

## Facility Decommissioning Evaluation D-Area Domestic Water Production Facilities (Building 483-7D and Ancillary Facilities)

This is a Simple Model Decommissioning per Facility Disposition Manual 1C

Prepared by: W.L.B. Griffin Date: 6/11/2020  
William B. Griffin  
EC&ACP Engineering  
Environmental Compliance and Area Completion Projects

Reviewed by: John K. Blankenship Date: 6/11/20  
John K. Blankenship  
EC&ACP Engineering  
Environmental Compliance and Area Completion Projects

Approved: Manuel I. Terronez Date: 06/16/2020  
Manuel I. Terronez  
EC&ACP Engineering Manager  
Environmental Compliance and Area Completion Projects

Approved: C.J. Ward Date: 6/17/20  
C.J. Ward  
EC&ACP Operational Compliance Manager  
Environmental Compliance and Area Completion Projects

Approved: R. Steven Shirley Date: 6/17/2020  
R. Steven Shirley  
Manager, EC&ACP Projects  
Environmental Compliance and Area Completion Projects

Approved: T.O. Oliver Date: 6-18-2020  
T.O. Oliver  
EC&ACP Chief Engineer



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*Prepared for*  
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Aiken, South Carolina

## Introduction

This document contains an evaluation of available existing information about a facility that is slated for decommissioning. This evaluation screens the project to determine whether it is appropriate to conduct the decommissioning under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), or to use a simpler graded approach.

This Facility Decommissioning Evaluation (FDE) consists of three sections. Part 1 contains a description of the project scope, including a brief summary of the purpose and history of the facility and photographs of the structures that are part of the project. Part 2 encompasses a series of questions, the answers to which determine the decommissioning model (CERCLA Model, Integrated Sampling Model, or Simple Model) that will be used. The three graded approach models are described in Facility Disposition Manual 1C, Procedure 501. Part 2 also includes a justification for the answers to each question. Part 3 is a list of references that were used for the evaluation.

## Conclusion

A review of the existing characterization data, process/building history, sample data and walk downs of the facility supports the determination that this building and its ancillary structures meet the criteria of a Clean Building, Simple Model as described in Facility Disposition Manual 1C, Procedure 501. This decision is supported by the documentation found throughout the body of this document. No chemical or hazardous radioactive contaminants are associated with this structure.

## Part 1. Project Scope

### Scope

This Evaluation has been prepared in accordance with requirements found in Facility Disposition Manual 1C, Procedure 502, "Preparing Decommissioning Decision Documents." The scope of this evaluation includes the following building and ancillary structures, which are further described in the next section:

- Building 483-7D, Chemical Feed Systems for Domestic Water
- Building 483-7D includes the following ancillary structures:

- 905-3D, Primary Domestic (Water) Well (Well only to remain in place during/after decommissioning)<sup>1</sup>
- 905-136D, Back-up Domestic (Water) Well (Well only to remain in place during/after decommissioning)<sup>1</sup>
- 905-5D, Elevated Domestic Water Storage Tank
- Domestic Water System - Clear Well
- Water Meter Pit
- Polyphosphate Injector Structure
- Chlorine Injector Structure
- Check Valve and Water Meter Structures
- Yard Hydrants (2)
- 453-2D, Air Switch AS-1
- 452-7D, Transformer (T-1) for Domestic Water System
- 453-1D, Air Switch AS-2
- 452-11D, Transformer (T-2) for Domestic Water System

The proposed decommissioning end-state for all above grade portions of the D-Area Domestic Water Production Facilities is demolition to the building slab or grade as appropriate. Curbed areas within Building 483-7D will be cleaved or breached at as many locations as necessary to ensure drainage of rainwater. Below grade portions of Building 483-7D such as the sump, trench drain, and floor drains will be filled with grout and/or concrete.

The proposed decommissioning end state for the below grade structures of the D-Area Domestic Water Production Facilities is In Situ Disposal. These structures are essentially concrete and predominantly below grade. Demolition is therefore impractical, and consequently, a portion of the structure will remain intact after decommissioning. These below grade structures will be filled to grade with gravel or crusher run, grout or controlled low strength material (CLSM).

The described decommissioning activities are not the final area closure actions. The decommissioning of a building is intended to reduce landlord costs, increase safety by removing excess facilities and reduce the potential for releases of hazardous substance to the environment.

