Hanford Facility RCRA Permit Modification Notification Forms

Part III, Operating Unit Group 14

Waste Encapsulation and Storage Facility

Index

Page 2 of 3: Addendum C, Process Information and Addendum I, Inspection Plan

Page 3 of 3: Instructions

Submitted by Co-Operator:

ALISON GREENE (Affiliate) Digitally signed by ALISON GREENE (Affiliate) Date: 2026.04.28 06:46:30 -07'00'

Alison Greene for Robert Bullock — Date

Reviewed by DOE Program Office:

DUANE CARTER Digitally signed by DUANE CARTER Date: 2026.04.28 07:22:56 -07'00'

Duane Carter — Date

Hanford Facility RCRA Permit Modification Form

Unit:	Permit Part
Waste Encapsulation and Storage Facility	***Part III, Operating Unit Group 14***

Description of Modification:

Addendum C, Process Information

Add language to Addendum C, Process Information, Section C.2.2.2.2 Transfer Operations, to identify a heavy track skidding system as an additional method for movement of the VCC/CSS within the Truckport. The air pallet transfer system remains in place, and either system may be used during transfer operations.

Addendum I: Inspection Plan

Update Addendum I, Inspection Plan, to include the heavy track skidding system as waste handling equipment subject to inspection when in use in Table I-1.

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

Enter relevant WAC 173-303-830:

Pursuant to WAC 173-303-830(4)(d)(i), this modification is requested to be reviewed and approved as a Class 1. WAC 173-303-830(4)(d)(ii)(A) states: "*Class 1 modifications apply to minor changes that keep the permit current with routine changes to the facility or its operation. These changes do not substantially alter the permit conditions or reduce the capacity of the facility to protect human health or the environment. In the case of Class 1 modifications, the director may require prior approval.*"

Modification Approved: ☒ Yes ☐ No

Reviewed by Ecology:

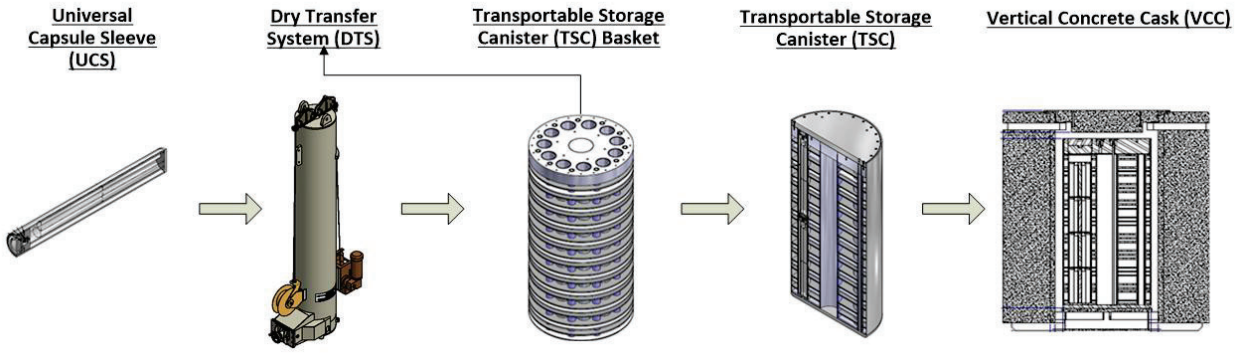
2026.04.30 13:24:06 -07'00'

E. J. Holbrook

Date

Revision Instructions:

Revise Addendum C and Addendum I to incorporate the changes shown herein.



C.2.2.2 Capsule Transfer Activities

During transfer operations, capsules are packaged into a CSS for transport to dry storage. The CSS consists of UCSs, a Transportable Storage Canister (TSC) basket, TSC, Vertical Concrete Cask (VCC), and a Dry Transfer System (DTS) used to move the UCS out of Hot Cell G (Figure C-15).

Figure C-15 Cask Storage System

C.2.2.2.1 Cask Storage System

A UCS can hold up to six standard cesium or strontium capsules or two Type W capsules. Despite having different capsule types, the UCS will have the same exterior dimensions of approximately 120 cm (49 in.) in height by 19 cm (7.5 in.) in diameter. Standard capsules are vertically stored in a UCS in a 3x2 array, while the Type W capsules are loaded in a 1x2 array. A single-piece aluminum shunt within the UCS defines the capsule cell location. The UCS is closed with a threaded plug lid assembly.

The DTS is positioned on the Hot Cell G cover block and conveys one loaded UCS between Hot Cell G and the Truckport.

