a liquid other than water is identified for use, the closure plan will be revised and submitted for approval prior to initiating closure activities. Flushing wastes will be treated in the pretreatment evaporation, cesium removal, and ultrafiltration processes. The concentrates will be transferred to a HLW melter. Water condensate will be routed to the LERF/ETF. One HLW melter may be operated after shutdown of the LAW LSMs to provide treatment for the solid flushing residues and evaporator concentrates. At the completion of treatment operations, the HLW melter will be shutdown by procedure for melter change out. ~~If needed, the HLW failed melters may be moved to the HLW melter cave from the failed melter storage building and size reduced to facilitate packaging for disposal;~~ The HLW failed melters will be disposed of in accordance with LDR requirements and to the degree necessary to meet disposal facility waste acceptance criteria (Section H.3.3). LAW LSMs are not expected to require decontamination or size reduction treatment, other than surface decontamination after the operating equipment openings are closed. Spent HLW melters will be overpacked, and shipped to a permitted disposal facility.

Structure Decontamination

- Building structure decontamination, stainless steel-lined secondary containment areas: Liners in the permitted mixed waste management unit secondary containment areas will be decontaminated using chemical or physical extraction technologies, or both. Most of the secondary containment areas in the mixed waste management units will be lined with stainless steel. Coated concrete floors in secondary containment areas will be decontaminated using only chemical extraction technologies, unless the protective coating is damaged or deteriorated. Damaged protective coating in secondary containment areas, and contaminated concrete under or behind liner breaches, will be decontaminated using physical extraction technologies. Decontamination solutions may be sampled to determine treatment requirements and transferred via existing pipelines to the LERF/ETF if they meet the LERF/ETF acceptance criteria or to another permitted Hanford TSD unit. Structure decontamination activities are described in Section H.3.3.
- Building structure decontamination, concrete secondary containment areas: Examples of mixed waste management units that have coated concrete secondary containment without stainless steel include the condensate tank system, the LAW LSM gallery containment building, ILAW container finishing containment building, and several secondary waste container storage areas. At the time of closure, the facility operating record will be reviewed and each mixed waste management unit will be inspected to determine if releases of dangerous/mixed wastes have occurred in these areas. If a release of dangerous/mixed waste has occurred on a secondary containment concrete floor where the protective coating is even slightly damaged or deteriorated, the concrete in that secondary containment area will be physically extracted to remove at least 0.6 cm of concrete from the original surface. This effort will demonstrate compliance with the clean debris surface standard. If a release is not documented or suspected, minor or hairline cracks may still be accepted in determining that the clean debris surface standard is met. If the secondary containment protective coating is intact, the surface may be decontaminated by chemical extraction. If chemical extraction is unsuccessful, or if the coating is damaged by the chemical extraction, physical extraction will be performed.

- Building examination to verify decontamination: After each mixed waste management unit in each building has been decontaminated, the mixed waste management units will be inspected and closure documentation will be examined to verify that the clean closure standards have been met.

Soil Investigation, Removal, and Verification

- Potentially contaminated soil identification: Areas in which soil could have become contaminated will be mapped during the liner or concrete secondary containment area inspection and decontamination process. Soil sampling protocols will be established and implemented if potentially contaminated areas are identified.
- Soil decontamination: Soil removal will be performed if necessary. A revised closure plan and a post-closure plan per WAC 173-303-610(3) and WAC 173-303-610(7) will be submitted if removal to the established risk-based standards is not feasible.
- Soil sampling to verify decontamination for indicator constituents: The soil will be sampled and analyzed for indicator constituents after the contaminated soil has been removed.

NOTE: Sampling of soil to verify decontamination ~~is~~ will be addressed per the SAP and is ~~in~~included as Appendix A of the~~is~~ Closure Plan.~~, and any revisions to this current SAP will be included in the revised Closure Plan. The revised Closure Plan will be submitted to Ecology for review and approval prior to closure in accordance with DWP Conditions III.10.C.8.c and III.10.C.8.d.~~

Disposition of Decontamination Wastes

- Disposition of decontamination fluids: Wastewater or chemical extraction solutions from decontamination activities will enter an existing collection system for waste characterization and verification against LERF/ETF waste acceptance criteria. At the final stage of closure, when the transfer pipeline to the LERF/ETF is taken out of service, decontamination solutions may be containerized and transported to the LERF/ETF by truck. Characterization of the closure residues in the permitted mixed waste management units will be documented based on process knowledge or analysis of the mixed waste treated in the units. If the wastewater cannot be accepted by LERF/ETF, it may be solidified and transferred to the CWC or another available permitted unit.
- Disposition of the building air emission control equipment (i.e., HVAC): Building air emission control equipment will remain in place until decontamination of other WTP components meets the clean closure performance standards. The HVAC equipment will be decontaminated to meet the clean closure performance standard, or will be removed, designated, and packaged to meet the waste acceptance criteria of a permitted disposal facility.
- Disposition of decontamination equipment: Equipment or materials used in performing closure activities will be decontaminated or disposed of at a permitted disposal facility. Personal protective equipment will be disposed of as appropriate.

The general order of closure activities was selected to minimize the potential for release of mixed waste constituents by removing the bulk of the mixed waste constituents early in the closure process. This order of closure also minimizes waste generation by reducing the

possibility that decontaminated areas will become contaminated again by ongoing closure efforts.

Detailed scheduling of closure activities depends on the necessary facility functions required to be maintained during the closure period and the degree of contamination in each permitted mixed waste management unit, especially after the mixed waste inventory is removed and decontamination activities start. The large number of tank systems increases the potential for a highly complex schedule. Similar tank systems and other types of permitted mixed waste management units may be grouped for the purpose of minimizing the bulk and complexity of plans for closure activities. The detailed decontamination operations schedule will be included in the revised closure plan to be submitted before the start of closure activities (see Section H.7.0).

Work will be performed in a manner that minimizes worker exposure to dangerous and/or mixed waste or other workplace hazards and will meet the ALARA principles.

Additional detail will be provided describing waste removal, equipment decontamination, and closure-generated dangerous/mixed waste disposal activities in the revised closure plans to be submitted prior to start of closure.

H.3.1 Maximum Extent of Operations

The maximum extent of operations during the active life of the WTP corresponds to the maximum mixed waste inventory with full feed tanks, the melters operating at design capacity, and full storage areas.

The general arrangement drawings in Addendum C show the locations of tanks, melters, miscellaneous units, containment buildings, and container storage areas. The dimensions of the permitted dangerous/mixed waste management units are included in Addendum C tables.

H.3.2 Removing Dangerous/Mixed Waste

The mixed waste feed inventory present in the WTP after the final receipt of waste feed from the DST system unit will be processed before the start of the first phase of closure. The mixed waste will be removed from tank systems to the maximum practical extent. Removal will be continued by processing the last bulk volumes of waste feed through the applicable pretreatment and vitrification systems, and transferring treated ILAW and IHLW to other TSD units or facilities from the container and canister shipping docks. These activities will follow normal operating procedures.

The following description of mixed waste removal is intended to provide a brief overview of the WTP permitted mixed waste management units closure activities.

At the completion of mixed waste treatment operations, DOE and its contractor will close the permitted mixed waste management units and deactivate the WTP facilities. Deactivation, when completed, will leave the facilities in a safe, stable, and passive state that can be monitored with minimal cost and minimal requirements for service support from either personnel or active equipment.

The WTP deactivation operations will comprise a large portion of the RCRA closure activities of the permitted mixed waste management units that will occur between the start of the closure period, as defined in WAC 173-303-610(3)(c)(ii), and the final shutdown of the HLW vitrification system. Closure operations for some permitted mixed waste management units may begin before the completion of treatment of the final batch of waste feed from the DST system unit.

Overlaps between dangerous/mixed waste management unit closure and the WTP facilities' deactivation activities, and the overall TSD facility permitting process, as defined in the *Hanford Federal Facility Agreement and Consent Order* (Ecology, EPA and DOE 2011) and the implementing attachment known as the *Tri-Party Agreement Action Plan*, Section 6.3, are illustrated in Figure H-6. The full extent of necessary interfaces, and detailed definition of the intermediate points in this timeline, will not be determined until deactivation and closure planning are finalized before the start of closure.

