

**WASTE ENCAPSULATION AND STORAGE FACILITY
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

Modification Date	Modification Number
11/16/2020	8C.2020.10F

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**WASTE ENCAPSULATION AND STORAGE FACILITY
ADDENDUM H
CLOSURE PLAN**

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**ADDENDUM H
CLOSURE PLAN**

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1 **H.1 Introduction**

2 This addendum describes closure activities for the Waste Encapsulation and Storage Facility (WESF)
3 Operating Unit Group (OUG) and furthermore complies with the closure requirements outlined in
4 Washington Administrative Code (WAC) 173-303-610(2) through (6), Dangerous Waste Regulations,
5 *Closure and post-closure*.

6 In the event of a proposed change in facility design or operation, or an unexpected event, including a
7 release of hazardous waste that affects the Closure Plan, a permit modification request to amend the
8 Closure Plan will be submitted to the Washington State Department of Ecology (Ecology) per
9 WAC 173-303-610(3)(b)(iii) and WAC 173-303-830, *Permit changes*, as applicable.

10 Any deviations from a Treatment, Storage, and Disposal Unit Closure Plan required by unforeseen
11 circumstances encountered during the closure activities that do not affect the overall closure strategy but
12 provide equivalent results shall be documented in the Unit-Specific Operating Record. Documentation
13 shall be made available to Ecology upon request, or during the course of an inspection in accordance with
14 WA7890008967, *Hanford Facility Resource Conservation and Recovery Act (RCRA) Permit, Dangerous*
15 *Waste Portion for the Treatment, Storage, and Disposal of Dangerous Waste* (hereinafter referred to as
16 the Hanford Facility RCRA Permit) Condition II.K.6.

17 **H.1.1 Hanford Facility Contact Information**

18 Contact information is described in WESF Addendum A, "Part A Form."

19 **H.1.2 Hanford Facility Description**

20 Located in southeastern Washington State, the Hanford Facility is owned by the U.S. government and is
21 managed and operated by the U.S. Department of Energy. Dangerous waste and mixed waste (i.e., waste
22 containing both dangerous and radioactive components) are generated and managed at the Hanford
23 Facility. Access control to the Hanford Facility is described in Attachment 3 of the Hanford Facility
24 RCRA Permit (WA7890008967).

25 **H.2 Waste Encapsulation and Storage Facility 225-B Building Description and Historic**
26 **Operations**

27 The WESF 225-B Building is located in the western portion of the 200 East Area of the Hanford Facility,
28 adjoining B Plant on the west end. Construction of the main two-story building (225-B Building) began
29 in 1971 and was complete by 1973. The building is approximately 47.6 by 28 by 11.7 m (156 by 91 by
30 38.5 ft) and is constructed of steel-reinforced concrete.

31 The WESF 225-B Building is partitioned into seven hot cells (A through G), the hot cell service area,
32 operating areas, building service areas, Truckport, and the pool cell area consisting of Pool Cells 1
33 through 12. Figures H-1 and H-2 show the WESF 225-B Building floor layout, Figure H-3 shows the
34 east/west sectional view, and Figure H-4 shows the north/south sectional view. Additional views and
35 photographs can be found in the WESF Addendum A. Security measures in effect at WESF during
36 closure are identified in WESF Addendum E, "Security."

