Decommissioning End Points Document
Building 485-D, D-Area Cooling Tower

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History of Revisions

Revision	Date	Revised Section	Change
0	05/17/2021	N/A	Initial Issue

1.0 Purpose and Scope

This document identifies the end points (and activities to achieve those end points) necessary to meet the Savannah River Site 485-D D-Area Cooling Tower decommissioning objective and end state vision. It is an upper tier planning document to be used by the Project Manager for the development of project schedules and by the planning organization for the development of work packages.

The end points were developed using the checklist methodology[1], which is a logical, top-down, seven-step process for identifying end points. The process takes into account the initial condition of the facilities, the decommissioning end-state vision and objective, facility boundaries, and types of work to be performed (or considered). This Simple Model decommissioning scope (i.e., the before and after condition of the facility along with boundaries) is further defined by the Facility Decommissioning Evaluation (FDE) (Reference 6.1), which addresses both the 485-D D-Area Cooling Tower and the 482-2D Switchgear Building. The 482-2D Switchgear Building, already decommissioned, had its own separate Decommissioning End Points Document.

This document has been developed in accordance with the requirements found in the Facility Disposition Manual 1C, Procedure 505, "Preparing a Project Decommissioning Plan."

2.0 Facility Description

Building 485-D (Figure 1) is a standard updraft industrial cooling tower constructed in 1952. The general materials of construction of the cooling tower are galvanized steel, wood, fiberglas siding & panels, and concrete. The cooling tower formerly had two 264" diameter updraft fans with 50 hp motors mounted on top of the structure. Fans and motors were removed during deactivation of the facility (Figure 2). The tower basin is reinforced concrete, approximately 63' long by 49' wide and 7'1" deep at the shallowest section (distal to the pump basin) and 7'3" proximal to the pump basin. The walls of the cooling tower basin extend approximately 3' above grade. There is a stairway on the east side of the cooling tower that allows access to the top of the cooling tower and a walkway across the top for access to the fans and drive motors. Figure 2 shows the 485-D D-Area Cooling Tower and proximate facilities

[1] See Reference 6.2 for additional information regarding the checklist method.

Figure 1. Building 485-D, D-Area Cooling Tower (Looking Southwest)

