

River Corridor Closure Contract

100 Area D4 Project Building Completion Report

**January 1, 2010, to
December 31, 2010**

May 2011

For Public Release

Washington Closure Hanford

Prepared for the U.S. Department of Energy, Richland Operations Office
Office of Assistant Manager for River Corridor



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EXECUTIVE SUMMARY

This report documents the final status of buildings after the completion of deactivation, decontamination, decommissioning, and demolition (D4) activities at the U.S. Department of Energy (DOE) Hanford Site's 100-F, 100-H, and 100-N Areas from January 1, 2010, to December 31, 2010. The following buildings are included in this report:

- 105-NA Emergency Diesel Building
- 183-H West Clearwell
- 1310-N Radioactive Chemical Waste Treatment Facility ("Golf Ball") and Silo
- 1322-N Waste Treatment Pilot Plant
- 1322-NA Effluent Water Treatment Plant Annex
- 1322-NB Crib Effluent Iodine Monitoring Facility
- 1322-NC Crib Sample Pump Pit
- 1605-NE East Observation Post
- 1722-N Decontamination – Hot Shop Building
- 1909-N Waste Disposal Valve Pit
- MO-417.

Demolition debris and soil associated with completion of these building closures were disposed at the Environmental Restoration Disposal Facility, located at the Hanford Site. Post-demolition direct-hand instrument surveys and Global Positioning Environmental Radiological Surveyor surveys were performed on excavations after loadout of debris and prior to backfill.

The 100 Area D4/Interim Safe Storage Project personnel worked a total of approximately 148,808.7 hours (manual and non-manual, not including subcontractors) from January 1, 2010, to December 31, 2010. During this time there were no Occupational Safety and Health Administration recordable injuries or first aid cases.

No clothing contamination and no skin contamination incidents occurred during demolition of the 100 Area buildings. Workers received 2,234.9 person-mrem of radiological exposure from January 1, 2010, to December 31, 2010, during their support of D4 activities associated with the

buildings discussed in this report. All boundary air sample results were below procedural action levels for the duration of the work performed.

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METRIC CONVERSION CHART

Into Metric Units			Out of Metric Units		
<i>If You Know</i>	<i>Multiply By</i>	<i>To Get</i>	<i>If You Know</i>	<i>Multiply By</i>	<i>To Get</i>
Length			Length		
Inches	25.4	millimeters	Millimeters	0.039	Inches
Inches	2.54	centimeters	Centimeters	0.394	Inches
Feet	0.305	Meters	Meters	3.281	Feet
Yards	0.914	Meters	Meters	1.094	Yards
Miles	1.609	kilometers	Kilometers	0.621	Miles
Area			Area		
sq. inches	6.452	sq. centimeters	sq. centimeters	0.155	sq. inches
sq. feet	0.093	sq. meters	sq. meters	10.76	sq. feet
sq. yards	0.836	sq. meters	sq. meters	1.196	sq. yards
sq. miles	2.6	sq. kilometers	sq. kilometers	0.4	sq. miles
Acres	0.405	Hectares	Hectares	2.47	Acres
Mass (weight)			Mass (weight)		
Ounces	28.35	Grams	Grams	0.035	Ounces
Pounds	0.454	Kilograms	Kilograms	2.205	Pounds
Ton	0.907	metric ton	metric ton	1.102	Ton
Volume			Volume		
teaspoons	5	Milliliters	Milliliters	0.033	fluid ounces
tablespoons	15	Milliliters	Liters	2.1	Pints
Fluid ounces	30	Milliliters	Liters	1.057	Quarts
Cups	0.24	Liters	Liters	0.264	Gallons
Pints	0.47	Liters	cubic meters	35.315	cubic feet
Quarts	0.95	Liters	cubic meters	1.308	cubic yards
Gallons	3.8	Liters			
cubic feet	0.028	cubic meters			
cubic yards	0.765	cubic meters			
Temperature			Temperature		
Fahrenheit	subtract 32, then multiply by 5/9	Celsius	Celsius	multiply by 9/5, then add 32	Fahrenheit
Radioactivity			Radioactivity		
picocuries	37	millibecquerel	Millibecquerels	0.027	Picocuries

1.0 SCOPE

This report documents the final status of buildings demolished at the 100-F, 100-H, and 100-N Areas of the U.S. Department of Energy (DOE) Hanford Site from January 1, 2010, to December 31, 2010. The following buildings are included in this report: 105-NA, 183-H, 1310-N, 1322-N, 1322-NA, 1322-NB, 1322-NC, 1605-NE, 1722-N, 1909-N, and MO-417.