Vitrified waste in storage at the WTP at the start of the closure period will be shipped to disposal units on the Hanford Site or to other appropriate facilities. If the inventory of untreated waste feed cannot be treated at the WTP, it will be transferred to a permitted TSD facility. Circumstances under which the waste feed inventory would not be treated through vitrification are not accounted for in this closure plan and would require revision of the plan. Properly completed shipping papers and certifications, as applicable, will accompany waste shipments.

Once the final batch of waste feed has been processed, residual heels will be flushed from the tank systems in accordance with deactivation procedures. Wastewater from flushing and decontamination solutions will be filtered, evaporated, and further treated as necessary in the WTP pretreatment building. The removed solids will be sent to the HLW melter. Wastewater will be sent to the LERF/ETF for treatment if acceptance criteria is met, or it will be transported to the CWC or another permitted TSD unit for storage, treatment, and disposal. Treatment in containers could be performed at the WTP if necessary or preferable, and if the resulting waste will meet the CWC or another TSD unit's waste acceptance criteria. The treatment in containers alternative is not likely to be used, due to the relatively large volumes of flush solutions that will be generated.

If non-radioactive is present as inventory at the start of the closure period at the dangerous/mixed waste container storage unit, it will be transferred to a permitted off-site facility for treatment or disposal. Non-radioactive dangerous waste generated during the closure or deactivation work will be managed similarly.

The TSD units available at the time of closure, and their waste acceptance criteria, may include additional units that are not available today.

Complete records will be kept as to the date of shipment, waste characterization, waste quantity, destination facility, land disposal restriction certifications and notifications, and other appropriate information for removed dangerous/mixed waste. Specific documentation requirements are

discussed in Addendum B1. This information will be included in the closure documentation supporting certification, which is described in Section H.4.1.

The specific types of off-site treatment and disposal units for dangerous wastes generated during closure will be determined and provided in the revised closure plan to be submitted before closure begins. Interfaces with the DST system unit and LERF/ETF will be specified in the revised plan to be submitted before the start of closure.

H.3.3 Decontaminating Structures, Equipment, and Soils

The only structures and equipment that may be contaminated at the start of the closure period are within the permitted mixed waste management unit secondary containment areas. Some of the types of waste handling equipment that may be located in each permitted mixed waste management unit can be determined by review of the design drawings and operating plans. Examples include, but are not limited to, cranes, power manipulators, and welding machines. Many other types of hand tools, instruments, lights and cameras, radiation monitors, buckets, and other equipment may be present in one or more permitted mixed waste management unit secondary containment areas. If contaminated with dangerous/mixed waste, these structures, tools, and equipment will be decontaminated, if feasible, using one or more of the following technologies to achieve the clean closure performance standard:

- Ultrahigh-pressure water jet
- Rotating cavitation water jet
- Soap scrubbing and wet vacuuming
- Steam vacuuming
- Vacuum abrasive blasting
- Soda blasting
- Shot blasting
- Ice blasting
- Hydroblasting
- Grit blasting
- Cryogenic CO_2 pellet blasting
- Sponge blasting
- Etching
- Rotating brushes/honing

More aggressive decontamination methods may be used on concrete if it becomes necessary to remove mixed waste accumulations that extend into the concrete:

- Needle scaler
- Paving breaker or chipping hammer
- Piston scabbler

These decontamination technologies were chosen based upon demonstrated effectiveness in a radioactive environment and the ability to successfully achieve the RCRA closure performance standard. These technologies are covered under the generic physical or chemical extraction technology categories listed in 40 CFR 268.45, Table 1. This approach is consistent with Ecology guidance (Ecology 2005) to achieve clean closure.

Specific methods of decontamination (and removal and disposal if required) of the permitted mixed waste management unit components and equipment will be determined at the time of closure. These methods will be based on information in the operating record, including historical mixed waste releases, and DOE plans for future use of the buildings. The feasibility, or practicality, of decontamination depends on many factors that cannot be fully defined until the closure plan is finalized. Decision criteria may include, but are not limited to, radiation hazards, secondary mixed waste volumes, schedule and budget restrictions, and availability of TSD facilities to receive secondary mixed wastes. Equipment and debris that are not decontaminated will be disposed of as mixed waste.

Decontamination solutions from interiors of tanks, attached piping, and other equipment will be collected in tank drain piping and collection tanks. Decontamination solutions from tank and pipe exterior surfaces, and from decontamination of other free-standing ancillary equipment and secondary containment walls and floors in the four types of permitted mixed waste management units will be collected in secondary containment area sumps, then transferred by pumping or gravity drainage to plant wash collection tanks. Exceptions to this process may include decontamination of small surface areas where drainage may be captured in portable collection basins or buckets. Transfers of decontamination solutions to the LERF/ETF, CWC or another on-site TSD unit, or if the waste is non-mixed, to an off-site TSD facility, are addressed in Section H.3.2.

The decontamination solutions and residues will be designated on the basis of process knowledge, or sampling and analysis if necessary, and transferred by existing hard piping to the LERF/ETF. The pipe connection to the LERF/ETF will be one of the last WTP components to be taken out of service, after decontamination activities are complete. The last few decontamination activities may require the collection of wastewater in a temporary sump and container, and will be transported by truck to the LERF/ETF.

Solid residues will be collected into containers by vacuuming or mechanical means (such as sweeping or shoveling), treated, if necessary, at the WTP, CWC, or WRAP to stabilize or solidify the residues, and disposed in the LLBG or a permitted disposal unit on the Hanford Site. Off-site mixed-waste landfill disposal facilities may be considered if an appropriate Hanford Site unit is not available.

Contaminated debris and solid decontamination residues removed from the WTP will be designated and packaged to meet the waste acceptance criteria of the receiving facility. Sampling of equipment and solid residues that are known to be contaminated and are intended for disposal is not necessary, if process knowledge is adequate to accurately designate the waste with the proper dangerous waste identification codes. Process knowledge includes the operating

record, which should provide adequate waste analyses and waste processing histories for each permitted mixed waste management unit in the WTP.
Information to support disposal of melters and other debris will be provided in a revised closure plan to be submitted before the start of closure.

H.3.3.1 Secondary Containment Structures and Associated Equipment

Within most of the process areas, stainless steel liners supported by steel reinforced concrete structures provide secondary containment for the process tanks, miscellaneous units, HLW melters, LAW melters, and ancillary equipment. Coated concrete surfaces (the walls and ceilings above the liners) in lined mixed waste management areas are not part of the required dangerous waste secondary containment structure, although additional controls may be provided for splashes and airborne contamination. Concrete in stainless-steel lined permitted secondary containment areas, where control of splashes, washdown sprays, or airborne contamination is necessary, will be coated during construction with a durable chemical-resistant impermeable protective coating. Top edges of the liner plates in these secondary containment areas will be sealed to the concrete surface.

Steel liners and coated concrete surfaces will be inspected visually. The visual inspection may be conducted remotely using CCTV. The purpose of the inspections will be twofold: to identify and map cracks that might provide a migration pathway for contaminants and to identify areas that are potentially contaminated with mixed waste or waste residues.

Identified cracks in secondary containment areas will be sealed to prevent infiltration of decontamination solutions between the stainless steel liner and the concrete, or migration into cracks in concrete. Coated concrete and liner surfaces will be decontaminated to achieve the clean debris surface standard using chemical extraction, or if necessary, through physical extraction as described in Section H.2.0.

Secondary containment areas with concrete surfaces are eligible for decontamination by chemical extraction only if the protective coating is intact. Minor cracking in the protective coating will not disqualify the concrete surface from being eligible for classification as a clean debris surface, if that surface has not been directly exposed to dangerous waste as a result of a container leak or some other release mechanism. The facility operating record will be consulted before decontamination work begins to identify those permitted mixed waste management units where leaks or other dangerous/mixed waste releases have occurred. These permitted secondary containment areas will also be physically inspected to determine whether the protective coating is intact, and whether undocumented evidence of a mixed waste release is present.

Secondary containment areas with intact protective coatings may be decontaminated with water washing if necessary. If additional decontamination is necessary, other technologies will be used, such as chemical decontamination solutions, ultrahigh-pressure water technologies, impact technologies such as sand blasting and CO_2 blasting, or other new technologies that may be developed prior to closure. Physical extraction methods that remove up to 0.6 cm of concrete will be necessary on concrete surfaces where the protective coating has peeled, bubbled, or is broken (before or after decontamination), exposing bare concrete. Stainless-steel liners may also require physical extraction treatment to remove mixed waste residues or corrosion. Inspections

of the concrete and liner surfaces for a clean debris surface will be documented in an inspection record. Details of the decontamination methods to be used will be developed and submitted for approval prior to initiating closure activities.