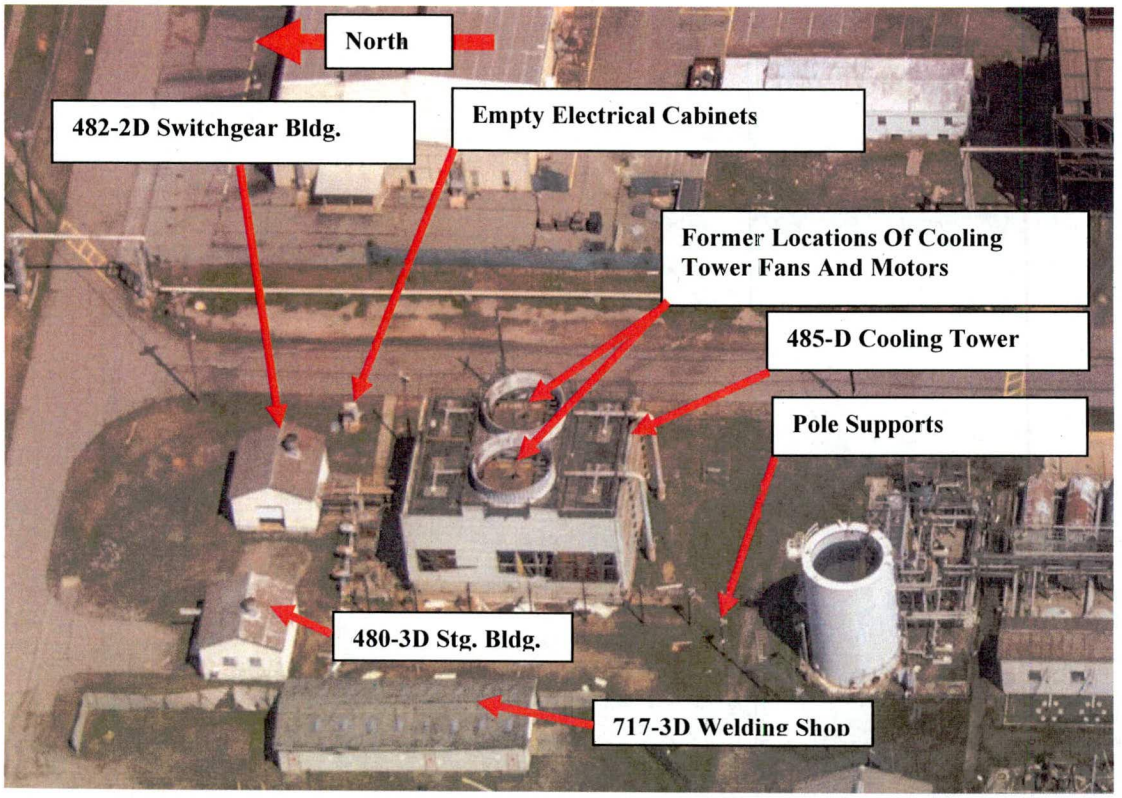


Figure 2. 485-D Cooling Tower Aerial Photo (Showing Fans and Motors Removed)

The three old 200 hp, vertically mounted, centrifugal recirculating pumps on the north side of the tower atop the pump basin (Figure 3) have been removed (Figure 4). The pump basin is approximately 20'8" by 26' wide and 10'11" deep, giving it a usable capacity of approximately 35,000 gallons. Access to the cooling tower basin is by a rung ladder on the west side of the basin, at the transition from the cooling tower basin to the pump basin. Sodium hypochlorite was provided to the cooling tower basin from Building 683-D. The sodium hypochlorite was used as a biocide/ algaecide in the cooling water. Sodium hypochlorite feed piping, as well as communication lines are carried overhead by a series of wooden poles, running northeast from Building 683-D. The poles are specific to the cooling tower and are included in the scope of this decommissioning.