The activities at these facilities generally included utility disconnection; planning; characterization; engineering; removal of hazardous and radiologically-contaminated materials; equipment removal; deactivation, decontamination, decommissioning, and demolition (D4) of the above-grade structure; and removal of the remaining slabs and foundation elements; “load-out” of debris to Hanford’s Environmental Restoration Disposal Facility (EDRF), followed by backfill. The backfill for a number of the buildings will be placed by the Washington Closure Hanford (WCH) Field Remediation (FR) Project.

Previous Building Completion Reports discuss 100 Area Building D4 activities that were completed before January 1, 2010.

2.0 FACILITY DESCRIPTION AND CONDITIONS

The buildings detailed in this report were located in the 100-F, 100-H, and 100-N Areas of the Hanford Site, which was constructed and operated for the production of plutonium. All of the buildings discussed in this report were located in the 100-F, 100-H, or 100-N Areas at the 100-N Area.

2.1 105-NA EMERGENCY DIESEL BUILDING

The 105-NA Emergency Diesel Enclosure was a 17.9-m² (192-ft²) pre-engineered, metal-framed building with a flat metal roof centered at 149525.346 N, 571153.606 E (Figure 1). The west wall was constructed with metal siding; the north wall was clad in metal siding and wire mesh, which had the only door to the facility. The east and south walls were shared with the 105-N Reactor building.

The 105-NA Emergency Diesel Enclosure housed an emergency lift station diesel pump, which provided pumping capacity for Zone 1 to respond to any emergency high water levels caused by a pipe break or fog-spray system activation.

The 105-NA Emergency Diesel Enclosure was demolished in 2010 under the River Corridor Closure Contract’s (RCCC) W. M. Dickson subcontract, and the debris loaded out and sent to EDRF. The demolition of 105-NA was completed concurrently with other work at the 105-N Reactor. The site will be backfilled following demolition of the adjacent fuel storage basin (FSB). Final D4 documentation includes the global positioning system (GPS) survey and sample data, all of which are included in the Post-Demolition Survey Report (PDSR) (CCN 157852). A Global Positioning Environmental Radiological Surveyor (GPERS)

radiological survey was not conducted. The GPERS survey has been deferred until a later, deeper level of excavation associated with the reactor interim safe storage (ISS) is reached.

Figure 1. 105-NA Emergency Diesel Building.



2.2 183-H WEST CLEARWELL

The 183-H West Clearwell was part of the 183-H Facility, which included a 790-m² (8,495-ft²), three-story Head House and Chemical Building, and sixteen 18,900-L (4,975-gal) capacity flocculation and subsidence basins connected to a Filter Plant and Pump room to treat raw water from the Columbia River. The facility was centered at 152796.0 N, 577781.5 E (Figure 2). Concentrated sulfuric acid received by rail was pumped to the head tank for pH control. Chlorine was added for algae control and alum was added as a flocculating agent in the process. Two covered, below-grade, reinforced-concrete clearwells (East and West) had a pump room centered between the two clearwells. The two clearwells had a combined capacity of 1.47 billion L (389 million gal) that routed water via a 91-cm (36-in.)-diameter pipe to supply water to the 190-H storage tanks, filter backwash, the high tanks, power house, fire, sanitary, and emergency filtered water. The clearwell held the treated water for use at 100-F for drinking water and facility process water, not including reactor coolant (demineralized water was used for reactor coolant).

The 183-H West Clearwell was demolished in 2010 under the RCCC, and the debris was loaded out and sent to ERDF. The 183-H roof and walls, 91 cm (3 ft) below grade, were

demolished. The remaining walls and below-grade slab were left in place as “clean concrete.” Approximately 30 holes were hammered through the floor in a grid pattern to prevent precipitation from pooling in the remaining structure. The backfill operations were deferred to the WCH FR Project to complete concurrent with FR backfill operations in the East Clearwell.

Final D4 documentation includes a post-demolition GPS survey, which is included in the PDSR (CCN 156123). No GPERS/Laser-Assisted Ranging and Data System (LARADS) survey was conducted at this site in accordance with *Agreement between DOE-RL and Ecology – Demolition of the 183-H West Clearwell, Sampling and Analysis Plan – 183-H* (CCN 149386).

Figure 2. 183-H West Clearwell.



2.3 1310-N RADIOACTIVE CHEMICAL WASTE TREATMENT FACILITY (“GOLF BALL”) AND SILO

The 1310-N Radioactive Chemical Waste Treatment Facility consisted of the 1310-N spherical tank (referred to as the “Golf Ball”), the 1310-N Pump House Silo, and the adjoining earthen berm. The Golf Ball was a 19-m (62-ft)-diameter spherical steel tank with a capacity of 3,420,000 L (900,000 gal), and centered at 149615.16 N, 571411.36 E (Figure 3). Approximately half of the tank was constructed below grade and was surrounded on three sides by an earthen berm installed as a radiological shield. The reinforced concrete Pump House Silo structure was 8.4 m (27.5 ft) in diameter and 15.3 m (50 ft) high, and centered at 149638.8 N, 571385.22 E. The silo was 12.2 m (40 ft) below grade.

