G-FDE-F-00061
Rev. 1, November 20, 2023

Facility Decommissioning Evaluation
Building 235-1F & 235-2F, Refrigeration Buildings No. 1&2

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

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Revision Log

Pages affected	Description of Revision
All	General modifications for new template. All references to 285-11F induced draft cooling tower and 252-20F substation were deleted as the equipment has been removed and is no longer within the scope of this evaluation.
5	Part 1. Project Scope: Added Asbestos Containing Materials (ACM) mentions.
10-11	Process History: Referenced isolation of electrical and mechanical lines and added work orders for chemical remediation / removal.
12-13	Part 2. Evaluation: Updated to current 1C manual decommissioning checklist. Result of simple model unchanged.
14	Part 3. Review of Existing Records: Added more reference documents as needed.

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 these buildings 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 releases of hazardous, chemical, or radioactive materials were 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 buildings which are further described in the next section:

- 235-1F: Refrigeration Building No. 1
- 235-2F: Refrigeration Building No. 2

The proposed decommissioning end-state for these facilities is demolition to the building slab.

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 substances to the environment.

Facility Description

Refrigeration Buildings 235-1F and 235-2F, built in the mid-1970s, contain three chillers and support systems for the supply of chilled water and cooling water (Figure 1). The chilled water was mixed with 35% Ethylene Glycol for Building 235-F air handling units. The cooling water from the chiller units to the cooling tower contained corrosion inhibitors and biocide. (Reference 3)

Building 235-1F is a 950 square foot prefabricated metal building that contains two (2) chillers, two (2) chilled water pumps, one (1) 120-gallon horizontal refrigerant storage tank, one (1) expansion tank, a steam reducing station, two (2) Motor Control Centers (MCCs), the water monitoring and chemical injection system, one (1) refrigerant monitor system, one (1) safety shower, and the distribution piping.

Building 235-2F is a 475 square foot prefabricated metal building with one (1) chiller, three (3) chilled water pumps, one (1) make up water tank, one (1) refrigerant monitor system, one (1) safety shower, and the distribution piping.

A baseline asbestos survey of the refrigeration buildings was completed on 9/21/2022 stating existence of non-friable and friable asbestos (Reference 4). All Asbestos Containing Material (ACM) shall be removed and properly disposed of by certified asbestos abatement personnel in accordance with all local, state, and federal asbestos abatement regulations prior to the decommissioning of the 235-1F and 235-2F buildings.

Figure 1 – Layout/Location of Buildings 235-1F & 235-2F.