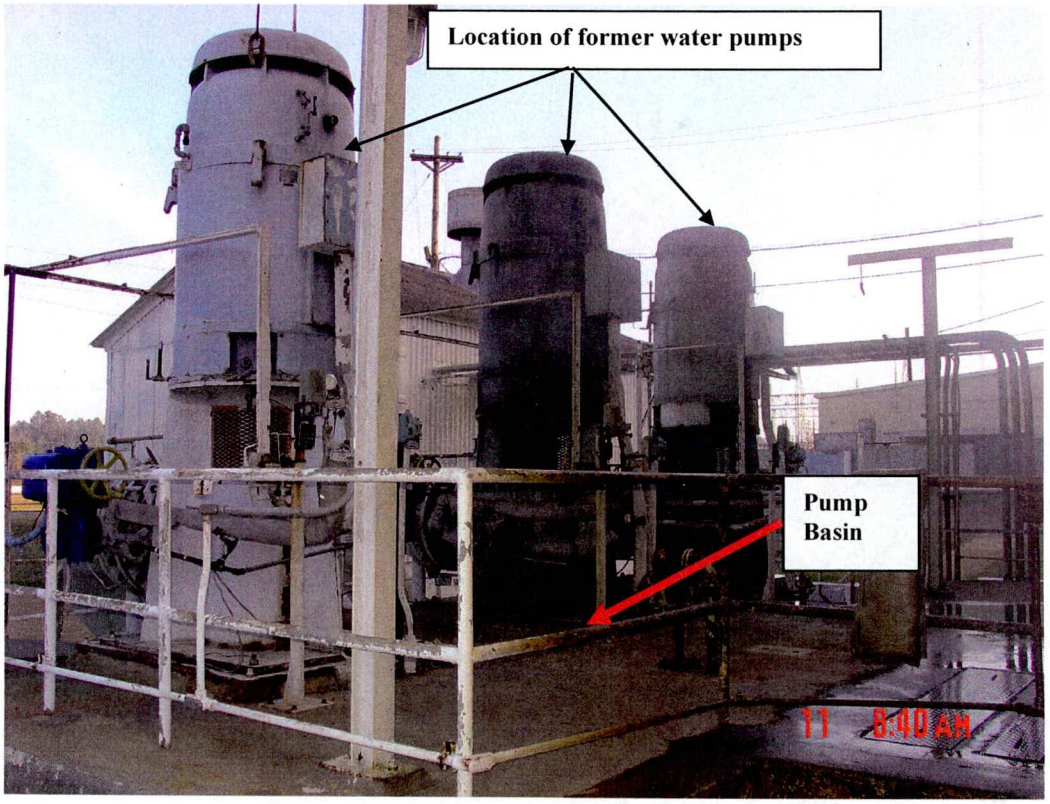


Figure 3. Building 485-D, Cooling Water Pumps Prior To Removal

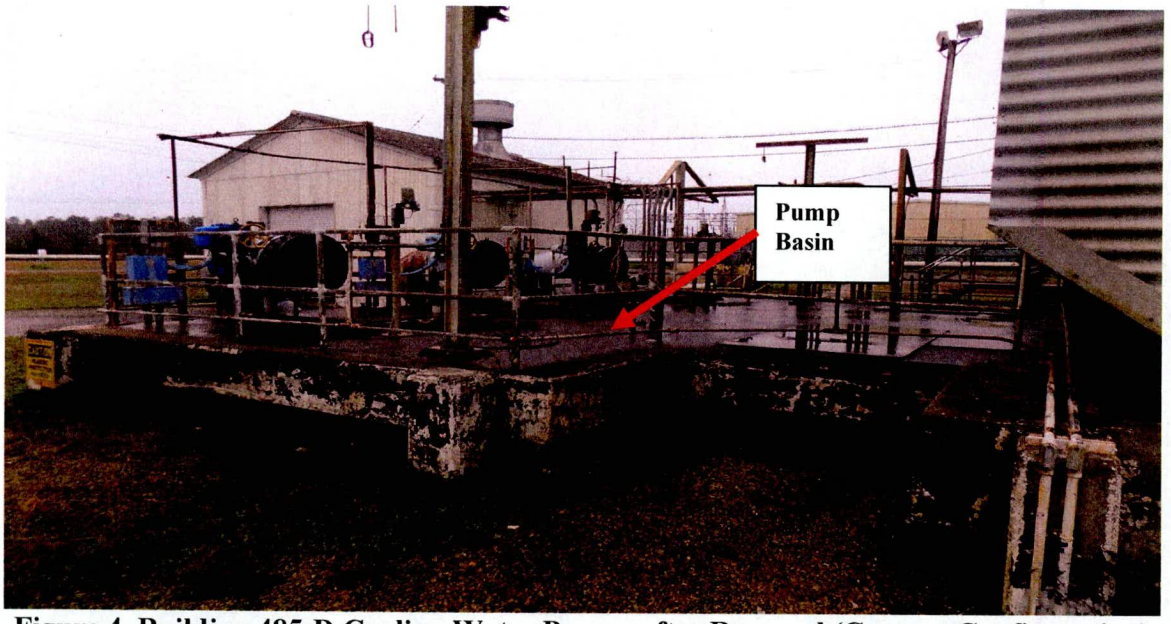


Figure 4. Building 485-D Cooling Water Pumps after Removal (Current Configuration)

The cooling tower provided cooling to the condenser circulating water for the 484-D Powerhouse. The Condenser Cooling Water Header is 42", influent and effluent. Piping is below grade. The cooling water header returning from the Powerhouse enters a manifold that split flow to the two sections of the cooling tower via two 20" pipes (Figure 5). The 24" discharge pipes from each of the three former cooling tower pumps go below grade at the north end prior to combining at a manifold to the 42" header feeding the Powerhouse.