The 1310-N Facility was constructed in 1963 and located east of Taholah Road about 230 m (755 ft) northwest of the 105-N Reactor. The 1310-N Chemical Waste Storage facility provided storage and treatment capacity for contaminated liquid wastes generated at the N Reactor. The Golf Ball was designed to neutralize effluent prior to disposal to the 200 Area or to the N-cribs

(i.e., 1301-N, 1325-N). The Golf Ball tank outlet was a single 30.5-cm (12-in.)-diameter pipe flowing to the Silo that incorporated pumps for circulation, export, and neutralization of waste. Composite Underground Line drawings (H-1-45007, Sheets: 49, 50, 56, and 67) show the underground piping associated with the facility.

The site was deactivated in 1997 under the Environmental Restoration Contract (ERC), which included removal of residual liquids in the Golf Ball and piping, as well as sediment removal from the Golf Ball. The 1310-N Golf Ball, Silo, and most of the berm were demolished in 2010 under the RCCC, and the debris was loaded out and sent to ERDF.

All that remains of the 1310-N complex are the eastern portion of the berm and an excavation approximately 45 m (148 ft) by 67 m (220 ft) and about 6 m (20 ft) deep. The backfill operations were deferred to the WCH FR organization to complete following removal of the associated WIDS sites. Piping was exposed in the north and northwest sides of the excavation. Figure 4 and the December 2, 2010, Civil GPS Survey depict the final condition of the project. Final D4 documentation includes a GPERS radiological survey, a GPS survey, and sample data, all of which are included in the PDSR (CCN 157088).

Figure 3. 1310-N Radioactive Chemical Waste Treatment (“Golf Ball”).

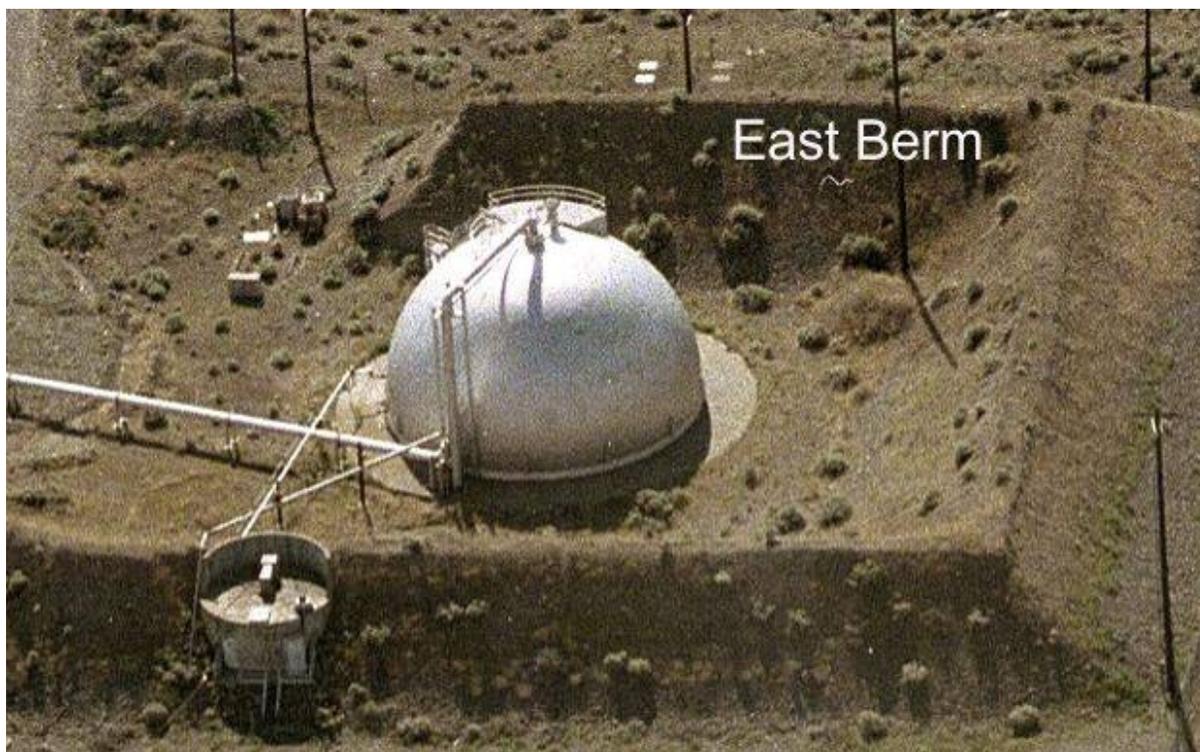
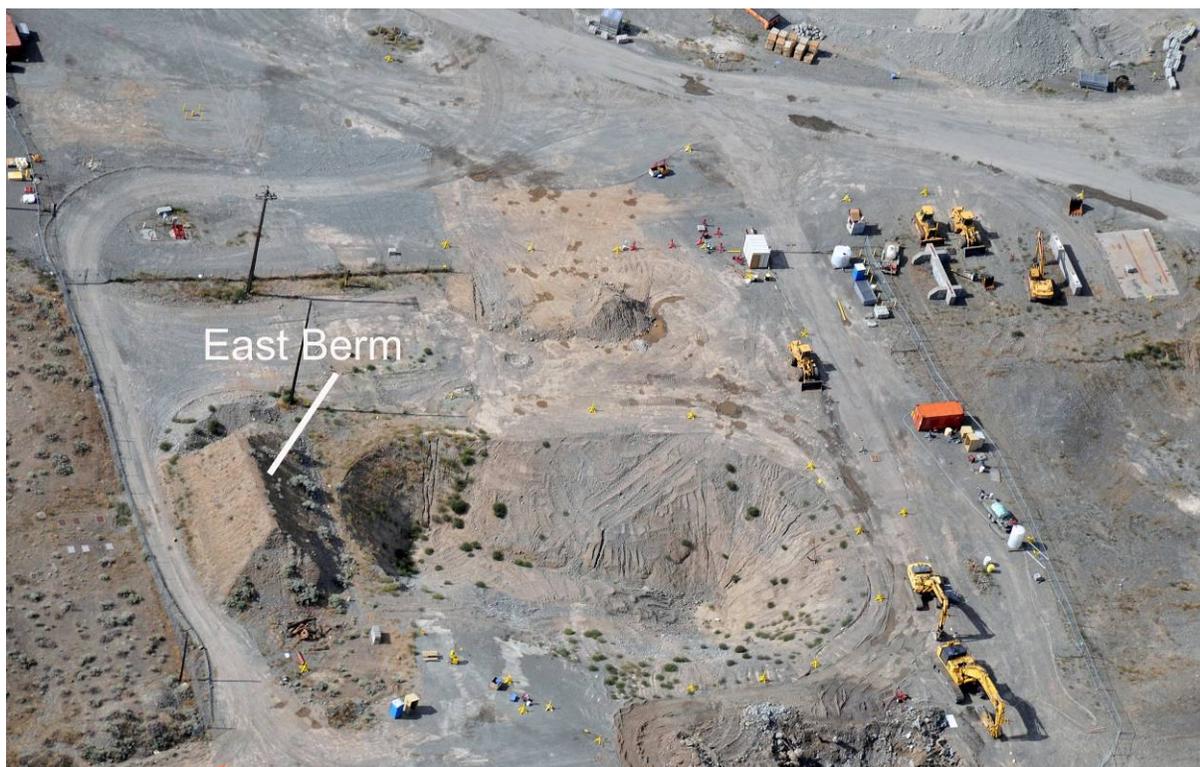


