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**ADDENDUM H  
CLOSURE PLAN**

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## 1 H. CLOSURE PLAN

2 The 325 HWTUs will be clean closed in accordance with the requirements of [WAC 173-303-610](#). No  
3 post closure activities currently are applicable or required because the 325 HWTUs will be clean closed.

4 Units or portions of units making up the 325 HWTUs Operating Unit Group may be closed pursuant to  
5 this Closure Plan individually, or more than one unit may be closed at the same time. [[WAC 173-303-  
6 610\(1\)\(d\)](#)]

### 7 H.1 Closure Plan

#### 8 H.1.1 Closure Performance Standard

9 The 325 HWTUs will be closed in a manner that:

- 10 • Minimizes the need for further maintenance;
- 11 • Controls, minimizes, or eliminates to the extent necessary to protect human health and the  
12 environment, post closure escape of dangerous waste, dangerous waste constituents, leachate,  
13 contaminated runoff, or dangerous waste decomposition products to the ground, surface water,  
14 ground water, or the atmosphere; and
- 15 • Returns the land to the appearance and use of surrounding land areas to the degree possible, given  
16 the nature of the previous waste management activities. [[WAC 173-303-610\(2\)\(a\)](#)]

17 The 325 HWTUs operating record will be reviewed at the time of closure to determine whether there have  
18 been releases from the dangerous waste management unit(s) being closed to the soil, groundwater, surface  
19 water, or air. A physical walkdown of the unit(s) being closed will also be performed. If there is any  
20 evidence of spills or leaks from the unit(s) into the environment, removal of contamination will be  
21 integrated with the final disposition of the 325 Building and underlying soil contamination, as described  
22 in the 300-FF-2 final Record of Decision and the approved Remedial Action Work Plan. [[WAC 173-303-  
23 610\(1\)\(e\)](#), [WAC 173-303-610\(3\)\(a\)\(ix\)](#)].

24 Clean closure decontamination standards for structures, equipment, bases, liners, etc., are those specified  
25 for hazardous debris in [40 CFR 268.45](#), Table 1 per Ecology clean closure guidance (Ecology 1994).  
26 [[WAC 173-303-610\(2\)\(b\)\(ii\)](#)] The 'clean debris surface' is the performance standard for metal and  
27 concrete surfaces.

28 Attainment of a 'clean debris surface' will be verified by a visual inspection in accordance with the  
29 standard that states:

30 *A clean debris surface means the surface, when viewed without magnification, shall be free of*  
31 *all visible contaminated soil and hazardous waste except residual staining from soil and waste*  
32 *consisting of light shadows, slight streaks, or minor discolorations and soil and waste in cracks,*  
33 *crevices, and pits may be present provided that such staining and waste and soil in cracks,*  
34 *crevices and pits shall be limited to no more than 5 percent of each square inch of surface area.*  
35 *([40 CFR 268.45](#), Table 1)*

#### 36 H.1.2 Closure Activities

37 Closure activities will remove dangerous waste from each unit being closed, and relocate for continued  
38 use, decontaminate, or dispose associated structures and equipment. [[WAC 173-303-610\(3\)\(a\)\(i\)](#)]

39 Partial closure could involve closing a portion of a unit or an entire unit. Except for the timing of the  
40 closure activities, partial closure activities would be conducted in the same way as those described in this  
41 closure plan for closure of the entire 325 HWTUs OUG, i.e. final closure. [[WAC 173-303-610\(3\)\(a\)\(ii\)](#)]

42 The hot cells are connected to the SAL tank by means of the drains in the trough in the front of the hot  
43 cells. The only way to introduce waste into the SAL tank is via the hot cell drains. Similarly, the only  
44 way to retrieve waste from the SAL tank is to pump it into containers in Cell 6 (northernmost cell in the

1 hot cell gallery) for storage and/or treatment. Decontamination in conjunction with closure is expected to  
2 introduce liquid waste into the SAL tank from the hot cells, and rinsate from the SAL tank closure will  
3 need to be treated and containerized in the hot cell. As a result, the SAL tank cannot begin closure until  
4 storage and treatment in the hot cells is concluded. Similarly, the hot cells cannot begin closure until the  
5 SAL tank is ready to close. Due to this mutual dependency, storage and treatment in the hot cells and in  
6 the SAL tank will begin closure only when the last of these two units begin closure. [[WAC 173-303-](#)  
7 [610\(3\)\(a\)\(i\)](#); [WAC 173-303-610\(4\)\(a\)\(i\)](#); [WAC 173-303-610\(4\)\(b\)\(i\)](#)]

