Savannah River NUCLEAR SOLUTIONS℠

Seventh Five-Year Remedy Review Report for Savannah River Site Operable Units with Engineered Cover Systems (U)

Aiken, South Carolina

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SAVANNAH RIVER SITE • AIKEN, SOUTH CAROLINA

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EXECUTIVE SUMMARY

This document presents the results of a technical evaluation of environmental remedies that implemented engineered cover systems at Savannah River Site. The remedies are evaluated to determine whether they are functioning as designed and whether they are protective of human health and the environment. This evaluation is required under Section 121 of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended by the Superfund Amendments and Reauthorization Act of 1986. Comprehensive Environmental Response, Compensation, and Liability Act requires remedial actions that result in any hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure to be subject to a remedy review every five years.

Due to the large number of Savannah River Site~~SRS~~ remedial decisions, U.S. Department of Energy, U.S. Environmental Protection Agency, and South Carolina Department of Environmental Services agreed to conduct the remedy reviews in five phases, approximately one year apart, with ~~OUs~~ operable units grouped by the following remedy types: (1) native soil covers and/or land use controls; (2) groundwater; (3) engineered cover systems; (4) geosynthetic or stabilization/ solidification cover systems; and (5) operating equipment. This is the third phase of the Seventh Five-Year Remedy Review Report, with this report evaluating Savannah River Site~~SRS~~ operable units ~~OUs~~ that have engineered covers as part of the ~~a~~ final remedy.

According to the data reviewed and the site inspections, the remedies evaluated in this report are functioning as intended. The exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of remedy selection are still valid. No new information has come to light that calls into question the protectiveness of any of the remedies evaluated. The remedies have been determined to be protective of human health and the environment. A recommendation to discontinue water-level measurements at the Central Shops Burning/Rubble Pits (631-1G and 631-3G) has been proposed since the water-level measurements have remained well below the bottom of the basin for more than five years and meets the requirements of three consecutive years of decreasing water level in Pit 631-3G as stated in the *Post-Construction Report (PCR)/Corrective Measures Implementation Report (CMIR)/Final Remediation Report (FRR) for the Central Shops*

Burning/Rubble Pits (631-1G and 631-3G/3GA) Operable Unit (U) (WSRC-RP-2004-4014, Revision 1, February 2005).

LIST OF ACRONYMS AND ABBREVIATIONS *(continued)*

MZ	mixing zone
MZCL	mixing zone concentration limit
N/A	not applicable
NBN	no building number
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NDMA	N-nitroso-dimethylamine
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRDC	National Resources Defense Council
NTCR	non-time critical removal
O&M	operation and maintenance
ORWBG	Old Radiological Waste Burial Ground
OU	operable unit
PAH	polyaromatic hydrocarbons
PBDE	polybrominated diphenyl ether
PBRP	P-Area Burning/Rubble Pit (131-P)
PCE	tetrachloroethylene
PCB	polychlorinated biphenyl
ρCi/g	picocuries per gram
ρCi/mL	picocuries per milliliter
ρCi/L	picocuries per liter
PCR	Post Construction Report
PFAS	per- and polyfluoroalkyl substances
PFOS	perflurorooctane sulfonic acid
PRG	Preliminary Remediation Goal
PTSM	principal threat source material
Q	quarter
RAO	remedial action objective
RCOC	refined constituent of concern
RCRA	Resource Conservation and Recovery Act
RDX	hexahydro-1,3,5-trinitro-1,3,5-triazine
RfC	reference concentration
RfD	reference dose
RFI	RCRA Facility Investigation
RG	remedial goal
RGO	remedial goal option
RI	Remedial Investigation
ROD	Record of Decision
RSL	regional screening level
S/S	stabilization/solidification
SARA	Superfund Amendments and Reauthorization Act of 1986