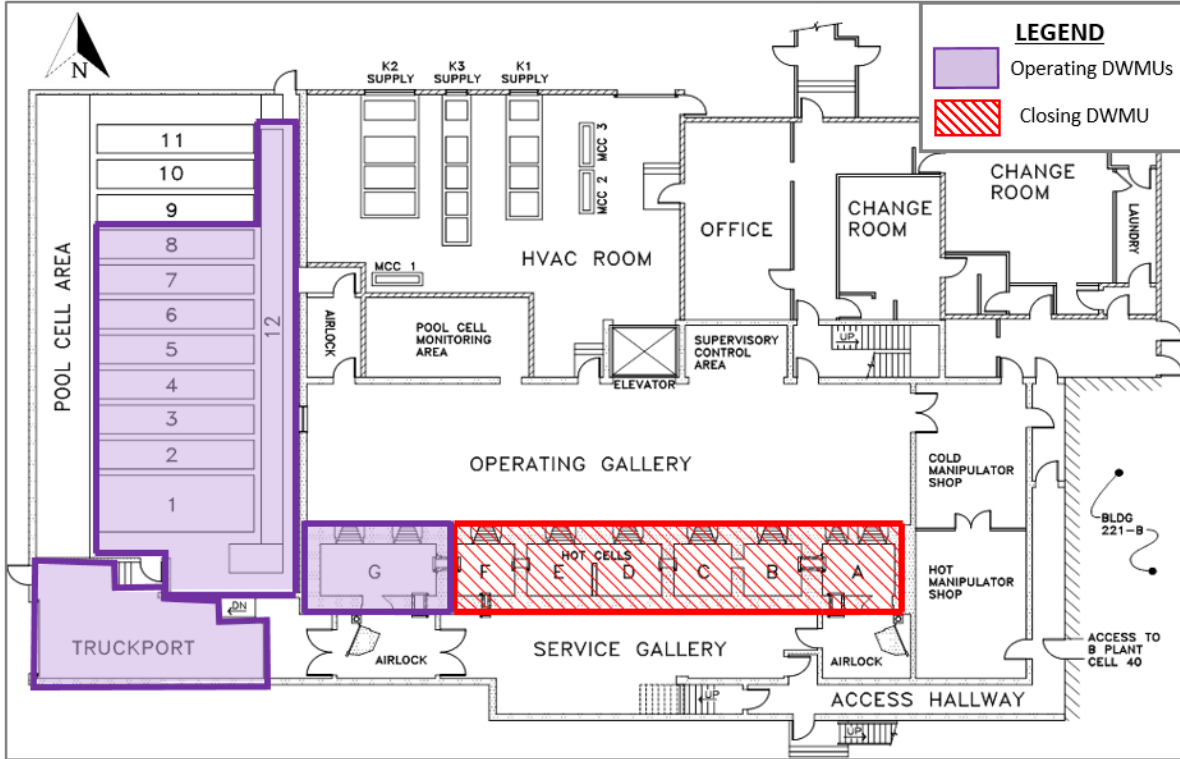


Figure H-1 Waste Encapsulation and Storage Facility 225-B Building Detailed First Floor Plan