The aluminum and steel TSC basket holds up to two UCS inside each of eleven cell locations. The TSC houses the TSC basket and provides confinement of the contents. The TSC closure lid is welded to the TSC shell when fully loaded to complete the TSC structure.

As a best management practice, strontium, cesium, and Type W capsules will not be loaded in a single TSC.

Each TSC is within a VCC, which is ~3.4 by 3 m (11 by 10 ft) in height and diameter, respectively. The thickness of the VCC concrete wall is ~0.6 m (2 ft) and the lid is ~0.3 m (1 ft). The structure of the VCC provides shielding protection for personnel and protects the TSC from external hazards and elements. The concrete cask is stable against tip-over and sliding during tornado, flood, and earthquake accidents. Modeling and analysis of an 28 cm (11 in.) drop of a fully loaded VCC demonstrates that the TSC will maintain confinement and there will be no release of waste.

C.2.2.2.2 Transfer Operations

To begin transfer operations, a single VCC containing the TSC basket and TSC is moved into the Truckport DWMU by use of an air pallet or a heavy track skidding system. The 3 m (10 ft) by 3 m (10 ft) air pallet is comprised of four interlocking plates topped with a layer of insulation, and is capable of lifting a fully loaded CSS a maximum of 7.6 cm (3 in.). The track skidding system, which is capable of moving a fully loaded CSS in push or pull mode, is comprised of skid shoes atop of interlocking rigid steel tracks sections. Each track section measures 16 inches wide by 6.5 inches tall with lengths of 10, 12, 15, 19, and 20 feet. Track sections are connected to create two runs of the required length. The CSS sits

on the skid shoes, which are pushed or pulled along the track by hydraulic cylinders connected to a power unit. The system has a working height of 17.8 cm (7 in). Only one VCC is stored within the Truckport at a time. Once inside the Truckport, the VCC lid and TSC outer and inner lids are removed. The Shielded Indexer Assembly (SIA) is placed on top of the VCC. The SIA is a revolving cylinder that allows access to each TSC cell while providing shielding for transfer of the UCS to the TSC. Furthermore, the SIA provides shielding before the TSC and VCC shielded lids are in place.

Within Hot Cell G, a UCS and closure plug assembly are manually placed in Hot Cell G, and the UCS is installed into the loading equipment. Capsules are transported from the pool cell area using the transfer cart and moved into Hot Cell G. Using the manipulators, a capsule is retrieved from the transfer chute, examined for deficiencies, and capsule identification number recorded. The capsule is then placed into the UCS using the manipulators. This process is repeated for all UCS capsule location. The closure plug assembly is lowered onto the UCS and closed. The UCS loading process for the Type W capsules follows the same steps as the standard capsules.

Once the UCS is closed, it is removed from Hot Cell G. The DTS is positioned on the Hot Cell G cover block shield gate (Figure C-16). After the cover block shield gate and DTS shield door are opened, the DTS hoist is lowered into Hot Cell G, and the grapple is engaged with the UCS. The UCS is retrieved from Hot Cell G and fully withdrawn into the DTS prior to closing the shield door and cover block shield gate.

Figure C-16 Dry Transfer System Depiction

The DTS is moved from Hot Cell G to the Truckport hatch and lowered onto the SIA using the Canyon Crane. The SIA shield gate and DTS shield door are opened, and the UCS is lowered into the TSC cell

using the hoist. Once fully lowered into position, the grapple is disengaged from the UCS and raised back up into the DTS prior to closing the DTS shield door and SIA shield gate. These steps are repeated as necessary for the transfer of the next UCS to the TSC basket.

Once all UCS(s) are loaded into the designated TSC cells, the SIA is removed from the TSC, and the TSC inner and outer lids are installed and sealed. Then, the VCC lid is installed and sealed. Upon initiation of transport, the rollup door is opened, and the CSS is relocated to the Truckport Apron by use of the air pallet or a heavy track skidding system. Once a CSS has been positioned on the apron, the vertical cask transporter (VCT) is connected to the VCC through the use of lifting lugs. The VCT provides wheeled transport for the CSS by using hydraulics to lift and carry a CSS no more than 28 cm (11 in.) above grade.

Each component of the CSS is marked with a unique identifier to record storage locations for tracking purposes. In addition, each VCC has a metal stamped label identifying the dangerous waste, the hazards associated with the waste contents, and the accumulation start date. Capsule movement will be recorded throughout capsule transfer operations and maintained in the operating record.

