

243Z Complex Demolition Report

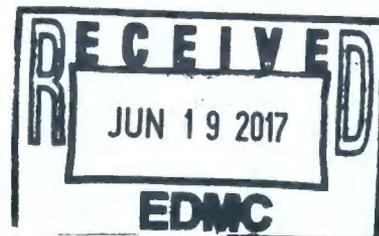
As Left Characterization

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract DE-AC06-08RL14788



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Change Control Record		
(3) Revision	(4) Description of Change – Replace, Add, and Delete Pages	Month/Year
0	Initial release of document describing demolition of the 243Z Complex including 243Z, 243ZA, 243ZB, and the attached 296Z015 stack.	April 2017

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Terms

ACM	asbestos-containing material
CERCLA	<i>Comprehensive Environmental Response, Compensation, and Liability Act of 1980</i>
FHA	fire hazards analysis
LLWSF	Low-Level Waste Storage Facility
LLWTF	Low-Level Waste Treatment Facility
PFP	Plutonium Finishing Plant
S&M	surveillance and maintenance
TEDF	Treated Effluent Disposal Facility

1 Introduction

The purpose of this report is to provide information that will support the following activities:

- Document summarizes the applicable actions required by HNF-22401, *Plutonium Finishing Plant (PFP) Complex End Point Criteria* (also referred to by document number NMS-16404) have been met.
- Prepare an overall turnover package documenting the as-left condition of the Plutonium Finishing Plant (PFP) site that will be transitioned to surveillance and maintenance (S&M).
- Develop a removal action report for the PFP *Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA)* removal action.
- Provide reference information for follow-on activities associated with the site.

This report describes the as-left condition of the 243Z Complex slabs. The report 243Z, 243ZA, 243ZB, and 296Z015 *Endpoint Criteria Checklist* (DOE/RL-2015-34) documented facility specific endpoint with detail documentation. This report provides a summary of information relating to endpoint compliance consistent with the overall objectives of HNF-22401. HNF-22401 requires that relevant information about the remaining slabs be part of the final turnover package for transition to S&M.

The 243Z Complex, consisted of four structures: 243Z, 296Z015, 243ZA, and 243ZB. The complex was used to treat cooling water and chemical sewer waste from 234-5Z, 236Z, and 291Z resulting in liquid waste that met the acceptance criteria for radionuclides discharged to the 200 East Area Treated Effluent Disposal Facility (TEDF). The 296Z015 exhaust stack provided ventilation for the building. The 243Z structures were part of the PFP Complex located in the 200 West Area of the Hanford Site in southeastern Washington State, and were removed under the CERCLA removal actions. Work on the 243Z structures was performed in accordance with DOE/RL-2005-13, *Action Memorandum for the Plutonium Finishing Plant Above-Grade Structures Non-Time Critical Removal Action*. Work was implemented in accordance with DOE/RL-2011-03, *Removal Action Work Plan for the Deactivation, Decontamination, Decommissioning, and Demolition of the Plutonium Finishing Plant Complex*.

2 Facility Description

The 243Z structures were located in the southern portion of the PFP Complex. Each of the 243Z Complex structures are described in the following subsections.

2.1 243Z Low Level Waste Treatment Facility

The 243Z Building and associated 296Z015 stack (Figure 1), known as the Low-Level Waste Treatment Facility (LLWTF), housed two waste water treatment trains and was constructed in 1993. This building was located south/southeast of the 234-5Z Building and had an approximate footprint of 2,450 ft². It was a metal fabricated structure built on a slab that contained no below-grade spaces. The single story building was a braced frame steel structure with metal siding. The walls and ceiling had batt insulation. The interior walls were finished with fiber-reinforced plastic wall panels, and there was a suspended acoustical ceiling. The 296Z015 steel exhaust stack was located adjacent to the north end of the building (Figure 1). The stack was 42 ft high with a foundation that extended to about 4.5 ft below-grade. Additional detail is available on drawings H-2-82724, *Architectural PFP LLWTF Floor Plan and Sections* (building), and H-2-82718, *Structural PFP LLWTF Stl Stack Pln, Sctns & Dtls* (stack).