Figure 5. Building 485-D, D-Area Cooling Tower Water Return Lines

3.0 End State Vision

The decommissioning end state for Building 485-D, which has no defined or anticipated future mission, is "Demolish" to, but not including, the concrete Cooling Tower Basin and Pump Basin. That end state results from removal of the above grade Cooling Tower structure and appurtenances to its concrete basin and removal of the Pump Basin appurtenances to its concrete cover slab. All coarse debris will be removed from the Cooling Tower Basin, Pump Basin cover slab, and from the area surrounding the facility footprint of this project. Unless noted otherwise in the Appendix B Endpoints, all concrete slab/pad penetrations greater than 2" in diameter will be cut off level with the slab and grouted in accordance with Reference 6.3. Concrete access steps to the Pump Basin and Cooling Tower stair tower will be removed. Cooling Water Return Lines on the south side of the Cooling Tower and Pump Discharge Lines on the Pump Basin north side will be cut off to grade and piping filled with riprap up to 2 feet below grade and with #57 stone the remaining 2 feet to grade. Concrete 4'-6" x 4'-6" x 6" thick cap slabs will be formed, reinforced with #4 bars on 12" centers each way, and poured (using Sakcrete or 3000 psi concrete) at grade over the cutoff Cooling Tower return lines and

pump discharge lines. The decommissioning end state for the Cooling Tower Basin and Pump Basin structures "In Situ" disposal.

The end state vision for the current 485-D Cooling Tower facility is further defined by the following statements:

- The end-state does not correspond to a "new waste unit."
- The end-state will have no remaining debris.
- The end-state will have no remaining physical hazards. The facility is not in a pedestrian heavily trafficked area, so the elevated slab/basin walls will pose no additional risks to the Site workers. No additional barricades or sloping will be required.
- The end-state requires no long-term stewardship activities.

4.0 Objective and Major Activities

The overall objective of this decommissioning is to place Building 485-D, D-Area Cooling Tower, in a safe, stable and low-cost end state that supports "area closure/completion." In other words, the decommissioning objective is threefold: (1) to reduce the risks to workers, the public and/or environment from residual radiological, chemical, biological, or physical hazards, (2) to minimize future S&M costs for the facility, and (3) to facilitate future "area closures/completion" actions by Area Completion Projects (ACP) personnel.

To meet the overall objectives, the following major activities (MAs) are required:

1. Complete preparatory operations.
2. Eliminate or reduce hazards
3. Perform dismantlement and removal activities.
4. Perform demolition activities.
5. Complete project closure activities.

Appendix B further defines the decommissioning activities and provides corresponding end points for each activity.

5.0 End Point Determination and Management

The decommissioning end points were derived based on a review of (1) existing facility documents, (2) subsequent walk downs of the facility, and (3) the strategy to execute decommissioning by using Savannah River Nuclear Solutions (SRNS) site personnel, subcontractor personnel, or a combination thereof.

Appendix A provides a layout of the structure to be decommissioned. Because it is relatively simple, the structure is handled as a single workspace (Zone A).

As required by SRS Manual 1C, Procedure 506, ACP will verify the completion of each decommissioning end point. That verification will be documented in a final decommissioning report. Documentation will include the Appendix B end points along with objective evidence (e.g., reference documents, interviews, or visual inspection) that the end points are complete.

The project planner is expected to adapt the end points selectively to the structure within this scope.

6.0 References

6.1 J. K. Blankenship, "Facility Decommissioning Evaluation, Buildings 485-D and 482-2D, D-Area Cooling Tower and Switchgear Building", G-FDE-D-00050, Rev. 0, dated May 11, 2020.

6.2 V. R. Fricke, "Choosing End-Points Using the Checklist Method", FDD-ENG-2001-00041, dated April 16, 2001.

6.3 "Site D&D Policy on Decommissioning End Points for Slabs, Pits, Basements and Basins (U)", SDD-2005-00170, Rev. 1, dated August 29, 2016.