C.2.2.2.3 Off-Normal Event

In the event of an off-normal condition during the UCS transfer process (e.g., misalignment within the VCC), a UCS may need to be temporarily returned to Hot Cell G while the facility responds appropriately. If this occurs, the UCS will be brought into Hot Cell G and placed in the Recovery Storage Assembly (RSA) for safe storage. When it is determined that the off-normal condition has been resolved the facility will return to normal operations.

If a condition occurs involving two UCS (e.g. a top and bottom UCS), then both UCSs may need to be temporarily returned to Hot Cell G while the facility responds appropriately. The top UCS will first be brought into Hot Cell G and placed in the RSA. The bottom UCS will then be brought into Hot Cell G and placed in the Upender Assembly (UEA). Once the condition is corrected, both UCSs will be returned to the TSC in their correct positions.

C.2.2.3 Heat Loading

Capsules are loaded into the CSS based on the total heat load of the cask. There are three design heat loads for strontium casks: 14.6 kW, 17.6 kW, and 22.3 kW. Casks loaded with cesium capsules have design heat loads of 15.6 kW and casks with Type W are 3.52 kW. To ensure the proper heat distribution, stainless steel capsule spacers may be included in the loading plan to take the place of a capsule.

Aluminum inserts in the UCS and TSC draw the heat away from the capsules. The casks are designed to direct the heat from the capsules through the VCC vents by means of convection. Since temperature is the limiting factor, the materials, CSS design, and loading plan have all been considered to ensure that the waste is maintained below the phase transition and melting points of the cesium and strontium waste. Cesium chloride undergoes a phase transition at temperatures as low as 330°C (626°F), therefore operating limits for the salt-capsule interface will not exceed 317°C (603°F). Strontium fluoride does not undergo a solid phase transition, and has a minimum melting point of 800°C (1472°F). Operating limits for the strontium salt-capsule interface is set at 540°C (1004°F).

The primary concern resulting in an increase in capsule temperature is vent blockage. Within the controlled environment of the Truckport, a complete blockage of the vents is not expected, however the accident scenario has been completed for this possibility. For a scenario in which all vents are completely blocked and no air flow occurs, the temperature will steadily rise until it reaches a steady-state. At steady-state, the stainless steel containment components (UCS and TSC) will not reach the allowable temperature limit of 815°C (1500°F).

In this accident scenario, the strontium fluoride will not melt due to its high melting point. The cesium chloride may undergo a phase transition due to the increase in temperature. However, in the event that the

Table I-1 Waste Encapsulation and Storage Facility Inspection Schedule

Inspection Item/Area	Frequency	Types of Problems and Evaluation Criteria
Truckport Apron	Before VCC is placed on apron and after transfer	Problem: Evidence of spills, cracks, gaps, or other degradation. Check for evidence of spills, leaks, or cracks.
Waste Handling Equipment[e]		
Canyon Crane	D	Problem: Crane is not operational. Check for proper function and operation.
Manipulators	D	Problem: Manipulator is not operational. Check for proper function and operation.
Air Pallet[d]	D	Problem: Air pallet is not operational. Check for proper function and operation.
Heavy Track Skidding System[d]	D	Problem: Heavy track skidding system is not operational. Check for proper function and operation.
Loading and Sealing Equipment[d]	Before the start of capsule loading in a VCC	Problem: The Upender, Recovery Shield Assembly (RSA) and the Recovery Transfer Assembly is not operational. Check for proper function and operation.
Dry Transfer System[d]	A	Problem: Hoist is not functioning properly. Visually inspect hoist components for proper function and operation.

[a]After initiation of closure, see Addendum H, "Closure Plan," for required inspections.

[b]Inspections will be on scheduled work days, excluding Hanford Facility closure days.

[c]Applies to Pool Cells 1-4, 6-8, and 12.

[d]Inspections will occur upon initiation of capsule transfer operations.

[e]Inspections are applicable only during equipment use. If the facility equipment has been inactive and inspections have been suspended, then an initial inspection will be conducted prior to use.

Unless otherwise noted, inspection frequencies are defined by the following periodicities:

Daily (D) = Once per calendar day.
Weekly (W) = Once per calendar week with a period that runs from Sunday to Saturday.
Monthly (M) = Once per calendar month.
Quarterly (Q) = Once per calendar quarter.
Semiannually (SA) = Once per 6-month calendar period.
Annually (A) = At least once per 12-month period ±30 days.

This inspection plan addresses the following unit group specific items:

- General facility.
- Storage areas.
- Waste handling equipment.