Figure 1. 243Z Building Before Demolition

2.2 243ZA Low-Level Waste Storage Facility

The 243ZA facility (Figure 2), known as the Low-Level Waste Storage Facility (LLWSF), was affiliated with the 243Z LLWTF. It collected and stored waste water from various PFP sources, pumped the waste water to 243Z for treatment, then stored the treated water in tanks prior to disposal via TEDF (HNF-SD-W049H-ICD-001, *200 Area Treated Effluent Disposal Facility Interface Control Document*). The tanks were constructed of fiberglass (isophthalic polyester resin). The waste water tank (TK-101), with a holding capacity of 1,000 gal, was located in a 17 ft deep sump pit along with pumping equipment and piping. TK-102 was a tank in a concrete above-grade secondary containment with a holding capacity of 5,600 gal. TK-102 was about 5 ft in diameter by 22 ft tall and was used as a surge tank to receive the treated water from 243Z. The 524 ft² structure, built in 1993, was 312 ft² above-grade and 212 ft² below-grade. Drawings H-2-82719, *Structural PFP LLWTF Tank Fnd Pln and Sections*; H-2-82720, *Structural PFP LLWTF Sump Pit Conc Sctns & Dtls*; and H-2-82721, *Structural PFP LLWTF Sump Pit Frmg Pln & Sctns*, provide additional detail.



Figure 2. 243ZA Storage Facility Before Demolition

2.3 243ZB Cooling Towers and Concrete Pad

The 243ZB cooling towers and concrete pad facility (Figure 3) was affiliated with the 243Z LLWTF. Constructed in 1993, 243ZB was located north of the 243ZA LLWSF. The two cooling towers were mounted on a concrete slab, approximately 24 ft by 15 ft. 243ZB housed the closed loop cooling water system and two fluid cooling units that supported 243Z Building operations.



Figure 3. 243ZB Cooling Towers and Pad Before Demolition

3 Demolition Preparation

The preparation for and demolition of the 243Z Complex were performed under the following work packages: 2Z-14-07002 WCN-1, *Isolate Mechanical Utilities in Building 243-Z*; 2Z-14-06767/M, *Electrical Isolation of 243-Z*; 2Z-15-00751, *Flush Drain Water Line From 291-Z to Man Hole (MH-Z3)*; and 2Z-15-01316/M, *Demolition of 243 Buildings*.

As part of demolition preparation, the building was characterized and electrically isolated, and hazardous materials were removed. A predemolition walkdown was performed to ensure that necessary predemolition actions were complete.

3.1 Characterization

The 243Z Complex was characterized as part of demolition preparation. The following reports were prepared to document the evaluation of the building for asbestos, waste disposal, radiological contamination, and beryllium hazards:

- CHPRC-02480, *Asbestos National Emission Standards for Hazardous Air Pollutants Inspection Report for the 243-Z Low Level Waste Treatment Facility*.
- CHPRC-02607, *Calculation of Chemical Content in Rubble Generated from 243Z Demolition*
- CHPRC, 2013, *243-Z, Low-Level Waste Treatment Facility Radiological Characterization Data Summary Report*.
- CHPRC, 2014, *Beryllium Verification Report For 243Z – Low Level Waste Treatment Facility*.

The radiological, asbestos, and beryllium evaluations found no evidence of radiological contamination, asbestos-containing material (ACM), or beryllium contamination associated with the 243Z Complex. The rubble evaluation identified some predemolition materials to be addressed (i.e., refrigerant and light bulbs that were removed from the area prior to demolition). No residual radiological, chemical, asbestos, or beryllium hazards associated with remaining exposed slab have been identified.