Concrete and steel grinding, scaling, or scabbling residues will be collected, placed in containers, and sampled and analyzed for indicator constituents.. The parameters, or the residues, will be designated based on knowledge of the process or the waste that contaminated the concrete or steel.

The operating record will be reviewed prior to closure to determine if decontamination procedures should be performed in any areas outside the permitted unit secondary containment areas. These areas may include equipment decontamination bays or secondary containment sumps in transfer tunnels, or other locations where mixed wastes may have been generated or transferred during the operating life of the WTP and accidentally released. A final revised closure plan that includes areas identified as a result of the operating record review will be submitted to Ecology for review and approval before closure starts. Floors and walls in non-permitted areas of the building (such as offices, lunch rooms, or bulk storage areas for non-hazardous materials) that do not have documented releases of dangerous or mixed waste are not included in this closure plan.

H.3.3.2 Building Air Emission Control Equipment

Building air emission control (i.e., heating, ventilation, and air conditioning, HVAC) equipment will remain in place and in operation as necessary to facilitate deactivation and decontamination of the WTP. HVAC equipment will be taken out of service in stages as radiological contamination is progressively removed or reduced. Compliance with applicable air emission standards and permits will be maintained. Air permits for operations will be evaluated to determine if they will support closure activities. The permits will be modified if necessary.

After completion of decontamination operations that may generate fumes, vapors, or dust that will be controlled by the building ventilation system, the HVAC equipment will be decontaminated, then dismantled, and reduced in size to the extent necessary to facilitate preparation for disposal. DOE may determine that the HVAC equipment will remain in place after closure.

Modifications to air emission standards or other appropriate standards to prevent or minimize the release of dangerous waste or dangerous waste constituents to the air or surrounding environment during closure will be specified in the revised closure plan to be submitted before the start of closure.

H.3.3.3 Soil

Discovery of an apparent or potential breach in a cell liner or in the protective coating in unlined permitted secondary containment areas, on an exterior wall, or bottom floor adjacent to soil will require further investigation. The presence of soil contamination will be a unit-specific determination based on WTP records and direct visual or CCTV inspection of the stainless-steel liners and concrete surfaces as described in Section H.2.0. The liner will be removed to allow access for additional investigation and decontamination if this inspection reveals areas of poor

liner integrity such as severe corrosion, weld breaks, or other damage to the steel. Coring and soil sampling will be performed if a liner breach or damaged protective coating is found on a wall or floor adjacent to external soil and if the concrete has lost integrity at that location. If the concrete is not cracked, deteriorated, or porous, and a clean debris surface can be obtained by physical extraction treatment, no further investigation or soil removal may be necessary. If soil is sampled, it will be analyzed for indicator constituents of concern identified on the basis of the mixed wastes contained in that permitted mixed waste management unit during the operating life of the plant.

If soil having levels of contamination that exceed the risk-based soil cleanup levels is found, it will be removed and managed as media containing dangerous waste, and will be designated and disposed of accordingly at a permitted disposal facility. Soil at the limits of excavation will be sampled and analyzed after removals are completed to confirm that the concentrations of dangerous waste constituents are below the risk-based exposure limits. The appropriate risk-based cleanup standard will be consistent with the future land-use classification from the *Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement* (DOE 1999). Risk assessment principles will be used to establish clean closure concentration limits for soils in accordance with WAC 173-303-610(2)(b)(i).

H.3.4 Sampling and Analysis to Identify Extent of Decontamination/Removal and to Verify Achievement of Closure Performance Standard

If there are stainless-steel lined secondary containment breaches or concrete that has lost integrity, efforts to define the extent of contamination will use a graded approach using field screening and survey followed by verification sampling if needed. This section is an outline for a SAP that describes the approach that will be followed for verification sampling. The SAP will also assist in confirming that decontamination and/or removal activities have attained the closure performance standard. Sampling may be employed where the clean debris surface standard cannot be met, such as interior tank and pipe surfaces, or where evidence is found indicating apparent failure of permitted mixed waste management unit secondary containment such as liner cracks.

However, the SAP cannot be finalized at this time because the dangerous waste COCs at each permitted dangerous/mixed waste management unit and restrictions on sampling and analysis activities due to high radiation levels are not adequately defined. Prior to closure, this closure plan will be revised to specify sampling and analysis techniques in a site-specific SAP that may include: sampling to determine the extent of dangerous/mixed waste contamination, sampling objectives, analytical parameters, sampling methods and locations, identification of sampling preservation, sampling and data quality control, the evaluation and reporting of data, and the chain-of-custody record.

Additional information, as follows, may be provided in the revised closure plan to be submitted prior to closure:

- Health and safety plan
- Details on sampling equipment

- COC indicator parameters for decontamination solution analyses
- Analytical methods that deviate from *Test Methods for Evaluating Solid Waste, Physical Chemical Methods* (EPA 1986), if any

H.3.4.1 Sampling to Confirm Decontamination of Structures and Soil

Sampling of decontamination solutions may be conducted for equipment, structures, and debris that do not meet the clean debris surface standard following the decontamination process. This sampling will serve to define the extent of remaining contamination or confirm adequate decontamination of equipment, structures, or debris. The sampling process will be repeated after each subsequent round of decontamination effort until the decontamination effort is either determined to be successful, or is terminated, and the contaminated component is removed and disposed of as dangerous or mixed waste.

Soil found to be contaminated will be removed as part of the closure activities, and sampling will be performed to confirm that levels of contamination in the remaining soil do not exceed Ecology-approved risk-based soil cleanup levels. The Sampling and Analysis Plan for WTP is referenced in Appendix A.

H.4.0 OTHER ACTIVITIES

This section describes the procedures to be followed in order to comply with closure certification requirements, to control run-on and runoff during closure, and to reuse equipment from the plant.

H.4.1 Certification of Closure

WAC 173-303-610(6) requires that within 60 days of completion of closure activities of the permitted dangerous/mixed waste management units, a closure certification will be submitted to Ecology. Following completion of closure, DOE (or the DOE-selected contractor) and an Independent Qualified Registered Professional Engineer will submit certifications that the permitted mixed waste management units have been closed in accordance with the approved closure plan. The certifications will be submitted in accordance with the Hanford Facility Dangerous Waste Permit (Ecology 2009) Condition I.I.1 to the following address:

Program Manager, Nuclear Waste Program
Washington State Department of Ecology
3100 Port of Benton Boulevard
Richland, Washington 99354

The following documentation will be prepared to support the closure certification, and will be provided or accessible to Ecology on request:

- Field notes related to closure activities
- A description of deviations from the approved closure plan and justifications for these deviations
- Documentation of the final disposition of dangerous wastes and dangerous waste residues, including contaminated media, debris, and treatment residuals

- Laboratory and field data (including quality assurance and quality control data) for samples and measurements, including those taken to determine background conditions or to determine or confirm clean closure
- A summary report that itemizes the data reviewed by the independent registered professional engineer and tabulates the analytical results of samples taken to determine or confirm clean closure

A draft decontamination documentation checklist and an example of RCRA closure certification statement are provided in Figure H-1 and Figure H-5, respectively.

Ecology will verify that the requirements for closure certification are properly completed per WAC 173-303-610(6). If the closure certification is accepted, Ecology will inform DOE of the acceptance in writing.

H.4.2 Run-on and Runoff Control

No runoff or run-on resulting from precipitation or surface water flows is anticipated in the areas undergoing closure. The WTP permitted dangerous/mixed waste management units are enclosed within highly secure reinforced concrete and steel frame buildings, with the exceptions noted below. Wash water or other liquids resulting from decontamination activities will be contained by WTP containment structures - floors, walls, ceilings, sumps, and catch tanks.

The only permitted mixed waste management units that may be exposed to direct precipitation are the two process condensate vessels outside the pretreatment building. The failed melter storage building will be a separate freestanding unit, and run-on or runoff control will be assured for this unit before and during operation of the WTP, as well as during the closure period. There will be no changes in the secondary containment capacities or runoff control design for this unit during closure activities.