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<sup>1</sup> Wells 905-3D (Figure 10) and 905-136D (Figure 12) will remain in service (minus associated pumps which are not required) during and after decommissioning of Building 483-7D and its ancillary facilities. The wells are artesian type which are pumped wells that will continue as artesian (they were not installed as artesian), and which do not require the pumps or any power to pump water to 484-17D to the injection wells for the D-Area Groundwater Treatability Study.

## Facility Description

The D-Area Domestic Water Production Facility is located on the Savannah River Site (SRS) in South Carolina to the north of the D-Area Powerhouse and 400-D Area. The D-Area Domestic Water Production Facility provided domestic water for D-Area. The facility includes wells (905-3D and 905-136D), a clear well, a treatment facility (Building 483-7D), electrical transformers (452-7D and 452-11D), electrical air switches (453-2D and 453-1D), and a 125,000-gallon elevated storage tank (905-5D). There are various other small ancillary items included as part of the facility and within the scope of this evaluation. See Figure 1 (based on Ref. 11 & Ref. 12) for a detailed layout of the domestic water production facility. The facility is in an area approximately 750' east to west by 220' north to south. The facility was constructed in 1996.

Building 483-7D (Figure 3) contains the chemical feed systems and sand filters for the domestic water system (see Figure 2 for building layout). The building is approximately 50' by 60' and 18'8" to the eaves, with a 2:12 sloped roof. On the west side of the structure is an attached 12' by 16' air compressor room. The building is steel and masonry construction with steel sheeting for the exterior and roof. The building interior is split into distinct areas for functionality.

The air compressor room has a door to the exterior of the building and a door to the interior of the building. There is one air compressor and one backwash air scour blower inside the air compressor room. The air compressor provided instrument air (Figure 5). The instrument air compressor is belt-driven and has its own receiver. The backwash air scour blower (Figure 6) provided air for backwash of the three sand filters (shown in Figure 7). The backwash blower is belt driven and does not have a receiver; it runs on demand. The floor drain of the air compressor room drains to the sump in the south end of the building. The disconnects and motor control centers for the air compressor and backwash air scour blower are in the compressor room. A small stained area of concrete under the backwash air scour blower (Figure 6) appears to be the result of lubricating oil leaking from the blower. This stain and any others that may be found in this room will be cleaned with a strong surfactant, Biosolve™, to remove oil residue from the concrete.

Interior to the main structure are, from west to east, the sand filters, the chemical injection system, and the chemical storage area. There is a 10' by 12' office at the northeast corner. Building 483-7D currently has electrical power and domestic water services provided. The electrical control center for the building is located on a pad against the north wall (Figure 4). There is a 75 kilovolt-amp (kVA), 440V to 208V/120V transformer, disconnects, motor controllers, power panel, raceway, etc. at the electrical control center. Also located throughout the building are various other motor controllers and starters, instrumentation and controls, receptacles and switches.

