

**2401-W WASTE STORAGE BUILDING
ADDENDUM H
CLOSURE PLAN
CHANGE CONTROL LOG**

Change Control Logs ensure that changes to this unit are performed in a methodical, controlled, coordinated, and transparent manner. Each unit addendum will have its own change control log with a modification history table. The “**Modification Number**” represents Ecology’s method for tracking the different versions of the permit. This log will serve as an up to date record of modifications and version history of the unit.

Modification History Table

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**ADDENDUM H
CLOSURE PLAN**

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**ADDENDUM H
CLOSURE PLAN**

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12 **ATTACHMENTS**

13 Attachment A CWC 2401-W Building Visual Inspection Documentation H.A.i
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TERMS

ASTM	American Society for Testing and Materials
BCSO	Benton County Sheriff's Office
CAA	Central Accumulation Area
CHPRC	CH2M HILL Plateau Remediation Company
CFR	Code of Federal Regulations
COC	Chain of Custody
CWC-WRAP	Central Waste Complex-Waste Receiving and Processing
DOE	U.S. Department of Energy
DOE-RL	U.S. Department of Energy, Richland Operations Office
DQA	Data Quality Assessment
DQO	Data Quality Objectives
DWMU	Dangerous Waste Management Unit
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
FWS	Field Work Supervisor
HEIS	Hanford Environmental Information System
HHE	Human Health and the Environment
IQRPE	Independent Qualified Registered Professional Engineer
MTCA	<i>Model Toxics Control Act—Cleanup</i> (WAC 173-340)
PQL	Practical Quantitation Limit
QA	Quality Assurance
QC	Quality Control
RCRA	Resource Conservation and Recovery Act of 1976
SAA	Satellite Accumulation Area
SAP	Sampling and Analysis Plan
SWOC	Solid Waste Operations Complex
VOA	Volatile Organic Analysis
WAC	Washington Administrative Code

2

1 H.1 Introduction

2 The purpose of this plan is to describe the Resource Conservation and Recovery Act (RCRA)/Hazardous
3 Waste Management Act (HWMA), Chapter 70.105 Revised Code of Washington (RCW) closure process
4 for the 2401-W Waste Storage Building Dangerous Waste Management Unit (DWMU), hereinafter called
5 the 2401-W Building. The 2401-W Building is located in the southeastern portion of the Central Waste
6 Complex (CWC)-Waste Receiving and Processing (WRAP) Complex in the 200 West Area of the
7 Hanford Site (Figure H-1). The U.S. Department of Energy (DOE) and CH2M HILL Plateau
8 Remediation Company (CHPRC), hereinafter called the Permittees, have agreed with the
9 U.S. Environmental Protection Agency (EPA) and Washington State Department of Ecology (Ecology)
10 through a Consent Agreement and Final Order (EPA Docket No. RCRA-10-2013-0113) to close this
11 DWMU. The 2401-W Building is no longer used for storage of dangerous or mixed waste and will be
12 clean closed.

13 This closure plan complies with closure requirements in Washington Administrative Code
14 (WAC) 173-303-610(2) through WAC 173-303-610(6), and WAC 173-303-630(10).

15 Amendments to this closure plan must be submitted as a permit modification request in accordance with
16 Permit Condition I.C.3.

17 Minor deviations from this closure plan must be addressed in accordance with Permit Condition II.K.6.

18 Closure requirements also follow Ecology guidance (Ecology Publication #94-111, *Guidance for Clean*
19 *Closure of Dangerous Waste Units and Facilities*). This closure plan is designed to fulfill the elements of
20 the Data Quality Objectives (DQO) Process, as defined in EPA Publication EPA/240/B-06/001, *Guidance*
21 *on Systematic Planning Using the Data Quality Objective Process* (EPA QA/G-4). A site-specific DQO
22 has been incorporated into this closure plan.

23 This closure plan describes in detail the closure activities necessary to achieve closure performance
24 standards for the 2401-W Building. Closure activities include:

- 25 • Removal of all dangerous and mixed waste.
- 26 • Records review (i.e., container storage, operating, and inspection records) for documented spills
27 or releases of dangerous or mixed waste and subsequent cleanup activities.
- 28 • Visual inspection to evaluate the condition of the floor surfaces and the likelihood of potential
29 exposure pathways for contamination of the underlying soil.
- 30 • Decontaminate the concrete surface to meet the Alternative Treatment Standards for Hazardous
31 Debris (i.e., removal of at least 0.6 cm of the surface layer; treatment to a clean debris surface).
- 32 • Visual inspection to confirm clean debris surface standard has been met.
- 33 • Sampling of underlying soil to ensure closure performance standards are met.
- 34 • Transmit closure certification to Ecology.

35 Closure will be performed in accordance with the schedule provided in Section H.6.

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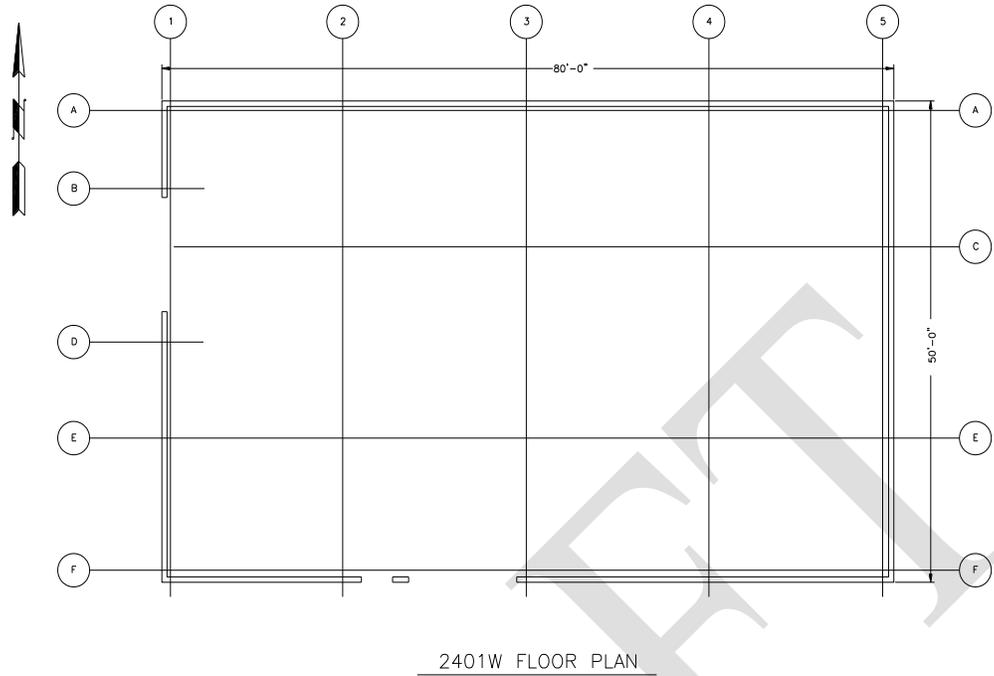
2 **Figure H-1 Central Waste Complex-Waste Receiving and Processing Complex Overview,**
3 **2401-W Building Dangerous Waste Management Unit**

4
5 **H.1.1 Unit Description**

6 The 2401-W Building is located on the south end of the CWC.

7 The 2401-W Building is a pre-engineered steel structure. It is approximately 15 m (50 ft) wide by 24 m
8 (80 ft) long by 6 m (20 ft) high (to the eave). The foundation is integrated into a perimeter concrete curb
9 15.2 cm (6 in.) above grade. Ramps were placed across the curb for loading and unloading operations.
10 The floors were coated with an epoxy resin floor surfacing system that was compatible with the
11 stored waste. Figure H-2 shows the general dimensions and layout of the 2401-W Building, and provides
12 perspective for the pictures of this area that follow. Figure H-3 shows the 2401-W Building from west
13 side of the building. Figure H-4 shows the interior of the 2401-W Building from the south. Figure H-5
14 shows an overhead view of the 2401-W Building.

15 The 2401-W Building does not currently store dangerous or mixed waste. Future dangerous waste
16 container storage and treatment of dangerous and mixed waste within the 2401-W Building is not
17 authorized. Currently it primarily serves as equipment and material storage, as well as recyclable and
18 universal waste storage to support the Central Waste Complex-Waste Receiving and Processing
19 (CWC-WRAP) operational activities.



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Figure H-2 Dimensions of 2401-W Building



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Figure H-3 2401-W Building (East) (February 2018)

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Figure H-4 2401-W Waste Storage Building Interior View (Center) (February 2018)

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4

Figure H-5 Overhead View of 2401-W Building (East) (October 2017)

1 **H.1.2 Maximum Waste Inventory**

2 The maximum inventory of dangerous and mixed waste stored in the 2401-W Building over its lifetime
3 included 318 containers with a total volume of 203 m³ (266 yd³). Dangerous waste was introduced into
4 2401-W Building in May 1989. The 2401-W Building also stored dangerous and mixed waste in a
5 Central Accumulation Area (CAA). Details on the dangerous and mixed waste containers are presented in
6 Section H.3.2.

7 **H.1.3 Personnel Safety and Training Requirements**

8 Closure will be performed in a manner to ensure the safety of Human Health and the Environment (HHE).
9 Health and safety requirements are addressed in Section H.1.3.1, and training for facility and closure
10 personnel is described in Section H.1.3.2.

11 **H.1.3.1 Health and Safety Requirements**

12 Personnel will be trained in the applicable safety and environmental procedures described in Table H-1.
13 Personnel will be equipped with appropriate personal protective equipment. Personnel will perform all
14 field operations and any necessary closure activities in compliance with applicable health, safety, and
15 environmental procedures and requirements.

16 Pre-job briefings will be performed to evaluate activities and associated hazards by considering the
17 following factors:

- 18 • Objective of the activities.
- 19 • Individual tasks to be performed.
- 20 • Hazards associated with the planned tasks.
- 21 • Environment in which the job will be performed.
- 22 • Facility where the job will be performed.
- 23 • Equipment and material required.
- 24 • Safety protocols applicable to the job.
- 25 • Training requirements for individuals assigned to perform the work.
- 26 • Level of management control.
- 27 • Proximity of emergency contacts.

28 **H.1.3.2 Training Requirements**

29 The Permittees have instituted training and qualification programs to meet training requirements imposed
30 by regulations, DOE orders, and national standards such as those published by the American National
31 Standards Institute/American Society of Mechanical Engineers. For example, the environmental, safety,
32 and health training program provides workers with the knowledge and skills necessary to execute
33 assigned duties safely. Permit Attachment 5, *Hanford Facility Personnel Training Program*, describes
34 specific requirements for the Hanford Facility Personnel Training Program. The Permittees will comply
35 with the training matrix shown in Table H-1, which provides training requirements for Hanford Facility
36 personnel associated with the 2401-W Building.

37 Project-specific safety training will provide the knowledge and skills that personnel need to perform work
38 safely and in accordance with Quality Assurance (QA) requirements. Training records are maintained for
39 each employee in an electronic training record database. The Permittee's training organization maintains
40 the training records system.