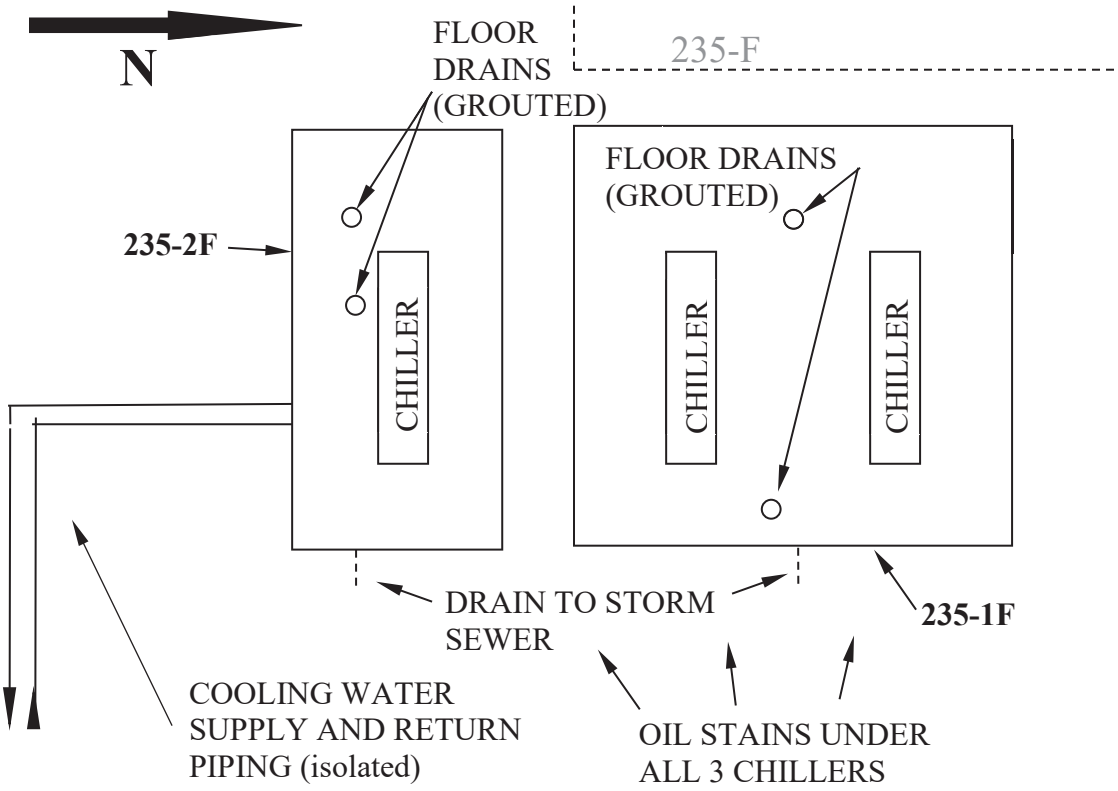

Photo 1 – Refrigeration Building No. 1 235-1F taken from east.

Photo 2 – Refrigeration Building No. 2 235-2F taken from south.

Photo 3 – Interior of Buildings 235-1F and 235-2F – Example of current state of drains.