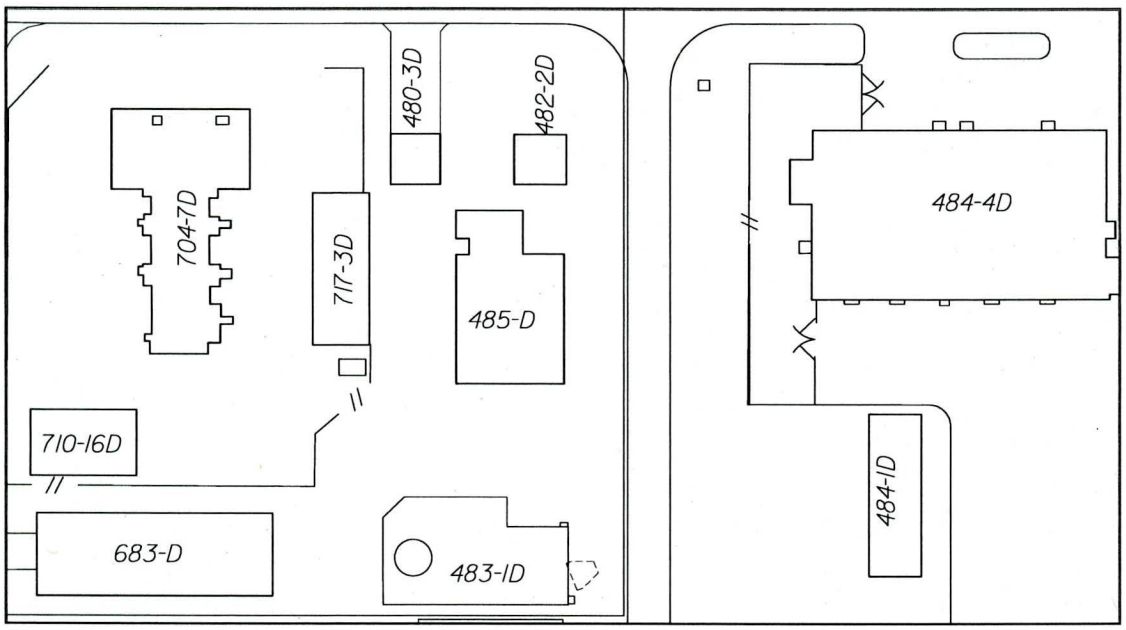
6.4 W. B. Griffin, "Engineering Survey & Interference Report for 485-D, D-Area Cooling Tower," Q-SDD-D-00014, dated October 21, 2020.

6.5 H. McGregor, "Environmental Compliance & Area Completion Projects Baseline Asbestos Inspection Report of Building 485-D", Q-APG-D-00026, Revision 1, dated May 10, 2021.

LISTING OF APPENDICES

A- Facility Layout
B- Listing of End Points and/or End Point Activities Along with Completion Verification

Appendix A – Facility Layout



Cooling Tower 485-D and Surrounding Area

The following utilities served or originated from the facility:

- Electricity
- Public Address System
- Cooling Tower and Pump Basin Drains to Process Sewer System

Appendix B – Listing of End Points and/or End Point Activities Along with Completion Verification