Table H-1 Training Matrix for the 2401-W Building Dangerous Waste Management Unit

Training Category Course Description ^a	Frequency of Training	Training Type ^b	Job Title/Position					
			Non-CWC Personnel or Visitor	FWS	SPOC	ECO	BED	FS
General Training	Annual	GHFT, CPT	X	X	X	X	X	X
Building Emergency	Annual	ECT					X	X
ECO Training	Initial	OT				X		
Facility Health and Safety	Annual	GHFT, CPT	X ^c	X	X ^c	X	X	X
Sampler	Annual	GHFT, CPT						X

a. The CWC-WRAP Dangerous Waste Training Plan provides a complete description of coursework in each training category.

b. Training types defined in Permit Attachment 5.

c. This training is required only if workers are unescorted in the facility.

BED = Building Emergency Director

FWS = Field Work Supervisor

CPT = Contingency Plan Training

GHFT = General Hanford Facility Training

ECO = Environmental Compliance Officer

OT = Operations Training

ECT = Emergency Coordinator Training

SPOC = Single Point of Contact

FS = Field Sampler

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2 **H.1.4 Maintenance and Security During Closure**

3 To maintain the 2401-W Building in a compliant manner during closure, measures are taken to ensure
4 inspections are performed, and security and emergency preparedness activities are in place.

5 **H.1.4.1 Inspections**

6 The 2401-W Building will be closed in a manner that demonstrates that all steps to prevent threats to
7 HHE have been met and will continue to be taken. After closure activities have been completed, the
8 2401-W Building will be inspected annually until Ecology approves the site closure certification.

9 Table H-2 shows annual inspection requirements that will be performed.

10

Table H-2 2401-W Building Inspection Schedule

Requirement Description	Frequency	DWMU Condition Inspection*
Signage	Annual	Warning signs are present and clearly legible.
Site – General	Annual	There is no evidence that unusual conditions exist at the closing DWMU site.

*The storage area is empty of dangerous and mixed waste. “No waste in storage” or equivalent words will be entered on the inspection log.

11

12 **H.1.4.2 Facility Security**

13 The following sections document security measures in effect at the CWC-WRAP.

1 **H.1.4.2.1 Security Provisions**

2 Located within the 200 West Area of the Hanford Facility, CWC-WRAP complies with access control and
3 warning sign requirements pursuant to WAC 173-303-310(1) and (2), *Security*.

4 Security measures are used to control access to the active portions of the Hanford Facility in accordance
5 with Permit Condition II.M, *Security*.

6 The entire Hanford Facility is a controlled access area as described in Permit Attachment 3, *Security*. The
7 security measures in Permit Attachment 3 and the unit-specific security measures prevent the unknowing
8 entry, and minimize the possibility for the unauthorized entry, of persons or livestock.
9 [WAC 173-303-310(1)]

10 **H.1.4.2.2 Central Waste Complex-Waste Receiving and Processing Access Control**

11 Unknowing entry and the possibility for unauthorized entry of persons or livestock onto the active
12 portions of the CWC-WRAP are minimized through implementation and maintenance of the following
13 security measures.

14 Access to CWC-WRAP DWMUs is controlled by an approximate 2.1 m (7 ft) high chain link fence
15 encircling the CWC-WRAP perimeter (Figure H-1). Alternate vehicle entry gates at points in the
16 perimeter fence are either locked or, when open for operations, subject to surveillance by CWC-WRAP
17 personnel. Authorization clearance for all entrants to the CWC-WRAP is required. During
18 non-operations hours, the main gate is locked. Gate keys are controlled and accessible by authorized
19 personnel only. [WAC 173-303-310(2)(c)]

20 Visitors to the CWC-WRAP are required to sign in and adhere to all personal protection requirements,
21 and are subject to escorting protocols.

22 Section H.1.3.2 provides the personnel training requirements for CWC-WRAP operators, workers, and
23 visitors.

24 Access to the 2401-W Waste Storage Building is restricted by the CWC-WRAP access controls described
25 above.

26 **H.1.4.2.3 Warning Signs**

27 Warning signs stating “Danger-Unauthorized Personnel Keep Out” are posted near the entrance gate of
28 the CWC-WRAP. Identical signs are posted along the perimeter fence lines at distances not to exceed
29 250 ft (76.2 meters) between signs. Permittees must maintain warning signs at points described in this
30 closure plan and ensure that signs are written in English, legible from a distance of 25 ft. (approximately
31 7.6 m) or more, and visible from all angles of approach. [WAC 173-303-310(2)(a)]

32 **H.1.4.3 Preparedness, Prevention, Emergency Procedures**

33 The CWC preparedness, prevention, and emergency procedures are described in the following
34 subsections. Contingency information is contained in the Building Emergency Plan for CWC, as well as
35 Permit Attachment 4, *Hanford Emergency Management Plan*. Note: The WRAP has a separate building
36 emergency plan from the CWC.

37 **H.1.4.3.1 Central Waste Complex Building Emergency Plan**

38 CWC is within the Hanford Facility. The Building Emergency Plan for CWC describes facility-specific
39 hazards and emergency planning and response. This site-specific plan is intended to be used in
40 conjunction with Permit Attachment 4, *Hanford Emergency Management Plan*. If an emergency occurs,
41 the on-call Building Emergency Director will be notified, and the requirements associated with Permit
42 Attachment 4, *Hanford Emergency Management Plan*, and the CWC Building Emergency Plan will be
43 implemented. A copy of the CWC Building Emergency Plan is kept in the operating record.

1 **H.1.4.3.2 Hanford Emergency Management Plan**

2 Permit Attachment 4, *Hanford Emergency Management Plan*, addresses site emergency management and
3 contingency plan requirements for the Hanford Facility.

4 **H.1.4.4 Facility Recordkeeping**

5 Historical records that describe dangerous and mixed waste management activities within the
6 2401-W Building are retained in the operating record, which ensures proper availability and retention
7 periods. These records describe the source of the chemicals, quantity, and hazards associated with the
8 chemicals.

9 Records will be stored in either electronic or hardcopy format. Documentation and records, regardless
10 of medium or format, are controlled in accordance with internal work requirements and processes to
11 ensure the accuracy and retrievability of stored records. Records required by the Tri-Party Agreement
12 (Ecology et al., 1989, [Hanford Federal Facility Agreement and Consent Order](#)) will be managed in
13 accordance with the requirements therein.

14 **H.1.5 Facility Contact Information**

15 2401-W Waste Storage Building Operator and Property Owner:

16 Doug S. Shoop, Manager
17 U.S. Department of Energy, Richland Operations Office
18 P.O. Box 550
19 Richland, WA 99352
20 (509) 376-7395

21 2401-W Waste Storage Building Co-Operator:

22 L. Ty Blackford, President and Chief Executive Officer
23 CH2M HILL Plateau Remediation Company
24 P.O. Box 1600
25 Richland, WA 99352
26 (509) 376-0556

27 **H.2 Closure Performance Standards**

28 The 2401-W Building will be closed in a manner that complies with the closure performance standards in
29 WAC 173-303-610(2)(a) and (b) and, therefore, achieves clean closure. The objectives of closure
30 activities for the 2401-W Building are as follows:

- 31
- 32 • Minimize the need for further maintenance.
 - 33 • Control, minimize, or eliminate to the extent necessary to protect HHE post-closure escape of
34 dangerous waste, dangerous constituents, leachate, contaminated runoff, or dangerous waste
decomposition products to the ground, surface water, groundwater, or atmosphere.
 - 35 • Remove all waste and waste residues and properly dispose of them in a RCRA permitted disposal
36 facility.
 - 37 • Decontaminate the concrete surface to meet the Alternative Treatment Standards for Hazardous
38 Debris (i.e., removal of at least 0.6 cm of the surface layer; treatment to a clean debris surface)
 - 39 • Perform soil sampling and analysis to ensure soils under the 2401-W Building meet standard
40 Model Toxics Control Act (MTCA) cleanup levels, and remove any soils contaminated above
41 these levels.

- 1 • Return the land to the appearance and use of surrounding land areas to the degree possible, given
2 the nature of the previous dangerous waste activity.

3 **H.3 Closure Activities**

4 The 2401-W Building will be clean closed.

5 The following closure activities are required to achieve and verify clean closure:

- 6 • Remove all dangerous and mixed waste inventory (completed, Section H.3.1).
7 • Review dangerous and mixed waste container storage, operating, and inspection records for
8 documented spills or releases of dangerous or mixed waste during periods of waste storage and
9 subsequent cleanup (completed, Section H.3.2).
10 • Perform initial visual inspection of the floor surfaces to identify dangerous or mixed waste related
11 staining, low points, joints/seams, cracks, holes, pits, or breaches significant enough to allow
12 contamination to reach underlying soil. Evaluate surface to identify potential for focused sample
13 locations (completed, Section H.3.2).
14 • Remove equipment and material from the 2401-W Building and perform a final visual inspection
15 of the floor to identify dangerous or mixed waste related staining, low points, joints/seams,
16 cracks, holes, pits, or breaches significant enough to allow contamination to reach underlying
17 soil. Evaluate surface to identify potential for additional focused sample locations
18 (Section H.3.4).
19 • Decontaminate the concrete surface to meet the Alternative Treatment Standards for Hazardous
20 Debris by removing of at least 0.6 cm of the surface layer to a clean debris surface
21 (Section H.3.5).
22 • Confirm the concrete surface meets closure performance standard of clean debris surface via
23 visual inspection (Section H.3.8 and H.5.1).
24 • Perform focused soil sampling below the 2401-W Building (Section H.4.4).
25 • Confirm analytical results from soil samples meet closure performance standards (Section H.3.9).
26 • Identify and manage contaminated environmental media (Section H.3.6).
27 • Identify and manage waste generated during closure (Section H.3.7).
28 • Transmit closure certification to Ecology as in Section H.5.3.

29 **H.3.1 Removal of Wastes and Waste Residues**

30 No dangerous or mixed waste is currently stored at the 2401-W Building. The last dangerous waste was
31 removed in November 2010 from the CAA. The 2401-W Building will not be used for dangerous or
32 mixed waste storage in the future.

33 It is unknown if dangerous or mixed waste residues are present at this DWMU. If dangerous or mixed
34 waste residues are found during clean closure activities, then such residues will be removed and managed
35 as newly generated waste in accordance with Section H.3.7.

36 **H.3.2 Operating Records Review and Visual Inspection**

37 In 1999, closure of the 2401-W Building was considered. A records review of the 2401-W Building was
38 completed for records covering waste storage from May 1989 to June 1999. There was no sign of
39 dangerous or mixed waste contamination found from the records review. Documentation for the prior
40 closure efforts is included DOE/RL-99-46, *2401-W Waste Storage Building Closure Plan*.

1 To support the development of this closure plan, an additional records review of the CWC-WRAP
2 container storage, operating, and inspection records were completed and submitted to the operating
3 record. The records review included the following operating record documents: facility operating
4 logbooks (including spill reports), waste management inspection records, and surveillance records. The
5 operating records that were reviewed focused on the period during active waste storage for the CWC
6 continuing on from the prior 1999 records review (i.e., June 1999 through December 2000) including:

- 7 • CWC Outside Storage Area A.
- 8 • CWC Outside Storage Area B.
- 9 • 2401-W Building.

10 The records review extended past the active waste storage period to August 2013. The records review
11 indicated no releases of dangerous or mixed waste in the 2401-W Building. Table H-3 provides a
12 summary of the records review for this current closure plan.

13 **Table H-3 Operating Records Review Summary**

Document Title	Document Type	Timeframe of Records Reviewed		Items of Concern Noted
		Start Date	End Date	
CWC Inspection Checklist	Weekly Inspection	07/1999	12/2000	No
CWC Operating Log	Logbook	06/01/1999	August 2013	No

14
15 Mixed waste container data found during the records review are presented in Table H-4.

