FACT SHEET

PART III, OPERATING UNIT GROUP 14, WASTE ENCAPSULATION STORAGE FACILITY

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UNIT DESCRIPTION

The Waste Encapsulation Storage Facility (WESF), Operating Unit Group 14, was constructed on the west end of B Plant in 1974. Its mission was to encapsulate and store cesium chloride and strontium fluoride salts that had been separated from Hanford's high-level tank waste.

WESF is a two-story, 20,000 square-foot building constructed of steel reinforced concrete. The building is 157 feet long and 40 feet high. It is partitioned into different areas:

- Seven hot cells (A through G).
- The hot cell service area.
- The pool cell area.
- Operating areas.
- Building service areas.

The dangerous waste management unit at WESF consists of the pool cells and the F and G Hot Cells. The cells isolate and maintain the mixed waste during normal storage conditions and in the event of any accident.

Mixed waste management activities started at WESF on July 14, 1997. Today, the WESF mission is to store encapsulated cesium and strontium capsules until they go to another storage unit, a treatment unit, or a national repository for disposal.

Hot Cells

The seven hot cells at WESF are labeled A through G. Permittees work in the hot cells remotely using manipulators. They load out waste and drums in hot cell A. Hot cells B through E were used to convert strontium nitrate and cesium carbonate into strontium fluoride and cesium chloride salts. Only hot cells F and G will remain active for cesium and strontium capsule storage.

The hot cell service area, on the south side of the hot cells, is used for access into hot cells A and G. The operating areas and other building service areas provide areas for instrumentation monitoring, utility support, or manipulator repair.

Pool Cells

WESF provides underwater pool storage of stainless steel capsules containing cesium-137 and strontium-90. WESF manages two dangerous waste streams of the cesium chloride and strontium fluoride salts from Hanford’s high-level tank waste.

The pool cell area consists of 12 pools lined with stainless steel. The depth of the pool water is about 13 feet. The permit only authorizes use of Pool Cells 1 through 8 and 12 for capsule storage. Each pool has a monitoring system to detect any leakage from capsules. The water cools the cesium and strontium capsules and provides radiation shielding. The Permittees use Pool Cell 12 to move capsules from hot cell G and between pool cells.

TYPE AND QUANTITY OF WASTE

The Permittees store a total of 1,936 cesium and strontium capsules at WESF. There are 1,335 cesium capsules and 601 strontium capsules. The waste is stored in stainless steel capsules. The largest capsules are about 53 centimeters (~21 inches) long and about 8 centimeters (~3 inches) in diameter.

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BASIS FOR PERMIT CONDITIONS

This permit is intended to protect human health and the environment while ensuring proper management of waste at the WESF. The permit addenda are incorporated into this permit and are enforceable by reference. Ecology bases the conditions and addenda on:

- The Hanford Facility Dangerous Waste Permit, Revision 8C.
- Modifications to Revision 8C of the Permit.
- Comment resolution meetings with the Permittees.

The permit includes requirements for complying with environmental standards and maintaining and modifying the permit. The permit conditions address specifics such as personnel training, adequate staffing, process controls, and inspection requirements.

GENERAL WASTE MANAGEMENT

The cesium and strontium capsules at the WESF meet the definition of a "container" in Washington Administrative Code (WAC) 173-303-040. However, the properties of the mixed waste require that they be managed under water for shielding and thermal cooling purposes. Therefore, the management standards appropriate for capsules in WESF differ from those for container management units at WAC 173-303-630.

These WAC requirements do not allow liquids to remain in secondary containment, or containers to remain in contact with liquids in secondary containment. The required pool storage, lethal nature of the capsule content, and heat generation of the capsules make it essentially impossible to comply with the requirements of WAC 173-303-630(3).

Therefore, Ecology is regulating the pool cells and the hot cells, along with the transfer chute between the hot cells and Pool Cell 12, as miscellaneous units rather than container storage units. We are basing requirements largely on the container management standards of WAC 173-303-630. We have adapted them to the unique characteristics of the capsules and the lethal nature of their contents.

These conditions are also based on the environmental performance standards of WAC 173-303-680(2). Below are the management standards for capsule storage at the WESF.

