

Decommissioning Project Final Report Buildings 485-D and 482-2D, D-Area Cooling Tower and Switchgear Building

Prepared by:	<p>BRIANNA ZAWACKI (Affiliate) Digitally signed by BRIANNA ZAWACKI (Affiliate) Date: 2021.11.17 08:17:33 -05'00'</p> <hr/> <p>Brianna Zawacki EC&ACP Engineering Environmental Compliance & Area Completion Projects</p>	Date: <u>11/17/2021</u>
Reviewed by:	<p>William B. Griffin Digitally signed by William B. Griffin Date: 2021.11.17 08:44:05 -05'00'</p> <hr/> <p>William B. Griffin EC&ACP Engineering Environmental Compliance & Area Completion Projects</p>	Date: <u>11/17/2021</u>
Reviewed by:	<p>KELSEY HOLCOMB Digitally signed by KELSEY HOLCOMB Date: 2021.11.17 10:17:34 -05'00'</p> <hr/> <p>Kelsey Holcomb Project Team Lead Environmental Compliance & Area Completion Projects</p>	Date: <u>11/17/21</u>
Reviewed by:	<p>Shannan Lucero Digitally signed by Shannan Lucero Date: 2021.11.17 12:18:06 -05'00'</p> <hr/> <p>Shannan Lucero Manager, Area Completion Projects Environmental Compliance & Area Completion Projects</p>	Date: <u>11/17/21</u>
Approved:	<p>CLARENCE WARD (Affiliate) Digitally signed by CLARENCE WARD (Affiliate) Date: 2021.11.18 07:08:07 -05'00'</p> <hr/> <p>C. J. Ward EC&ACP Environmental Compliance Authority Manager Environmental Compliance & Area Completion Projects</p>	Date: <u>11/18/21</u>
Approved:	<p>THELESIA OLIVER (Affiliate) Digitally signed by THELESIA OLIVER (Affiliate) Date: 2021.11.17 14:04:59 -05'00'</p> <hr/> <p>T. O. Oliver EC&ACP Chief Engineer Environmental Compliance & Area Completion Projects</p>	Date: <u>11/17/2021</u>
Approved:	<p>CHRISTOPHER BERGREN (Affiliate) Digitally signed by CHRISTOPHER BERGREN (Affiliate) Date: 2021.11.18 13:54:47 -05'00'</p> <hr/> <p>C. L. Bergren Director, EC&ACP Environmental Compliance & Area Completion Projects</p>	Date: <u>11/18/21</u>



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History of Revisions

Revision	Date	Revised Section	Change
0	11/02/2021	N/A	Initial Issue

LIST OF ABBREVIATIONS AND ACRONYMS

ACM	Asbestos Containing Material
EPA	(U.S.) Environmental Protection Agency
EC&ACP	Environmental Compliance & Area Completion Projects
FAI	Final Acceptance Inspection
FDE	Facility Decommissioning Evaluation
ft	feet
PACM	Presumed Asbestos Containing Material
S&M	Surveillance and Maintenance
SCDHEC	South Carolina Department of Health and Environmental Control
SOW	Statement of Work
SRNS	Savannah River Nuclear Solutions
SRS	Savannah River Site
yd	yard(s)

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1.0 SUMMARY

Building 485-D was a standard updraft industrial cooling tower located in the northern section of 400-D Area of the Savannah River Site (SRS) constructed in 1952. The cooling tower provided cooling to the condenser circulating water for the 484-D Powerhouse. Building 482-2D was a single-story, 24' by 24' structure located in the northern section of 400-D Area of the SRS, just north of the 485-D Cooling Tower. It was built in 1952 and used to contain the dry transformers and switchgear for the cooling tower equipment. The transformers and switchgear were removed during deactivation. Ancillary to 482-2D were two back-to-back electrical cabinets mounted on a raised concrete pedestal. The ultimate end-state condition after decommissioning of 485-D was demolition and removal of the 485-D D-Area Cooling Tower Facilities down to, but not including the concrete Cooling Tower Basin and concrete Pump Basin. All interfacing utilities were isolated, disconnected, and plugged. Surrounding soil disturbed during decommissioning was re-graded and seeded. The final end-state condition after decommissioning of 482-2D was demolition and removal of the 482-2D Switchgear Building down to, but not including its concrete floor slab and surrounding concrete support walls for the 482-2D prefab building. All interfacing utilities were isolated, disconnected, and plugged. Floor protrusions were cut flush with the slab and floor openings filled to achieve a uniform surface. Surrounding soil disturbed during decommissioning was re-graded and seeded. The final decommissioning end-state for the ancillary electrical cabinets to 482-2D was demolition to, but not including the concrete pedestal.