16 **Table H-4 Mixed Waste Container Data**

Container Quantity	Facility ID	Waste Package Type	Total Volume (m ²)	Waste Type	Beginning Storage Date	Ending Storage Date	Assigned Waste Codes
318	2401-W	Various	203.4	DW/MW	05/12/1989	12/18/2000	D001, D002, D003, D005, D006, D007, D008, D009, D011, D018, D019, D023, D030, D032, D033, D035, D036, D038, F001, F002, F003, F004, F005, U169, WP01, WP02, WSC2, WT01, WT02

DW/MW = Dangerous Waste/Mixed Waste
ID = identification

1 For the purposes of focused sampling, a visual inspection was performed by the Permittees for the visible
2 floor surface in the 2401-W Building on August 14, 2013, to identify any dangerous or mixed waste related
3 staining, major cracks, crevices, pits, low areas, or joints/seams. No dangerous or mixed waste related
4 staining, major cracks, crevices, pits, low areas, or joints/seams were identified during the visual
5 inspection.

6 Ecology and the Permittees performed an additional walkdown and inspection of the DWMU in
7 November of 2018. Ecology added six focused soil samples at locations where construction joints/seams
8 of the concrete floor intersect. Sample locations are identified in Figure H-7. Section H.4.4.1 provides
9 details on the sample design for the focused soil samples.

10 Ecology and the Permittees conducted the above inspections without removing stored equipment and non-
11 waste materials. Once all stored equipment and materials have been removed from the 2401-W Building
12 to support sampling and decontamination activities, an additional visual inspection will be performed by
13 the Permittees and Ecology (Section H.3.4).

14 Supporting documentation for the visual inspection is included in Attachment A, CWC 2401-W Building
15 Visual Inspection Documentation.

16 **H.3.3 Unit Components, Parts, and Ancillary Equipment**

17 The 2401-W Building does not have any unit components, parts, or ancillary equipment identified for
18 removal as part of closure. The sampling locations will be sealed after sampling, and the 2401-W
19 Building will remain in place pending confirmation and acceptance of clean closure.

20 **H.3.4 Inspection of Unit Before Decontamination**

21 Once closure activities begin, all stored equipment and material will be removed from the 2401-W
22 Building. A visual inspection of the floor surface by the Permittees and Ecology will be conducted to
23 identify any dangerous waste or mixed waste related staining, low points, joints/seams, cracks, holes, pits,
24 or breaches significant enough to allow contamination to reach underlying soil. Additional focused
25 sampling will be performed if the visual inspection identifies areas where waste has an avenue to reach
26 the underlying soil. If additional focused soil sampling is identified, the Permittees will submit a permit
27 modification request to modify the closure plan.

28 **H.3.5 Decontamination**

29 Decontamination of the concrete surface in the 2401-W Building DWMU will be performed by physically
30 extracting at least 0.6 cm (~1/4 in.) of the concrete surface layer, to a clean debris surface. A series of
31 cutter blades, impact hammers, rotating grinding wheels, or similar equipment will be used to break up
32 the concrete surface layer. Physical extraction techniques will be performed in accordance with 40 Code
33 of Federal Regulations (CFR) 268.45, Table 1, *Alternative Treatment Standards for Hazardous Debris*,
34 and will include one or more of the following:

- 35 • Abrasive blasting.
- 36 • Scarification, grinding, and planning.
- 37 • Spalling.

38 Decontamination includes the following steps:

- 39 1. Ensure all stored materials and equipment are relocated or removed from the area.
- 40 2. Seal all significant cracks including expansion joints identified during the visual inspection
41 (Section H.3.4) using an appropriate sealant material.
- 42 3. Decontaminate the concrete surface by removing at least 0.6 cm (~1/4 in.), to a clean debris
43 surface (as defined in Section H.5.1.1).

1 Residual material from decontamination activities will be managed as newly generated waste in
2 accordance with Section H.3.7.

3 Equipment used during decontamination and sampling will be decontaminated for re-use or disposed of
4 and managed as newly generated waste in accordance with Section H.3.7. A small temporary
5 decontamination area (approximately 10 by 20 feet) may be established near the 2401-W Building. This
6 area will be constructed of Visqueen™ or an equivalent material, and will be used for decontamination of
7 sampling equipment, personal protective equipment, and other miscellaneous small equipment used
8 during decontamination and sampling efforts. When decontamination of equipment is completed, the
9 Visqueen™ or equivalent material and rinsate will be removed and managed as newly generated waste in
10 accordance with Section H.3.7.

11 **H.3.6 Identifying and Managing Contaminated Environmental Media**

12 The records review and visual inspection outlined in Section H.3.2 did not identify any releases of
13 dangerous or mixed waste or the presence of staining that could be related to dangerous or mixed waste.
14 Contaminated environmental media (soil) removal is not anticipated. However, contaminated soil will be
15 remediated at the focused sample location(s) where analytical results indicate contamination.

16 If contamination above closure performance standards is identified, then the nature and extent of
17 contamination will be evaluated. Soil surrounding the focused sampling location will be removed up to
18 4.6 m (15 ft) below the surface. Contaminated soil will be removed using equipment capable of removing
19 the quantity of material required to complete removal. If contamination exists in the soil deeper than 4.6
20 m (15 ft), the Permittees will collaborate with Ecology for a path forward on closure.

21 Contaminated soil will be managed as a newly generated waste stream. Contaminated soil will be
22 managed in accordance with all applicable requirements of WAC 173-303-170, *Requirements for*
23 *generators of dangerous waste*, through 173-303-230, *Special conditions*. [WAC 173-303-610(5)]

24 The contaminated soil will be containerized, labeled, and sampled for waste characterization.
25 Contaminated soil will be placed in U.S. Department of Transportation-compliant containers and sent to a
26 RCRA permitted disposal facility or staged at central accumulation areas in accordance with all applicable
27 requirements of WAC 173-303-200, *Conditions for exemption for a large quantity generator that*
28 *accumulates dangerous waste*. Contaminated soil subject to the requirements of WAC 173-303-140,
29 *Land disposal restrictions*, (which includes by reference 40 Code of Federal Regulations [CFR] 268 Land
30 Disposal Restrictions) will be characterized, designated, and stored or treated, as applicable, prior to
31 disposal in a RCRA permitted disposal facility.

32 **H.3.7 Identifying and Managing Waste Generated During Closure**

33 Closure activities for the 2401-W Building will result in waste generated during closure activities,
34 requiring management and disposal. A vacuum-equipped system will remove dust and chips during
35 scarification, grinding, and planning to prevent release of possible contamination. Decontamination will
36 be performed during calm, dry weather to prevent possible releases. When decontamination activities are
37 performed near the edge of the concrete, tarps or similar material will be placed adjacent to the concrete
38 to catch any additional waste materials. Concrete and dust collected during closure activities for the
39 DWMU will be containerized, labeled, and sampled to properly characterize such waste prior to disposal.

40 Concrete will be removed from the surface layer of the floor to meet the clean debris surface standard,
41 concrete will also be removed to access the underlying soil for focused sampling. Any material that is
42 physically extracted will be managed as a newly generated waste stream in accordance with
43 WAC 173-303-610(5).

1 Newly generated waste will be managed in accordance with all applicable requirements of
2 WAC 173-303-170 173-303-230. Once waste characterization results are received, all waste will be
3 designated and shipped to a RCRA permitted facility for treatment, storage, or disposal. Dangerous and
4 mixed waste will be treated, if necessary, to meet land disposal restrictions in WAC 173-303-140 *Land*
5 *disposal restrictions*, (which incorporates by reference 40 CFR 268) then ultimately disposed in a RCRA
6 permitted waste disposal facility.

7 Management and disposal of waste generated during closure will be documented and included as part of
8 the clean closure certification documentation (Section H.5.3).

9 **H.3.8 Closure Performance Standards for Concrete and Soil**

10 The following subsections discuss closure performance standards for concrete and soil.

11 **H.3.8.1 Closure Performance Standards for Concrete**

12 For the 2401-W Building, the point of compliance, or location where it is determined that the closure
13 performance standard has been achieved, is the surface of the concrete flooring. On completion of
14 decontamination activities, the 2401-W Building will be visually inspected to verify that the clean debris
15 surface standard has been met (Section H.5.1.1).

16 **H.3.8.2 Closure Performance Standards for Soil**

17 The presumed exposure pathways considered for the 2401-W Waste Storage Building are:

- 18 • WAC 173-340-740(3), *Model Toxics Control Act (MTCA)—Cleanup, Unrestricted land use soil*
19 *cleanup standards*, Method B (cancer and noncancer), that considers human health based on
20 direct soil contact.
- 21 • WAC 173-340-740(2), Table 740-1, *Method A Soil Cleanup Levels for Unrestricted Land Uses*
22 (WAC 173-340-900), which includes closure performance standards for human health based on
23 unrestricted land use. MTCA Method A is only used if MTCA Method B is not available in the
24 Cleanup Levels and Risk Calculation tables.
- 25 • WAC 173-340-747, *Deriving soil concentrations for groundwater protection*, which notes soil
26 concentrations protective of groundwater.
- 27 • WAC 173-340-7493, *Site-specific terrestrial ecological evaluation procedures*, that considers
28 ecological indicators (plants, biota, wildlife) in Table 749-3, *Ecological Indicator Soil*
29 *Concentrations (mg/kg) for Protection of Terrestrial Plants and Animals* (WAC 173-340-900).
- 30 • WAC 173-340-750, *Cleanup standards to protect air quality*, that describes human health risks
31 due to fugitive vapors and dust.

32 Of the exposure pathways listed above, MTCA Method B direct soil contact, or Method A as applicable,
33 is always considered a complete and viable exposure pathway for all soil samples. The exposure pathway
34 for soil protective of groundwater assumes that water or rainwater on a surface has an avenue to percolate
35 through the surface and underlying soil to groundwater. The scenario for ecological indicators requires
36 that vegetation, biota, and wildlife be present in order for the pathway to be complete. The exposure
37 scenario for inhalation of fugitive vapors and dust assumes a complete pathway, which would begin with
38 a source of contaminated media and end with a receptor.

39 Of the viable exposure pathways, the most conservative closure performance standard is selected.
40 Per WAC 173-340-740(5)(c), the closure performance standard value cannot be below the following:

- 41 • Hanford Site background.
- 42 • Laboratory practical quantitation limit (PQL) found in the CHPRC laboratory contracts.

43 If a closure performance standard is below both values, the higher of these two values is selected.

1 A number of exposure pathways considered from the list above were determined to be incomplete
2 pathways and were excluded when determining closure performance standards. The records review of
3 waste stored in the 2401-W Waste Storage Building indicate no releases (Section H.3.2). Therefore, there
4 is no known waste-related source of contaminated media and the inhalation exposure pathway has been
5 excluded. The concrete floor is within a maintained building where no vegetation is present; therefore,
6 the soil pathway protective of ecological indicators has been excluded. When considering soil levels
7 protective of groundwater, there must be a route of exposure from water or rainwater to the underlying
8 soil. The 2401-W Waste Storage Building is an enclosed structure, with a foundation that is integrated
9 into a perimeter concrete curb 6 in. (15.2 cm) above grade. During operations, the floors (including
10 joints/seams) were coated with an epoxy resin floor surfacing system that was compatible with the
11 stored waste. The visual inspections (Section H.3.2) did not identify dangerous or mixed waste related
12 staining, major cracks, crevices, pits, or low areas. With no indication of a route of exposure from water
13 or rainwater to the underlying soil, the soil concentration protective of groundwater pathway was
14 excluded when calculating closure performance standards. The remaining applicable pathway for
15 evaluation of closure performance standards was direct contact with soil which, as noted in the previous
16 paragraph, is always a viable exposure pathway for soil samples.