LIST OF ACRONYMS AND ABBREVIATIONS *(continued/end)*

SCDES[1]	South Carolina Department of Environmental Services
SCHWMR	South Carolina Hazardous Waste Management Regulations
SE	site evaluation
SEMS	Superfund Enterprise Management System
SRL	Savannah River Laboratory
SRLSB	Savannah River Laboratory Seepage Basins (904-53G1, 904-53G2, 904-54G, and 904-55G)
SRNL	Savannah River National Laboratory
SRNS	Savannah River Nuclear Solutions, LLC
SRS	Savannah River Site
SSHASP	site-specific health and safety plan
SVE	soil vapor extraction
SWP	southwest plume
TCE	trichloroethylene
TCP	1,2,3-trichloropropane
TNT	2,4,6-trinitrotoluene
TZ	transmissive zone
UAZ	upper aquifer zone
USDOE	United States Department of Energy
USEPA	United States Environmental Protection Agency
USFS-SR	United States Department of Agriculture Forest Service – Savannah River
UTRAU	Upper Three Runs Aquifer Unit
VOC	volatile organic compound
WSRC	Washington Savannah River Company
WSRC	Westinghouse Savannah River Company
yd / yd^3	yard or yards / cubic yard

1 South Carolina Department of Environmental Services (SCDES) was known as South Carolina Department of Health and Environmental Control prior to July 1, 2024.

SAVANNAH RIVER SITE SUMMARY

I. INTRODUCTION

Section 121 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), requires that remedial actions which result in any hazardous substances, pollutants, or contaminant remaining at the site be subject to a five-year remedy review. The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 CFR 300.430(f)(4)(ii)) further provides that remedial actions which result in any hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure to be reviewed every five years to ensure protection of human health and the environment. The purpose of five-year remedy reviews is to evaluate the implementation and performance of the selected remedy at an operable unit (OU) to determine if the remedy is and will continue to be protective of human health and the environment. The evaluation of the remedy and the determination of protectiveness should be based on and sufficiently supported by data and document reviews, site interviews, ~~and~~ visual inspections, etc. The methods, findings, and conclusions of remedy reviews are documented in Five-Year Remedy Review Reports. The reports also identify any issues found during the review and provide recommendations to address the issues.

The U.S. Department of Energy (USDOE) prepared this seventh five-year remedy review for Savannah River Site (SRS) OUs that included engineered cover systems in the remedial action pursuant to CERCLA Section 121 and as amended by SARA and the NCP. During implementation of the five-year remedy review process at the SRS, the U.S. Environmental Protection Agency (USEPA), the South Carolina Department of Environmental Services (SCDES), and the USDOE recognized that remedial action decision document(s) would be issued for multiple OUs. Rather than generate individual five-year remedy review reports for each OU, the USDOE and regulatory agencies determined that it would be more cost effective to conduct a remedy review for all applicable OUs on the same five-year cycle. The First Five-Year Remedy Review was issued in August 1997 (WSRC 1997); the Second

Five-Year Remedy Review was issued in February 2004 (WSRC 2003b); the Third Five-Year Remedy Review was issued in January 2009 (WSRC 2008); the Fourth Five-Year Remedy Review was issued in February 2014 (SRNS 2014); and the Fifth Five-Year Remedy Review was issued in December 2018 (SRNS 2015, SRNS 2017, SRNS 2018a, SRNS 2018b, and SRNS 2018c), the Sixth Five-Remedy Review was issued in December 2023 (SRNS 2019, SRNS 2020, SRNS 2021, SRNS 2022, SRNS 2023). The issuance of the Seventh Five-Year Remedy Review is in progress: Phase 1 (Native Soil Covers and/or Land Use Controls) was issued in January 2025; Phase 2 (Groundwater Remedies) was issued in January 2026.

The size of each report has grown considerably since 1997 due to the increasing number of OU remedies evaluated, and the level of detail required for data reviews, site inspection reporting, and document formatting based on USEPA guidance. To allow for a more even distribution of resources, a recommendation was made by SRS in the Fourth Five-Year Remedy Review Report (SRNS 2014) that future reviews should be conducted in phases based on OU groupings with similar remedies. In addition to a reduction in the total volume for future remedy review reports, evaluating similar remedies in the same review period would support easier identification and resolution of similar issues and allow for more efficient implementation of similar initiatives. Beginning with the Fifth Five-Year Remedy Review Report, the USDOE, USEPA, and SCDES agreed to segregate the five-year remedy review report into five OU groupings (grouped by remedy similarity) with a different group submitted annually on a five-year cycle. The SRS OUs are grouped by the following remedy types:

(1) Native Soil Covers and/or Land Use Controls (LUCs);
(2) Groundwater;
(3) Engineered Cover Systems;
(4) Geosynthetic or Stabilization/Solidification Cover Systems; and
(5) Operating Equipment.