### 8 **H.1.3 Maximum Extent of Operation**

9 The physical boundaries of the 325 HWTUs' individual units are shown in Addendum A.

## 10 **H.2 Closure of Container Storage and Treatment Areas (Non-Hot Cell)**

### 11 **H.2.1 Removing Dangerous Waste**

12 Inventory removal procedures from the container storage/treatment unit(s) being closed will be identical  
13 to the waste handling, treating, packaging, and manifesting activities given in Addendum B and C of this  
14 permit.

15 During closure, wastes will simply be relocated to other, unclosed portions of the 325 HWTUs (in the  
16 case of partial closure) or transferred to other Hanford Permit operating units for subsequent management.  
17 Offsite treatment and/or storage facilities may be used if appropriate.

### 18 **H.2.2 Decontaminating Structures, Equipment, and Soil**

19 At the time of partial or final closure of the unit(s) being closed, equipment and structures in the unit(s)  
20 being closed will either be removed and disposed of, or be decontaminated. Equipment and structures  
21 that exhibit a 'clean debris surface' before starting closure activities will be considered decontaminated  
22 and receive no further decontamination.

23 Decontamination methods for equipment and structures will be selected from appropriate technologies  
24 ([40 CFR 268.45](#), Table 1) such as water washing and spraying, high-pressure water jet scarifiers, abrasive  
25 blasting, aquablasting, or mechanical concrete scrubbers and scarifiers. Such technologies will be used  
26 until a clean debris surface is obtained or the effort to decontaminate is abandoned (i.e. the equipment or  
27 structure is removed for disposal.)

28 All equipment used for decontamination will be decontaminated or disposed of before closure is  
29 complete. All cleaning and decontamination waste will be collected and analyzed as described in Section  
30 H.2.4. Any disposable equipment will be placed in a container and properly disposed.

31 If review of the operating record determines that releases to the firewater containment tank have not  
32 occurred during the operating life of the 325 HWTUs, the internal surface of the firewater containment  
33 tank will be visually inspected. If a 'clean debris surface' is present at the beginning of the closure  
34 process, the firewater containment tank will be considered clean closed. If the surface of the liner does  
35 not meet the 'clean debris surface' standard, the tank liner will be removed and disposed. If the  
36 underlying tank surface does not meet the clean debris surface standard, it will be decontaminated in  
37 accordance with this section or disposed.

### 38 **H.2.3 Management of Decontamination Waste from Closing Container Units (Non-Hot 39 Cell)**

40 Decontamination waste from closing container storage and treatment units will be placed in containers  
41 and sampled to determine disposal requirements. Samples from each container will be analyzed as set  
42 forth in Table H.1. Decontamination waste will be managed at a permitted TSD unit or treated and  
43 disposed onsite.

1 **H.2.4 Inspection to Identify Extent of Decontamination/Removal and to Verify**  
2 **Achievement of Closure Standard**

3 *Attainment of a 'clean debris surface' will be verified by a visual inspection in accordance with*  
4 *the standard that states: A clean debris surface means the surface, when viewed without*  
5 *magnification, shall be free of all visible contaminated soil and hazardous waste except residual*  
6 *staining from soil and waste consisting of light shadows, slight streaks, or minor discolorations*  
7 *and soil and waste in cracks, crevices, and pits may be present provided that such staining and*  
8 *waste and soil in cracks, crevices and pits shall be limited to no more than 5 percent of each*  
9 *square inch of surface area. ([40 CFR 268.45](#), Table 1).*

10 Areas of degraded surface material, such as significant concrete cracking or heavily gouged steel, will be  
11 evaluated by non-destructive or destructive means to determine depth of significant surface defects,  
12 amount of contamination present in the defects, and to determine if environmental contamination has  
13 resulted from the material defect.