17 Soil sampling and analysis will be conducted in accordance with the closure plan SAP located in
18 Section H.4. Analytical results of the soil samples will be individually compared to closure performance
19 standards consistent with closure requirements. [WAC 173-303-610(2)(b)(i)]

20 If target analytes are found above closure performance standards, then the contaminated soil will be
21 remediated and confirmatory sampling will be conducted in accordance with Section H.4.4.3 to ensure the
22 closure performance standards are met for the remaining soil. If failed constituents of concern do not
23 meet closure performance standards after soil remediation, then the Permittees will meet with Ecology to
24 determine a path forward for closure. The sample design for focused samples is discussed in
25 Section H.4.4.1.

26 **H.3.9 Development of Closure Performance Standards for Soil**

27 The target analytes considered for evaluation during closure sampling and analysis were derived from a
28 list of all waste codes identified at other CWC closure DWMUs. Table H-5 provides the closure
29 performance standards for soil for each individual target analyte associated with the dangerous waste
30 codes identified. A list of closure performance standard values for all exposure pathways was provided to
31 Ecology in July 2017 as correspondence from DOE (17-AMRP-0217, “Dangerous Waste Management
32 Unit [DWMU] 277-T Building Closure Plan Comment Disposition, and Performance Standards for
33 Future Solid Waste Operations Complex [SWOC] Closure Plans”), which Ecology acknowledged
34 (17-NWP-100, “Dangerous Waste Management Unit [DWMU] 277-T Building Closure Plan Comment
35 Disposition and Performance Standards for Future Solid Waste Operations Complex [SWOC] Closure
36 Plans”). Values in Table H-5 have been adjusted to remove nonviable pathways as noted above.

Table H-5 Closure Performance Standards for Soil and Analytical Performance Requirements

CAS Number	Waste Code(s) ^a	Analyte	Closure Performance Standards		PQL ^b (mg/kg)
			Value (mg/kg)	Basis	
SW-846 Method 6010			Accuracy Requirement ±20% Recovery^c Precision Requirement ≤35 RPD^d		
7440-38-2	D004	Arsenic ^e	2.00E+01	Background	1.00E+01
7440-39-3	D005	Barium	1.65E+03	Groundwater Protection	5.00E+00
7440-43-9	D006	Cadmium	6.90E-01	Groundwater Protection	5.00E-01
7439-92-1	D008	Lead	2.50E+02	Unrestricted Land Use (MTCA Method A)	5.00E+00
7782-49-2	D010	Selenium	1.00E+01	PQL	1.00E+01
7440-22-4	D011	Silver	1.36E+01	Groundwater Protection	1.00E+00
1314-62-1 (7440-62-2)	(P120)	Vanadium pentoxide (analyzed as vanadium)	4.00E+02	Human Health – Direct Contact (noncancer)	5.00E+00
SW-846 Method 6020			Accuracy Requirement ±20% Recovery^c Precision Requirement ≤35 RPD^d		
7440-38-2	D004	Arsenic ^e	2.00E+01	Background	1.00E+00
SW-846 method 7196			Accuracy Requirement ±20% Recovery^c Precision Requirement ≤35 RPD^d		
18540-29-9	D007	Chromium (Hexavalent)	5.00E-01	PQL	5.00E-01
SW-846 Method 7471			Accuracy Requirement ±20% Recovery^c Precision Requirement ≤35 RPD^d		
7439-97-6	D009	Mercury ^f	2.09E+00	Groundwater Protection	2.00E-01
SW-846 Method 8015			Accuracy Requirement ±30% Recovery^c Precision Requirement ≤30 RPD^d		
67-56-1	F003	Methanol	6.43E+01	Groundwater Protection	5.00E+01
SW-846 Method 8260			Accuracy Requirement ±30% Recovery^c Precision Requirement ≤20 RPD^d		
67-64-1	F003	Acetone	2.89E+01	Groundwater Protection	2.00E-02
71-43-2	D018, F005	Benzene	2.82E-02	Groundwater Protection	5.00E-03
71-36-3	U031, F003	<i>n</i> -Butyl alcohol (1-Butanol)	3.31E+00	Groundwater Protection	2.50E-01
75-15-0	F005, (P022)	Carbon disulfide	5.65E+00	Groundwater Protection	5.00E-03
56-23-5	D019, F001, F002	Carbon tetrachloride	4.60E-02	Groundwater Protection	5.00E-03
108-90-7	F002	Chlorobenzene	8.74E-01	Groundwater Protection	5.00E-03
67-66-3	D022	Chloroform	7.50E-02	Groundwater Protection	5.00E-03
108-94-1	F003, (U057)	Cyclohexanone	1.74E+02	Groundwater Protection	1.00E-01

Table H-5 Closure Performance Standards for Soil and Analytical Performance Requirements

CAS Number	Waste Code(s) ^a	Analyte	Closure Performance Standards		PQL ^b (mg/kg)
			Value (mg/kg)	Basis	
123-91-1	(U108)	1,4-Dioxane	1.00E+01	Human Health – Direct Contact (cancer)	5.00E-01
141-78-6	F003	Ethyl acetate	2.97E+01	Groundwater Protection	5.00E+00
100-41-4	F003	Ethylbenzene	6.05E+00	Groundwater Protection	5.00E-03
60-29-7	(U117), F003	Diethyl ether [ethyl ether, ethoxyethane, or 1,1'-oxybis-ethane]	6.85E+00	Groundwater Protection	1.00E-02
78-83-1	F005	Isobutanol	9.70E+00	Groundwater Protection	5.00E-01
78-93-3	D035, F005	Methyl ethyl ketone (MEK) (2-Butanone)	1.96E+01	Groundwater Protection	2.00E-02
108-10-1	F003, (U161)	Methyl isobutyl ketone (4-Methyl-2-Pentanone)	2.73E+00	Groundwater Protection	2.00E-02
75-09-2	F001, F002	Methylene chloride	2.18E-02	Groundwater Protection	5.00E-03
127-18-4	D039, F001, F002	Tetrachloroethylene	5.30E-02	Groundwater Protection	5.00E-03
109-99-9	(U213)	Tetrahydrofuran	3.00E+01	Groundwater Protection	1.00E+1
108-88-3	F005	Toluene	4.65E+00	Groundwater Protection	5.00E-03
71-55-6	F001, F002, (U226)	1,1,1-Trichloroethane	1.58E+00	Groundwater Protection	5.00E-03
79-00-5	F002	1,1,2-Trichloroethane	2.78E-02	Groundwater Protection	5.00E-03
79-01-6	D040, F001, F002	Trichloroethylene	2.64E-02	Groundwater Protection	5.00E-03
76-13-1	F001, F002	1,1,2-Trichloro-1,2,2-trifluoro ethane	1.11E+04	Groundwater Protection	1.00E-02
75-69-4	F002	Trichlorofluoromethane	2.82E+01	Groundwater Protection	1.00E-02
75-01-4	D043	Vinyl chloride	1.00E-02	PQL	1.00E-02
1330-20-7	F003	Xylenes (total)	1.46E+01	Groundwater Protection	1.00E-02
SW-846 Method 8270			Accuracy Requirement ±30% Recovery^c Precision Requirement ≤30 RPD^d		
95-48-7	F004	<i>o</i> -Cresol reported as total cresols ^g	2.33E+00	Groundwater Protection	3.33E-01
121-14-2	D030	2,4-Dinitrotoluene	3.33E-01	PQL	3.33E-01
95-50-1	F002	1,2-Dichlorobenzene (Ortho-dichlorobenzene)	7.03E+00	Groundwater Protection	3.33E-01
111-44-4	(U025)	bis (2-chloroethyl) ether (dichloroethyl ether)	3.33E-01	PQL	3.33E-01
67-72-1	D034	Hexachloroethane	3.33E-01	PQL	3.33E-01

Table H-5 Closure Performance Standards for Soil and Analytical Performance Requirements

CAS Number	Waste Code(s) ^a	Analyte	Closure Performance Standards		PQL ^b (mg/kg)
			Value (mg/kg)	Basis	
98-95-3	F004	Nitrobenzene	3.33E-01	PQL	3.33E-01
87-86-5	D037	Pentachlorophenol	6.60E-01	PQL	6.60E-01
110-86-1	F005	Pyridine	6.60E-01	PQL	6.60E-01
SW-846 Method 9012			Accuracy Requirement ±20% Recovery^c Precision Requirement ≤35 RPD^d		
57-12-5	(P030)	Cyanides, Total ^e (soluble cyanide salts)	4.80E+01	Human Health – Direct Contact (noncancer)	1.00E+00
SW-846 Method 9056			Accuracy Requirement ±20% Recovery^c Precision Requirement ≤35 RPD^d		
64-18-6	(U123)	Formic acid (measured as Formate)	7.20E+04	Human Health – Direct Contact (noncancer)	2.00E+00
Not Analyzed			Not Analyzed		
CAS Number	Waste Code(s)	Analyte	CAS Number	Waste Code(s)	Analyte
75-07-0	(U001)	Acetaldehyde ⁱ	1338-23-4	(U160)	MEK peroxide ^j (2-Butanone peroxide)
75-36-5	(U006)	Acetyl chloride ^j	79-46-9	F005	2-Nitropropane ⁱ
107-20-0	(P023)	Chloroacetaldehyde ^k	1314-80-3	(U189)	Phosphorus pentasulfide ^j
110-80-5	F005, (U359)	2-Ethoxyethanol ^l	N/A	F001, F002	Chlorinated fluorocarbons ^m

References:

- 17-AMRP-0217, “Dangerous Waste Management Unit (DWMU) 277-T Building Closure Plan Comment Disposition, and Performance Standards for Future Solid Waste Operations Complex (SWOC) Closure Plans.”
- 17-NWP-100, “Dangerous Waste Management Unit (DWMU) 277-T Building Closure Plan Comment Disposition and Performance Standards for Future Solid Waste Operations Complex (SWOC) Closure Plans.”
- DOE/RL-92-24, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*.
- ECF-HANFORD-11-0038, *Soil Background for Interim Use at the Hanford Site*.
- Ecology, 2005, Pub. #94-111, *Guidance for Clean Closure of Dangerous Waste Units and Facilities*. Section 5.6.2 states “...Ecology believes that MTCA unrestricted site use cleanup levels for soil represent very conservative assessments of the potential exposure risks posed by concrete.”
- Ecology, 2013, “Issues associated with Establishing Soil Cleanup Levels for arsenic.”
- Ecology, 2019, *Cleanup Levels and Risk Calculation (CLARC) Data Tables, Toxics Cleanup Program*.
- Howard et al., 1991, *Handbook of Environmental Degradation Rates*.
- SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*, Third Edition; Final Update V.
- WAC 173-340, *Model Toxics Control Act—Cleanup*.
- 173-340-740, *Unrestricted land use soil cleanup standards*.
- 173-340-747, *Deriving soil concentrations for groundwater protection*.