MA - 1	COMPLETE PREPARATORY OPERATIONS		
End Point #	**Activity**	**Endpoint**	**Verification Method**
MA – 1.1	Submit Environmental Evaluation Checklist for approval to document a NEPA (National Environmental Policy Act) review and identify any environmental permits needed.	Notice of NEPA Approval (NONA) is issued.	Document Review
MA – 1.2	Submit Site Clearance Permit for approval.	Site Clearance Permit approved.	Document Review
MA – 1.3	Prepare and submit request for screening of real property for disposition.	Building and equipment, as applicable, have been declared excess.	Document Review
MA – 1.4	Update all property systems, Master Building List (MBL) and the Financial Information System (FIS).	Systems have been updated.	Interview EC&ACP & SI Property Managers, as applicable
MA – 1.5	As needed, sample and analyze materials (e.g., paints, insulation, etc.) for PCBs and other hazardous constituents. Define segregation practices and waste management for identified components. This can be done in parallel with demolition activities.	Waste Identification Form (WIF) with segregation practices is approved and issued.	Document Review
MA – 1.6	Perform a building inspection for asbestos containing materials and issue the required report.	Building Inspection Report is issued.	Document Review
MA – 1.7	Perform an Engineering Survey and Interference Report.	Engineering Survey is issued.	Document Review
MA – 1.8	Conduct Readiness Review.	Readiness Review is complete.	Document Review
Section 2	**ELIMINATE OR REDUCE HAZARDS**		
MA – 2.1	Verify no hazardous energy is present. Isolate per Manual C2, Procedure FDP 2.04, if any is identified.	Verification Report is approved and issued, if hazardous energy is identified.	Document Review
MA – 2.2	Remove and dispose of hazardous materials, as applicable.	Hazardous materials are dispositioned.	Document Review
MA – 2.3	Prepare and submit notice of asbestos disturbance, if any is later found.	Asbestos abatement project license is received.	Document Review
MA – 2.4	Complete asbestos abatement actions, if any is later found.	Asbestos abatement is complete.	Document Review
MA – 2.5	Complete any remaining deactivation activities.	All deactivation activities are completed.	Visual Verification
Section 3	**PERFORM DISMANTLEMENT AND REMOVAL ACTIVITIES**		
End Point #	**Activity**	**Endpoint**	**Verification Method**
MA – 3.1	Remove any remaining loose miscellaneous materials.	Building is free of loose miscellaneous materials.	Visual Verification

Section 4	PERFORM DEMOLITION ACTIVITIES		
End Point #	Activity	Endpoint	Verification Method
MA – 4.1	Obtain demolition permit as required by South Carolina Codes and Regulations, SC Reg. R61-86.1 Section XIII.	Demolition license is received.	Document Review
MA – 4.2	Take precautions to minimize interference with roads and other facilities.	Traffic plan is issued.	Document Review
MA – 4.3	Take precautions to preserve any stakes, monuments or benchmarks.	If applicable, stakes, monuments or benchmarks are protected.	Document Review
MA – 4.4	Employ and implement measures for controlling suspended solids in storm water run-off as a result of demolition activities.	Storm water pollution prevention plan is issued.	Document Review
MA – 4.5	Remove Cooling Water Return Lines from south side of Cooling Tower to grade. Fill piping with riprap up to 2 feet below grade and with #57 stone the remaining 2 feet to grade.	Return Lines have been removed and filled with riprap and #57 stone..	Visual Observation
MA – 4.6	Form, reinforce with #4 bars on 12" centers each way, and pour 4'-6" x 4'-6" x 6" thick cap slabs (using Sakcrete or 3000 psi concrete) over the cutoff pipes at grade.	Caps have been poured.	Visual Observation
MA – 4.7	Strip cap slab forms.	Cap slab forms have been stripped.	Visual Observation
MA – 4.8	Remove all piping, electrical, structural (including handrails), etc. appurtenances from atop the Pump Basin with the exception of access covers and covers installed over pump openings..	All piping, electrical, structural, handrails, etc. appurtenances have been removed from atop the Pump Basin.	Visual Observation
MA – 4.9	Cut off the 24" pump discharge lines flush with grade. Fill piping with riprap up to 2 feet below grade and with #57 stone the remaining 2 feet to grade.	Pump Discharge Lines have been removed and filled with riprap and #57 stone..	Visual Observation
MA – 4.10	Form, reinforce with #4 bars on 12" centers each way, and pour 4'-6" x 4'-6" x 6" thick cap slabs (using Sakcrete or 3000 psi concrete) over the cutoff pump discharge lines at grade.	Caps have been poured.	Visual Observation
MA – 4.11	Remove pole supports, sodium hypochlorite feed piping, and communications circuitry running from 683-D to the 485-D Cooling Tower. Pole supports shall be removed or cut off flush with grade.	Pole supports, sodium hypochlorite feed piping, and communications circuitry have been removed. Pole have been cut to grade or filled with CLSM if removed.	Visual Observation
MA – 4.12	Demolish and remove the 485-D Cooling Tower structure down to, but not including, the Cooling Tower Basin, Pump Basin and concrete slab atop the Pump Basin.	Cooling Tower Basin, building footprint and proximate area is free of specified elements.	Visual Observation
MA – 4.13	Clean Cooling Tower Basin, building footprint and proximate area of all coarse debris and rubble.	The Cooling Tower Basin, building footprint and proximate area is free of all coarse debris and rubble.	Visual Observation
MA – 4.14	Remove concrete access steps to Pump Basin without damaging Pump Basin concrete wall.	Pump Basin concrete steps have been removed.	Visual Observation