The trigger date for the submittal of the next five-year remedy review report to the regulatory agencies is based on the USEPA signature date of the previous report. The final

signature for the last grouping of the Seventh Five-Year Remedy Review Report is due no later than December 31, 2028. A more detailed discussion of the phased reviews and transition schedule are provided in Appendix A.

This report documents the Seventh Five-Year Remedy Review for the third OU grouping, OUs with engineered cover systems selected as the final remedy and includes a review of remedy decision documents for ten USEPA Superfund Enterprise Management System (SEMS) units at the SRS. SEMS is a database maintained by the USEPA as part of the Superfund program that assigns a unique tracking number to hazardous waste sites considered for cleanup under CERCLA. Remedy decision documents may include more than one SEMS unit and/or SRS OU.

The SRS OUs evaluated in this document were grouped together because of similar remedies. Figure 1 identifies the location of the SRS OUs evaluated in this document. The data evaluation and visual inspections for the SRS OUs with engineered cover systems were conducted from July 2025 through December 2025.

This report was prepared using the *Comprehensive Five-Year Review Guidance* (USEPA 2001) and is supplemented by the *Recommended Evaluation of Institutional Controls: Supplement to the "Comprehensive Five-Year Review Guidance"* (USEPA 2011), *Clarifying the Use of Protectiveness Determinations for Comprehensive Environmental Response, Compensation, and Liability Act Five-Year Reviews* (USEPA 2012), and *Five-Year Review Recommendation Template* (USEPA 2016). This report summarizes common elements for the entire SRS. The remedy reviews are included as Appendix C through Appendix L.

Site Chronology

A summary of the regulatory history of SRS is provided below beginning with the 1988 National Resources Defense Council (NRDC) Consent Decree (Civil Action No. 1:85-2583-6). The Consent Decree was an agreement between the NRDC and other interested parties, SCDES, and USDOE to amend Parts A and B of the Resource Conservation and Recovery Act (RCRA) Permit Application to include the Metallurgical Laboratory Basin

(904-11G) and associated Carolina Bay, the Acid/Caustic Basin (904-74G, 904-75G, 904-78G, and 904-80G), and the Mixed Waste Management Facility (643-28G) to include closure, groundwater monitoring and post-closure activities. The Savannah River Laboratory Seepage Basins (904-53G, 904-54G, and 904-55G) and New TNX Basin (904-120G) were also included in the Consent Decree for closure consistent with RCRA requirements~~in a RCRA-like manner~~. The Consent Decree was signed on May 26, 1988. On December 21, 1989, SRS was included on the National Priorities List (NPL). The inclusion created a need to integrate the established RCRA Facility Investigation (RFI) program with CERCLA requirements to provide for a focused environmental program. In accordance with Section 120 of CERCLA 42 U.S. Code Section 9620, the USDOE has negotiated a Federal Facility Agreement (FFA) (FFA 1993) with the USEPA and the SCDES to coordinate remedial activities at SRS into one comprehensive program which fulfills these dual regulatory requirements. USDOE functions as the lead agency for remedial activities at SRS, with concurrence by the USEPA-Region 4 and the SCDES.

A summary status of SRS is provided in the Five-Year Summary Review Form in Table 1. A chronology of site events including the effective dates for the Consent Decree, the FFA, and the NPL Listing is provided in Appendix A. Chronologies of significant activities and regulatory milestones for individual OUs are included in the site-specific remedy review reports (Appendix C through Appendix L).