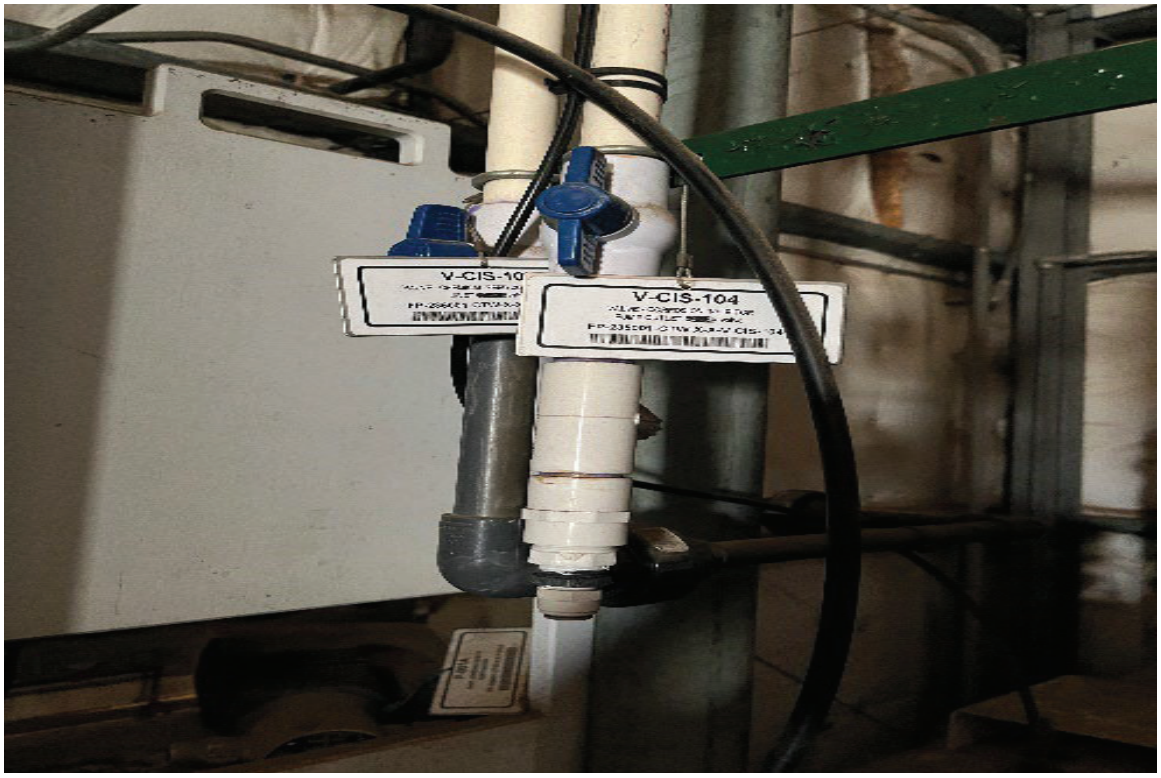

Photo 4 – Interior of Building 235-1F – Chemical treatment inlet.

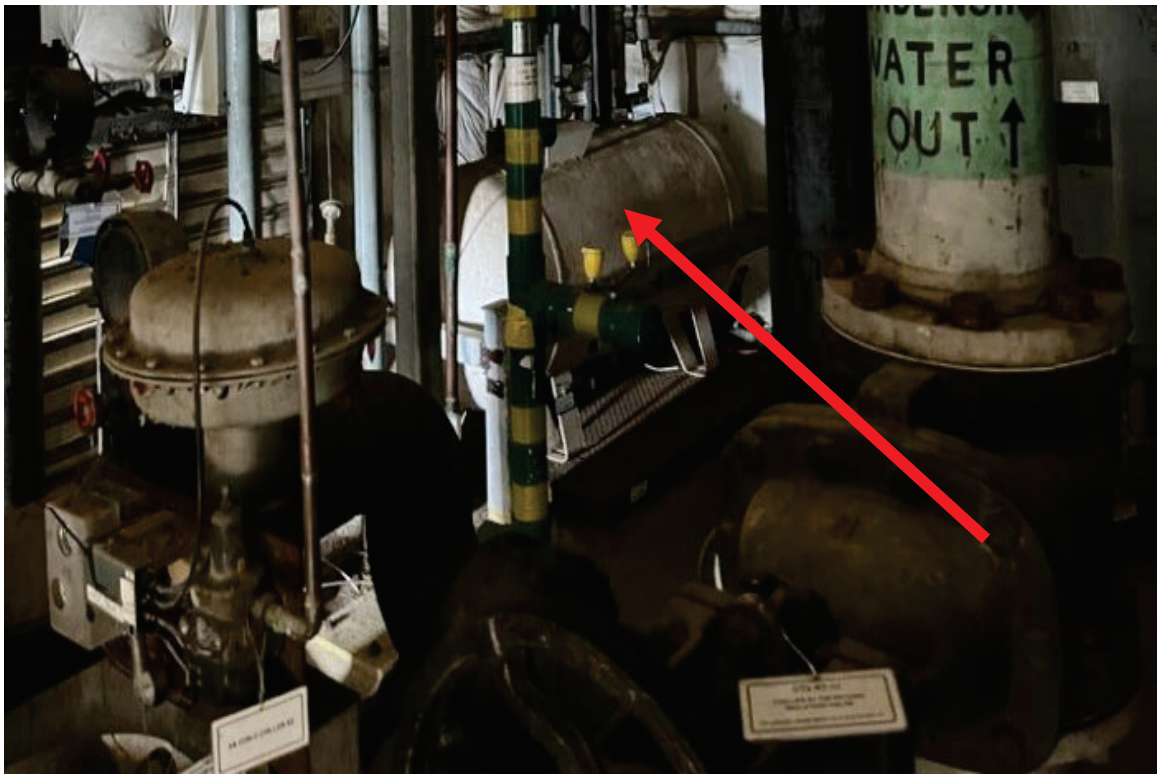

Photo 5 – Interior of Building 235-1F – Refrigerant Storage Tank

Photo 6 – Centrifugal Chiller (1 of 3)