Figure 4. 1310-N Site Following Demolition.



2.4 1322-N WASTE TREATMENT PILOT PLANT

The 1322-N Waste Treatment Pilot Plant was a reinforced-concrete structure with a flat concrete roof and foundation that measured 8.2 m (27 ft) by 7.9 m (26 ft) by 7.5 m (24.5 ft) high and extended 4.6 m (15 ft) below grade. The facility was centered at 149674.28 N, 571385.22 E (Figure 5). 1322-N housed a drainage tank and valve pit used to divert effluent waste from the reactor plant to the 1301-N crib or the 1310-N chemical waste tank. 1322-N was located about 65 m (213 ft) north of 1310-N Radioactive Liquid Waste Treatment Facility (Golf Ball) and about 261 m (856 ft) northeast of the 105-N Reactor.

The building and slab were demolished in 2010 under the RCCC, and debris left at the edges of the resultant excavation measured approximately 27 m (88.6 ft) by 33 m (108.3 ft) by 3.7 m (12 ft) deep. The site was transferred to FR for completion of remaining remedial actions and final cleanup documentation.

The backfill operations were deferred to the WCH FR organization to complete following removal of the associated Waste Information Data System (WIDS) sites. Final D4 documentation includes a GPERs radiological survey, a GPS survey, and sample data, all of which are included in the PDSR (CCN 157108).

Figure 5. 1322-N Waste Treatment Pilot Plant.



2.5 1322-NA EFFLUENT WATER TREATMENT PLANT ANNEX

The 1322-NA Effluent Water Pilot Plant was a rectangular, one-story, pre-engineered corrugated-metal structure with a poured concrete foundation centered at 149674.13 N, 571401.37 E (Figure 6). 1322-NA contained the automated sequential sampling equipment for the 30.5-cm (12-in.) and 91-cm (36-in.) radioactive drain lines and riverbank springs, respectively, and was used for pilot testing ion exchange (IX) columns for the 107-N Facility. Eight IX columns were contained inside of an open concrete sump 3.4 m (11 ft) by 1.2 m (4 ft) by 0.9 m (3 ft) deep. Each of the eight IX columns measured 1.2 m (4 ft) long and 15.2 cm (6 in.) in diameter.