- Use of containers: The Permittees must store all wastes in cesium capsules, strontium capsules, or Type W capsules, as documented in Section C.1 of Addendum C.
- Container identification: Permittees must maintain elsewhere detailed information about the contents of each capsule, indexed to the unique identification number. Permittees also must place this information in the WESF section of the facility operating record.
- Container inspections: The lethal nature of the capsules precludes traditional visual inspection. The Permittees must review the data from leak detection equipment monitors to detect leaks.
- Containment: The Permittees must always manage the capsules in heavily shielded concrete structures. This will also ensure highly effective containment of the wastes in the capsules in the highly unlikely event of a spill or release from a capsule.
- Closure: Based on the design and construction of the cesium and strontium capsules, closure requirements are based on closure by removal or decontamination.

The Permittees must keep the capsules sealed at all times, with their end caps welded in place. The 316L and Hastelloy materials resist corrosion and are compatible with the cesium and strontium salts in the capsules.

The traditional storage configuration of rows of drums with access aisles in the container storage requirements of WAC 173-303-630(5)(c) does not fit the configuration and available space in the pool

cells and the hot cells. Therefore, the permit conditions reflect the established rack storage in the pool cells. The conditions also reflect a general performance-based storage configuration in the hot cells.

WESF does not dispose of waste, and does not place wastes on the land. The permit needs no conditions for potential release of dangerous waste or dangerous constituents. This approach is consistent with WAC 173-303-630, which is the basis for most of the miscellaneous unit provisions of this chapter.

WAC 173-303-680(3) requires that monitoring, testing, analytical data, inspections, response, and reporting procedures and frequencies ensure compliance with the requirements of:

- WAC 173-303-320 (General Inspection).
- WAC 173-303-340(1) (Preparedness and Prevention).
- WAC 173-303-390 (Facility Reporting).
- WAC 173-303-64620 (Corrective Action).

This Permit satisfies these requirements as follows:

- Inspection requirements: Conditions III.14.H.1 as WESF-specific requirements. The basis of inspection requirements in Chapter 14 and Permit Condition II.X for WESF is WAC 173-303-320.
- Preparedness and Prevention: These requirements are satisfied through Permit Condition III.14.F.1.
- Facility Reporting: Condition I.F covers the reporting requirements for WESF because it does not accept, treat, or dispose of dangerous and/or mixed waste.
- Corrective Action: There are no actual or threatened releases of dangerous waste or dangerous constituents from WESF. We are not setting any corrective action conditions under WAC 173-303-64620. We believe the closure plan, based on closure by removal or decontamination, will fully protect human health and the environment.

Condition III.14.B.1 authorizes the Permittees to store dangerous and mixed waste in WESF. It is explicit about the wastes and how and where the Permittees may store the waste.

Condition III.14.B.2 requires the Permittees to maintain the physical structure of WESF. Any changes must be made through the permit modification process.

Condition III.14.B.3 addresses WESF operating requirements for dangerous waste management activities. The Permittees must follow the requirements for dangerous waste management operations in Addendum C. For operating and maintenance requirements beyond those in Addendum C, the Permittees must ensure proper operation of WESF, compliance with applicable permit conditions, and protection of human health and the environment. The basis for this condition is WAC 173-303-680(2).

The Permittees will comply with any compliance schedule and any work required in the LDR report required by Tri-Party Agreement Milestone M-26. The milestone calls for the treatment or acquisition of treatment capacity, or the continued storage of waste in WESF. Such a schedule could refer to the requirements of Milestone M-92-05, which sets a date when the U.S. Department of Energy (USDOE) must determine the disposition path for the capsules.

WASTE ANALYSIS REQUIREMENTS

The Permittees have no plans to place more waste into WESF. The Permittees have designated the waste now in WESF according to WAC requirements. The Permittees will not manage any additional waste at WESF, and will not treat any waste at WESF. Therefore, there is no need to establish permit requirements for sampling or analysis.

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If the Permittees wish to accept more waste or treat waste, they must seek a permit modification according to WAC 173-303-830. Ecology would then establish waste sampling and analysis requirements to ensure compliance with WAC 173-303-300.

Recordkeeping and Reporting

The basis of Permit Condition III.14.D.1 is WAC 173-303-380 and WAC 173-303-810(16). The condition is to ensure the Permittees follow proper procedures for recordkeeping and reporting.

SECURITY

WESF is within the secured area of Hanford. Access to the unit is subject to the general security provision of Condition II.L. Security provisions, access controls, and signage specific to this unit will comply with the requirements of WAC 173-303-310.