Process History

To avoid contamination of utility systems due to new processing missions, the 235-1F and 235-2F buildings were installed in the mid-1970s to house chillers and associated components relocated from inside Building 235-F. Replacement of the original chillers and piping in Buildings 235-1F and 235-2F began in 1998 due to the phasing out of refrigerants containing chlorofluorocarbons (CFCs). Segments of the original Building 235-2F cooling water supply and return headers were not replaced along with the chillers, and no evidence of contamination has been found in locations where this piping was opened for maintenance or modifications. The final phase of the chiller replacement project included the 285-11F Cooling Tower installation in 2004 and the subsequent startup and isolation of the system from the 285-F Cooling Tower and pumps. The 285-11F Cooling Tower was removed as an equipment dismantlement and removal action completed August of 2023 (Reference 2). In May of 2023, the refrigerant was pumped out of all 3 chillers (Reference 5). The chilled water has been removed from piping in Buildings 235-1F and 235-2F (Reference 6). Mechanical and electrical isolations have been completed for both buildings (Reference 7).

Chemical Process

Chemical Name	Process location	Evidence of spills?
Chlorofluorocarbons (Freon refrigerant)	original chiller units (removed). 235-1F and -2F.	none
Tetrafluoromethane (R134A refrigerant)	replacement chiller units (drained). 235-1F and -2F	none
Ethylene Glycol (antifreeze)	chilled water tank/ piping (No water). 235-1F and -2F	none
3D Trasar 3DT230 (Corrosion Inhibitors) and 3DTBR10 (Sulfuric Acid).	cooling water piping/chemical injection system (No water). 235-1F and -2F	none
NALCO STABREX® ST70 (Biocide containing Sodium Hypochlorite and Sodium Bromide as active constituents)	cooling water piping/chemical injection system (No water). 235-1F and -2F	none

Radioactive Process

Isotope	*Contaminated areas/others*
none	none

There are no sumps, secondary containment structures, or significant cracks in the refrigeration buildings. Two floor drains in each building (4 total) were grouted during deactivation to prevent continued access to the storm sewer. The small plastic secondary containment basin under the biocide/corrosion inhibitor monitoring and addition station in Building 235-1F was removed during deactivation. Any oil stains on the concrete under the three chiller units will be thoroughly cleaned with Biosolve® surfactant during decommissioning. Refrigerant Tetrafluoroethane (R134a) has been pumped out and removed (Reference 5). The line draining work order (Reference 6) states that the piping containing the chilled water and cooling water has been drained. Components remaining after deactivation such as various light bulbs, ballasts, thermostats with mercury switches, and circuit boards will be removed during decommissioning and prior to structure demolition. Wastes generated during decommissioning will be characterized and managed in accordance with Savannah River Site (SRS) procedures and State and Federal regulations.

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 historic review of spills/releases to the environment. This review includes a review of the 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 serves as a review of releases/spills to the environment prior to August 16, 1993. The FFA and ORPS/SIRIM list no occurrences for Buildings 235-1F and 235-2F.

Wastes generated during decommissioning will be characterized and managed in accordance with Savannah River Site (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 (Reference 8) in which the facilities with historical significance are listed. 235-1F is listed in the document as non-historically significant, and 235-2F carries no mention.

Part 2. Evaluation

Clean Facilities

	Question	Yes	No	Justification
1.	Has the facility ever contained or processed radioactive or hazardous material other than stored packaged material or materials of construction? *If yes, go to question 4.*	x		Chemicals (biocide, ethylene glycol) for prevention of biological growth, corrosion, and buildup of deposits were pumped into the cooling water piping in Building 285-11F and circulated through Buildings 235-1F and 235-2F.
2.	If there was stored packaged material, has there ever been a spill? *If No or N/A, this is a Simple Model. Stop.*			
3.	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)? *If Yes, this is a Simple Model. Stop.*			