Notes: Screening levels considered when developing closure performance standards were drawn from the following:

- MTCA (WAC 173-340-740, *Model Toxics Control Act—Cleanup, Unrestricted land use soil cleanup standards*) (Ecology, 2019, *Cleanup Levels and Risk Calculation (CLARC) Tables, May 2019 data tables are the most recent*). MTCA Method B values represent both cancer and noncancer human health risk values from direct soil

Table H-5 Closure Performance Standards for Soil and Analytical Performance Requirements

CAS Number	Waste Code(s) ^a	Analyte	Closure Performance Standards		PQL ^b (mg/kg)
			Value (mg/kg)	Basis	

contact. The most conservative value of the two Method B published values will be used. Method A values are substituted when MTCA Method B values are not provided in the CLARC tables.

- WAC 173-340-747. Section 4 describes the fixed parameter three-phase partitioning model. Where applicable, these values were used. Values selected were from the 25°C vadose zone. If values were not listed for 25°C, values from the 13°C vadose zone were used.
 - Background levels as published in ECF-HANFORD-11-0038, *Soil Background for Interim Use at the Hanford Site*, and DOE/RL-92-24, *Hanford Site Background: Soil Background for Nonradioactive Analytes*. Background values were used at the 90th percentile of calculated Hanford background values.
 - Closure performance standard values for all exposure pathways were provided to Ecology in July 2017 correspondence from DOE (17-AMRP-0217) and which values Ecology acknowledged (17-NWP-100). Values in this table have been adjusted to remove nonviable pathways.
 - Values taken from the above resources that fell below background levels were not considered.
- a. Many of the chemicals listed in this table also have P and U waste codes associated with them (WAC 173-303-9903, *Discarded chemical products list*). (1) These codes are listed in the table because it is unknown whether or not the waste container had a “discarded chemical product” (per WAC 173-303-081) or if it was a chemical contaminant of the waste. (2) The P and U code designations do play a part in the determination of dangerous waste criteria (WAC 173-303-100), as they indicate that chemical as either acutely hazardous (P) or dangerous (U) waste based on toxicity and/or persistence calculations. For these reasons, the P and U codes are listed in parentheses.
- b. Highest allowable PQL will be defined in the individual laboratory contract with CHPRC. In practice, the laboratory PQL values have the potential to be lower.
- c. Accuracy criteria for associated batch matrix spike percent recoveries. Evaluation based on statistical control of laboratory control samples is also performed. Precision criteria for batch laboratory replicate matrix spike analyses or replicate sample analysis.
- d. Precision is determined by the laboratory based on historical data or statistically derived control limits. Limits are reported with the data. Where specific acceptance criteria are listed, those acceptance criteria may be used in place of statistically derived acceptance criteria.
- e. Arsenic – the Hanford Site closure performance standard is 20 mg/kg based (Ecology, 2013), indicating that the Method A soil closure performance standard of 20 mg/kg can be used to define natural background levels when developing Method B soil closure performance standards for the Hanford Site. One of the two methods (SW-846 6010 or 6020) may be used.
- f. Mercury – Equation 740-1 and Equation 740-2 from WAC 173-340-740(3)(b) are used to calculate the MTCA Direct Contact Human Health soil closure performance standards. The MTCA human health direct contact soil closure performance standard for mercury is calculated to be 24 mg/kg.
- g. Cresols – the closure performance standard for *o*-cresol will be reported as total cresols: a total of the three isomeric forms: *o*-cresol, *m*-cresol, and *p*-cresol.
- h. Cyanides – Copper (P029), potassium (P098), and sodium cyanides (P106), as well as other cyanide salts not specified will be analyzed as total cyanide.
- i. Acetaldehyde and 2-nitropropane are listed with inhalation values in the CLARC Tables. However, because the inhalation pathway is not being addressed as part of this closure plan, they will not be analyzed.
- j. Acetyl chloride, MEK peroxide, and phosphorus pentasulfide are not listed in the CLARC Tables. They would most likely be inhalation hazards if present (based on NIOSH chemical hazard data), so they are not being calculated as closure performance standards and will not be analyzed.
- k. Chloroacetaldehyde – No previous records of analysis on the Hanford Site. CAS is not listed in CLARC tables. Chloroacetaldehyde is not listed in the CLARC Tables. It would most likely be an inhalation hazard if present, so it is not being calculated as a closure performance standard and will not be analyzed.
- l. 2-Ethoxyethanol – Due to the extremely short half-life of 2-ethoxyethanol (between 168 and 672 hours), its presence in soil samples is highly unlikely; therefore, samples will not be analyzed for this constituent. Degradation rates from Howard et al., 1991, p. 420.

Table H-5 Closure Performance Standards for Soil and Analytical Performance Requirements

CAS Number	Waste Code(s) ^a	Analyte	Closure Performance Standards		PQL ^b (mg/kg)
			Value (mg/kg)	Basis	

m. A CFC is an organic compound that contains only carbon, chlorine, and fluorine, produced as a volatile derivative of methane, ethane, and propane. Examples of CFCs include 1,1,2-trichloro-1,2,2-trifluoroethane (CFC-133) and trifluoromethane (CFC-11).

CAS = Chemical Abstracts Service

CHPRC = CH2M HILL Plateau Remediation Company

CFC = chlorofluorocarbon

CLARC = Cleanup Levels and Risk Calculation

MTCA = *Model Toxics Control Act–Cleanup*

N/A = not applicable

PQL = practical quantitation limit

RPD = relative percent difference

1

2 **H.3.10 Conditions that will be Achieved when Closure is Complete**

3 Upon completion of the closure activities, the 2401-W Building will remain in an “as-is” state with the
4 building remaining in place, and the focused soil sampling locations capped after sampling. The 2401-W
5 Building will continue to be used for equipment and material storage in support of CWC-WRAP
6 operations. Once Ecology accepts the clean closure certification, a permit modification request will be
7 submitted to remove the 2401-W Building DWMU from the Permit.

8 **H.4 Sampling and Analysis Plan**

9 Sampling and analysis of the soil below the 2401-W Building will be conducted to confirm whether
10 closure performance standards have been met. Sampling includes six focused soil samples (Figure H-7).
11 Sampling and analysis will be performed in accordance with the sampling and quality standards
12 established in this closure SAP.

13 **H.4.1 Sampling and Analysis Plan Requirements**

14 Sampling and analysis activities were designed using the EPA guidance document EPA/240/R-02/005,
15 *Guidance on Choosing a Sampling Design for Environmental Data Collection for Use in Developing a*
16 *Quality Assurance Project Plan* (EPA QA/G-5S) and Ecology Publication #94-111, and will be conducted
17 via this SAP. The objective of the soil sampling described in this section is to determine if the closure
18 performance standards (Table H-5) established in this closure plan pursuant to WAC 173-303-610(2)(b)(i)
19 and WAC 173-303-610(2)(b)(ii) have been satisfied, demonstrating clean closure for the 2401-W
20 Building.

21 The closure SAP details sampling and analysis procedures in accordance with SW-846, *Test Methods for*
22 *Evaluating Solid Waste: Physical/Chemical Methods*, Third Edition; Final Update V; the American
23 Society for Testing and Materials (ASTM) *Annual Book of ASTM Standards* (ASTM International, 2017);
24 and applicable EPA guidance. Sampling and analysis activities will meet applicable requirements of
25 SW-846, ASTM standards, and EPA-approved methods at the time of closure. This SAP was also
26 developed using guidance from Ecology Publication #94-111, Section 7.0, Sampling and Analysis for
27 Clean Closure, and EPA/240/R-02/005.

28 **H.4.2 Sampling and Analysis Schedule**

29 Closure sampling and analysis will be performed in accordance with the closure plan schedule located in
30 Section H.6.

1 **H.4.3 Project Management**

2 The following subsections address project management and ensure that the project has defined goals,
3 participants understand the goals and approaches used, and planned outputs are appropriately
4 documented. Project management roles and responsibilities discussed in this section apply to the major
5 activities covered under this SAP.

6 **H.4.3.1 Project/Task Organization**

7 The Permittees are responsible for planning, coordinating, sampling, preparing, packaging, and shipping
8 samples to the contract analytical laboratory. The project has the following key positions.

9 **Regulatory Representative.** Ecology will assign an Ecology employee as Project Manager responsible
10 for oversight of the 2401-W Building closure.

11 **Project Manager and Technical Lead.** The CHPRC Project Manager provides oversight of closure
12 activities and coordinates with the DOE, Richland Operations Office (DOE-RL), Ecology, and contract
13 management. In addition, support is provided to the project technical lead to ensure that work is
14 performed safely and cost effectively.

15 The Project Manager (or designee) for the 2401-W Building closure sampling is responsible for direct
16 management of sampling documents and requirements, field activities, and subcontracted tasks.

17 The Project Manager is responsible for ensuring that project personnel are working to the approved
18 version of the 2401-W Building Closure Plan in the Permit and for providing updates to field personnel.

19 The Project Manager works closely with QA, Health and Safety, and the Field Work Supervisor (FWS) to
20 integrate these and other lead disciplines in planning and implementing the work scope. The Project
21 Manager also coordinates with DOE-RL and the primary contractor management on all sampling
22 activities. The Project Manager supports DOE-RL in coordinating sampling activities with the
23 Regulatory Representative.

24 **Environmental Compliance Officer.** The Environmental Compliance Officer provides technical
25 oversight, direction, and acceptance of project and subcontracted environmental work, and develops
26 appropriate mitigation measures with a goal of minimizing adverse environmental impacts.

27 **Health and Safety.** The Health and Safety organization is responsible for coordinating industrial safety
28 and health support within the project, as carried out through health and safety plans, job hazard analyses,
29 and other pertinent safety documents required by federal regulation or internal primary contractor work
30 requirements.

31 **Waste Management Lead.** The Waste Management Lead communicates policies and protocols, and
32 ensures project compliance for storage, transportation, disposal, and waste tracking.

33 **Field Work Supervisor.** The FWS is responsible for planning and coordinating field sampling resources.
34 The FWS ensures that samplers are appropriately trained and available. Additional related responsibilities
35 include ensuring that the sampling design is achievable, understood, and can be performed as specified.

36 The FWS must document all deviations from procedures or other problems pertaining to sample
37 collection, chain of custody (COC) protocols, analytes, sample analysis, sample transport, or
38 noncompliant monitoring. As appropriate, such deviations or problems will be documented in the field
39 logbook or in nonconformance report forms in accordance with internal corrective action procedures.