PREPAREDNESS AND PREVENTION

Condition III.14.F.1 and Addendum F cover preparedness and prevention requirements. The Permit has specific requirements to control ignition sources and to manage ignitable and reactive wastes. The Permittees will prevent ignitable and reactive wastes from exposure to excessive heat and sources of ignition. The Permittees must store incompatible wastes in approved separate secondary containment to prevent mixing. The basis for these requirements is WAC 173-303-340.

CONTINGENCY PLAN AND EMERGENCY RESPONSE

Conditions II.A, III.14.G, and Addendum J establish contingency plan requirements.

INSPECTIONS

Conditions II.X, III.14.H, and Addendum I require a written inspection schedule. The Permittees must follow the schedule in Addendum I for inspecting monitoring, safety, and emergency equipment and security systems. The inspections are to detect and prevent malfunctions, deterioration, operator error, or discharges that could harm human health or the environment.

Condition II.X includes requirements for the Permittees to correct problems these inspections reveal. It also includes inspection recordkeeping requirements. The basis for these inspection requirements is WAC 173-303-320.

TRAINING

The Permit requires the Permittees to develop and maintain a training program for dangerous waste management employees. The program must ensure the workers have the skills and knowledge to do their work safely. The Permittees must maintain the training requirements in Addendum G in a Dangerous Waste Training Plan prepared according to Condition II.C.1. The training program and written training plan must meet the requirements of WAC 173-303-330.

OTHER GENERAL REQUIREMENTS

Wastes at WESF are not ignitable or reactive, and they are managed in sealed containers. There is no potential for accidental ignition or reaction, and no need to establish a Permit condition based on the requirements of WAC 173-303-395(1).

The Permittees must comply with all other environmental protection laws and regulations through Condition II.Q.

The requirements of WAC 173-303-395(4) and (5) (for loading and unloading areas and for surface impoundments) do not apply to WESF. No permit conditions are needed.

Condition III.14.U.1, satisfies the labeling requirements of WAC 173-303-395(6). The basis of this condition is WAC 173-303-680(2), and WAC 173-303-395(6).

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CLOSURE

The closure plan in WESF Addendum H complies with the requirements of WAC 173-303-610(2). It calls for closure by removal or decontamination ("clean closure"). WESF's clean closure must confirm no spills or leaks of dangerous and/or mixed waste.

The Permittees will remove all mixed waste capsules. Using records in the Operating Unit Group 14 section of the facility operating record, the Permittees will show that no releases of dangerous or mixed waste from the capsules. Closure will not create any new dangerous or mixed waste streams or mixed waste volume, since the wastes are in sealed capsules.

Condition III.14.K requires the Permittees to follow the closure plan in Addendum H. The plan complies with the requirements of WAC 173-303-610. It also complies with the requirements from WAC 173-303-630(10) that are appropriate for the dangerous waste management units in Operating Unit Group 14 under WAC 173-303-680(2).

WESF is not authorized to receive additional waste. Therefore, WESF has received the final volume of dangerous waste. WAC 173-303-610(4)(a) requires the Permittees to treat, remove from the unit, or dispose of on-site, all dangerous waste from a dangerous waste management unit within 90 days after receiving the final volume of dangerous waste. Similarly, WAC 173-303-610(4)(b) requires that closure activities be completed within 180 days after receiving the final volume of dangerous waste.

Because there is no treatment, disposal, or other management alternative to continued storage of capsules in WESF, compliance with WAC 173-303-610 will take longer than 90 days. Instead, the Permittees are required to submit a permit modification to revise the closure plan when a viable treatment or management option is available. Tri-Party Agreement Milestone M-92-05 requires USDOE to determine the disposition path for the capsules. This permit condition is based on WAC 173-303-815(3) and WAC 173-303-610(4)(a) and (b).

MISCELLANEOUS UNIT MANAGEMENT STANDARDS

Conditions III.14.U.1, U.2, and U.3 address management of the hot cells and pool cells. They address the use of containers (capsules), container identification and inspection, containment, and closure. These permit conditions reflect all the requirements in WAC 173-303-680(2) that are appropriate for the miscellaneous units, including sections (a), (b), and (c).

REQUESTED VARIANCES OR ALTERNATIVES

The requirement to store the containers in the pool cells precludes the implementation of standard storage and inspection requirements. Therefore the permit specifies alternative requirements.

STATE ENVIRONMENTAL POLICY ACT (SEPA)

The SEPA determination for WESF is in the Hanford-Wide Permit Fact Sheet.

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