The building and slab were demolished in 2010 under the RCCC. Some piping was left at the edges of the resultant excavation, which measured approximately 27 m (88.6 ft) by 33 m (108.3 ft) by 3.7 m (12 ft) deep. The site was transferred to FR for completion of remaining remedial actions and final cleanup documentation.

The backfill operations were deferred to the WCH FR organization to complete following removal of the associated WIDS sites. Final D4 documentation includes a GPERS radiological survey, a GPS survey, and sample data, all of which are included in the PDSR (CCN 157108).

Figure 6. 1322-NA Effluent Water Treatment Plant Annex.



2.6 1322-NB CRIB EFFLUENT IODINE MONITORING FACILITY

The 1322-NB Crib Effluent Iodine Monitoring Facility was a rectangular, one-story, pre-engineered corrugated-metal structure on a poured concrete foundation that measured 9 m (30 ft) by 5 m (15 ft) and centered at 149689.74 N, 571394.40 E (Figure 7). The building was previously named 119-B in the 100-B/C Area where it was used as part of the 105-B Reactor stack sampling system. 1322-NB was used as a station for valving and sampling.

The building and slab were demolished in 2010. Some piping was left at the edges of the resultant excavation, which measured approximately 27 m (88.6 ft) by 33 m (108.3 ft) by 3.7 m (12 ft) deep. The site was transferred to FR for completion of remaining remedial actions and final cleanup documentation.

The backfill operations were deferred to the WCH FR organization to complete following removal of the associated WIDS sites. Final D4 documentation includes a GPERs radiological survey, a GPS survey, and sample data, all of which are included in the PDSR (CCN 157108).

Figure 7. 1322-NB Crib Effluent Water Iodine Monitoring Facility.



2.7 1322-NC CRIB SAMPLE PUMP PIT

The 1322-NC Crib Sample Pump Pit was a small rectangular concrete pit with a corrugated-metal roof that measured 4.3 m (14 ft) by 1.8 m (6 ft) by 1.2 m (4 ft) above grade and centered at 149688.53 N, 571398.51 E (Figure 8). Entrance to the structure was through a hatch in the roof. 1322-NC was connected to the east side of the 1322-NB Building and was used for sampling of effluent prior to discharge to the crib.

The building and slab were demolished in 2010 under the RCCC. Some piping was left at the edges of the resultant excavation, which measured approximately 27 m (88.6 ft) by 33 m (108.3 ft) by 3.7 m (12 ft) deep. The site was transferred to FR for completion of remaining remedial actions and final cleanup documentation.

The backfill operations were deferred to the WCH FR organization to complete following removal of the associated WIDS sites. Final D4 documentation includes a GPERS radiological survey, a GPS survey, and sample data, all of which are included in the PDSR (CCN 157108).

Figure 8. Crib Sample Pump Pit.



2.8 1605-NE EAST OBSERVATION POST

The 1605-NE East Observation Post was an approximately 6 m² (64 ft²) pre-engineered, steel-framed structure with steel siding that was located on the roof (approximately 22 m [75 ft] above grade) of the 105-N Reactor building, centered at 149192.028 N, 571223.602 E (Figure 9).

The 1605-NE East Observation Post was added to the roof of the 105-N Reactor building in 1987 as part of the 100-N Reactor security upgrade. The structure was designed for full time occupation by security guards.

The 1605-NE East Observation Post was demolished in 2010 under the RCCC's W. M. Dickson subcontract, and the debris was loaded out and sent to ERDF.

No GPERs or GPS surveys were performed at the 1605-NE location, as the 105-N Building remains beneath the former 1605-NE structure location. Additional information is presented in the PDSR (CCN 157853).

Figure 9. 1605-NE East Observation Post.



2.9 1722-N DECONTAMINATION – HOT SHOP BUILDING

The 1722-N Decontamination – Hot Shop Building was a rectangular, pre-engineered, one-story, metal-framed structure with a corrugated-metal exterior wall and gable roof built on a concrete slab. The facility was 12.2 m (40 ft) by 7.6 m (25 ft) and attached to the west wall of the 105-N Reactor about 8.4 m (27 ft) north of the fuel storage basin, centered at 149535.84 N, 571154.31 E (Figure 10). The 1722-N Building was added to the 105-N Reactor building in the late 1960s to expand the covered floor space for decontamination work near the FSB.