Background

The SRS was constructed during the 1950s to produce materials used in the fabrication of nuclear weapons, primarily tritium and plutonium, in support of our nation's defense programs. Production of nuclear materials for the defense program was discontinued in 1988. SRS has provided nuclear materials for the space program, as well as for medical, industrial, and research efforts up to the present. Chemical and radioactive wastes are by-products of nuclear material production processes. These wastes have been treated, stored, and in some cases, disposed of at SRS. Past disposal practices (e.g., seepage basins, pits and piles, landfills, etc.) have resulted in soil and groundwater contamination.

A core team process for sharing and interpreting information and working together to reach agreement on key remedial decisions among USDOE, USEPA, and SCDES was implemented at SRS in 2000. The core team process has made environmental cleanup at SRS efficient and has allowed remediation at many OUs to be accomplished on an accelerated schedule.

The collaborative efforts of the USDOE, USEPA, and SCDES support a consistent approach to site characterization, human health and ecological risk analyses, remedy selection, establishment of remedial goals and remedy implementation for individual OUs at SRS. Technical and administrative protocols have been established to promote the consistent implementation of USEPA guidance at OUs across SRS. An environmental database is used to track sampling, analysis, and results of environmental characterization and monitoring. The environmental database is not available to the public directly. However, the information retained in the database is provided in regulatory documents that are submitted to USEPA and SCDES for review and approval and are available to the public in the SRS Administrative Record File (ARF) (https://public.srs.gov/missions-and-programs/environmental-stewardship/arf-irf-index/). The ARF is available at the following locations:

U.S. Department of Energy
Public Reading Room
Gregg-Graniteville Library
University of South Carolina – Aiken
471 University Parkway
Aiken, South Carolina 29801

Thomas Cooper Library
Government Information and Maps Department
University of South Carolina
1322 Greene Street
Columbia, South Carolina 29208

An SRS Area Completion Strategy (WSRC 2006) was developed which allowed for the simultaneous characterization and cleanup of multiple OUs and potential sources of contamination in congested industrial areas.

Basis for Taking Action

The most prevalent soil contaminants at SRS are cesium-137 and organic chemicals (volatile or semivolatile). Other radionuclides, metals, polychlorinated biphenyls, and pesticides are present, but less common, at levels that exceed human health risk-based standards at a variety of OUs.

Based on the remedial investigations and technical evaluations, the OUs addressed in this remedy review were determined to contain hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure. The specific contaminants and remedial actions for each OU are described in greater detail in the OU-specific appendices (Appendix C through Appendix L).

Remedial Actions

Remedial actions may target source areas, soil, vadose zone, and/or groundwater. Cleanup levels, formerly referred to as remedial goals in SRS decision documents, are defined for individual OUs, and are included as part of the remedial action objectives (RAOs). RAOs specify the exposure pathway to be mitigated and the receptor to be protected. In general, RAOs at SRS are:

- Prevent exposure of trespassers, industrial workers, and hypothetical residents to soils or groundwater containing unacceptable levels of contaminants.
- Prevent exposure of ecological receptors to soils, surface water or groundwater containing unacceptable levels of contaminants.
- Prevent or minimize the migration of contaminants to groundwater at levels that exceed maximum contaminant levels (MCLs)/cleanup levels.
- Reduce the contaminant concentrations in the groundwater plume to below MCLs/cleanup levels.
- Prevent or minimize the discharge of contaminated groundwater to surface water at levels that exceed MCLs/cleanup levels.

Additionally, LUCs are part of all remedial actions where hazardous substances, pollutants, or contaminants remain on-site above levels that allow for unlimited use and unrestricted exposure. The type of LUCs and their implementation, and reference to the OU-specific land use control implementation plan (LUCIP) are described in Section VII of the OU-specific appendices. LUCs are defined for individual OUs, but in general, LUC objectives at SRS are:

- Prevent exposure to, or ingestion of, contaminated media.
- Prohibit residential use.
- Prevent unauthorized access.
- Prevent unauthorized intrusive activity.
- Maintain the integrity of the cover systems.