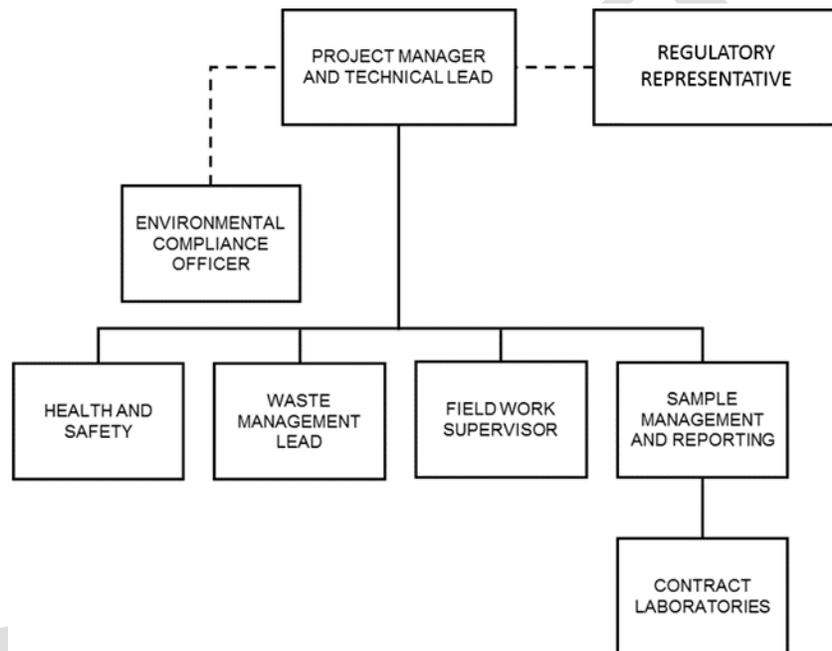
40 The FWS is responsible for communicating field corrective actions to the Project Manager and for
41 ensuring that immediate corrective actions are applied to field activities.

1 **Sample Management and Reporting.** The Permittee’s sampling organization coordinates field
2 sampling as well as laboratory analytical work, ensuring that laboratories conform to the specifications of
3 SW-846 analytical methodology at the time of closure. The sampling organization receives the analytical
4 data from the laboratories, performs the data entry into the Hanford Environmental Information System
5 (HEIS) database, and arranges for data validation. The sampling organization is responsible for
6 informing the Project Manager of any issues reported by the contract analytical laboratory.

7 **Contract Laboratories.** The contract laboratories analyze samples in accordance with established
8 procedures and provide necessary sample reports and explanation of results in support of data validation.

9 The roles described above make up the project organization structure (regarding sampling and analysis)
10 and interact in a manner shown graphically in Figure H-6.

11



12 **Figure H-6 Sampling and Analysis Plan Project Organization**

13

14 **H.4.3.2 Field Sampler Training/Certification**

15 Training records of field samplers are maintained by the sampling organization, retained in the electronic
16 training record database, or archived with operating records. Field samplers will be collecting grab
17 samples of the soil beneath the concrete floor for analysis to determine if soil closure performance
18 standards have been met.

19 **H.4.3.3 Sampling Documents and Records**

20 The Project Manager is responsible for ensuring that the current version of the SAP is being used and
21 providing any updates to field personnel. Version control is maintained by the administrative document
22 control process. Changes to the SAP affecting the data needs will be submitted as a permit modification
23 request.

1 Logbooks are required for field activities. A logbook must be identified with a unique project name and
2 number. The individual(s) responsible for logbooks will be identified in the front of the logbook and only
3 authorized persons may make entries in logbooks. After review, logbooks will be signed by the field
4 manager, supervisor, cognizant scientist/engineer, or other responsible individual. Logbooks will be
5 permanently bound, waterproof, and ruled with sequentially numbered pages. Pages will not be removed
6 from logbooks for any reason. Entries will be made in indelible ink. Corrections will be made by
7 marking through the erroneous data with a single line, entering the correct data, and initialing and dating
8 the changes.

9 The Project Manager is responsible for ensuring that a project file is properly maintained. The project file
10 will contain the records or references to their storage locations. The following items will be included in
11 the project file, as appropriate:

- 12 • Field logbooks or operational records.
- 13 • Global positioning system data.
- 14 • Sample authorization forms.
- 15 • Data forms.
- 16 • COC forms.
- 17 • Sample receipt records.
- 18 • Inspection or assessment reports and corrective action reports.
- 19 • Interim progress reports.
- 20 • Final reports.
- 21 • Laboratory data packages.
- 22 • Data verification and validation reports.

23 The contract analytical laboratory is responsible for maintaining, and having available upon request, the
24 following items:

- 25 • Analytical logbooks.
- 26 • Raw data and Quality Control (QC) sample records.
- 27 • Standard reference material or proficiency test sample data.
- 28 • Instrument calibration information.

29 Records may be stored in either electronic or hard copy format. Documentation and records, regardless
30 of medium or format, are controlled in accordance with internal work requirements and processes to
31 ensure the accuracy and retrievability of stored records. Records required by the Tri-Party Agreement
32 (Ecology et al., 1989, [Hanford Federal Facility Agreement and Consent Order](#)) will be managed in
33 accordance with the requirements therein.

34 **H.4.4 Sampling Design and Analysis**

35 The sampling design includes input parameters used to determine the number and location of samples.
36 The primary purpose of sampling the soil is to determine if analytical results meet closure performance
37 standards (Table H-5)

38 **H.4.4.1 Sampling Process Design**

39 This SAP takes guidance from Ecology Publication #94-111, Section 7.0, to determine the type of
40 sampling design that will be used to demonstrate clean closure. When designing the sampling plan,
41 focused sampling methods were considered. The basis for sampling is described in the following
42 paragraphs.

1 **Focused (Judgmental) Sampling.** As identified in Ecology Publication #94-111, Section 7.2.2, Focused
2 Sampling, this method is selective sampling of areas where contamination is expected or releases have
3 been documented.

4 Focused sampling should be conducted in addition to grid sampling where there is evidence of leaks or
5 spills or potential for a dangerous waste constituent to migrate. Focused sampling could involve liner
6 sampling along a drainage-way, boundary, or other linear dimension. Likely areas for focused sampling
7 include, but are not limited to:

- 8 • Containers, tanks, waste piles, or any other units (such as ancillary pipes) in contact with soil;
- 9 • Below any sumps or valves;
- 10 • Load or unload areas;
- 11 • Storage units with underlying pavements or concrete that appears to be cracked or broken; and
- 12 • Areas receiving runoff or discharge from DWMUs, such as a ditch, a swale, or the discharge
13 point down gradient from a pipe.

14 Evidence for additional areas of focused sampling could include:

- 15 • Visual or olfactory evidence of contamination including evidence based on direct reading field
16 instrumentation or field test kits;
- 17 • Knowledge, such as reports by employees, inspectors, or others that releases have or may have
18 occurred;
- 19 • Length of time the unit has been in existence;
- 20 • Entries into the unit operating record; and
- 21 • Soil gas surveys or soil borings.

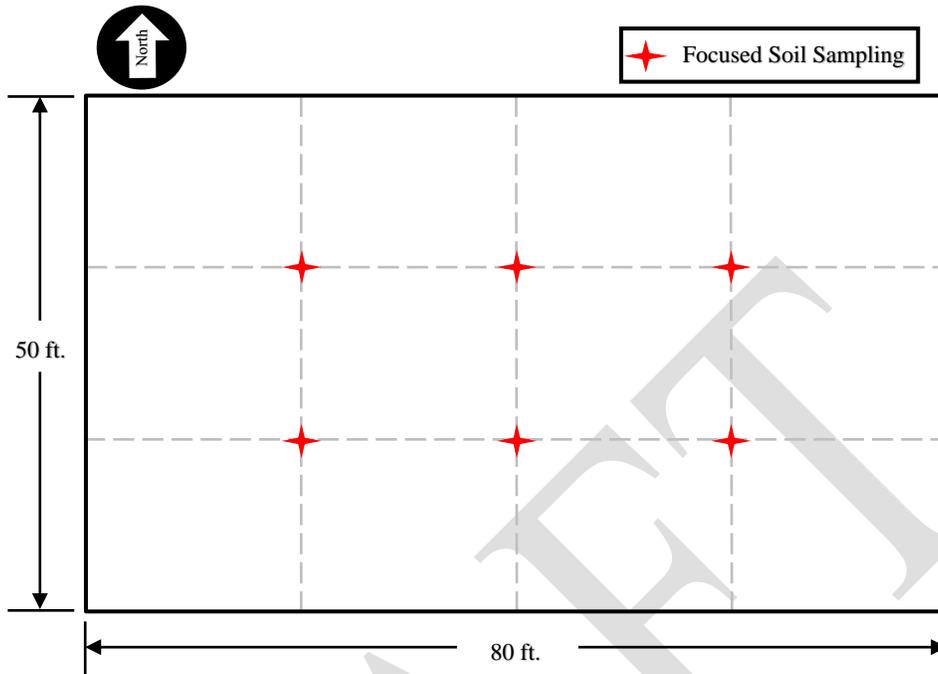
22 Per Ecology's visual inspection (Section H.3.2) and additional professional judgment, six focused sample
23 locations are identified for the soil beneath the 2401-W Building (Figure H-7).

24 The intersections where two construction joints/seams meet are considered possible avenues for waste to
25 migrate to the soil below the concrete; therefore, these locations were identified for focused soil sampling.

26 Selection of focused sampling units (i.e., the number and location of samples) is generally based on
27 knowledge of the feature or condition under investigation and on professional judgment. Focused
28 sampling is distinguished from probability-based sampling in that inferences are based on professional
29 judgment, not statistical scientific theory. Therefore, conclusions about the target population are limited
30 and depend entirely on the validity and accuracy of professional judgment.

31 The use of statistical evaluation for focused data is not possible. Any focused data must be reviewed
32 directly against the closure performance standards as to whether they are above or below the standards.

1



2 **Figure H-7 Sampling Locations**

2

3

4 **H.4.4.2 Sampling Methods and Handling**

5 The grab sample matrix will consist of soil collected in clean sample containers. Soil will be collected at
6 a depth of no more than 15 cm (6 in.) below ground surface, unless staining or discoloration indicates
7 contamination is below that depth. For the purpose of this SAP, ground surface is defined as the exposed
8 surface layer once concrete has been removed. Once the soil is collected, the sampled media will be
9 screened to remove material larger than approximately 2 mm (0.08 in.) in diameter, which allows for a
10 larger surface area-to-volume ratio. This ratio increases the likelihood of identifying any potential
11 contamination in the sample.

12 To ensure sample and data usability, sampling will be performed in accordance with established sampling
13 practices, procedures, and requirements pertaining to sample collection, collection equipment, and sample
14 handling. Sampling includes the following:

- 15 • Preparation and review of sampling paperwork such as COC or labels.
- 16 • Sample container and equipment preparation.
- 17 • Field walkdown of sample area (includes locating and marking sample locations).
- 18 • Sample collection.
- 19 • Sample packaging and shipping.

20 Sample preservation and holding time requirements are specified in Table H-6. These requirements are in
21 accordance with the analytical method specified. The final container type and volumes will be identified
22 on the sampling authorization form and the COC form.

Table H-6 Preservation, Container, and Holding Time Requirements for Soil Samples

EPA Method	Analysis (Analytes)	Preservation Requirement	Holding Time	Bottle Type
6010	ICP-AES (Metals)	None	180 days	G/P
6020	ICP-MS (Metals)	None	180 days	G/P
7196	Colorimetric (Hexavalent Chromium)	Cool to $\leq 6^{\circ}\text{C}$	30 days from sampling to extraction; 7 days from extraction to analysis	G/P
7471	Cold Vapor Atomic Absorption (Mercury)	Cool to $\leq 6^{\circ}\text{C}$	28 days	G/P
8015	GC/Flame Ionization Detector (Non-halogenated Organics [Methanol])	Cool to $\leq 6^{\circ}\text{C}$	14 days	G
8260	GC/MS (Volatile Organic Compounds)	Frozen*	14 days	G
8270	GC/MS (Semivolatile Organic Compounds)	Cool to $\leq 6^{\circ}\text{C}$	14 days from sampling to extraction; 40 days from extraction to analysis	Amber Glass

Reference: SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*, Third Edition, Final Update V.