Historic operations included decontamination of tools and equipment for reactor and fuel storage basin maintenance, and a type of airlock and loading dock between the reactor facility decontamination station and the outside areas west of the reactor. The building was deactivated in 1986 under the ERC. The 1722-N Building and slab were demolished in 2010 under the RCCC's W. M. Dickson subcontract. The debris was loaded out and sent to ERDF. Backfill will be placed following demolition of the adjacent FSB.

No GPERS survey was performed specific to the 1722-N location. The 1722-N footprint was located over a much larger excavation that extended to approximately minus 85 m (28 ft) as part of the 105-N demolition activities. A pre-demolition GPS survey of 1722-N was performed on October 26, 2006. A post-demolition survey was not performed or required because a larger

excavation was conducted below 1722-N. Additional information is presented in the PDSR (CCN 157865).

Figure 10. 1722-N Decontamination - Hot Shop Building.



2.10 1909-N WASTE DISPOSAL VALVE PIT

The 1909-N Valve Pit was a below-grade 2.8 m (9.3 ft) by 4.2 m (13.75 ft) by 4.3 m (14.25 ft) deep reinforced-concrete valve pit with a reinforced-concrete cover block centered at 149551.30 N, 571120.99 E (Figure 11). The 1909-N Valve Pit was located 25 m (82 ft) southwest of the 1303-N Spacer Silos, 20 m (66 ft) east of the 107-N Recirculation Facility, and approximately 88 m (289 ft) west of the 105-N Reactor. The 1909-N Valve Pit was constructed in 1963 as part of the original N Reactor complex radioactive drain system.

The 1909-N Valve Pit was not listed in a remedial or removal action work plan (RAWP) for the 100-N Area and was added to the ancillary facilities D4 scope through the *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) (Ecology et al. 1989) amended June 22, 2010. The 1909-N Valve Pit was demolished in 2010 under the RCCC, and debris was loaded out and shipped to ERDF. Backfill will be placed following demolition of the adjacent FSB.

A GPERS survey was not conducted at this site because the 1909-N excavation will be engulfed by a much larger excavation created by the removal of nearby facilities including the FSB and 107-N Recirculation Cooling Building. The radiological and civil surveys of the larger excavation will be placed in the 1909-N Facility Status Change Form to comply with the RAWP.

A post-demolition GPS survey of the 1909-N Valve Pit was performed on December 2, 2010. Additional information is presented in the PDSR (CCN 156288).

Figure 11. 1909-N Waste Disposal Valve Pit.



2.11 MO-417

The Mobile Office MO-417 trailer, constructed in 1986, was a double-wide trailer measuring 8.5 m (28 ft) by 20 m (66 ft). MO-417 was centered at 147744.07 N, 580703.51 E (Figure 12). The building was located in the 100-F Area, northeast of the 105-F Reactor, immediately north of “F” Avenue. Two 250-gal wastewater holding tanks received effluent from restrooms within the trailer. The trailer had a small kitchen and was equipped to support a nearby microwave tower in the 100-F Area (HNF-5833). Previously located in the 100-BC Area during the ISS project for the 105-C Reactor, the trailer was moved to the 100-F site by 2000. Prior to 1996, MO-417 was used by Kaiser Hanford personnel in the 300 Area.

The MO-417 trailer was demolished in 2010, and the debris loaded out and shipped to ERDF.

Final D4 documentation includes a GPERS survey and a pre-demolition GPS survey, which are included in the PDSR (CCN 157239). A post-demolition survey was not performed. Additional information is presented in the PDSR (CCN 157239).

Figure 12. MO-417.



3.0 PROJECT ACTIVITIES

3.1 ENGINEERING AND PERMITS

The Removal Action Work Plan (RAWP) for 100-N Area Ancillary Facilities (DOE-RL 2006) was prepared to satisfy the requirements of the action memorandum (Ecology et al. 1999), outlining how compliance with and enforcement of applicable regulations will be achieved for cleanup of 100 Area facilities. Additionally, the RAWP and the Environmental Control Plan for 100-N D4/ISS Activities (WCH-79) serve as the decommissioning and project management plans, respectively, for the 100 Area project. The RAWP was prepared in accordance with the Tri-Party Agreement (Ecology et al. 1989) and was approved by the U.S. Department of Energy, Richland Operations Office and regulators.

The following are plant forces work reviews (PFWRs) completed for the demolition of each building:

- 105-NA Emergency Diesel Enclosure, *Plant Forces Work Review*, PFWR 8850-0110-06, Rev. 0, dated October 25, 2005
- 183-H West Clearwell, *183H Clearwell Basin Demolition*, PFWR 8850-016-09, Rev. 0, dated July 22, 2009
- 1310-N Radioactive Chemical Waste Treatment, *1310-N Demolition*, PFWR 8850-051-06, Rev. 0, dated July 24, 2006
- 1322-N, 1322-NA, 1322-NB, and 1322-NC, *Demolition of the 1322-N, NA, NB, and NC Effluent Water Pilot Plant Facilities*, PFWR 8850-029-06, Rev. 0, dated March 13, 2006
- 1605-NE East Observation Post, *Plant Forces Work Review*, PFWR 8850-011-06, Rev. 0, dated October 25, 2005
- 1722-N Decontamination – Hot Shop Building, *Plant Forces Work Review*, PFWR 8850-011-06, Rev. 0, dated October 25, 2005
- 1909-N Waste Disposal Valve Pit – none found
- MO-417, Mobile Office, *Mobile Office Demolition MO-417-F*, PFWR 8850-017-10, Rev. 0, dated May 12, 2010.