Table 2 lists the remedial actions for each of the OUs in this five-year remedy review report. The remedial actions are described in greater detail in the OU-specific appendices (Appendix C through Appendix L). Table 3 provides a summary of the LUC objectives for the OUs with engineered cover systems.

Status of Implementation

The remedial actions listed in Table 2 have been implemented. LUCs are ongoing at all OUs discussed in this five-year remedy review. The status of all response actions or remedial actions for each of the engineered cover systems is discussed in greater detail in the OU-specific appendices (Appendix C though Appendix L). These actions include removal and remedial actions conducted prior to a final Record of Decision (ROD).

Systems Operation and Maintenance

A site-wide maintenance program is in place to care for cover systems, signs, monitoring wells, and other infrastructure associated with environmental remediation. Operation and maintenance (O&M) of cover systems consist of growing grass, mowing, managing surface

stormwater drainage, inspections, and repair of erosion or subsidence as necessary. Identifying signs must remain legible.

The costs of the O&M activities for the individual OUs have been compiled as part of this five-year remedy review. As part of the process of selecting the most appropriate action for each OU, the cost of implementing each of the remedial alternatives was estimated and reported in the respective remedy decision documents. Table 4 compares the actual costs incurred at SRS OUs with engineered cover systems over the time period from fiscal year (FY) 2021 to FY2025 to the estimated costs from the remedy decision documents projected for the same time period. The review for the actual costs incurred (i.e., FY2021 to FY2025) is based on the time-period since the last review for these OUs was conducted in the Sixth Five-Year Remedy Review Report (SRNS ~~2018a~~2021). Site-specific details concerning costs incurred are included for each OU in Appendix C through Appendix L.

In support of the beneficial reuse of brownfield locations, the U.S. Department of Agriculture Forest Service – Savannah River (USFS-SR) began establishing pollinator habitats in 2019 within the boundaries of previously closed waste units located in M-Area, P-Area, R-Area, and T-Area where they will not interfere with existing cover systems or LUCs. Additionally, the USFS-SR also plants 100 acres of pollinator habitat annually at SRS, primarily along powerline rights-of-way. Other USFS-SR practices include adjusted planning practices to encourage a more diverse plant population, and thinning of 3,500 acres of forest annually, which creates conditions more conducive to pollinator habitat.

III. PROGRESS SINCE LAST REVIEW

For the OUs evaluated in this review, the previous protectiveness statements from the Sixth Five-Year Remedy Review Report (SRNS 2021) concluded that the remedies for these OUs were protective (Table 5). There have been no new remedial actions implemented since the Sixth Five-Year Remedy Review Report (SRNS 2021) was signed by USDOE, USEPA, and SCDES and issued to the public.

There were no recommendations or follow-up actions from the Sixth Five-Year Remedy Review Report that impacted the OUs with engineered soil covers evaluated in this report.

in *The Savannah River Site Environmental Bulletin*, which will be sent (postal service and email) to the SRS mailing list. The SRS mailing lists consists of USDOE and SRS contractor personnel, SRS Citizens Advisory Board, members of the public, surrounding SRS, community leaders and organizations, etc. The report and Fact Sheet will be posted on the SRS external webpage and will be made available to the public at four information repositories and online.

Data Review, Site Inspections, and Interviews

According to the data review, the site inspections, and interviews, the remedies selected for the SRS OUs included in this report are functioning as intended by the decision documents. The exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection are still valid for all OUs included in this report. No new information has come to light that calls into question the protectiveness of the remedies.

SRS was greatly impacted by Hurricane Helene and closed in response during the period of September 27, 2024 through October 6, 2024 with the exception of emergency and essential personnel. The site resumed normal operations on October 7, 2024. Environmental Compliance and Area Completions Projects (EC&ACP) Operations and Monitoring personnel evaluated the impacts of Hurricane Helene to all SRS OUs. Within a month after Hurricane Helene occurred, all OUs were reinspected for damages and repaired as needed. No damages have been identified at the OUs evaluated in this report that would affect the protectiveness of the remedies.