A review of the existing characterization data, process/building history, sample data and walk downs of the facilities prior to decommissioning supported the determination that Buildings 485-D and 482-2D met the criteria of a Clean Building, Simple Model as described in the Facility Disposition Manual 1C, Procedure 501. This decision was supported by the documentation found in the Facility Decommissioning Evaluation (FDE), G-FDE-D-00050, Rev. 0, dated 5/11/2020, Reference 8.01. No chemical, hazardous or radioactive materials were associated with these structures other than commonly used materials of construction, which were managed as waste during demolition in accordance with established SRS practices. Since there was no evidence of contamination on the slabs for both buildings or within the basin for 485-D before demolition, no final verification surveys were required. The FAI-51 Final Acceptance Inspection of Building 482-2D (Reference 8.10) was performed on 4/28/2021 and no additional work or cleanup was required. The FAI-51 of Building 485-D (Reference 8.11) was performed on 9/21/2021 and no additional work or cleanup was required.

2.0 PURPOSE AND SCOPE

The purpose of this report is to document what was done to the facilities as a part of the decommissioning project, and the condition the facilities were left in at the completion of the project. The requirement for this report is found in the Facility Disposition Manual 1C, Procedure 506, "Preparing a Decommissioning Project Final Report".

2.01 Facility Description

Building 485-D was a standard updraft industrial cooling tower constructed in 1952. The general materials of construction of the building were galvanized steel, wood, and concrete. The cooling tower had two 264" diameter updraft fans which were mounted in the center-top of the cooling tower. The 50-hp motors for the fans were mounted to the north of the fans, atop the tower. The basin of the tower is reinforced concrete. The cooling tower basin itself is approximately 63' long by 49' wide and 7'1" high at the shallowest section (distal to the pump basin) and 7'3" proximal to the pump basin. The concrete walls of the cooling tower basin extend approximately 3' above grade. There was a stairway on the east side of the cooling tower that allowed access to the top of the cooling tower and a walkway. The walkway allowed access to the fans and drive motors and the cooling tower itself.

The three old 200-hp, vertically mounted, centrifugal recirculating pumps on the north side of the tower atop the pump basin were removed during deactivation. The pump basin is approximately 20'8" long by 26' wide and 10'11" deep, giving it a usable capacity of approximately 35,000 gallons. Sodium hypochlorite injection went to the cooling tower basin from Building 683-D. Sodium hypochlorite was used as a biocide/algaecide in the cooling water. Sodium hypochlorite feed piping, as well as communication lines were carried overhead by a series of wooden poles. The poles were specific to the cooling tower and were included in the scope of this decommissioning. They proceeded from the cooling tower south to Building 683-D. Access to the cooling tower basin was by a rung ladder on the west side of the basin, at the transition from the cooling tower basin to the pump basin.

The cooling tower provided cooling to the condenser circulating water for the 484-D Powerhouse. The Condenser Cooling Water Header was 42", influent and effluent. The piping is below grade. The cooling water header returning from the 484-D Powerhouse entered a manifold that split flow to the two sections of the cooling tower via two 20" pipes. The 24" discharge pipes from each of the three cooling tower pumps went below grade at the north end prior to combining at a manifold to the 42" header feeding the 484-D Powerhouse.