3.2 Cold and Dark Process

As part of the cold and dark process in preparation for demolition of the building, electrical feeds to the building were isolated, air gapped, and sealed. In addition, the piping and drain to the TEDF line were plugged and filled with grout. The process was documented in work packages 2Z-14-07002 WCN-1, 2Z-15-06767/M, and 2Z-15-00751 and comprehensively documented in CHPRC, 2015, *Verifications of Hazardous Energy Isolations for Building 243Z Complex (243Z, 243ZA and 243ZB)* (included in DOE/RL-2015-34, Appendix A).

3.3 Predemolition Walkdown

A predemolition walkdown of the 243Z Complex was conducted on August 20, 2015. The results of the walkdown were documented on the 243Z Low-Level Waste Treatment Facility Ready for Demolition Task Checklist to verify that the predemolition conditions were met, including predemolition material removal, adequate sealing of penetrations, and completion of preparations to support the removal. A copy of the completed predemolition checklist is provided in DOE/RL-2015-34, Appendix A.

3.4 Demolition, Post-Demolition Walkdown, and Document Review

Removal of the structure was uneventful. A post-demolition walkdown was conducted to ensure that final conditions meet endpoint requirements. A copy of the completed post-demolition walkdown checklist is provided in DOE/RL-2015-34.

The building slab at 243Z LLWTF has been covered with gravel as shown in Figure 4. The below-grade equipment was removed from the 243ZA sump pit, the buried line was plugged (Figure 5), and the pit was backfilled (Figure 6). The single buried line leaving the sump pit to TEDF was isolated and plugged (Figure 5) along subsequent buried lines isolated at manholes 3 and 4 (Figure 5). The slab at 243ZB was been left uncovered (Figure 7).