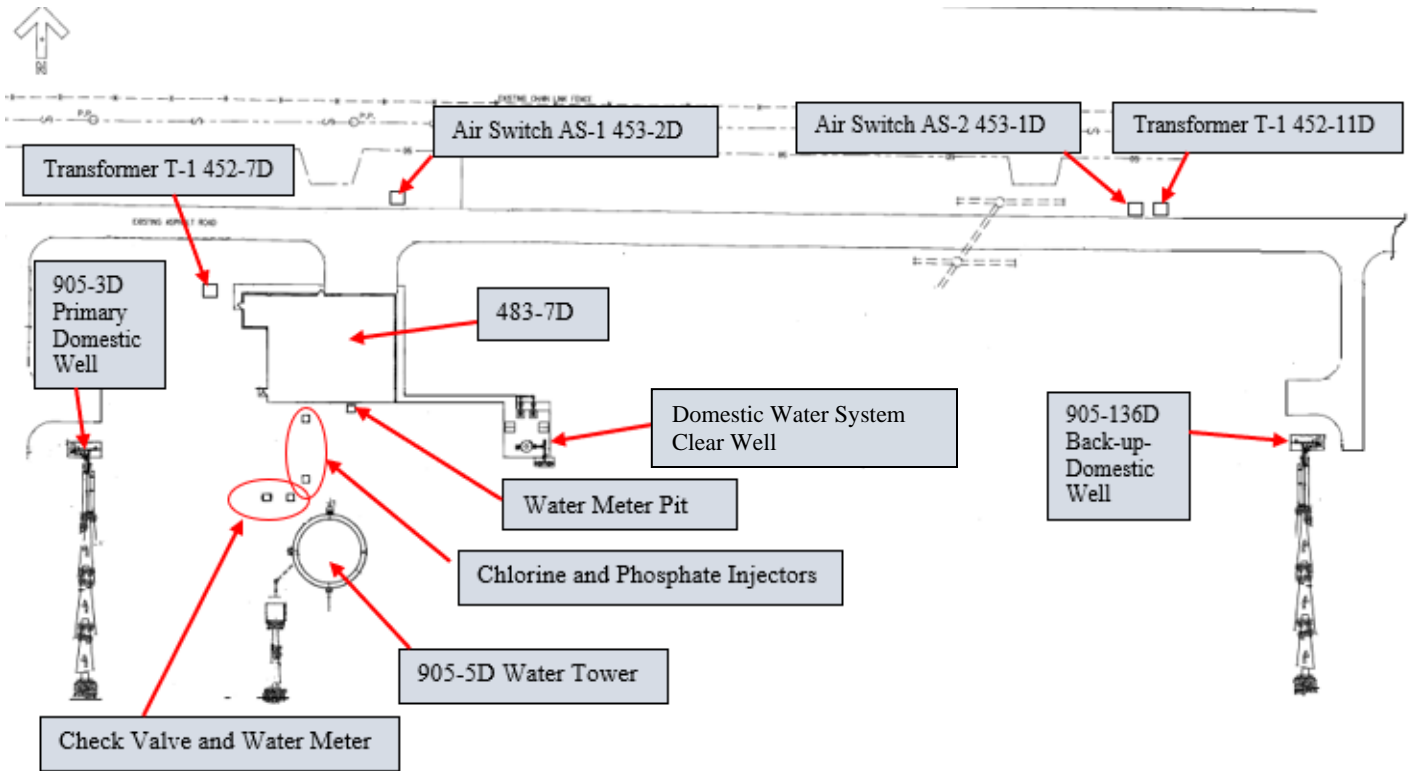


Figure 1. D-Area Domestic Water Production Facilities Area Layout





**Figure 3. Building 483-7D**



**Figure 4. Building 483-7D Electrical Control Pad**



**Figure 5. Building 483-7D Instrument Air Compressor**



**Figure 6. Building 483-7D Backwash Air Scour Blower**

There are three sand filters on the west side of the interior of Building 483-7D (Figure 7). Each sand filter is 10' in diameter and 10' high. The filter vessels are lined carbon steel. The interior of the vessels is lined with an epoxy coating approximately 5 mils thick. The sand filters contained gravel of varying sizes, manganese greensand (removed in 2009) and anthracite (activated carbon) which were drained during deactivation in 2013 (Ref. 8). Under the sand filters are floor drains that collect in the sump at the south end of the building.



**Figure 7. Building 483-7D Sand Filters**

The chemical injection portion of the building is positioned centerline in the building. There were four chemical injection stations: sodium hypochlorite, polyphosphate, soda ash and potassium permanganate. The southern-most station was the potassium permanganate station. The equipment for the potassium permanganate station equipment and potassium permanganate were removed in 2009. Each remaining station has a poly tank and two or three metering pumps and is surrounded by its own containment dike (concrete curbing). The containment dikes were designed to overflow into the sump at the south end of the building in the event of any spills or overflow, but there is no recorded or documented evidence of any spills having occurred.

The chemical storage areas are located on the east side of the building. The chemical storage is enclosed by concrete block on three of the four sides of each storage area (Figure 8). The storage areas are aligned to be opposite their corresponding injection station. The storage areas, from north to south, were for sodium hypochlorite, polyphosphate, soda ash and potassium permanganate. The potassium permanganate area was converted to a water chemistry lab (Figure 9). All chemicals were removed from the building in 2013 during deactivation (Ref. 8). The storage areas front a drainage channel that slopes to the sump at the south end of the building. The sump at the south end of the building has two sump pumps. The sump is approximately 5' by 3' 6" and 4' deep with a galvanized steel grate over it. The sump was discharged to the 483-6D Surge Basin.