Building 482-2D was a prefab single-story, 24' by 24' structure located in the northern section of 400-D Area of the SRS, just north of the 485-D Cooling Tower. It was built in 1952 and used to contain the dry transformers and switchgear for the cooling tower equipment. The transformers and switchgear were removed during deactivation. The building had a prefab steel frame structure erected on an approximately 2' high concrete wall on a concrete slab. The siding and roof of the building were corrugated asbestos (Q-APG-D-00006, Revision 0, Reference 8.03). Both the siding and roof were removed by the asbestos abatement contractor prior to decommissioning per G-SOW-D-00009, the SOW for the Abatement of Asbestos Containing Material in D-Area Buildings 480-3D, 482-2D, 484-4D, 485-D, and 704-7D (Reference 8.09). The building had an 8' by 10' roll-up door in the west wall and a standard metal 36" hinged personnel door in the east wall. Building 482-2D had no floor drains or sumps.

Two 200-amp, 2.4 kilovolt (kV) feeders provided line power from the 484-D Powerhouse to the 2.4 kV switchgear in 482-2D. The 2.4 kV switchgear fed the cooling tower pumps and two transformers. One transformer stepped down to 120 V for control power. The other transformer stepped down the 2.4 kV feed to 440 V. The 440 V switchgear was used to provide power to the cooling tower fans, the heaters in 482-2D, power to 483-D and a lighting transformer that fed a miscellaneous power panel. All the switchgear and the transformers described resided within Building 482-2D and were disconnected and removed during deactivation.

Outside, to the southeast of 482-2D, were two ancillary, back-to-back electrical cabinets mounted on a raised concrete pedestal. Both electrical cabinets were deenergized, disconnected, and their contents removed. The east cabinet was approximately 5' tall by 3' wide by 16" deep. The west cabinet was approximately 42" tall by 42" wide by 16" deep.

An asbestos survey of Building 485-D was conducted on May 6, 2021, with the results indicating no Asbestos Containing Materials (ACM) or Presumed Asbestos Containing Materials (PACM) (Reference 8.02). See Appendix A, Figure 1 for a photo of the building prior to decommissioning and Figure 2 for a photo of the area after decommissioning. A revised asbestos survey of the Building 482-2D structure was conducted on October 29, 2020, Q-APG-D-00006, Revision 1 (Reference 8.04), after the asbestos siding and roof had been removed in accordance with G-SOW-D-00009, Reference 8.09 and original asbestos survey Q-APG-D-00006, Revision 0, Reference 8.03. The results of the revised survey (Reference 8.04) showed no Asbestos Containing Materials (ACM) or Presumed Asbestos Containing Materials (PACM). See Appendix A, Figure 3 for a photo of the building prior to asbestos abatement, Figure 4 for a photo of the building after asbestos abatement, and Figure 5 for a photo of the building after decommissioning.

2.02 New Facility Information

SRS identified no new facility information during or as a result of the facility decommissioning.

3.0 DECOMMISSIONING MODEL APPROVAL

The facilities were decommissioned using the Simple Model as described in Facility Disposition Manual 1C. The selection of the model was based on an FDE (Reference 8.01). No regulator walkdown of the facilities occurred due to COVID-19 travel restrictions. The FDE received South Carolina Department of Health and Environmental Control (SCDHEC) concurrence on June 28, 2020, and U.S. Environmental Protection Agency (EPA) concurrence on December 5, 2020 (References 8.05 and 8.06 respectively).