Figure 4. 243Z Post Demolition Slab As-Left Condition

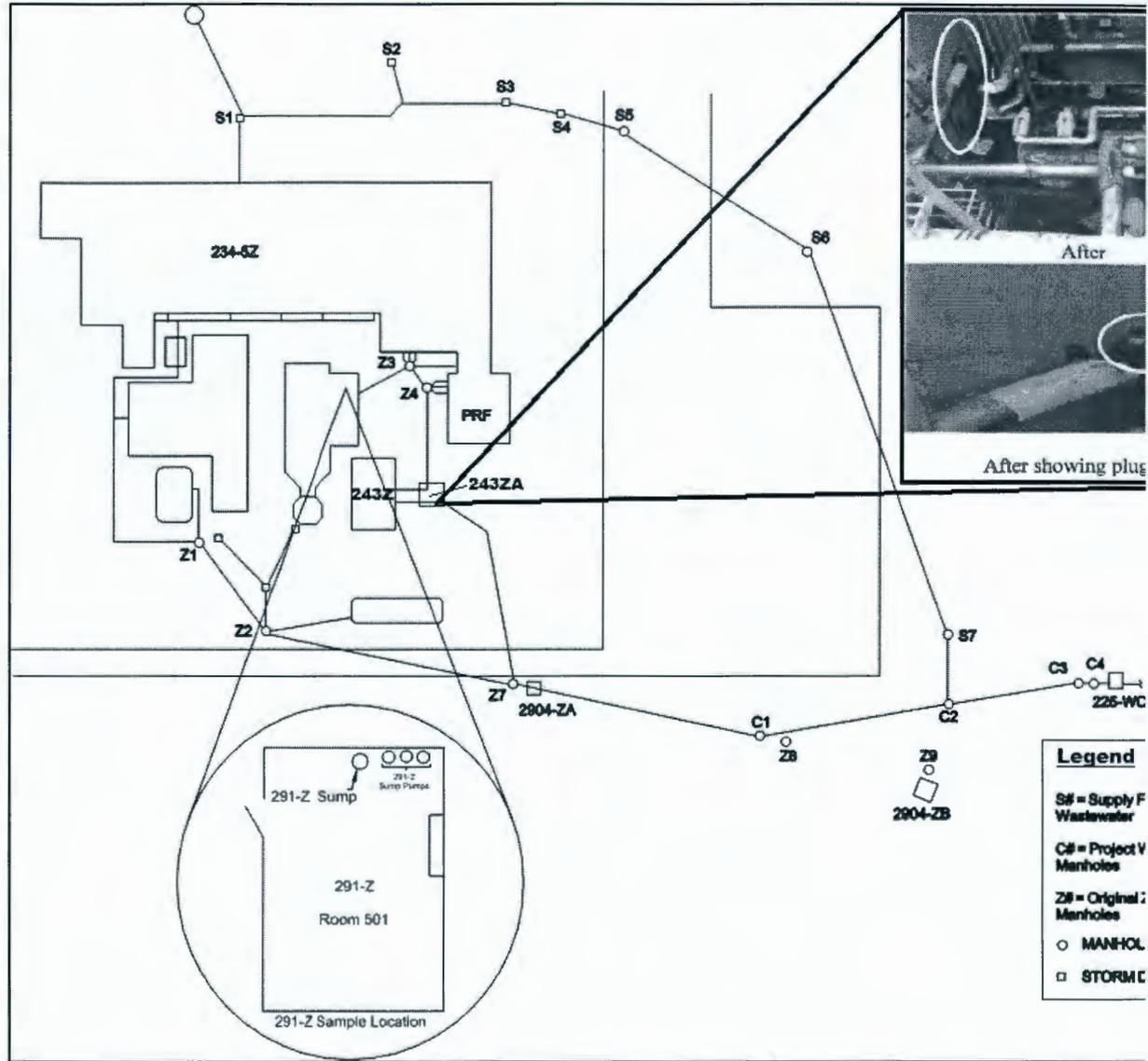


Figure 5. 243Z Underground Piping Schematic Isolations at Manholes 3 and 4 (Z3 and Z4) and 243ZA



Figure 6. 243ZA Facility Slab As-Left Condition

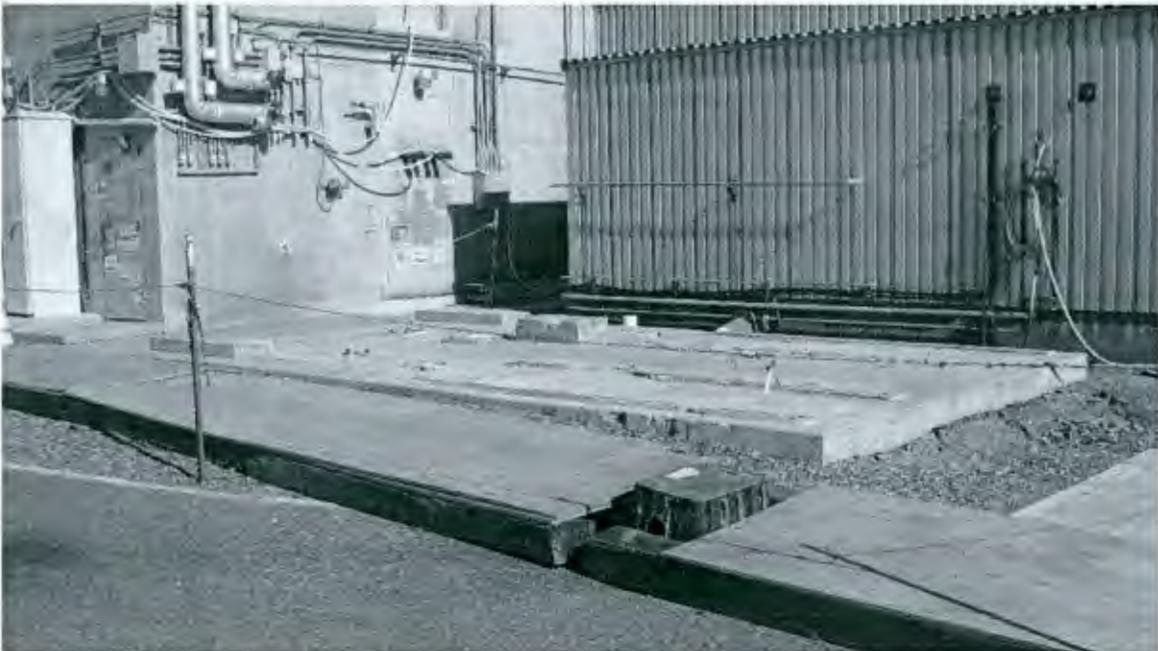


Figure 7. 243ZB Cooling Towers Slab As-Left Condition

4 As-Left Condition

This chapter summarizes the overall status of the site and provides pertinent information associated with the site.