Activities such as groundwater monitoring and run-on and runoff control will be described in a revision to the closure plan prior to closure.

H.4.3 Equipment Reuse

Equipment may be decontaminated and reused during or after closure, if practicable. For example, contaminated (radiological) material and handling equipment such as shield doors, cranes, and power manipulators may be decontaminated in order to reduce radiation dose rates. This will allow initial or repeated personnel entry to areas where additional decontamination, debris size reduction, or packaging and encapsulation activities will be conducted. Equipment described in Sections H.3.0 and H.6.0 will be decontaminated using methods selected from those specified under 40 CFR 268.45, or equivalent technologies.

Criteria for determining whether equipment will be reused or disposed of include the following:

- Degree of contamination (radiological)
- The need to minimize potential worker radiation and dangerous/mixed waste exposures during decontamination; the amount of decontamination residues that would be generated

- The value of the equipment
- Compliance with the approved schedule and budget

Equipment that could be used by DOE in future operations at the WTP site, in other Hanford projects, or at different DOE facilities, may be decontaminated first.

H.5.0 MAXIMUM WASTE INVENTORY

The estimated maximum mixed waste inventory for each type of permitted mixed waste management unit is listed in Table H-1. These are total storage capacity volumes from the WTP Part A form in Addendum A.

The actual volumes present at the start of the closure period will be much less than values shown in the table. For example, the containment buildings and container storage areas may be empty or nearly empty on the date of completion of treatment of the final volume of waste feed, and the tank systems are not likely to contain more than a few percent of the maximum capacity.

H.6.0 CLOSURE OF TANKS, CONTAINER STORAGE, CONTAINMENT BUILDINGS, AND MISCELLANEOUS UNITS

This section of the closure plan identifies specific closure requirements for each type of permitted mixed waste management unit at the WTP, and describes the removal of wastes and equipment, decontamination of the unit, and disposition of decontamination residues. A summary of the closure standards and activities for each type of permitted mixed waste management unit is provided in Table H-2.

The performance standards and closure activities for many of the mixed waste management unit components are similar or identical for the four types of units, as indicated in the table. Differences in the detailed closure procedures will be due in part to variations in permitted mixed waste management unit design, and different ancillary equipment present in various units, even in units of the same type. In the process cells/caves secondary containment areas for tanks or miscellaneous units, initial decontamination activities will be performed remotely, while the same types of activities may be performed by personnel in most of the other mixed waste management units, such as container storage units.

An overall estimate of the volume of closure wastes to be generated has not been prepared, due to the uncertainties regarding final disposition of the WTP equipment and structures. The estimate of the volume of closure wastes will be provided in an amended closure plan and submitted for approval prior to initiating closure activities. The volume of decontamination wastes that will be generated may be relatively large if most of the tanks, piping and related equipment, and major portions of the concrete and steel structures are removed and disposed of as waste. Volume of wastes may also be large if the same equipment and structures are completely decontaminated, resulting in large amounts of secondary residues, personnel protective equipment, and decontamination solutions. The volume of immobilized waste that will be generated during the closure period depends in part on the composition of the final batch of waste feed, which cannot be predicted at this time.

H.6.1 Closure of Tank Systems

Tank systems will be decontaminated using chemical and/or physical extraction technologies. Types of tank systems that will be decontaminated include, but are not limited to, the following:

- LAW and HLW feed and storage tank systems
- Evaporators and condensers
- Waste filtration tanks
- Ion exchange tanks
- PTF condensate tanks

Types of ancillary equipment that may be decontaminated include, but are not limited to, the following:

- Waste transport, rinse, and washdown piping
- Pumps, agitators, wash rings, and ejectors
- Air, steam, and water lines in secondary containment areas
- Intra-facility pipelines

Decontamination of tank systems including tanks, piping, and other ancillary equipment will be conducted using chemical extraction technology and water washing and spraying. High-pressure steam or other physical extraction technologies identified in Section H.3.3 will also be used to remove contamination if necessary. The decontamination procedures for closure of tanks will include, but may not be limited to, the following:

- Tank systems will be flushed after the final batch of bulk waste has been processed through that tank system. Large-volume flush solutions will remove as much waste as possible before smaller scale decontamination work begins. Flush water will be transferred to the pretreatment evaporation and ultrafiltration systems, and the concentrates will be sent to the HLW melter for vitrification, if the HLW vitrification system is operating. (If either or both vitrification systems will not be operating during the first phase of the closure period, this closure plan will be revised to account for changes in treatment and disposal of waste feed and flushing wastes, as necessary.) Water condensate from the evaporator will be routed to the LERF/ETF. The HLW melter will be shut down after flushing wastes are treated. Tank decontamination activities to be performed after completion of flushing may involve any of the chemical or physical extraction technologies identified in Section H.3.3. Used decontamination solutions will be transferred to the LERF/ETF or another permitted TSD facility.
- Physical evidence of mixed waste contamination in the secondary containment systems may be used, in addition to the operating record, to determine whether decontamination of the exterior of a tank system is needed. Before using decontamination solutions on the outside of a tank, the floor and wall liners will be inspected for cracks or other breaches. The cracks will be sealed before beginning decontamination treatment, or other engineered containment devices (such as collection basins) will be used to collect and contain solutions. The outer

tank surface then will be cleaned with water or detergents, or other technologies as necessary, and rinsed. Decontamination of secondary containment for permitted mixed waste management units will be similar or identical to the procedures used for mixed waste container storage and containment building units.

- After the tanks are decontaminated, the tank interiors may be inspected using CCTV cameras to determine compliance with the clean debris surface standard. Because of possible radiation exposure, visual inspection of the process cells may be performed remotely using a camera with a zoom lens, or using another device that allows verification that the standard is met. Inspections will be documented in an inspection record.
- The outside of the tanks also will be inspected for compliance with the clean debris surface standard, and inspections will be documented in an inspection record.
- If tanks or ancillary equipment cannot be determined by visual inspection to meet the clean debris surface standard, the tanks may undergo further decontamination, or rinsate samples may be obtained to determine if the decontaminated tank meets the designation limit performance standard for clean closure. Before or after decontamination efforts, a tank system may be designated as mixed waste debris, removed, reduced in size, packaged, treated by encapsulation, and sent to a permitted disposal facility.
- Decontamination residues will be collected, designated, and transferred to a permitted disposal facility.

The decontamination procedures for piping and ancillary equipment will include, but will not be limited to, the following activities:

- The facility design and process information, in combination with operating records, will be used to identify the equipment associated with treatment of mixed waste. Piping that may have carried mixed waste or may have become externally contaminated with mixed or dangerous waste will undergo decontamination. Contaminated piping may include waste transfer piping, sump contents transfer piping, nitric acid transfer piping, and other piping associated with waste treatment and secondary waste transfer.
- The piping will undergo bulk flushing at the same time the tanks are flushed. Flushing of the pipes and other ancillary equipment will remove the waste in order to meet the clean debris surface standard. Chemical and/or physical extraction technologies may be used to attempt to remove the remaining waste from piping and other ancillary equipment. Where it is not possible to visually verify that the clean debris surface standard has been met, verification may be attempted by rinsate sampling, analysis, and comparison of analyses with designation limits.
- If it is not possible to meet the clean debris surface standard or designation limits, contaminated portions of the piping and ancillary equipment will be removed, designated as dangerous/mixed waste, packaged in waste containers, transferred to the CWC or another permitted unit, encapsulated, and disposed of at a permitted landfill disposal unit on the Hanford Site. Encapsulation may be performed at the CWC or elsewhere.

H.6.2 Closure of Container Storage Areas

Each permitted mixed waste container storage unit will be evaluated for historical spills or other releases of dangerous or mixed wastes by review of the facility operating records and by visual inspection. The Visual inspections will determine if the container storage unit can be declared clean using the clean debris surface standard by checking for signs of any spills and/or releases of waste and loss of integrity, breaks, cracks, gaps, and other signs of deterioration of container storage area floors. If the record review and inspection support the conclusion that no releases of dangerous/mixed waste to the floor occurred, no further decontamination or sampling work will be required for that permitted mixed waste container storage unit. If either the inspection or record review indicate that dangerous/mixed waste releases to the floor of a mixed waste container storage occurred, decontamination will be required. If the protective coating is intact, physical extraction treatment will not be performed. If the coating is cracked or more severely damaged, physical extraction treatment will be required to remove at least 0.6 cm from the original surface. If the extent of the historical releases (the actual location on the floor) cannot be determined, the entire floor surface of the container storage area will be treated. If the resulting surface cannot be documented as a clean debris surface, the treatment may be repeated or the full thickness of the floor may be removed. The solid residues or rubble produced by treatment or removal will be disposed of as dangerous/mixed waste, unless sampling and analyses are performed to support a request for an Ecology determination that the rubble is not dangerous/mixed waste.