*Preservation techniques for soil samples collected include refrigeration immediately following collection (placing on ice) and freezing overnight prior to shipping. Holding times are from sampling to analysis unless specified otherwise.

AES = atomic emission spectrometry

ICP = inductively coupled plasma

EPA = U.S. Environmental Protection Agency

MS = mass spectrometry

GC = gas chromatography

G/P = glass/plastic

- 1
- 2 A sampling and data-tracking database (e.g., HEIS) is used to track the samples from the point of
- 3 collection through the laboratory analysis process. HEIS sample numbers are issued to the sampling
- 4 organization for the project. Each sample is identified and labeled with a unique HEIS sample number.
- 5 To prevent potential contamination of the samples, clean equipment will be used for each sampling
- 6 activity. Equipment used during sampling will be decontaminated or disposed of and managed as newly
- 7 generated waste in accordance with Section H.3.6. Level I EPA pre-cleaned sample containers will be
- 8 used for samples collected for chemical analysis. Container sizes may vary, depending on laboratory-
- 9 specific volumes/requirements for meeting the PQL.
- 10 The date and time of sample collection, and the sample location, depth, and corresponding HEIS numbers
- 11 will be documented in the sampler's field logbook. A custody seal (e.g., evidence tape) will be affixed to
- 12 each sample container (except for Volatile Organic Analysis [VOA] sample containers) or the sample
- 13 collection package in such a way as to indicate potential tampering. The custody seal will be inscribed
- 14 with the sampler's initials and date. Custody tape is not applied directly to VOA sample containers based
- 15 on the potential for affecting analyte results or fouling of laboratory equipment. Alternatively, VOA vials
- 16 are placed in a sealable plastic bag affixed with custody seals and any other required
- 17 labels/documentation.

1 Data verification and validation will also note any issues with sample collection and analysis. Each
2 sample container will be labeled with the following information on firmly affixed, water-resistant labels:

- 3 • Sample authorization form and form number.
- 4 • HEIS number.
- 5 • Sample collection date and time.
- 6 • Sampler identification (e.g., initials).
- 7 • Analysis required.
- 8 • Preservation method (if applicable).
- 9 • COC identification number.

10 In addition to the container label information, sample records must include:

- 11 • Sample location.
- 12 • Matrix (e.g., soil).

13 Sample custody will be maintained in accordance with existing Hanford Facility protocols to ensure
14 maintenance of sample integrity throughout the analytical process. COC protocols will be followed
15 throughout sample collection, transfer, analysis, and disposal to ensure that sample integrity is
16 maintained. A COC record is initiated in the field at the time of sampling and will accompany each set of
17 samples shipped to any laboratory. At a minimum, the following information must be identified on a
18 completed COC record:

- 19 • Collector(s) names.
- 20 • Project designation.
- 21 • Unique sample numbers.
- 22 • Date, time, and location (or traceable reference thereto) of sample collection.
- 23 • Chain of possession information (i.e., signatures/printed names of all individuals involved in the
24 transfer of sample custody and storage locations, dates of receipt and relinquishment).

25 Additional information regarding the sample and specific analytical instructions may also be documented.

26 Discrepancies with the sample material (unusual color, texture, or odor), collection techniques, containers,
27 or transfer packages are noted in the field logbook, communicated with the Project Manager, and
28 corrective actions are initiated. For example, where a custody seal is damaged or missing, each case is
29 individually reviewed for usability of the sample. The damaged or missing seal and action taken will be
30 documented in the final data package. Data verification and validation will also note any issues with
31 sample collection and analysis.

32 Contaminated environmental media and newly generated waste resulting from sampling activities will be
33 handled in accordance with all applicable requirements of WAC 173-303-170 through WAC 173-303-230
34 as outlined in Sections H.3.6 and H.3.7.

35 **H.4.4.3 Sampling and Analysis Requirements to Address Removal of Contaminated Soil**

36 If focused soil sample results based on direct comparison (Section H.4.4.1) indicate contamination above
37 closure performance standards, then sample location(s) will be remediated to remove contaminated soil.
38 Following remediation, confirmatory sampling will be performed. Analytical results of confirmatory
39 sample(s) collected at focused sample location(s) will be directly compared to the closure performance
40 standards to confirm remediation efforts were effective and the area is clean. If after remediation the soil
41 does not meet closure performance standards, then the Permittees will meet with Ecology to determine a
42 path forward for closure.

1 **H.4.4.4 Analytical Methods**

2 All analyses and testing will be performed consistent with this closure plan, laboratory contracts, and
3 laboratory analytical procedures at the time of closure. The contracted analytical laboratory must achieve
4 the lowest PQLs consistent with the selected analytical method (identified in Table H-5) in order to
5 confirm that the closure performance standards are met.

6 **H.4.4.5 Quality Control**

7 QC procedures must be followed in the field and laboratory to ensure that reliable data are obtained.
8 Field QC samples will be collected to evaluate the potential for cross-contamination and provide
9 information pertinent to field sampling variability. Field QC samples include the collection of:

- 10 • Field trip blanks.
- 11 • Field transfer blanks.
- 12 • Equipment rinsate blanks.
- 13 • Field duplicates.

14 Laboratory QC samples estimate the precision and bias of the analytical data. Laboratory QC samples
15 include:

- 16 • Method blanks.
- 17 • Laboratory duplicates.
- 18 • Matrix spikes.
- 19 • Matrix spike duplicates.
- 20 • Surrogates.
- 21 • Laboratory control samples.

22 Field and laboratory QC samples are summarized in Table H-7.

23

Table H-7 Project Quality Control Sampling Summary

QC Sample Type	Frequency	Characteristics Evaluated
Field QC		
Field Trip Blanks	One per 20 samples, minimum of one per decision unit	Field trip blanks are used to assess contamination from sample containers or during transportation and storage procedures.
Field Transfer Blanks	One per day that volatile organic compounds are sampled	Field transfer blanks are used to assess contamination from surrounding sources during sample collection.
Equipment Rinsate Blanks	One per 20 samples per analytical method	Equipment rinsate blanks are used to measure the cleanliness of sampling equipment and effectiveness of equipment decontamination procedures. Equipment rinsate blanks are not required if only disposable equipment is used, or if rinsing between samples is not practical (e.g., core drilling equipment).

Table H-7 Project Quality Control Sampling Summary

QC Sample Type	Frequency	Characteristics Evaluated
Field Duplicates	One per 20 samples with a minimum of one per decision unit	Field duplicates are used to assess the precision of the entire data collection activity, including sampling, analysis, and site heterogeneity.
Laboratory QC*		
Method Blanks	One per batch	Method blanks measure contamination associated with laboratory sample preparation and analysis.
Laboratory Duplicates	One per laboratory analytical batch	Laboratory duplicates measure laboratory reproducibility and precision.
Matrix Spikes	One per laboratory analytical batch	The matrix spike recovery measures the effects of interferences in the sample matrix and reflects the accuracy of the determination.
Matrix Spike Duplicates	One per laboratory analytical batch	The relative percent difference between matrix spikes and matrix spike duplicates measures the precision of a given analysis.
Surrogates	Added to each sample and QC (laboratory and field) sample	Surrogate standards are added prior to extraction of the sample to evaluate accuracy, method performance, and extraction efficiency.
Laboratory Control Samples	One per laboratory analytical batch	The laboratory control samples measure the accuracy of the analytical method.

*Batching across projects is allowed for similar matrices.

1

2 **H.4.5 Data Review, Verification, Validation, and Usability Requirements**

3 Analytical results will be received from the contract analytical laboratory, loaded into a database
4 (e.g., HEIS), and verified in accordance with Section H.4.5.1. A total of 5% of the data will be validated
5 as described in Section H.4.5.2. A data quality assessment (DQA) will be conducted to ensure the output
6 of the DQO process provided appropriate values (Section H.4.5.3).

7 **H.4.5.1 Data Verification**

8 Verification activities ensure analytical data in the database were properly uploaded and reflect the
9 contract laboratory program equivalent data packages. The steps outlined below will consider both the
10 primary and QC samples. Activities will include, but are not limited to, the following;

- 11 • Amount of data requested matches the amount of data received (number of samples for requested
12 methods of analytes).
- 13 • Correct procedures/methods are used.
- 14 • Issues with sample collection and analysis are noted.
- 15 • Documentation/deliverables are complete.
- 16 • Hard copy and electronic versions of the data are identical.
- 17 • Data is reasonable based on analytical methodologies.

1 **H.4.5.2 Data Validation**

2 The contract analytical laboratory supplies the equivalent of contract laboratory program analytical data
3 packages intended to support data validation by the third party. These data packages are supported by QC
4 test results and raw data. Data validation includes both primary and QC samples, and considers issues
5 with sample collection and analysis.

6 Controls are in place to preserve the data sent to the validators, such as allowing only additions to be
7 made, not changes to the raw data. The format and requirements for data validation activities are based
8 on the most current version of EPA-540-R-08-01, *National Functional Guidelines for Superfund Organic*
9 *Methods Data Review* (OSWER 9240.1-48), and EPA-540-R-10-011, *National Functional Guidelines for*
10 *Inorganic Superfund Data Review* (OSWER 9240.1-51). As defined by the validation guidelines, 5% of
11 the analytical results will undergo Level C validation.

12 **H.4.5.3 Data Quality Assessment**

13 A DQA will be performed on the final data using the guidance in EPA/240/B-06/002, *Data Quality*
14 *Assessment: A Reviewer's Guide* (EPA QA/G-9R), and implementing the specific requirements in
15 Sections H.4.5.1 through H.4.5.2.

16 **H.4.6 Revisions to the Sampling and Analysis Plan and Constituents to be Analyzed**

17 Changes to the SAP may be necessary due to unexpected events during closure. An unexpected event
18 would be an event outside the scope of the SAP or a condition that inhibits implementation of the SAP as
19 written. Revisions to the SAP will be submitted no later than 30 days after the unexpected event as a
20 permit modification request. [WAC 173-303-610(3)(b)]

21 **H.5 Confirmation and Certification of Closure Activities**

22 Confirmation of closure will be performed using methods defined in Section H.5.1. Closure certification
23 is performed by an Independent Qualified Registered Professional Engineer (IQRPE) (Section H.5.2).
24 Certification will be submitted to Ecology as described in Section H.5.3, and the conditions of the
25 DWMU after closure are described in Section H.3.10. The 2401-W Building will remain intact after
26 closure. The timing of closure is described in Section H.6.

27 **H.5.1 Confirmation of Clean Closure**

28 The 2401-W Building will be clean closed through confirmation of successful decontamination of the
29 concrete by removing at least 0.6 cm (~1/4 in.) of the surface to a clean debris surface (Section H.5.1.1);
30 and confirmation that samples of the underlying soil meet soil closure performance standards (Table H-5).

31 **H.5.1.1 Confirmation of Clean Debris Surface**

32 On completion of decontamination of the concrete surface, the area will be visually inspected to verify
33 whether the clean debris surface standard has been met.