It was determined that the *Davis-Bacon Act of 1931* prevailing wage rates for 183-H, 1310-N, 1322-N, 1322-NA, 1322-NB, 1322-NC, 1909-N, and MO-417 were not applicable for the buildings listed above, and the work was performed by plant forces.

The following Initial Hazard Categorizations (IHCs) were performed on each building before demolition:

- 105-NA is documented in CCN 095435
- 183-H is documented in IHC-2009-0004
- 1310-N is documented in IHC-2006-0038
- 1322-N, 1322-NA, 1322-NB, and 1322-NC are documented in IHC-2007-0011
- 1605-NE is documented in IHC-2005-0032
- 1722-N is documented in IHC-2005-0032
- 1909-N is documented in IHC-2008-0010
- MO-417 is documented in CCN 151402 and 154210.

Excavation work was undertaken after obtaining excavation work permits are as follows:

- 105-NA: DAN-3449-2
- 183-N: DAN-2776-02
- 1310-N: DAN-2998, DAN-2998-1, DAN-2998-2, and DAN-2998-3
- 1322-N, 1322-NA, 1322-NB, and 1322-NC: DAN-2916 and DAN-2998-3
- 1605-NE: None required, structure was on the roof of 105-N
- 1722-N: DAN-3449-2
- 1909-N: DAN-3549-2
- MO-417: DAN-3985.

3.2 HAZARDOUS MATERIAL REMOVAL

The scope of the demolition project included removing and properly disposing of hazardous materials (e.g., oils, grease, asbestos-containing material, mercury, lead, and polychlorinated biphenyls). All known hazardous materials were removed from inside and outside of the buildings prior to demolition.

3.3 UTILITY AND DRAIN ISOLATION

All electrical, water, and telecommunications services were disconnected from the buildings prior to hazardous material removal operations. Floor drains were inspected for mercury and then sealed to provide isolation. Sanitary sewers to the building were disconnected during early deactivation activities and all drains were grouted.

3.4 DEMOLITION OF STRUCTURES

After the utilities were isolated, hazardous materials and equipment were removed and the above-grade structures were deemed ready for demolition. The building structures were then demolished using excavator-mounted hydraulic shears, hydraulic hammers, and bucket-and-thumb combination shovels. The foundations for these facilities were likewise removed. The debris was segregated for load-out and disposal. Standard ERDF roll-off containers with 6-mil liners were used to package and ship debris.

3.5 SITE RESTORATION

The remaining condition and posting of the aforementioned buildings are listed in Table 1.

Table 1. Site Conditions. (2 Pages)

Building	Remaining Conditions	Postings
105-NA	105-NA was demolished and the debris loaded out and sent to ERDF. Backfill TBD.	None.
183-H	The roof has been removed and the walls of the 183-H West Clearwell have been demolished to 91 cm (3 ft) below grade and the concrete floor slab cleared of rubble and debris.	Downposted and released.
1310-N	All that remains of the 1310-N complex is a portion of the berm and an excavation approximately 45 m (148 ft) by 67 m (220 ft) and about 6.1 m (20 ft) deep. Piping was exposed in the north and northwest sides of the excavation.	Downposted and released.
1322-N	All buildings and slabs were removed during 100-N/D4 demolition activities. Some piping was left at the edges of the resultant excavation, which measured approximately 27 m (88.6 ft) by 33 m (108.3 ft) by 3.7 m (12 ft) deep. Final closures will be completed by FR.	The final work progress survey indicated that the 1322-N excavation was posted HCA/RA approximately 1.8 m (6 ft) outside the top of slope of the excavation.
1322-NA	All buildings and slabs were removed during 100-N/D4 demolition activities. Some piping was left at the edges of the resultant excavation, which measured approximately 27 m (88.6 ft) by 33 m (108.3 ft) by 3.7 m (12 ft) deep. Final closures will be completed by FR.	The final work progress survey indicated that the 1322-N excavation was posted HCA/RA approximately 1.8 m (6 ft) outside the top of slope of the excavation.
1322-NB	All buildings and slabs were removed during 100-N/D4 demolition activities. Some piping was left at the edges of the resultant excavation, which measured approximately 27 m (88.6 ft) by 33 m (108.3 ft) by 3.7 m (12 ft) deep. Final closures will be completed by FR.	The final work progress survey indicated that the 1322-N excavation was posted HCA/RA approximately 1.8 m (6 ft) outside the top of slope of the excavation.
1322-NC	All buildings and slabs were removed during 100-N/D4 demolition activities. Some piping was left at the edges of the resultant excavation, which measured approximately 27 m (88.6 ft) by 33 m (108.3 ft) by 3.7 m (12 ft) deep. Final closures will be completed by FR.	The final work progress survey indicated that the 1322-N excavation was posted HCA/RA approximately 1.8 m (6 ft) outside the top slope of the excavation.
1605-NE	1605-NE was demolished and the debris loaded out and sent to ERDF.	None.
1722-N	The 1722-N Decontamination - Hot Shop Building was demolished and the debris loaded out and sent to ERDF.	None.
MO-417	Mobile Office MO-417 was demolished and the debris loaded out and sent to EDRF. The area is graded flat to match the surrounding ground.	Downposted and released.