The presence of through-thickness cracks or other loss of integrity, if found in concrete floors that rest directly on soil, in secondary containment areas where dangerous/mixed waste releases are documented or suspected, may require a soil contamination investigation. Examples of adequate evidence that a release may have occurred include discoloration or staining of the concrete, odor, or elevated radiation readings observed during the initial closure inspection. Soil and possibly concrete samples will be obtained by coring in the vicinity of known or suspected mixed waste releases. Soil contaminated at concentrations above the risk-based soil cleanup levels will be removed, and confirmation samples will be taken at the limits of the excavation to confirm adequate removal. If analytical results are less than the Hanford soil background levels but greater than the risk-based soil cleanup concentrations, a request for approval of a clean closure-determination will be submitted to Ecology. The request will be supported with the analytical and other pertinent data for that mixed waste container storage unit.

If soil contamination is so extensive that the zone of contamination cannot be practically removed, or if groundwater contamination could result, the closure plan will be revised to provide for additional investigation and measures to address corrective action requirements.

Decontamination documentation will be prepared as described in Sections H.3.4 and H.4.1.

H.6.3 Closure of Containment Building Units

One containment building unit, the pretreatment plant hot cell maintenance area containment building unit, will be used for secondary waste (mostly debris) decontamination, size reduction, and packaging operations throughout the operating life of the WTP. It may be used for these same functions during the closure period. The HLW melter (cave) containment building may be used for similar operations during closure, after the normal melter operations have been

completed. In particular, the HLW melter containment building may be used to partially decontaminate and overpack failed HLW melters that were stored in the failed melter storage building (container storage area) during the operating life of the plant.

After completion of operations to facilitate closure of other permitted mixed waste management units, the melters and associated spent parts, feed apparatus, and off-gas control equipment will be removed. The containment buildings will be closed in the same manner, following the same inspection, decontamination, and documentation requirements identified in Sections H.6.1 and H.6.2 for tank system secondary containment areas and mixed waste container storage units. Several significant differences in design and mixed waste types may result in substantially longer time requirements for closure of the permitted containment building units, as compared to mixed waste container storage units. For example, most operations in the HLW melter cave will be conducted with remotely operated equipment until the final decontamination stages are reached. Complex remote operations are necessarily slow, and the full extent of necessary decontamination, size reduction, and packaging work will not be known until the final stages of closure. The ILAW container finishing line and container fixative containment building units are also larger and contain more equipment than most of the mixed waste container storage units.

Other containment building units are more similar to mixed waste container storage units, including coated concrete rather than cladded floors and walls. These containment buildings will be closed in the same manner as the mixed waste container storage units (Section H.6.2), with the added complications of various types of waste handling equipment such as power manipulators, cranes, and the LAW LSMs.

H.6.4 Closure of Miscellaneous Units

The HLW and LAW melters are miscellaneous units. Several times during the life of the WTP, spent melters will be removed from the HLW melter cave and LAW LSM gallery containment buildings. Removal and replacement of spent melters is not considered closure. One or more of the LAW melters may actually be removed and not replaced before the start of the closure period. The HLW melter is planned to be operating during the deactivation period (the first part of the closure period). If necessary, the HLW melter may be removed and replaced during the closure period to provide treatment for the residues from tank system flushing operations. Such removal and replacement would not be considered closure, although it may occur during the closure period.

LAW melter operating equipment openings will be closed and the exterior surfaces decontaminated. The melters will be removed from the LAW melter gallery as intact assemblies, encapsulated, if required, and shipped to the LLBG or another permitted treatment/disposal unit. Failed HLW melters may be stored during the closure period, while treatment, transport, and disposal operations are arranged. HLW melters may be partially decontaminated and packaged in an overpack in the HLW melter cave during the final phases of closure activities. HLW melters in the failed melter storage building (container storage area) may be returned to the HLW melter cave for partial decontamination and packaging. Both types of melters will be treated in accordance with the immobilization treatment standard and disposed of at permitted mixed waste disposal facilities.

Removal of melter components will be accomplished according to standard procedures for the operational period of the plant. Special HLW melter closure activities, such as size reduction, decontamination of components, or packaging of components and decontamination residues, may require the development of new procedures or the installation of new equipment.

Other miscellaneous units such as offgas scrubbers, condensers, precipitators, reboilers, oxidizers, and adsorbers will be closed in the same manner, following the same inspection, decontamination, and documentation requirements identified in Sections H.6.1 and H.6.2 for tank systems and container storage areas.

H.7.0 SCHEDULE FOR CLOSURE

For the purposes of this closure plan, the design life of the WTP is estimated at 40 years of operations. The estimated three-year schedule for closure is provided in Figure H-7.

As required by WAC 173-303-610(3)(c), WTP will notify Ecology at least 45 days before the date on which the closure period is expected to start. In addition, WAC 173-303-610(3)(c) requires that the closure period begin no later than 30 days after the date on which WTP receives the final volume of dangerous waste. Due to the complexity of the WTP operations, the 30-day requirement to start closure activities will likely be unable to be met. Processing of the final batch of waste feed may require approximately nine months after receiving the final waste feed transfer from the DST system unit. Additional evaluation of the schedule will be conducted prior to closure.

The date of receipt of the final volume of bulk waste feed in the melters and various other specific individual permitted mixed waste management units within the WTP will be at the end of the processing of that final batch of waste feed. This date will roughly correspond to the date of the start of deactivation operations. The pretreatment and HLW feed preparation and melter systems may continue to operate for several months after the start of the closure period. These systems will be processing the tank system flush solutions and producing immobilized waste glass containing most of the residual waste constituents left in the tanks at the start of the closure period.

The year the WTP permitted mixed waste management units close will depend on the time required for the initial portion of the tank waste inventory to be processed, the degree of success in this mission, and whether the WTP will be used to continue to process the remaining Hanford tank waste inventory. Other factors that could affect the year of closure include changes in operational requirements, lifetime extension upgrades, a different operating contractor, and other unforeseen factors.

This estimated three-year closure schedule is necessarily general and is not meant to be definitive. For example, completion of decontamination of the pretreatment building and residue removal is shown at approximately 21 months after the start of the closure period. However, decontamination of the LAW and HLW vitrification plant tanks and other permitted mixed waste management units is expected to require use of pipelines through the pretreatment building to transfer decontamination solutions and rinsates to the LERF/ETF. Therefore, the final decontamination of piping and collection tanks in the pretreatment building may not be

completed until after the LAW and HLW vitrification plant tanks and other permitted mixed waste management units are decontaminated.

A more specific schedule will be provided in the revision of this closure plan prior to the start of closure activities. The revised schedule will take advantage of final design and operating procedure information that is not available at this time. The schedule for closure will include a breakdown of activities to be performed after the date of completion of vitrification processing of the last batch of waste feed from the DST system.

H.8.0 EXTENSION FOR CLOSURE TIME

The following discussion addresses the extension of the dangerous/mixed waste removal and closure time periods as specified in WAC 173-303-610(4)(a) and (b), respectively. The first citation requires that within 90 days after receiving the final volume of dangerous waste (the DST waste), the owner or operator will treat, remove from the dangerous/mixed waste management unit, or dispose of all dangerous wastes in accordance with the approved closure plan. The second requirement is that all closure activities will be completed within 180 days after receiving the final volume of dangerous waste.

The need for more than 90 days to remove dangerous/mixed wastes and more than 180 days to complete closure activities is anticipated. This need is due in part to the high radiation fields in many of the mixed waste management units, even after the entire bulk waste inventory has been processed and the residues (the inventory present at the start of the closure period) are removed by flushing. Processing of the final batch of waste feed may require approximately nine months of operation at or near design capacity of the plant, prior to the start of deactivation and closure work. As explained in Section H.7.0, these processing operations will be completed, or nearly completed, at the start of the closure period.