Contaminated Facilities

	Question	Yes	No	Justification
4.	Is the facility listed as a Resources Conservation and Recovery Act (RCRA)/CERCLA Unit in Appendix C of the SRS FFA? *If Yes, this is a CERCLA Model. Stop.*		x	Not listed Appendix C of FFA. (Reference 9)
5.	Is the facility listed as a Site Evaluation Area in Appendix G of the SRS FFA? *If Yes, this is a CERCLA Model. Stop.*		x	Not listed in A ppendix G of FFA. (Reference 9)
6.	Is there evidence that there has been a release of hazardous or radioactive materials outside the structure? *If Yes, this is a CERCLA Model. Stop.*		x	Review of the ORPS/SIRIM database and FFA Appendices C and G support that determination that these facilities were not part of a release of hazardous or radioactive material out of the structure because the facilities were not listed in those resources.
7.	Is there a substantial threat of a release of hazardous or radioactive materials outside the structure? *If Yes, this is a CERCLA Model. Stop.*		x	
8.	Has the facility been assigned a hazard category as defined in Facility Safety Document Manual 11Q? *If No, stop and refer facility for evaluation to assign a hazard category, then proceed.*	x		The “Other Industrial” Hazard Category is supported by the absence of radioactive materials and storage of chemicals in quantities below the thresholds found in 40 CFR 302.4.
9.	Is the hazard category Nuclear (HC- 2 or 3), radiological, or high hazard chemical? *If Yes, this is a CERCLA Model. Stop.*		x	These facilities are "Other Industrial."
10.	Has DOE-SR directed that the decommissioning be performed using the CERCLA Model? *If yes, this is a CERCLA Model. Stop.*		x	
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? *If Yes, this is a CERCLA Model. Stop.*		x	

	Question	Yes	No	Justification
12.	Is the facility a formerly nuclear, radiological, or high-hazard chemical facility? *If Yes, this is an Integrated Sampling Model. Stop.*		x	No radiation and no high-hazard chemicals are associated with these facilities.
13.	Has EC&ACP's Regulatory Support Group determined that a final survey is not required for this facilty? *If Yes, this is a Simple Model. If No, this is an Integrated Sampling Model. Stop*	x		Chemicals previously in use have since been removed, and no evidence of radiological contamination is present. EC&ACP Environmental Compliance Authority determined that a final survey is not required. **This is a Simple Model Decommissioning.**

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	G-FDE-F-00061	Rev. 0, 03/12/2007	Facility Decommissioning Evaluation Refrigeration Building Nos. 1 & 2, 235-1F, 235-2F
2	G-SOW-F-00365	Rev. 0, 05/25/2023	Dismantlement and Removal of Equipment 285-11F Cooling Tower, 252-20F Substation, Utility Piping and Components on Exterior of 235-F
3	V-PMP-F-00290	Rev. 0, 12/8/2022	Safe Shutdown Plan 235-1F Refrigeration Building No. 1, 235-2F Refrigeration Building No. 2, 285-11F Induced Draft Cooling Tower, and 607-3F Sewage Lift Station Building
4	Q-APG-F-00321 Q-APG-F-00319	Rev. 0, 09/2022	Baseline Asbestos Inspection Report 235-1F and 235-2F, respectively.
5	Work Order #01967296	Final, 05/03/2023	Work Order to drain refrigerant from chiller units of v35 (235-1F,2F)
6	Work Order #19646760, #1985046, #2020796, and #2024178	Multiple dates	Draining of Chilled Water and Cooling Water from Piping for Refrigeration Buildings.
7	M-DCP-F-19007	Rev. 0, 11/25/2019	Isolation of Electrical and Mechanical Utility Feeds to Building 235-F, 235-1F, 235-2F, 607-3F and Cooling Tower 285-11F.
8	N/A	Final, 01/26/2005	Savannah River Site's Cold War Built Environment Cultural Resources Management Plan
9	WSRC-OS-94-42	Rev. 26, 10/20/2023	Federal Facility Agreement Appendices C & G
x			