34 The following definition of a "clean debris surface" standard is identified in 40 CFR 268.45, Table 1,
35 footnote 3:

36 "Clean debris surface" means the surface, when viewed without magnification, shall be
37 free of all visible contaminated soil and hazardous waste except that residual staining
38 from soil and waste consisting of light shadows, slight streaks, or minor discolorations,
39 and soil and waste in cracks, crevices, and pits may be present provided that such staining
40 and waste and soil in cracks, crevices, and pits shall be limited to no more than 5% of
41 each square inch of surface area."

1 This confirmation step will be documented. Documentation may include photos, locations and
2 dimensions of residual staining or waste remaining, cracks, crevices, or pits (if any). Staining or waste
3 remaining on the surface should be calculated to confirm whether the impacted area is less than 5% of the
4 surface. Once it has been determined that the clean debris surface standard has been met, then the
5 concrete surfaces shall have achieved the closure performance standard for concrete, and that portion of
6 2401-W Building will be considered clean.

7 If a clean debris surface is not achieved for the concrete surfaces after initial treatment the Permittees will
8 continue to remove additional layers of concrete to achieve a clean debris surface. If a clean debris
9 surface cannot be achieved then the Permittees will meet with Ecology to determine a path forward for
10 closure.

11 **H.5.1.2 Confirmation of Soil Sample Results**

12 Soil sample results from the contract analytical laboratory will be reviewed to confirm that target analytes
13 have met closure performance standards (Table H-5). Once it has been determined that soil sample
14 results have met closure performance standards, then the soil beneath the 2401-W Building will be
15 considered clean.

16 Once clean closure has been confirmed for the 2401-W Waste Storage Building DWMU, a closure
17 certification will be prepared in accordance with Section H.5.3.

18 **H.5.2 Role of the Independent Qualified Registered Professional Engineer**

19 An IQRPE will be retained to provide certification of the closure as required by WAC 173-303-610(6).
20 The IQRPE will be responsible for observing field activities and reviewing documents associated with
21 clean closure of the 2401-W Building. At a minimum, the following field activities will be completed:

- 22 • Observe and/or review equipment removal activities and disposition records.
- 23 • Review 2401-W Waste Storage Building visual inspection documentation.
- 24 • Observe and/or review decontamination of the 2401-W Building concrete surface.
- 25 • Verify that the concrete surface meets the clean debris surface standard.
- 26 • Verify the locations of soil samples are as specified in the SAP.
- 27 • Observe and/or review soil sampling activities.
- 28 • Review sampling procedures and results.
- 29 • Observe and/or review contaminated environmental media removal (as applicable).
- 30 • Observe and/or review newly generated waste management and disposition records.
- 31 • Verify that closure activities were performed in accordance with this closure plan.

32 The IQRPE will record observations and reviews in a written report that will be retained in the operating
33 record. The resulting report will be used to develop the clean closure certification, which will then be
34 submitted to Ecology.

35 **H.5.3 Closure Certification**

36 Within 60 days of completion of closure of the 2401-W Building DWMU, a certification that the DWMU
37 has been closed in accordance with the specifications in this closure plan will be submitted to Ecology by
38 registered mail. The certification will be signed by the Permittees and by the IQRPE.

39 At the time of the closure certification submittal, the Permittees will submit to Ecology information to
40 support the closure certification. [WAC 173-303-610(6)]

1 The supporting information will include at least the following:

- 2 • All field notes and photographs related to closure activities.
- 3 • A description of any minor deviations from this closure plan and justification for these deviations.
- 4 • Documentation of the removal and final disposition of any unanticipated contaminated
- 5 environmental media.
- 6 • Documentation of the removal and final disposition of any newly generated waste.
- 7 • All laboratory and/or field data, including sampling procedures, sampling locations, QA/QC
- 8 samples, and COC procedures for all samples and measurements, including samples and
- 9 measurements taken to determine background conditions and determine or confirm clean closure.
- 10 • A summary report that identifies and describes the data reviewed by the IQRPE, and tabulation of
- 11 the analytical results of samples taken to determine and confirm clean closure performance
- 12 standards were met.
- 13 • Description of the 2401-W Building DWMU appearance at completion of closure, including what
- 14 parts of the former unit, if any, will remain after closure.

15 **H.6 Closure Schedule and Time Frame**

16 Closure activities will be completed no more than 180 days after the effective date of the approved permit
17 modification incorporating this closure plan. [WAC 173-303-610(4)(b)]

18 Should an unexpected event occur and an extension to the 180-day closure activity expiration date be
19 deemed necessary, a permit modification request will be submitted to Ecology for approval at least
20 30 days prior to expiration of the 180 days. [WAC 173-303-610(4)(c)]

21 The permit modification request will include the statement that closure activities, will of necessity, take
22 longer than 180 days to complete, including the supporting basis for the statement. The permit
23 modification request will also include necessary information demonstrating that all steps to prevent
24 threats to HHE have been and will continue to be taken, including compliance with all applicable permit
25 requirements. [WAC 173-303-610(4)(b)]

26 The closure certification will be submitted to Ecology within 60 days following completion of closure
27 activities at the 2401-W Building DWMU (Table H-8 and Figure H-8).

28

Table H-8 2401-W Waste Storage Building Dangerous Waste Management Unit Closure Schedule

Closure Activity Description		
Activity	Description	Duration
Closure Activities		
Remove All Waste	Package and ship dangerous or mixed waste to a RCRA permitted facility for treatment, storage, or disposal.	Completed (Section H.3.1)
Records Review	Perform review of 2401-W Building container storage, operating, and inspection records.	Completed (Section H.3.2)
	Inspect floor surface for dangerous and mixed waste-related staining.	

Table H-8 2401-W Waste Storage Building Dangerous Waste Management Unit Closure Schedule

Closure Activity Description		
Perform Initial Visual Inspection of 2401-W Waste Storage Building	Inspect for visible holes, cracks, crevices, pits, or other breaches in structural integrity Identify focused sampling locations (as applicable).	Completed (Section H.3.2 & Attachment A)
Remove Equipment and perform Final Visual Inspection of 2401-W Waste Storage Building	Remove equipment and material from the 2401-W Building and perform a final visual inspection of the floor surface (Section H.3.4).	20 Days
Decontaminate Floor Surface	Decontaminate 2401-W Building floor surface (Section H.3.5) to meet clean debris surface standard (Section H.5.1.1).	150 Days
Confirm Clean Debris Surface	After decontamination, visually inspect floors to verify that clean debris surface standard has been met. (Section H.5.1.1)	10 Days
Address Soil Beneath 2401-W Waste Storage Building	Perform focused sampling and analysis in accordance with SAP (Section H.4).	70 Days
	Perform data verification/validation and data quality assessment (Section H.4.5).	
	If necessary, remove contaminated environmental media, resample, and analyze (Section H.4.4.3).	
Confirm Closure Performance Standards for Soil	Review sample results from contract analytical laboratory. Ensure soil closure performance standards were met (Section H.3.9).	10 Days
Complete Closure of the 2401-W Building DWMU	Complete closure activities within 180 days after the date on which the closure plan is effective. Request extension if necessary.	180 Days
Closure Certification		
Permittees and IQRPE Submit Closure Certification	Within 60 days of completion of closure activities; submit certification to Ecology that the DWMU has been closed in accordance with specifications in this closure plan (Section H.5.3).	60 Days

Reference: WAC 173-303-610, Dangerous Waste Regulations, *Closure and post-closure*.

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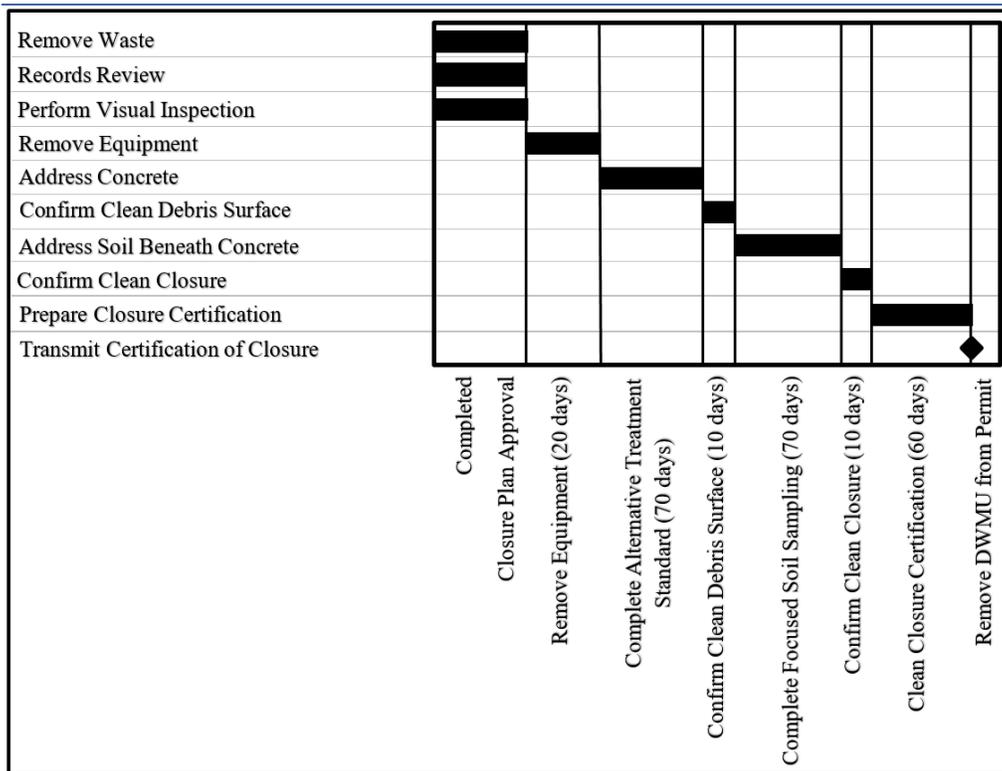


Figure H-8 2401-W Building Closure Schedule Activities

2

3

4 **H.7 Closure Costs**

5 An annual report outlining updated projections of anticipated closure costs for the Hanford Facility
6 treatment, storage, and disposal units having final status is not required per Hanford Facility Permit
7 Condition II.H.

8 **H.8 References**

9 17-AMRP-0217, 2017, “Dangerous Waste Management Unit (DWMU) 277-T Building Closure Plan
10 Comment Disposition, and Performance Standards for Future Solid Waste Operations Complex
11 (SWOC) Closure Plans” (letter to Alexandra K. Smith, Nuclear Waste Program, from Joe R.
12 Franco), DOE-RL, Richland, Washington, July 12. Available at:
13 <http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=0069231H>.

14 17-NWP-100, 2017, “Dangerous Waste Management Unit (DWMU) 277-T Building Closure Plan
15 Comment Disposition and Performance Standards for Future Solid Waste Operations Complex
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DRAFT

ATTACHMENT A
CWC 2401-W BUILDING VISUAL INSPECTION DOCUMENTATION

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CWC, 2401-W BUILDING

Purpose:

A visual inspection walkdown of the CWC 2401-W Building to determine if there is any evidence of spills and/or leaks from waste packages containing dangerous that were and are stored at this location. The inspection was to identify and document by photographing any waste related staining of the storage area surface (i.e., concrete floor), and to denote any remaining waste related items.

The inspection was performed on August 14, 2013, by Brett M. Barnes, Environmental Compliance Officer (CHPRC).

Results:

No staining of any kind was identified on the storage area surface.

Housekeeping will be performed on the area prior to closure and the debris material will be removed.

Signature/Date:

Brett M. Barnes: Brett M Barnes 8/14/2013

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