**Figure 8. Building 483-7D Chemical Storage Area (Typical)**



**Figure 9. Potassium Permanganate Area after Conversion to Water Chemistry Lab**

The office space contained typical office furniture and equipment, including a desk, chairs, computer, filing cabinets, shelves, etc.

The domestic water wells are standard deep-bore wells. Primary Domestic Well, 905-3D (Figure 10), is located at the west end of the area and Back-up Domestic Well, 905-136D (Figure 12), is located at the east end of the area. The wells have submerged well pumps rated at 7.5 horsepower (hp) and 200 gallons per minute (gpm). The pumps are 3-phase, 60 hertz (Hz), 460 V Grundfos® submersible centrifugal pumps. There is an electrical panel with disconnects, motor starters, etc. for each pump at each well location. Primary Domestic Well 905-3D goes to a depth of 740 ft. (Ref. 6), while Backup Domestic Well, 905-136D goes to a depth of 765 ft (Ref. 7). Each of the two wells has an electrical control panel adjacent to it that services it. The electrical control panels (Figure 11 for 905-3D shown) are identical and have disconnects, a 480V to 208/120V transformer, a 208/120V power panel, and instrumentation for the production well.



**Figure 10. 905-3D Primary Domestic Well**

Building 905-5D, elevated domestic water storage tank (Figure 13 & Ref. 13) is a 125,000- gallon, epoxy-coated (interior) and painted (exterior) carbon steel storage tank on risers which was drained in 2013 (Ref. 8). The top of the tank is approximately 165' above grade. The tank is approximately 32' in diameter with a 24' head range. The tank sits on four anchored and cross-braced legs with the riser pipe in the center of the riser section. There is an overflow pipe off the side of the tower that discharges out of the tank drain to the south of the tower (Figure 14).