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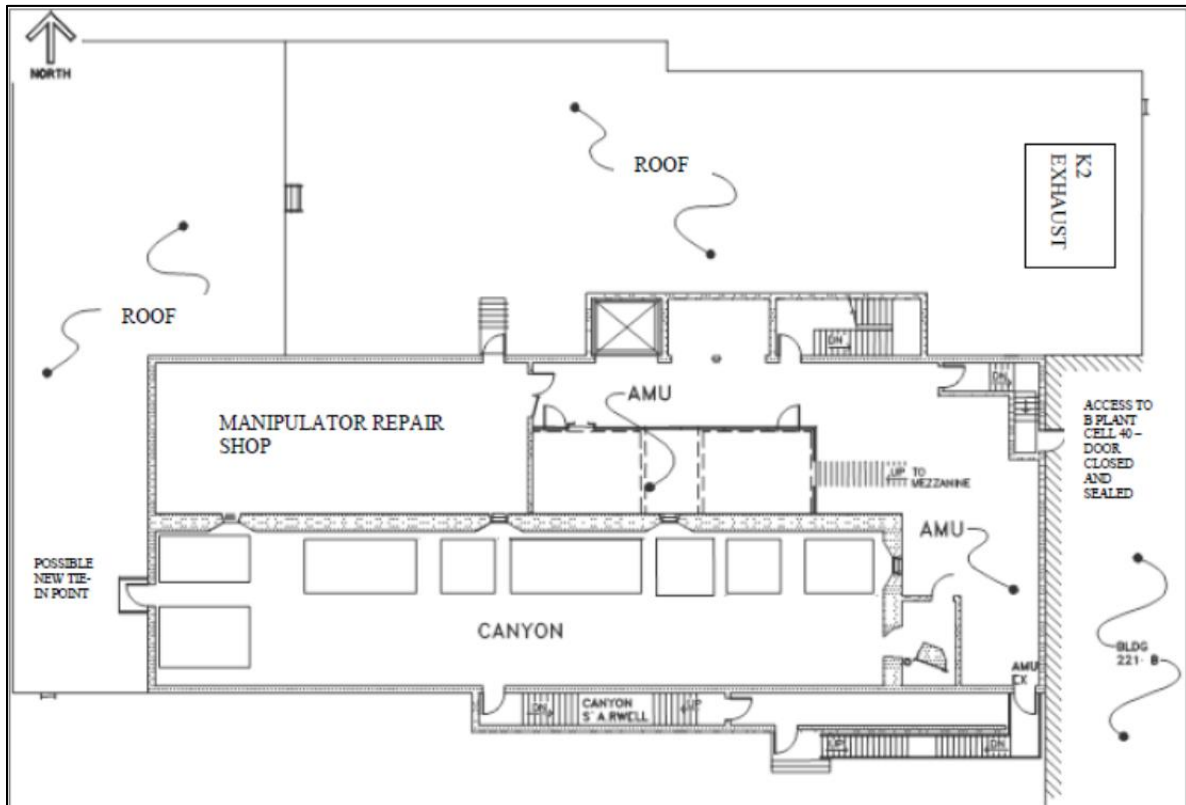
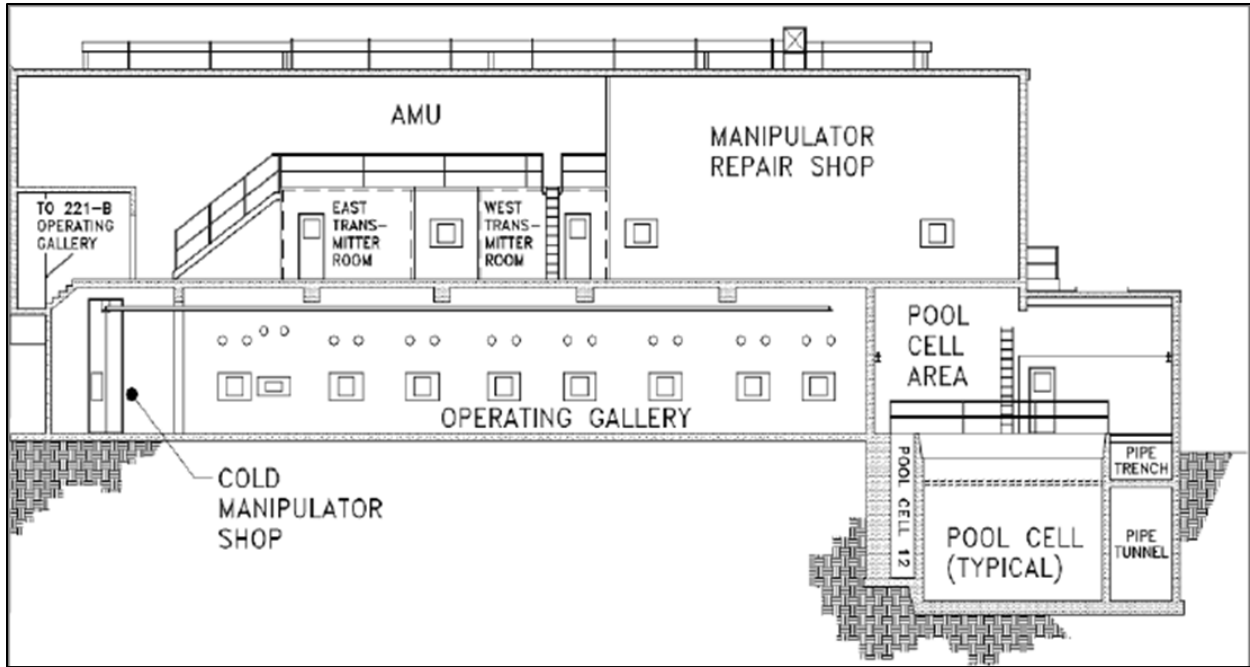


Figure H-2 Waste Encapsulation and Storage Facility 225-B Building Second Floor Plan