The large number of mixed waste management units and extensive integrated ancillary equipment such as piping, valves, filters (mostly welded together), and the need to coordinate closure activities with other TSD units both at Hanford and offsite, means that more time will be required for closure than would be necessary for a typical dangerous waste management facility.

The decontamination operations described in this closure plan are intended to avoid excessive secondary waste generation and to provide for the recycling of some pieces of equipment. The decontamination operations will include extensive use of chemical and physical decontamination treatment technologies. Incineration is not considered as an option for dangerous/mixed wastes to be generated during closure. Solidification, encapsulation, and landfilling of dangerous and mixed wastes will be deliberately minimized. The volumes of wastes that will be disposed of will also be minimized to the extent practical by physical size reduction. Size reduction will allow packaging of large tanks, pipe, and support structures in relatively small, densely packed drums or waste boxes. These waste management priorities are emphasized to support this request for extension of the waste removal and closure periods, as suggested in Section 8.3 of the Ecology *Guidance for Clean Closure of Dangerous Waste Units and Facilities* (Ecology 2005).

The WTP operator will take the actions necessary to prevent threats to human health and the environment from the unclosed but not operating WTP, including compliance with applicable

permit requirements. During the first several months of the closure period, a large portion of the plant will be operating to remove waste residues from the tank systems to the maximum practical extent. Flushing, vitrification, and other deactivation activities will require continued security and monitoring of the other non-operating portions of the plant, and no part of the plant will be unsecured or abandoned during the closure period.

If necessary, an extension of the three-year closure schedule will be requested and the need for the extension demonstrated in accordance with WAC 173-303-610(4)(a) and (b). The request would be determined prior to initiating closure activities, or during closure activities should closure conditions necessitate. A revised closure plan will be submitted for approval if an extension is necessary.

Condition II.R.1 Hanford Facility Dangerous Waste Permit (Ecology 2009) requires the Permittees to notify Ecology in writing, as soon as possible, of deviations or expected deviations from the schedules of the permit. The Permittees will include with the notification information supporting their claim that they have used best efforts to meet the required schedules. If Ecology determines that the Permittees have made best efforts to meet the schedules of the permit, Ecology will notify the Permittees in writing by certified mail that the Permittees have been granted an extension. Such an extension will not require a permit modification under Condition I.C.3. Should Ecology determine that the Permittees have not made best efforts to meet the schedules of the permit, Ecology may take such action as is deemed necessary. Copies of correspondence regarding schedule extensions will be kept in the operating record.

Condition II.R.1 Hanford Facility Dangerous Waste Permit (Ecology 2009) provides that any schedule extension granted through the approved change control process identified in the *Hanford Federal Facility Agreement and Consent Order* (Ecology, EPA, and DOE 1998) will be incorporated into the permit. Such a revision will not require a permit modification under Condition I.C.3.

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Table H-1 Maximum Waste Inventory

Mixed Waste Management Unit	Maximum Inventory [a]
Total container storage	1,089,000 gal
Total tank storage	5,276,000 gal

[a] Miscellaneous (e.g., melter and offgas equipment) and containment building units are not counted, as they will be processing the volumes previously stored in tanks, and producing treated and secondary wastes that are included in the container storage total.

Table H-2 Clean Closure Performance Standards and Activities[a]

Mixed Waste Management Unit Type	Components	Performance Standards	Closure Activities
Tank system	Exterior surfaces Interior surfaces Ancillary equipment Secondary containment	Clean debris surface, designation limits, or removal	Extraction technologies or removal of tanks Liner and concrete decontamination and/or removal
Container storage area	Floor, walls, and ancillary equipment	Clean debris surface, designation limits, or removal	Extraction technologies Liner and concrete decontamination and/or removal
Containment building	Floor, walls, and ancillary equipment	Clean debris surface, designation limits, or removal	Extraction technologies Liner and concrete decontamination and/or removal
Miscellaneous units (melter)	Melters and ancillary equipment	Removal	Removal
Miscellaneous units (others)	Exterior surfaces Interior surfaces Ancillary equipment Secondary containment, as applicable	Clean debris surface, designation limits, or removal	Extraction technologies or removal of miscellaneous units Liner and concrete decontamination and/or removal

a Refers to WAC 173-303-610 and 40 CFR 268.45, Table 1, as incorporated by reference at WAC 173-303-140 (2)(a).

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1 **Figure H-1 Sample Clean Debris Surface Checklist**

DECONTAMINATION CHECKLIST

This checklist is intended to document decontamination work and the attainment of a clean debris surface for the following components, structures, and materials.

1 Building or location:
2 Component or Area:
3 Material (such as concrete, metal):
4 Decontamination treatment method[1]:
5 Decontamination treatment parameters:
- Temperature
- Propellant
- Solid media (such as shot, grit, beads)
- Pressure
- Residence time
- Surfactants
- Detergents
- Grinding or striking media (such as wheels, piston heads)
- Depth of surface layer removal in cm (in concrete, for example)
- Other

The decontamination of the building, component, or material identified in steps 1 through 3 was completed as specified at steps 4 and 5.

_____	_____ /	_____
Title	Signature	Date

6 Performance Standard:

I have visually inspected the above-identified material before / after (circle one) decontamination or treatment in accordance with the closure plan. Dangerous waste residues have / have not (circle one) been removed to attain a clean debris surface[2].

_____	_____ /	_____
Authorized Representative	Signature	Date

Notes:

1 Decontamination treatment will use a chemical or physical extraction method as listed in Table 1, Alternative Treatment Standards for Hazardous Debris (40 CFR 268.45).

2 Clean debris surface as defined in Table 1, Alternative Treatment Standards for Hazardous Debris (40 CFR 268.45): "'Clean debris surface' means the surface, when viewed without magnification, will be free of all visible contaminated soil and hazardous waste except that residual staining from soil and waste consisting of light shadows, slight streaks, or minor discolorations, and soil and waste in cracks, crevices, and pits may be present provided that such staining and waste and soil in cracks, crevices, and pits will be limited to no more than 5 % of each square inch of surface area."

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Figure H-2 Closure Strategy Flowchart for Tank Systems