4.1 As-Left Description

The 243Z Complex slabs were left in a clean slab-on-grade condition (with and without gravel) (Figures 4, 7, and 8). Buried line isolations were made with plugs in manholes 3 and 4, and the effluent line to TEDF from the 243ZA sump was plugged prior to backfill.

4.1.1 Key Documentation and Drawings

No drawings associated with the PFP Retention Basin and Valve Pit would be deemed essential or support drawings per current engineering configuration management requirements. The drawing set for the 243Z Complex (H-2-82708 through H-2-82733) could be considered historical information.

4.1.2 Site Radiological and Hazardous Material Characterization

There is no history of spills, releases, or identified radiological or chemical hazards associated with the site. The predemolition radiological, asbestos, and beryllium evaluations found no evidence of radiological contamination, ACM, or beryllium contamination. In accordance with the predemolition waste planning evaluation (CHPRC-02824, *Evaluation of Chemical Content in Rubble from 2735-Z, 225-WC, and MO-671 Demolition*), hazardous materials (e.g., refrigerant and light bulbs) were removed from the area prior to demolition.

4.2 Endpoint Objectives

The 10 measurable objectives outlined in Section VI of HNF-22401 that define the clean slab-on-grade objective are evaluated in Table 1.

Table 1. Clean Slab-on-Grade Objectives

Objective	Status	Comment
Above-grade structures are removed.	Met	No comment.
Below-grade portions of buildings will be emptied and stabilized.	Met	243ZA sump pit emptied and backfilled.
Buried pipes and ducts will be drained and sealed.	Met	Manholes M3 and M4 sealed. Effluent line to TEDF was plugged in 243ZA sump pit.
The portion of concrete slab that is exposed to the weather will be free of dispersible radiological contamination.	Met Subject to Change	Exposed portions of the 234ZA and 243ZB pads were surveyed and free of radiological contamination. Slabs are in close proximity to the 236Z demo zone and will need further evaluation
The exposed surface of the slab will be free of tripping and puncture hazards.	Met	No comment.
The exposed surface of the slab will be suitable for exposure to the weather for at least 20 years.	Subject to Change	Slabs are in close proximity to the 236Z demo zone and will need further evaluation

Table 1. Clean Slab-on-Grade Objectives

Objective	Status	Comment
Subsurface radiological areas will be posted per regulations.	Met	Posted as part of the PFP fenced area.
All penetrations through the slab (e.g., piping and conduits) will be sealed with grout or equivalent suitable for exposure to the weather for 20 years.	Met	No comment.
All wastes are removed.	Met	No comment.
No exposed surface soil contamination areas are allowed.	Met	No comment.

4.3 Administrative Endpoint Review

The administrative endpoints specified in HNF-22401 will be formally evaluated for the overall project at completion. To facilitate the formal evaluation, the administrative endpoints applicable to the 243Z Complex were reviewed (Table 2) to ensure that applicable documentation is available for this review.

Table 2. Administrative Endpoint Review

Checklist Number	Item ^a	Description ^a	Status
Admin-1	Complete/close outstanding audit findings and occurrence reports.	A review of facility and site action tracking systems and open occurrence reports will be conducted and items will be addressed and closed.	Not applicable ^b .
Admin-2	Document configuration management performed in accordance with site standards.	The final configuration of the PFP Complex will be reviewed against controlled drawings to verify proper incorporation of structure and utility modifications/isolations.	Not applicable ^b .
Admin-3	Provide essential drawings and a list of all facility drawings necessary for S&M.	This endpoint will be done in conjunction with the development of the draft S&M Plan. The essential drawing list will be updated to reflect the condition of the PFP Complex area at the end of the project. A separate list containing both the essential drawing and those required to support S&M.	Not applicable ^b .
Admin-4	Document remaining industrial hazards and compliance with industrial safety requirements.	This endpoint compiles the individual endpoints into one report reflecting the remaining industrial hazards.	Not applicable ^b .
Admin-5	Document compliance with confined space program.	This endpoint compiles the individual endpoints into one report reflecting the remaining confined spaces.	243ZA sump pit has been backfilled see section 3.4 of this document.