14 **H.3 Closure of the Shielded Analytical Laboratory Hot Cells and Tank**

15 The activities required for the closure of the SAL hot cells and tank system are described in the following  
16 sections. As noted in Section H.1.2, these units will be closed at the same time as their operations are  
17 mutually interdependent.

18 **H.3.1 Removing Dangerous Waste**

19 Closure or partial closure activities will be initiated by removal of the dangerous waste inventory present  
20 in the hot cell and tank at the time of closure or partial closure. Inventory removal procedures will be  
21 performed in accordance with the waste handling, treating, packaging, and manifesting requirements of  
22 Addenda B and C of this Permit.

23 During closure, wastes will simply be relocated to other, unclosed portions of the 325 HWTUs (in the  
24 case of partial closure) or transferred to other Hanford Permit operating units for subsequent management.  
25 Offsite treatment and/or storage facilities may be used if appropriate.

26 **H.3.2 Decontaminating Equipment, Structures, and Soils**

27 At the time of hot cell tank closure, all equipment and structures in dangerous waste storage and treatment  
28 areas will be either removed and disposed of, or decontaminated in accordance with this section.  
29 Equipment and structures that exhibit a 'clean debris surface' before starting closure activities will be  
30 considered decontaminated and receive no further decontamination.

31 Decontamination methods for equipment and structures will be selected from appropriate technologies  
32 found in [40 CFR 268.45](#), Table 1, such as water washing and spraying, high-pressure water jet scarifiers,  
33 abrasive blasting, aquablasting, or mechanical concrete scrubbers and scarifiers. Other methods not  
34 included in [40 CFR 268.45](#), Table 1 may be utilized to address non-RCRA contaminants, but cannot be  
35 used alone to achieve a clean debris surface. These methods will be used until a clean debris surface is  
36 obtained, or the effort to decontaminate is abandoned (i.e. the equipment or structure is removed for  
37 disposal.)

38 All equipment used for decontamination will be decontaminated or disposed of before closure is  
39 complete. All cleaning and decontamination waste will be collected and managed as described in  
40 Section H.3.5. Any disposable equipment will be containerized and disposed of based on the status of the  
41 waste as dangerous, nondangerous, or mixed waste.

42 No contaminated soil is expected to be removed in conjunction with the closure of the hot cells and SAL  
43 tank units at the 325 HWTUs OUG due to the construction of the building and the scope of operations. If  
44 it is necessary to remove soil, the closure plan will be amended to include necessary details such as soil  
45 removal, sampling to verify adequacy of removal, and subsequent management of the removed soil. Soil  
46 removal may also be deferred to the 300-FF-2 cleanup in accordance with H.1.1.

**1 H.3.3 Decontamination of Hot Cell Trough**

2 The collection trough in the interconnected SAL hot cells will be decontaminated using an appropriate  
3 decontamination technique ([40 CFR 268.45](#), Table 1) until a clean debris surface is obtained. Any  
4 wastewater collected in each sump from the cleaning process will be collected in the SAL waste tank  
5 system and managed as dangerous waste.

**6 H.3.4 Decontamination of the Shielded Analytical Laboratory Tank System**

7 At closure, the SAL tank and ancillary equipment, tank secondary containment pan, and associated tank  
8 piping will be decontaminated using water washing and spraying ([40 CFR 268.45](#), Table 1). This may be  
9 followed by other appropriate techniques if necessary to obtain a clean debris surface. Run-off of  
10 decontamination solutions and wastewater will be prevented either by performing cleaning activities  
11 within existing containment structures or within portable containment pans or by surrounding the  
12 decontamination area with plastic and absorbent pads.

**13 H.3.5 Management of Decontamination Waste from SAL**

14 Decontamination liquid from the SAL hot cells will be accumulated in cell or in the tank and sent to a  
15 permitted facility. All nonliquid waste generated during decontamination operations and the equipment  
16 used (e.g., sandblast grit, personnel protective equipment and clothing, disposable equipment) will be  
17 collected in containers and stored onsite. Samples of the waste could be collected and analyzed as  
18 described in Section H.2.4.