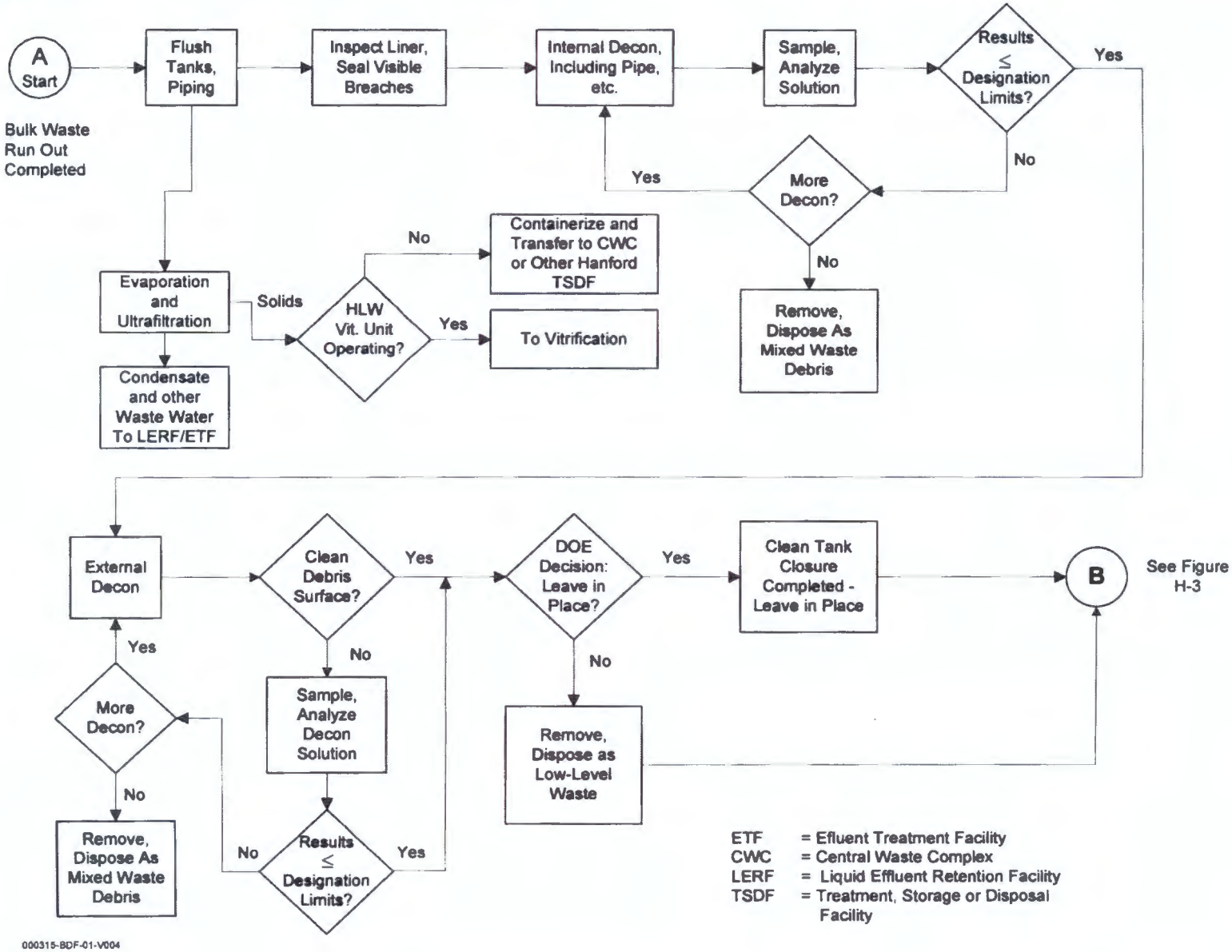

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Figure H-3 Closure Strategy for Container Storage, Containment Building, Miscellaneous Unit, and Tank System Secondary Containment Areas

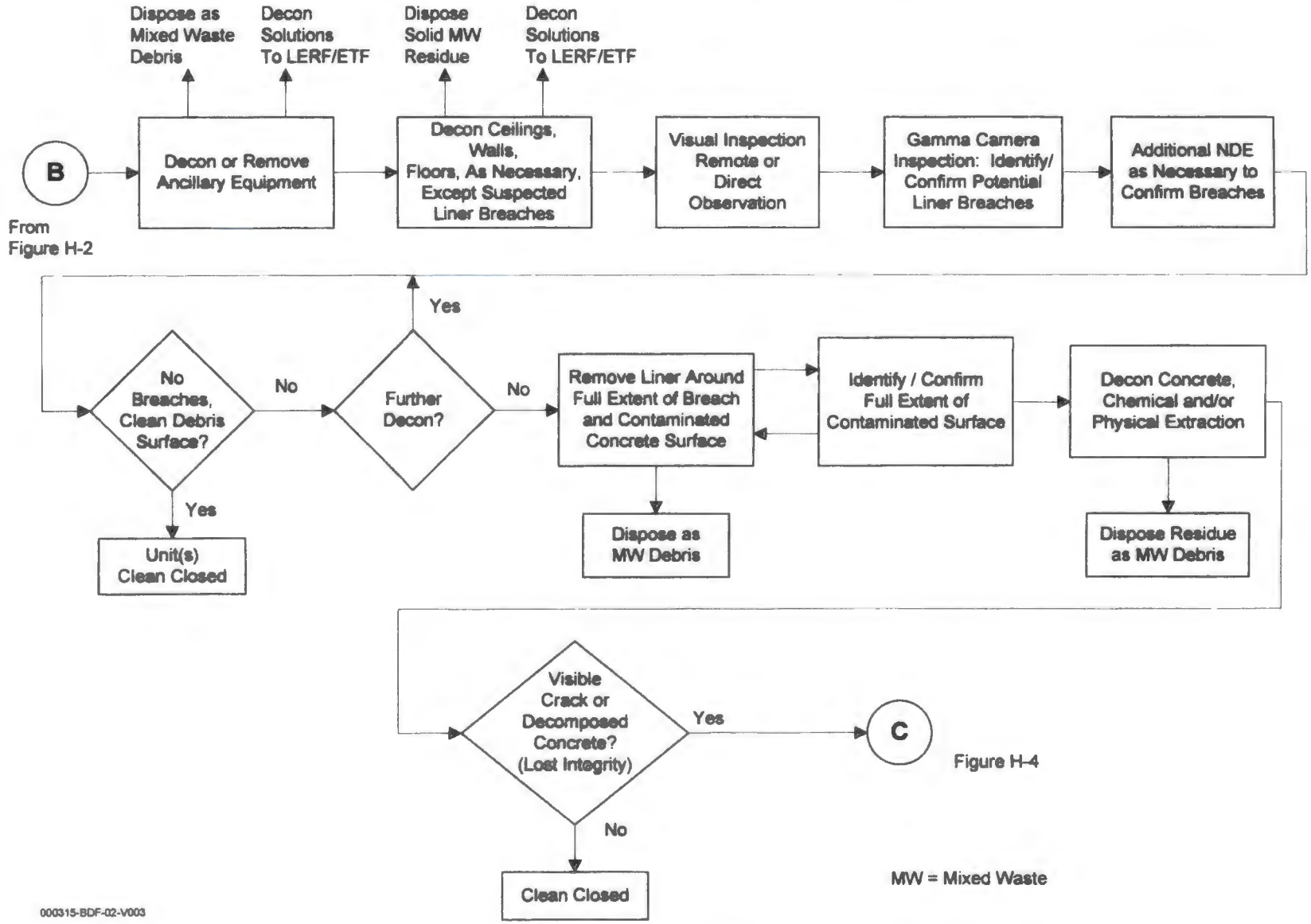

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Figure H-4 Closure Strategy Flowchart for Soils and Groundwater

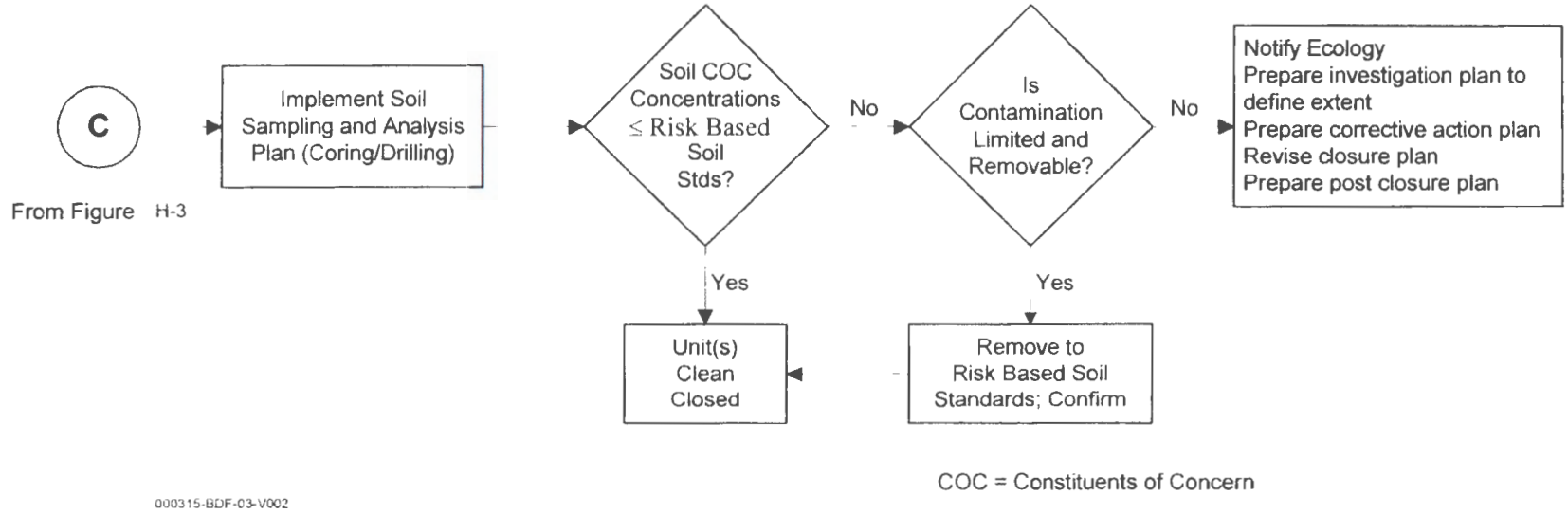

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Figure H-5 Example Closure Certification Statement

RCRA CLOSURE CERTIFICATION
FOR

River Protection Project – Waste Treatment Plant
Hanford Site
US Department of Energy, Richland Operations Office

We, the undersigned, hereby certify that _____ closure activities were performed in accordance with the specifications in the approved closure plan.