Section 4 (cont'd)	**PERFORM DEMOLITION ACTIVITIES**		
End Point #	**Activity**	**Endpoint**	**Verification Method**
MA – 4.15	Remove concrete access steps to Cooling Tower stair tower.	Cooling Tower stair tower concrete steps have been removed.	Visual Observation
MA – 4.16	Cut all above ground and concrete surface protrusions (e.g., bolts, rebar, etc.) level with the top of the Cooling Tower Basin, slab atop the Pump Basin, or grade, whichever applies.	All above ground and concrete surface protrusions have been cut level with the top of the Cooling Tower Basin, concrete slab atop the Pump Basin, or grade, whichever applies.	Visual Observation
MA – 4.17	Cut floor penetrations of 2" in diameter or greater (excluding the pump openings) flush with the Pump Basin slab, plug, and fill with cementitious material.	2" diameter or greater floor penetrations (excluding the pump openings) have been cut flush with slab and filled with cementitious material	Visual Observation
MA – 4.18	Perform a Final Acceptance Inspection (8Q-51) of the completed work.	Final Acceptance Inspection completed and recorded (8Q-51).	Document Review
MA – 4.19	Complete any incomplete or new work items identified during the Final Acceptance Inspection.	Remaining work items identified during final inspection completed.	Document Review
MA – 4.20	Remove from jobsite and dispose of all equipment, rubble, sanitary waste, scrap metal, and trash as the work progresses.	Jobsite equipment and waste dispositioned.	Document Review and Visual Observation
Section 5	**COMPLETE PROJECT CLOSURE ACTIVITIES**		
End Point #	**Activity**	**Endpoint**	**Verification Method**
MA – 5.1	Ensure all Work Packages have been completed.	Work Packages are complete.	Document Review
MA – 5.2	Prepare as-built information and a request for Site Clearance Permit Closure, OSR 3-120, and submit as required by Manual 1D Procedure 3.02.	Request for Site Clearance Permit Closure is issued.	Document review.
MA – 5.3	Issue correspondence for retirement of assets.	Property Record Closeout letter is issued and recorded in the project file.	Document Review
MA – 5.4	Issue correspondence for deletion (voiding) of engineering documents.	Records Disposition letter 482-2D is issued and recorded in the project file.	Document Review
MA – 5.5	Revise (by Site Infrastructure Engineering) technical baseline documents, as appropriate, which cannot be voided.	Appropriate technical baseline documents have been revised.	Document Review
MA – 5.6	Prepare and issue Completion of Decommissioning End Points (CDEP) document.	CDEP document has been issued.	Document Review
MA – 5.7	Prepare and issue Decommissioning Project Final Report (DPFR).	DPFR is issued.	Document Review

Temporary Delegation of Authority

In accordance with SRS 1B Management Requirements and Procedures Manual, Procedure 3.10 Limits of Authority Procedure, temporary delegation of authority is hereby granted as indicated.

Delegating Manager: **OLIVER, THELESIA O.**

Department: **E1000 - FACILITIES & SYSTEMS ENG**

I hereby grant my authority to **TERRONEZ, MANUEL I.** for the period of **May 20, 2021** to **May 20, 2021**. For signature authority, a copy of this delegation will be attached to all documents signed on my behalf.