**Figure 11. 905-3D Primary Domestic Well Electrical Panel**



**Figure 12. 905-136D Back-Up Domestic Well & Electrical Panel**

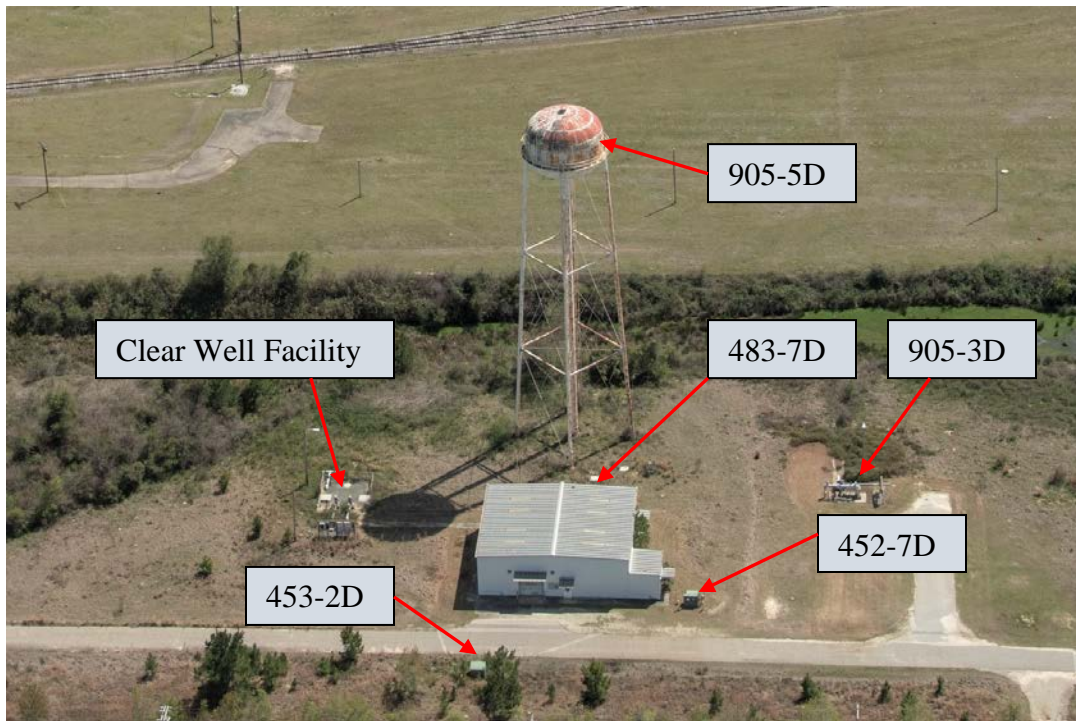


Figure 13. Building 905-5D Elevated Domestic Water Storage Tank



Figure 14. Building 905-5D Elevated Domestic Water Storage Tank Drain

The domestic water system clear well (Ref. 14) is an underground concrete degasser and holding tank for water discharged from the domestic water wells prior to treatment (Figure 15). The inside dimensions of the clear well are 20' by 20' by 15'8" deep, giving it a usable capacity of approximately 6,200 gallons. The walls and roof of the clear well are 12" thick reinforced concrete. The floor of the clear well is 24" thick reinforced concrete. There are two 4' square watertight aluminum access covers on the roof of the clear well. Atop the clear well are two transfer pumps that provided the motive force for moving the water through Building 483-7D and into the elevated storage tank. Also, on the pad are piping, valves and support structures for the system.

There was a degasification unit with blower installed at the clear well, but it has been removed. There is an electrical control panel on the north side of the clear well for the clear well pumps and instrumentation (Figure 16). The panel has disconnects, motor control centers for the pumps, a 480V/120V transformer, raceway, control panel and a 120V power panel.



**Figure 15. Domestic Water Facility Clear Well**



**Figure 16. Domestic Water Facility Clear Well Electrical Panel**

The water meter pit, the polyphosphate injector structure, the chlorine injector structure, and the check valve and water meter structures are all located between Building 483-7D and the elevated domestic water storage tank (Figure 17 and Figure 18). Each of these structures has a pre-cast 3' square concrete box set below grade with an aluminum access door at grade level. The boxes are approximately 4' deep. Each of the boxes has a 4" diameter drain to 4" of crushed stone. There are two small pad-mounted yard hydrants at the south of Building 483-7D, approximately 18" from the rear wall of the building (Figure 18). The pads are 1'6" by 3' and the hydrants have 1" supply lines from the domestic water system.

453-2D, Air Switch AS-1 (Figure 19) is located across the road directly north of Building 483-7D. 452-7D, Transformer T-1 for the domestic water system, is located at the northwest corner of Building 483-7D (Figure 20). 453-1D, Air Switch AS-2 (Figure 21), is located to the east of and across the road from Building 483-7D next to 452-11D, Transformer T-2 (Figure 22). Electrical power at 13.8 kilovolt (kV) is fed to the air switches from two locations. The transformers are 13.8kV/440V pad-mounted dry type transformers. See also References 16 and 17.



**Figure 17. Domestic Water Facility Clear Well Check Valve and Water Meter Structures (Near) and Chlorine Injector Structure (Far)**



**Figure 18. Incoming Domestic Water Meter Pit (Near Left) and Polyphosphate Injection Structure (Far Left) and Yard Hydrants**



**Figure 19. 453-2D - Air Switch AS-1**



**Figure 20. 452-7D, Transformer (T-1) for Domestic Water System**



**Figure 21.** 453-1D, Air Switch AS-2



**Figure 22.** 452-11D, Transformer (T-2) for Domestic Water System

## Process History

Review of records, walk downs and interviews indicate that no chemical or radioactive processes were performed in Building 483-7D (i.e., no chemical, mechanical, or electrical energy or interaction was performed to change the state of an input material or to produce a new output product).

Since becoming operational in 1993, the domestic water production facilities associated with Building 483-7D were used for their intended purpose. Potassium permanganate along with green sand filters were used until 1996 to control iron in the water. The iron content was not as big a problem as anticipated so the green sand filters were replaced with regular sand filters, and the potassium permanganate was eliminated in 1996. Sodium hypochlorite, soda ash and polyphosphate (Virchem® 931) were still in use until 2013 when all water treatment activities were terminated, and the facility was only used for the fire water system which did not require treated water. All chemicals were removed from the building in 2013 when the existing wells were converted to a fire water system. Domestic water treatment was no longer required and SCDHEC was notified accordingly (See Ref. 8, Deactivation Project Final Report, V-PCOR-D-00042). No radioactive process was ever established at the facilities.

## Chemical Process

Chemical Name	Process Location	Evidence of Spills?
N/A	N/A	N/A

## Radioactive Process

Isotope	Contaminated Areas/Others
N/A	N/A

Floor drains in the facility are as shown in Figure 3 and previously described.