_____	_____ /	_____
Owner/Operator	Signature	Date
_____	_____ /	_____
Contractor Representative	Signature	Date
_____	_____ /	_____
Independent Registered Professional Engineer	Signature	Date

Washington State PE # _____

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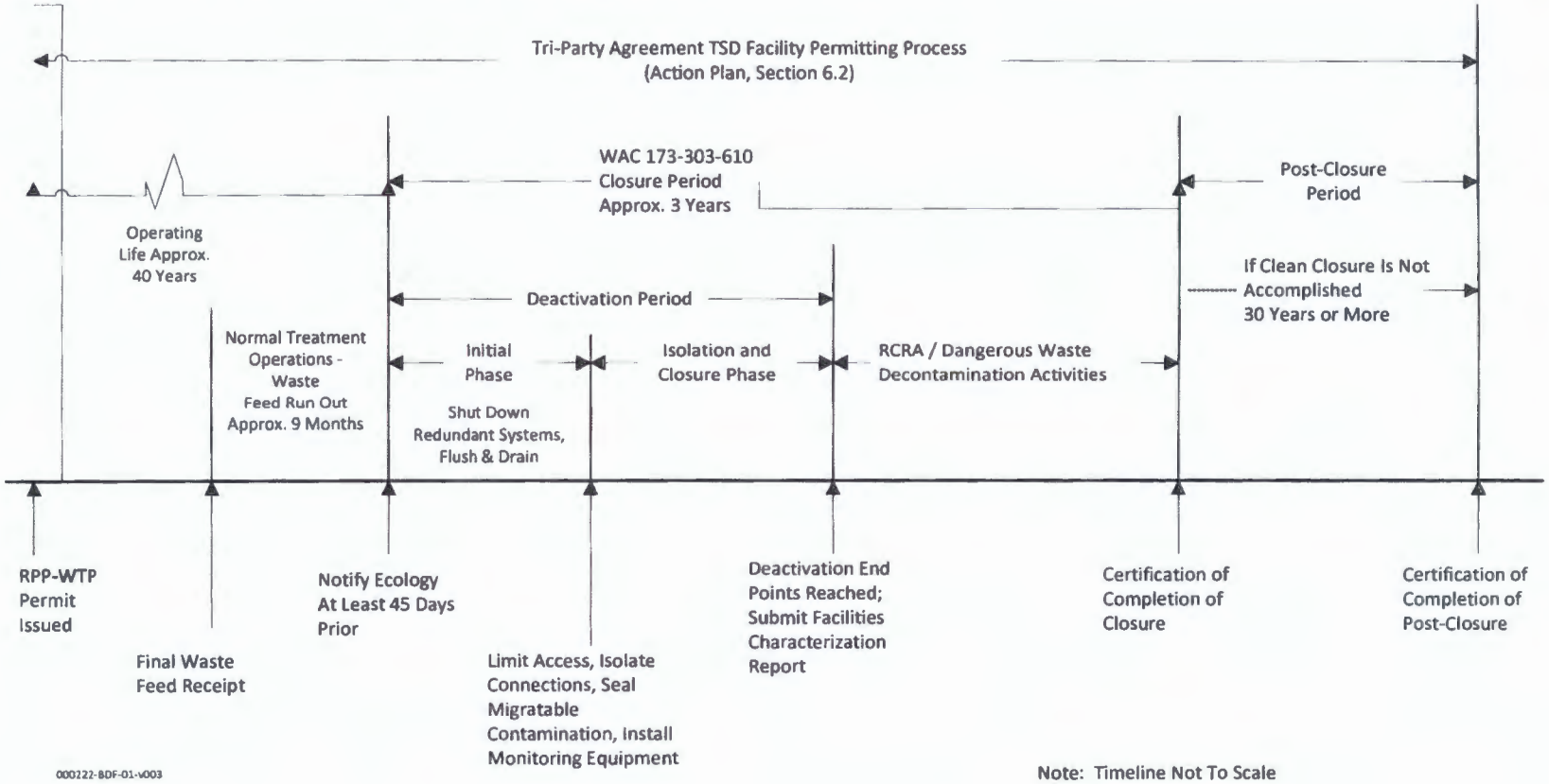
Figure H-6 WTP Permitting, Deactivation, and Closure



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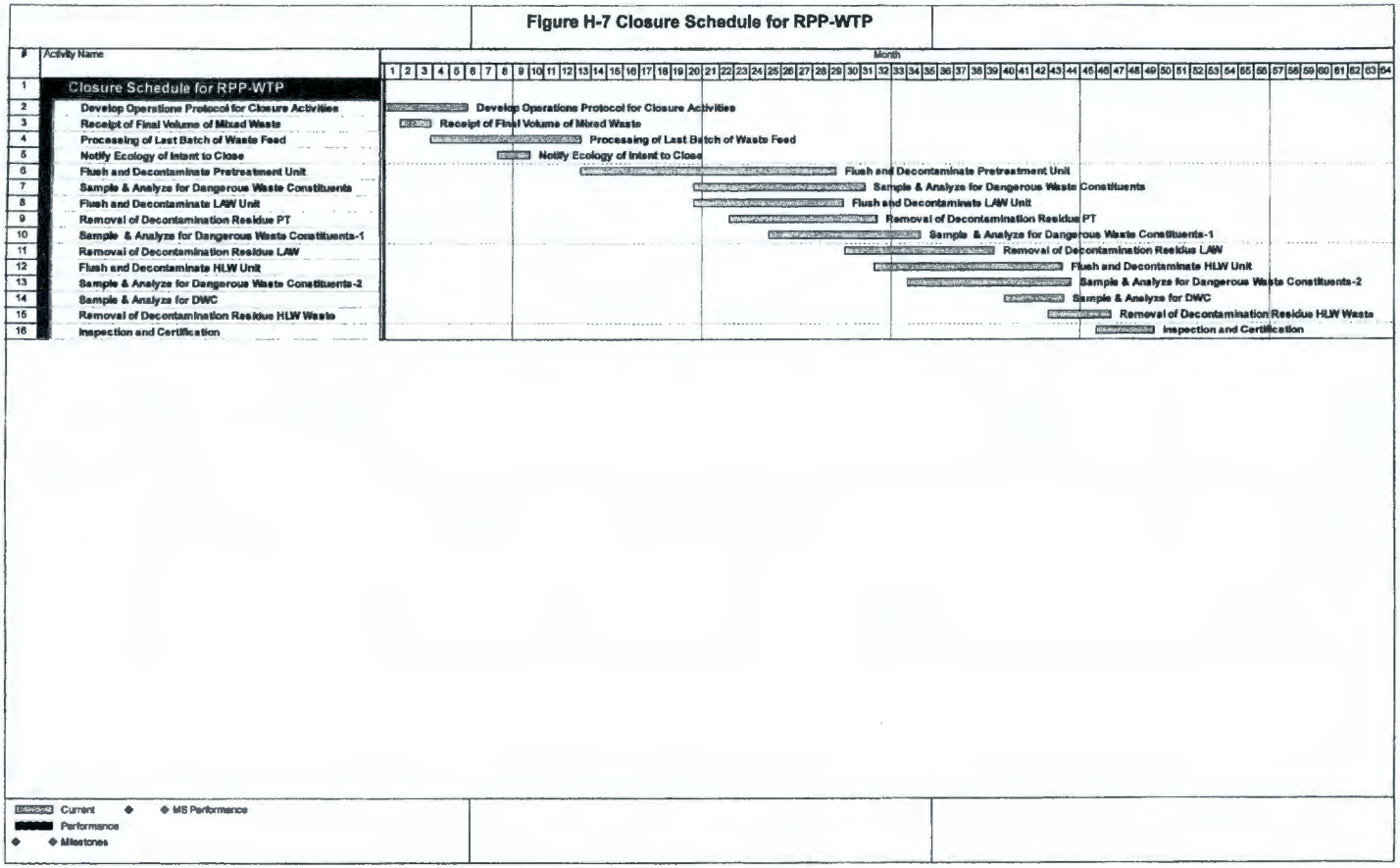
Figure H-7 Closure Schedule for WTP