Table 1. Site Conditions. (2 Pages)

Building	Remaining Conditions	Postings
1909-N	The 1909-N Valve Pit was removed, the 10-in. and 6-in. pipes were capped, and the area was downposted and the excavation backfilled. Final closures will be completed by FR.	The area was downposted and the excavation backfilled before GPERS surveys were performed. Area will be excavated again during future demolition activities.

- D4 = deactivation, decontamination, decommissioning, and demolition
- ERDF = Environmental Restoration and Disposal Facility
- FR = Field Remediation
- GPERS = Global Positioning Environmental Radiological Surveyor
- HCA = high contamination area
- RA = radiation area
- TBD = to be determined

4.0 COST AND COMPLETION

Building completion costs and dates are shown in Table 2.

Table 2. Cost and Completion Data.

Building	Total Cost (\$)	Completion Date
105-NA	\$5,911	08-01-2010
183-H	\$645,864	09-27-2010
1310-N	\$2,307,190	10-20-2010
1322-N	\$549,667	11-16-2010
1322-NA	\$11,127	11-16-2010
1322-NB	\$6,203	11-16-2010
1322-NC	\$5,168	11-16-2010
1605-NE	\$5,018	08-15-2010
1722-N	\$31,560	08-16-2010
1909-N	\$211,023	11-11-2010
MO-417	\$42,272	11-08-2010

5.0 RECYCLED MATERIAL AND WASTE DISPOSAL

One of the objectives of the 100 Area demolition project is to support recycling and waste minimization. However, radiological contamination, primarily due to biological vectors (i.e., mud daubers and wasps), is prevalent throughout the site. This prevented the salvage and offsite

transfer of material and equipment from the buildings. Owing to the prevalent contamination, all of the building debris was shipped to ERDF for disposal.

Waste volume transferred to ERDF from the 100-N Building demolition project is listed in Table 3.

Table 3. 100-N Demolition Project Waste Transferred to ERDF.

Building	Number of ERDF Containers	Waste Volume (m ³)	Net Weight (tons)
105-NA ^a	-	-	-
183-H	454	4,068.6	5853.86
1310-N	1401	12,225.0	21,582.25
1322-N	258	2,322.0	3,841.71
1322-NA	3	27.0	49.88
1322-NB	3	27.0	51.02
1322-NC	1	9.0	18.96
1605-NE	4	36.0	16.98
1722-N ^a	-	-	-
1909-N	52	676.0	793.7
MO-417	18	216	72.94

^a Information not available; waste merged with 105-N Reactor Building waste.

ERDF = Environmental Restoration Disposal Facility

- = not available

6.0 OCCUPATIONAL EXPOSURES

6.1 PERSONNEL INJURIES

WCH personnel worked a total of approximately 148,808.7 hours (manual and non-manual, not including subcontractors) from January 1, 2010, to December 31, 2010, on the 100 Area D4/ISS project. There were no Occupational Safety and Health Administration recordable injuries or first aid cases during this time period associated with the 100 Area D4/ISS Project.

6.2 PERSONNEL RADIOLOGICAL EXPOSURES

No clothing contamination and no skin contamination incidents occurred during demolition of the 100 Area buildings discussed in this report. Workers received 2234.9 person-mrem of radiological exposure from January 1, 2010, to December 31, 2010, during their support of D4 activities associated with the buildings discussed in this report. All boundary air sample results were below procedural action levels for the duration of the work performed.

7.0 LESSONS LEARNED

No “lessons learned” specific to any of the buildings discussed in this report are documented. In an effort to minimize employee injuries, WCH continued to implement a procedure requiring a temporary fence around demolition areas. This helped to control employee access in and around work zones. It was also effective in establishing the minimum distance people can be from demolition activities. The superintendent and the field safety representative control the areas and limit access inside the fence lines, this reduces the risk of injury in and around the work zone.

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