## Summary of Existing Characterization

Characterization has been accomplished using a combination of process knowledge/historical release information, verification walk downs and sampling as appropriate.

An important part of the characterization portion of this evaluation is a historical review of spills/releases to the environment. This review includes a review of the Savannah River Site (SRS) Occurrence Reporting and Processing System/Site Item Reportability and Issue Management (ORPS/SIRIM) database conducted from the effective date of the Federal Facility Agreement (FFA), August 16, 1993, to present and a review of the FFA. The FFA (Ref. 2) serves as a review of releases/spills to the environment prior to August 16, 1993.

There is no documented evidence of spills in the facility. Review of the applicable appendices within the Federal Facility Agreement (FFA) is negative regarding Building 483-7D and associated structures. There are no post-FFA records within the Savannah River Site (SRS) Occurrence Reporting and Processing System/Site Item Reportability and Issue Management (ORPS/SIRIM) database for the structures. SRS historical spill files, accessible via InSite (the SRS internal website), do not reveal any spills having occurred at the structure. Inspections reveal no evidence of chemical spills inside or outside the structures within the scope of this FDE. A small stain is shown in Figure 6 on the concrete under the backwash air scour blower which appears to be the result of lubricating oil leaking from the blower. This stained area of concrete along with any other stains throughout the building discovered during decommissioning will be cleaned with a strong surfactant (i.e. BioSolve™) prior to completion of decommissioning.

A South Carolina licensed asbestos inspector conducted an asbestos survey of the facilities, equipment and appurtenances and found no evidence of Asbestos Containing Materials (ACMs) (Reference 9). Gaskets in piping systems were inaccessible for bulk sampling, therefore are considered Presumed Asbestos Containing Material (PACM). If the work (demolition) method used avoids the separation of flanges, they will not be disturbed. Gaskets in unbroken flanges are determined to be in a hardened substance and therefore not subject to regulatory requirements if undisturbed.

Wastes generated during decommissioning will be characterized and managed in accordance with SRS procedures and State and Federal regulations.

### **Historical Significance**

A review has been conducted in accordance with a Programmatic Agreement. This review resulted in the publication of a Cultural Resources Management Plan (SRS's Cold War Built Environment Cultural Resources Management Plan; January 26, 2005) in which the facilities with historical significance are listed. This facility is not listed in that reference and therefore is not historically significant.

## Part 2. Evaluation

Clean Facilities				
	Question	Yes	No	Justification
1.	<p>Has the facility ever contained or processed radioactive or hazardous material other than stored packaged material or materials of construction?</p> <p><i>If yes, go to question 4.</i></p>		X	<p>No processes in this building, only storage of sodium hypochlorite (for water disinfection), polyphosphate (to prevent pipe corrosion), soda ash (to raise the pH in the well water) and potassium permanganate (which was used in conjunction with green sand filters up until 1996 to control iron), but the iron was not as big a problem as anticipated, so the green sand was removed and replaced with regular sand filters and the use of potassium permanganate was stopped. Sodium hypochlorite was used instead because it is a low-hazard, inexpensive and effective biocide in water treatment. Sodium hypochlorite is used in a 12.5% solution with water. It is a stable, low hazard source of chlorine in solution. Even so, when left to the open air, the chlorine volatilizes out of solution. Injection of the materials into the water took place outside the facility in the injection pits behind (on the south side of) of Building 483-7D. Any stains in the concrete slab of the structure will be cleaned with a strong surfactant, such as BioSolve™ as part of the decommissioning activities for the building.</p>
2.	<p>If there was stored packaged material, has there ever been a spill?</p> <p><i>If No or N/A, this is a Simple Model. Stop.</i></p>		X	<p>There is no documented evidence of spills of chlorine within or outside of the facility. EC&amp;ACP has determined that a final survey is not required. EC&amp;ACP determined that the nature of the chemicals used, the history of the facility and current facility condition do not warrant a final survey.</p> <p><b>Building 480-3D will be a Simple Model decommissioning.</b></p>
3.	<p>Was spill confined inside structure and cleaned to free release standard per Radiological Control Manual 5Q (for radiological) or continued occupancy per Industrial Hygiene Manual 4Q (for hazardous)?</p> <p><i>If Yes, this is a Simple Model. Stop.</i></p>			N/A