**19 H.3.6 Inspection to Identify Extent of Decontamination/Removal and to Verify  
20 Achievement of Closure Standard**

21 Attainment of a 'clean debris surface' will be verified by a visual inspection in accordance with the  
22 standard that states: A clean debris surface means the surface, when viewed without magnification, shall  
23 be free of all visible contaminated soil and hazardous waste except residual staining from soil and waste  
24 consisting of light shadows, slight streaks, or minor discolorations and soil and waste in cracks, crevices,  
25 and pits may be present provided that such staining and waste and soil in cracks, crevices and pits shall be  
26 limited to no more than 5 percent of each square inch of surface area. ([40 CFR 268.45](#), Table 1).

27 Areas of degraded surface material, such as significant concrete cracking or heavily gouged steel, will be  
28 evaluated by non-destructive or destructive means to determine depth of significant surface defects,  
29 amount of contamination present in the defects, and to determine if environmental contamination has  
30 resulted from the material defect.

31 The SAL tank and ancillary waste piping will be evaluated for meeting the clean debris standard by use of  
32 fiber-optic cameras or other nondestructive examination techniques.

**33 H.4 Maximum Waste Inventory**

34 The 325 HWTUs are used to store and treat a variety of different research-and-operations-related  
35 dangerous waste. The maximum inventory of waste that could be present at any one time in the  
36 325 HWTUs DWMUs is given in the following table.

<b>Activity</b>	<b>HWTU</b>	<b>SAL Containers</b>	<b>SAL Tank</b>	<b>Cask Handling Area</b>	<b>Truck Lock</b>	<b>3714 Pad</b>
Storage (liters)	9000	3000	1218	10370	10370	17620
Treatment (liters/day)	946	568	1218	10370	10370	17620

37

## 1 **H.5 Schedule for Closure**

2 Completion of closure activities for units at the 325 HWTUs OUG is expected to take up to two years  
3 from the date of receipt of the final volume of waste at the units. This extended time for closure is  
4 necessary due to ALARA concerns present in the facility, particularly the six interconnected hot cells.  
5 Closure activities are summarized in Table H.2, and a detailed schedule of closure activities is provided in  
6 Table H.3.

## 7 **H.6 Extension for Closure Time**

### 8 **H.6.1 Extension for Inventory Removal**

9 An extension of the time for removal of the inventory of dangerous waste from container  
10 treatment/storage unit(s) being closed designated for closure is requested for the 325 HWTUs. Acquiring  
11 disposal approvals and arranging shipping to receiving facilities for mixed waste requires longer than the  
12 90 days anticipated under [WAC 173-303-610\(4\)\(a\)](#). The expected time needed to remove all waste from  
13 container treatment/storage units being closed is 180 days. For waste in the tank and hot cells, the  
14 expected time to complete inventory removal is two years.

15 The extended period for removal of the inventory of dangerous waste is needed to accomplish the  
16 procedures that are needed to safely work with the ALARA concerns that are present. All activities  
17 required to remove the inventory of dangerous waste will be conducted in accordance with applicable  
18 Permit conditions and all safety systems will continue to be operated. The removal of the inventory of  
19 dangerous waste will be conducted following procedures that are designed to be protective of the workers  
20 and the environment.

### 21 **H.6.2 Extension for Closure Period**

22 An extension of the closure time is requested for the 325 HWTUs units being closed. The ALARA  
23 concerns that are present necessitate this extension. The expected time needed to close the units is two  
24 years.

25 The extended closure period exceeding the 180 days given in [WAC 173-303-610\(4\)\(a\)](#) is needed to  
26 accomplish the procedures that are needed to safely work with ALARA concerns that are present in the  
27 SAL. All closure activities will be conducted in accordance with applicable Permit conditions and all  
28 safety systems will continue to be operated. Closure activities will be conducted following procedures  
29 that are designed to be protective of the workers and the environment. [[WAC 173-303-610\(4\)\(b\)\(i\)](#)]

## 30 **H.7 Closure Cost Estimate**

31 An annual report outlining updated projections of anticipated closure costs for the Hanford Facility  
32 TSD units having final status is not required per Permit Condition II.H.

33

1 **Table H.1. Analysis Parameters for Closure of the 325 Hazardous Waste Treatment Units**

Parameter and EPA SW-846 <sup>a</sup> 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

<sup>a</sup> SW-846 = EPA Test Methods for Evaluating Solid Wastes (Third Edition, latest update, 1986).

2 **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.

1 **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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