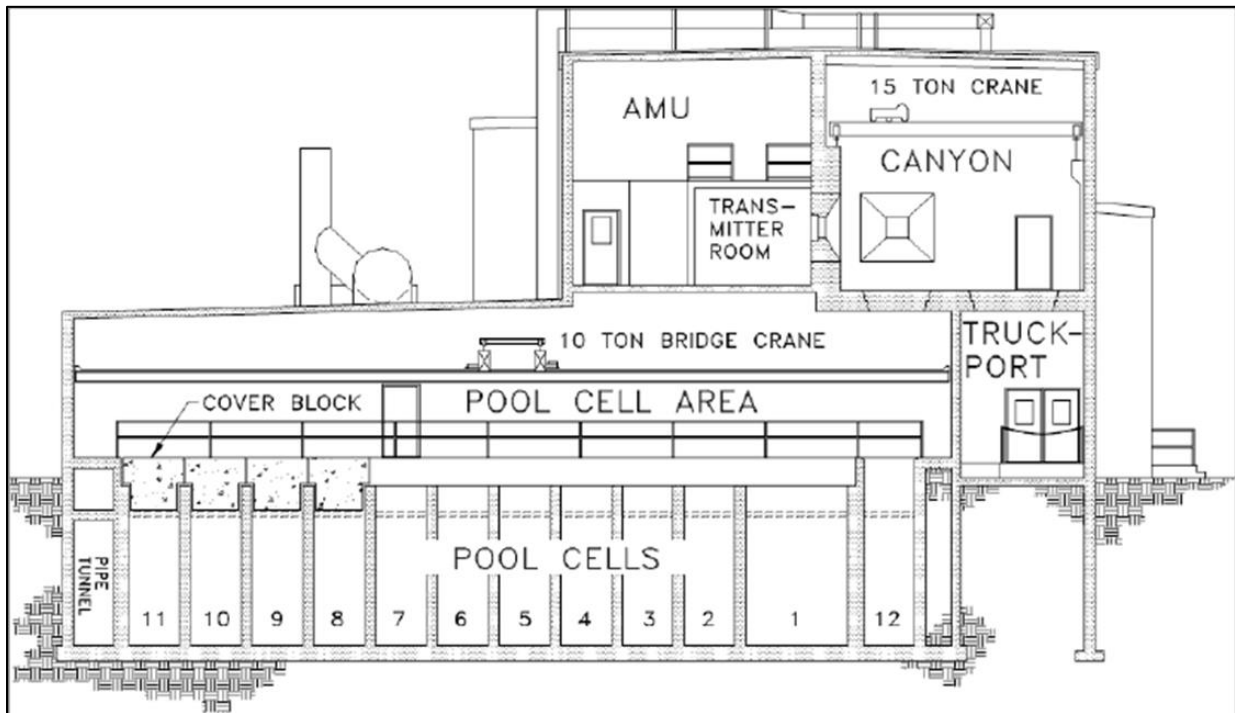
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**Figure H-3 Waste Encapsulation and Storage Facility
225-B Building East/West Sectional View**



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**Figure H-4 Waste Encapsulation and Storage Facility
225-B Building North/South Sectional View**

1 The WESF 225-B Building was built to process, encapsulate, store, and maintain radioactive cesium-137
2 and strontium-90 that have been separated from the plutonium production waste stored in underground
3 storage tanks on the Hanford Facility. Extraction operations took place in the adjacent B Plant Complex,
4 where the radioactive isotopes were then transferred to WESF.

5 Encapsulation operations were supported via the hot cells, service gallery, operating gallery, and building
6 service areas. The hot cells provided the necessary equipment to support encapsulation operations while
7 protecting the workers from high levels of radiation and contamination. Located on the south side of the
8 hot cells, the service gallery contained necessary support equipment for the various hot cell processes,
9 including utility and auxiliary process piping. Located on the north side of the hot cells, the operating
10 gallery contained manipulators used by process personnel to work remotely in the hot cells. Lead glass
11 windows provided shielding and direct viewing into the hot cells from the operating gallery.

12 Once encapsulated, the cesium and strontium salts were then transferred from the hot cells to the pool cell
13 area for capsule storage. Underwater storage of the capsules provides both radioactive shielding and heat
14 removal.

15 By September 1985, processing was complete, and WESF had transitioned into a standby and
16 surveillance mode. In 2001, water sources to Hot Cells A through F were isolated, and manipulators were
17 removed from Hot Cells A through E. Water sources and manipulators associated with Hot Cell G
18 remained operational to support future capsule maintenance activities, as necessary.