4.0 DECOMMISSIONING ACTIVITIES COMPLETED

Execution of the Buildings 485-D and 482-2D decommissioning was planned and described in the FDE (Reference 8.01) and the Decommissioning End Points Documents (References 8.07 and 8.08). Building 485-D was decommissioned by CTI and Associates, Inc (Savannah River Nuclear Solution's mentor protégé subcontractor). The 485-D above grade structure was demolished to its concrete walls for the Cooling Tower Basin, and concrete walls and concrete cover slab for the Pump Basin. All appurtenances to the Pump Basin's concrete cover slab were removed. The concrete access steps to the Pump Basin and Cooling Tower stair tower were removed. Cooling Water Return Lines on the south side of the Cooling Tower and Pump Discharge Lines on the Pump Basin north side were cut off to grade and resulting holes were filled with riprap up to 2 feet (ft.) below grade and with #57 stone the remaining 2 ft. to grade. Concrete 6" thick cap slabs were formed, reinforced with #4 bars on 12" centers each way, and poured (using 3000 psi concrete) at grade over the #57 stone covering the cutoff Cooling Tower return lines and pump discharge lines. The decommissioning end state for the Cooling Tower Basin was to remove all debris from the basin after demolition and leave open to the atmosphere. The Pump Basin slab cover was left in place, including steel plates over the pump locations. All concrete slab/pad penetrations greater than 2" in diameter were cut off level with the slab and grouted. Decommissioning of the Cooling Tower, Building 485-D, was confirmed complete in the FAI-51 walkdown on 9/21/2021 (Reference 8.11). Both Building 482-2D and 485-D were decommissioned by CTI and Associates, Inc (Savannah River Nuclear Solution's mentor protégé subcontractor). The 482-2D structure was demolished to its concrete slab and low concrete support wall for the prefab structure. Protrusions (i.e., anchor bolts, rebar, etc.) were cut off flush with the top of the slab, foundation wall or grade, as applicable. Conduits, piping and other penetrations that were 2 inches or more in their least dimension were cut flush with the top of the slab and/or wall, plugged, and filled with cementitious material (e.g., grout or concrete). The electrical cabinets on the concrete pedestal south of 484-2D were cut off flush with the top of the concrete pedestal. 482-2D decommissioning was confirmed complete in the FAI-51 walkdown on 4/28/2021 (Reference 8.10).

5.0 WASTE MANAGEMENT

5.01 Salvage and Reuse

Building 485-D

Eight hundred ten (810) cubic feet of scrap metal from the Building 485-D decommissioning were transferred to 741-N, Salvage and Reclamation Building, for recycling.

Building 482-2D

Thirty (30) cubic yards of scrap metal from the Building 482-2D decommissioning were transferred to 741-N, Salvage and Reclamation Building, for recycling.

5.02 Waste Disposal

Table 1: Building 485-D Waste Generation

Waste Classification	Waste Source	Disposed to	Total Volume
LLW	N/A	N/A	N/A
ACM	Non-friable Asbestos	Three Rivers Landfill	N/A
PCB	Lamp/light ballasts	Solid Waste	N/A
CSR	Construction debris	Three Rivers Landfill	18,000 ft ³
Recycle Metals	Doors, wall studs, beams	741-1N Salvage Yard	810 ft ³

Table 2: Building 482-2D Waste Generation

Waste Classification	Waste Source	Disposed to	Total Volume
LLW	N/A	N/A	N/A
ACM	Non-friable Asbestos	Three Rivers Landfill	N/A
PCB	Lamp/light ballasts	Solid Waste	N/A
CSR	Construction debris	Three Rivers Landfill	N/A
Recycle Metals	Doors, wall studs, beams	741-1N Salvage Yard	30 yd ³

LLW – Low level radioactive waste
 N/A – Not applicable
 ACM – Asbestos-containing material
 PCB – Polychlorinated biphenyl
 CSR – Clean Structural Rubble

6.0 FINAL FACILITY CONDITION

6.01 Final Facility Condition and Remaining Hazards

485-D was demolished to its concrete Cooling Tower Basin and Pump Basin. The concrete access steps to the Pump Basin and Cooling Tower stair tower were removed to grade. 482-2D was demolished down to the concrete slab and low support wall for the prefab building structure. For Both 485-D and 482-2D, piping penetrations were cut off flush to the buildings' slab, wall, or grade, as applicable, and floor openings were filled with grout to achieve a uniform surface. The electrical cabinets ancillary to 482-2D were cut off flush with the top of the concrete pedestal.

6.02 Risk Assessment Summary

A review of the existing characterization data, process/building history, sample data and walk downs of the facility prior to decommissioning supported the determination that Buildings 485-D and 482-2D met the criteria of a Clean Building, Simple Model as described in Manual 1C, Procedure 501.

This decision was supported by the documentation found in the FDE, Reference 8.01. No chemical, hazardous, or radioactive materials were associated with these structures other than commonly used materials of construction, which were managed as waste

during demolition in accordance with established SRS practices. The amounts of such materials, if any, were described in Section 5.02 of this report. Since there was no evidence of contamination on the buildings' slabs either before or after structure demolition, no final verification survey was required.