<b>Contaminated Facilities</b>				
	<b>Question</b>	<b>Yes</b>	<b>No</b>	<b>Justification</b>
4.	Is the facility listed as a Resources Conservation and Recovery Act (RCRA)/CERCLA Unit in Appendix C of the SRS FFA? <i>If Yes, this is a CERCLA Model. Stop.</i>			N/A
5.	Is the facility listed as a Site Evaluation Area in Appendix G of the SRS FFA? <i>If Yes, this is a CERCLA Model. Stop.</i>			N/A
6.	Is there evidence that there has been a release of hazardous or radioactive materials outside the structure? <i>If Yes, this is a CERCLA Model. Stop.</i>			N/A
7.	Is there a substantial threat of a release of hazardous or radioactive materials outside the structure? <i>If Yes, this is a CERCLA Model. Stop.</i>			N/A
8.	Has the facility been assigned a hazard category as defined in Facility Safety Document Manual 11Q? <i>If No, stop and refer facility for evaluation to assign a hazard category, then proceed.</i>			N/A
9.	Is the hazard category Nuclear (HC- 2 or 3), radiological, or high hazard chemical? <i>If Yes, this is a CERCLA Model. Stop.</i>			N/A
10.	Has DOE-SR directed that the decommissioning be performed using the CERCLA Model? <i>If yes, this is a CERCLA Model. Stop.</i>			N/A
11.	Does the complexity of the facility or the nature and extent of contamination warrant a higher than normal level of rigor and detail for decommissioning planning and evaluation? <i>If Yes, this is a CERCLA Model. Stop.</i>			N/A
12.	Is the facility a formerly nuclear, radiological, or high-hazard chemical facility? <i>If Yes, this is an Integrated Sampling Model. Stop.</i>			N/A
13.	Has EC&ACP's Regulatory Support Group determined that a final survey is not required for this facility? <i>If Yes, this is a Simple Model. If No, this is an Integrated Sampling Model. Stop</i>			N/A

N/A = not applicable

## Part 3. Review of Existing Records

The following facility records were reviewed as a part of this evaluation:

Ref #	Document No.	Revision/Date	Title
1.	SRNS-RF-2008-00086-000-M&O	Revision 19-01-MO, Feb. 14, 2019	Standard Requirements Identification System FA00 Facility List.
2.	WSRC-OS-94-42	Rev 0, Aug. 16, 1993 All updates through Sept. 21, 2018, including Rev. 0 Appendices C, G and K for Fiscal Year 2019	FFA for the SRS, Administrative Document No. 89-05-FF
3.	N/A	N/A / Since 1993	D-Area SIRIM and ORPS reports 08/1993 to 05/2009.
4.	N/A	Final January 26, 2005	Savannah River Site's Cold War Built Environment Cultural Resources Management Plan
5.	S-EHS-D-00001	Rev 0, April 2006	D-Area Hazards Survey
6.	W2013033	December 1991, Rev. 1	Primary Domestic Well Section
7.	W2013039	December 1991, Rev. 1	Backup Domestic Well Section
8.	V-PCOR-D-00042	Rev. 0, July 1, 2014	Deactivation Project Final Report Building 484-D Powerhouse and Ancillary Buildings
9.	Q-APG-D-00022	Rev. 0, December 2, 2019	Baseline Asbestos Inspection Report of Bldg. 483-7D
10.	SDD-2005-00170	Rev. 0, March 23, 2005	Site D&D Policy on Decommissioning End Points for Slabs, Pits, Basement and Basins (U)
11.	W2013030	Rev. 0, October 28, 1996	D-Area Domestic Water System, Site Plan
12.	W2013031	Rev. 0, October 28, 1996	D-Area Domestic Water System, Enlarged Site Plan
13.	W2013048	Rev 0 / October 28, 1996	Elevated Storage Tank Enlarged Site Plan and Elevation Bldg. 905-5D
14.	W2013049	Rev 0 / October 28, 1996	Clearwell & Degasification Unit
15.	W2013063	Rev 0 / October 28, 1996	Chemical Feed Floor Plan and Elevation Bldg. 483-7D
16.	W2013036	Rev. 1, October 28, 1996	Electrical Site Plan & Legend
17.	W2013077	Rev. 1, October 28, 1996	Power Plan