19 **H.2.1 Waste Encapsulation and Storage Facility Closing Unit Group Description**

20 The WESF Closing Unit Group (CUG) consists of one Dangerous Waste Management Unit (DWMU),
21 Hot Cells A through F. The initial closure phase for WESF Hot Cells A through F CUG began in 2014
22 with the WESF Stabilization and Ventilation Project. The K3 exhaust ventilation system was replaced
23 with a new system (K3N) and was then stabilized with grout. Other areas potentially containing legacy
24 contamination were also stabilized with grout as described in WESF Addendum H, "Hot Cells A
25 through F Dangerous Waste Management Unit Closure Plan," located in Part V, Unit-Specific Conditions
26 for Units Undergoing Closure, of the Hanford Facility RCRA Permit (WA7890008967). Due to the level
27 of contamination in this CUG, grouting was chosen to stabilize Hot Cells A through F, the Hot Cell A
28 Airlock, the underground K3 exhaust ventilation system ducting, the hot pipe trench and K3 ventilation
29 duct trench underneath the hot cells, and the K3 filters and filter pit.

30 Final closure activities for Hot Cells A through F include demolition and removal of the hot cells,
31 management and disposal of the hazardous debris, visual verification of underlying soil, and sampling and
32 analysis of soil to confirm clean closure.

33 **H.2.2 Waste Encapsulation and Storage Facility Operating Unit Group Description**

34 The current WESF OUG mission is continued safe storage of cesium and strontium capsules, including
35 necessary maintenance, examination, decontamination, movement, storage, surveillance, and transfer.
36 The three DWMUs that constitute the WESF OUG are the Pool Cells, Hot Cell G, and the Truckport.
37 Appendices to this Closure Plan detail the closure requirements for each of these DWMUs.

38 Initial closure activities include a records review and visual inspection and deactivation of equipment.
39 Final closure activities include the demolition and removal of the DWMUs, management and disposal of
40 waste generated during closure, visual verification of the underlying soil, and sampling and analysis of
41 soil to confirm clean closure.

1 WESF OUG currently stores 1,936 capsules, 1,335 of which contain cesium chloride salt, while the
2 remaining 601 contain strontium fluoride salt. Capsules will be transferred from the Pool Cells to Hot
3 Cell G and the Truckport for packaging into a storage system for transport to dry storage. Removing the
4 capsules from the Pool Cells and placing them into dry storage provides safe and compliant storage and
5 protects human health and the environment. See WESF Addendum C, “Process Information,” for further
6 information.

7 Major Milestone M-092 addresses the disposition path for the cesium and strontium capsules with a
8 milestone due date of August 31, 2025, to complete the transfer of the cesium and strontium capsules
9 from WESF to a new permitted, interim safe storage facility. Once capsules have been packaged and
10 transferred to the interim storage facility, closure activities described in this Closure Plan can be initiated.

11 **H.2.3 Products and Production Processes**

12 The WESF OUG does not generate products nor have production processes.

13 **H.2.4 List of Wastes**

14 Two waste streams are managed at WESF consisting of cesium chloride and strontium fluoride salts
15 stored within double-walled capsules. The maximum historical dangerous waste storage at WESF is
16 1,936 capsules. The cesium and strontium salts are known to have chemical impurities with associated
17 Dangerous Waste Codes (shown in parentheses) consisting of barium (D005), cadmium (D006),
18 chromium (D007), lead (D008), and silver (D011).

19 For a comprehensive list of dangerous and mixed waste managed in accordance with RCRA regulations,
20 including estimated annual quantities, refer to the WESF Addendum A. Waste designations for cesium
21 and strontium capsules are shown in Tables B-1 and B-3 of the WESF Addendum B, “Waste Analysis
22 Plan.”

23 **H.2.5 Dangerous Waste Management Units**

24 The WESF treatment, storage, and disposal unit group boundary consists of four DWMUs as depicted in
25 Figure H-1 of Attachment A. Three of these units (Pool Cells, Hot Cell G, and Truckport) are operating
26 (Section H.2.2), and one unit (Hot Cells A through F) is in extended closure status (Section H.2.1). The
27 Pool Cells DWMU and Hot Cell G DWMU remain operational because both are necessary for continued
28 maintenance and storage of the cesium and strontium capsules. The Truckport DWMU is operational to
29 facilitate transfer operations of the capsules to dry storage. The fourth DWMU consists of Hot Cells A
30 through F, which is no longer necessary to support WESF storage operations and therefore is considered a
31 closing unit.

32 This Closure Plan addresses closure of the WESF OUG. Closure Plans for the Pools Cells, Hot Cell G,
33 and Truckport DWMUs are individually described in Appendices HA, HB, and HC, respectively. Upon
34 completion of the final closure activities specified in these appendices, the WESF OUG will have
35 achieved RCRA clean closure.

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