6.03 Post Decommissioning Requirements

The remaining structures are free of physical, chemical, and radiological hazards; therefore, they need no further decommissioning action. No surveillance and maintenance (S&M) activities were identified for the remaining structures (concrete slabs and concrete basins) because they pose no threat to human health or the environment while awaiting area completion.

7.0 CONCLUSIONS/RECOMMENDATIONS

Building 485-D was demolished. Its concrete foundation and the concrete Cooling Tower Basin and Pump Basin have been left in place. Building 482-2D was demolished and its concrete slab and low support wall have been left in place. All decommissioning activities have been completed in accordance with federal and state regulations. The remaining structures are free of physical, chemical, and radiological hazards; therefore, they need no further decommissioning action. No S&M activities were identified for the remaining structures because they pose no threat to human health or the environment while awaiting area completion.

In accordance with the "Memorandum of Agreement for Achieving an Accelerated Cleanup Vision at the Savannah River Site", this report will be maintained as a record for reference and use in the D-Area Operable Unit Completion Record of Decision. To ensure facility remnants are addressed during the area completion process, Buildings 485-D and 482-2D will be added to Appendix K.2 of the Federal Facility Agreement for the SRS.

8.0 REFERENCES

- 8.01** G-FDE-D-00050, Revision 0, dated 5/11/2020, "Facility Decommissioning Evaluation Buildings 485-D and 482-2D, D-Area Cooling Tower and Switchgear Building"
- 8.02** Q-APG-D-00026, Revision 1, dated May 10, 2021, "Baseline Asbestos Inspection Report of Building 485-D"
- 8.03** Q-APG-D-00006, Revision 0, dated October 30, 2019, "Baseline Asbestos Inspection Report of Building 482-2D"
- 8.04** Q-APG-D-00006, Revision 1, dated November 3, 2020, "Baseline Asbestos Inspection Report of Building 482-2D"
- 8.05** SRNS-OS-2020-00278, dated June 28, 2020, SCDHEC Concurrence on the FDE for 485-D and 482-2D
- 8.06** SRNS-OS-2020-00459, dated December 5, 2020, USEPA approval of the FDE use of the Simple Model for 480-3D, 704-7D, 483-3D, 485-D, 482-2D, 710-16D, 484-5D, 484-9D, and 717-3D

- 8.07** V-PMP-D-00042, Rev. 0, dated November 02, 2020, “Decommissioning End Points Document Building 482-2D, Switchgear Building”
- 8.08** V-PMP-D-00044, Rev. 0, dated May 17, 2021, “Decommissioning End Points Document Building 485-D, D-Area Cooling Tower”
- 8.09** G-SOW-D-00009, Revision 0, dated 4/6/2020, “Statement of Work for the Abatement of Asbestos Containing Material in D Area Buildings 480-3D, 482-2D, 484-4D, 485-D, and 704-7D”
- 8.10** G-SDD-D-00005, dated 4/28/2021, “FAI-51, “Final Acceptance Inspection of Building 482-2D”
- 8.11** G-SDD-D-00015, dated 9/21/2021, "FAI-51, "Final Acceptance Inspection of Building 485-D"
- 8.12** V-PCOR-D-00042, Revision 0, dated 7/1/2014, “Deactivation Project Final Report 484-D Powerhouse and Ancillary Buildings”
- 8.13** V-PCOR-D-00052, Revision 0, dated 7/5/2021, “Completion of Decommissioning End Points for Building 482-2D, Switchgear Building”
- 8.14** V-PCOR-D-00058, Revision 0, dated 11/2/2021, “Completion of Decommissioning End Points for Building 485-D, D-Area Cooling Tower”

9.0 APPENDICES

Appendix A - Photographs

Appendix A - Photographs



Figure 1: Building 485-D (Looking Southwest) Before Decommissioning

Appendix A – Photographs (Continued)



Figure 2: Building 485-D (Looking Southwest) After Decommissioning

Appendix A – Photographs (Continued)



Figure 3: Building 482-2D (Looking Southwest) Before Asbestos Abatement

Appendix A – Photographs (Continued)



Figure 4: Building 482-2D (Looking South) After Asbestos Abatement

Appendix A – Photographs (Continued)



Figure 5: 482-2D (Looking Southeast) After Decommissioning