Table 2. Administrative Endpoint Review

Checklist Number	Item^a	Description^a	Status
Admin-6	Document compliance with the asbestos program.	The post demolition condition of the PFP Complex will be assessed for compliance with the site asbestos program.	No asbestos; see Section 3.1 of this document.
Admin-7	Document amount and location of remaining hazardous substances and/or dangerous wastes.	This endpoint compiles the individual endpoints into one report reflecting the remaining hazardous substances/dangerous wastes.	No hazardous substances; see Section 3.1 of this document.
Admin-8	Complete and provide current FHA.	An FHA will be completed reflecting the endpoint condition of the PFP Complex.	Not applicable ^b .
Admin-9	Transfer facility physical property records.	The property records for the PFP Complex will be updated as the transition and dismantlement effort removes excess and or disposes of property.	The demolition status of the facility will be documented via a Facility Status Change Form.
Admin-10	Provide an S&M Plan.	The transition and dismantlement project/contractor has the historic and current knowledge of the PFP Complex and will develop an S&M Plan for the S&M organization. The oncoming project/contractor has the responsibility to release the S&M Plan under their document release procedures.	Not applicable ^b
Admin-11	Provide a current/updated building emergency plan.	The PFP Complex building emergency plan will be updated (or cancelled) to reflect the endpoint condition.	Not applicable ^b .
Admin-12	Provide S&M procedures and files.	Procedures utilized by the transition and dismantlement project/contractor to conduct S&M at the end of the project will be copied and placed in the completion package files.	Not applicable ^b .
Admin-13	Provide identified regulatory commitments and regulatory documentation.	The transition and dismantlement project/contractor has the historic and current knowledge of the PFP Complex existing commitments and documentation. As such, the transition and dismantlement project/contractor will compile outstanding commitments and documentation to support the S&M organization to complete the commitments/documentation. These along with recently (within the last year of the project) completed commitments documentation (closure/completion letters) will be included in the completion package files.	Not applicable ^b .
Admin-14	Transfer classified documents to repository.	All classified documents will be removed from the PFP Complex and placed in a site-approved repository.	Not applicable ^b .

Table 2. Administrative Endpoint Review

Checklist Number	Item ^a	Description ^a	Status
Admin-15	Verify transition and dismantlement completion package contents are complete.	This is a final review of the document log for the completion package files. This will ensure the intended documentation provided in the files have not been removed or checked out and not returned.	Not applicable ^b .
Admin-16	Provide existing regulatory permitting documentation.	The remaining regulatory permits and supporting documentation will be compiled and provided to the S&M organization.	Not applicable ^b .
Admin-17	Compile available historical data including chemical and plutonium spills, holdup, releases, and constituents associated with building processing to support final remediation.	This endpoint is designed to capture useful information on the remaining structures/systems that has been kept by facility personnel (i.e., engineers, health physics, and operations) and is not available through other sources prior to their leaving the facility. This data will be compiled and placed in the completion package files. Documentation already maintained by the Hanford Site document control system and/or libraries will be referenced only.	No history of spills at 243Z Complex. See Section 4.1.2 of this document.

a. Description is originated from HNF-22401, *Plutonium Finishing Plant (PFP) Complex End Point Criteria*.

b. These administrative criteria are not separately evaluated for 243Z Complex. All criteria will be addressed globally in the turnover package to Central Plateau S&M, and this document supports that evaluation.

FHA = fire hazards analysis

5 References

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