The Revision 0 report was submitted on February 5, 2026. Regulatory site inspections with USDOE, USEPA and SCDES personnel were held on March 19, 2026 via Microsoft Teams and face-to-face. SRNS personnel were also present at the meeting. During the meeting, participants viewed drone footage of the OUs with engineered cover systems and were provided an opportunity to walk down the OUs. The USEPA and SCDES elected not to perform a walk down because the drone video provided them with better views of the OU.

V. TECHNICAL ASSESSMENT

The technical assessment of the environmental cleanup program at SRS and each of the OU-specific remedies evaluated in this report (Appendices C through Appendix L) are described by answers to the following three questions posed by the USEPA guidance.

- Question A: Is the remedy functioning as intended by the decision documents?
- Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs still valid?
- Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

Question A: Is the remedy functioning as intended by the decision documents?

Answer: Yes. SRS engineered cover remedies and related activities are functioning as intended as demonstrated below.

- Contaminated material has been excavated and consolidated or left in place under protective cover systems breaking the pathway for worker exposure and for the migration of contaminants to groundwater.
- For all final remedial actions, LUCs are in place and are effective in preventing unauthorized access to the OUs with engineered cover systems and include physical access controls to SRS (e.g., fences, guards, security patrols, etc.) and administrative controls (SRS is a secured government facility with land use restrictions and a Site Use/Site Clearance program).
- The cover system maintenance program and LUCs have been effective in maintaining the integrity of the cover systems at SRS OUs. The inspection reports indicate no significant deficiencies.
- Thermal technologies have been successful at SRS in removing volatile organic compounds from subsurface zones characterized by very high concentrations and dense

non-aqueous phase liquid. Dynamic Underground Stripping was successfully used at the M-Area Hazardous Waste Management Facility as discussed in Appendix I.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs still valid?

Answer: Yes. The exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of remedy selection are still valid for all OUs included in this report. An evaluation of chemical and radiological standards including federal and state promulgated standards (i.e., chemical-specific ARARs) that were in place when the last five-year remedy review was initiated in 2021 to the current 2025 standards was conducted to determine if there were any changes that would affect the protectiveness of the selected remedies. There were some changes in chemical- and radiological-specific standards that could affect the protectiveness of the remedies. In May 2024, the residential soil screening level for lead decreased from 400 mg/kg to 200 mg/kg. If other sources of lead are present, the screening level is 100 mg/kg. Additionally, some chemical-specific standards decreased from 2020 to 2025 due to updated values used in calculating the regional screening levels (RSLs). However, the protectiveness of the remedies were not affected as the cover systems and LUCs prevent exposure. Although new MCLs and RSLs were established for per- and polyfluoroalkyl substances (PFAS) compounds, an evaluation of PFAS for the OUs with engineered covers as the final remedies indicated no impact to remedy protectiveness. There were no changes in action-specific or location-specific requirements that would impact any remedy. This evaluation is included in Appendix B and described in the OU-specific appendices.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

Answer: No. No other information that could call into question the protectiveness of the selected remedies and no outstanding issues have been identified in this Seventh Five-Year Remedy Review.

For all OUs, current and reasonably anticipated future land use at SRS remains consistent with assumptions in the respective decision documents.

VI. ISSUES/RECOMMENDATIONS

Remedial actions evaluated in this Five-Year Remedy Review Report for SRS remain protective of human health and the environment and are effective and functioning as intended. The OUs without issues and recommendations are listed in Table 6.

The OU with issues and recommendations is listed in Table 7 and summarized below.

- Due to water-level measurements at Central Shops Burning/Rubble Pits (631-1G/631-3G) OU continuously being below the bottom of the basin for more than five years, SRS proposes to discontinue taking water-level measurements since these results meet the requirement of three consecutive years of decreasing water-level in Pit 3G (WSRC 2005).

VII. PROTECTIVENESS STATEMENT(S)

The protectiveness statements for each remedy are based on the recommended language from the *Comprehensive Five-Year Review Guidance* (USEPA 2001), *Clarifying the Use of Protectiveness Determinations for Comprehensive Environmental Response, Compensation, and Liability Act Five-Year Reviews* (USEPA 2012), and *Five-Year Review Recommended Template* (USEPA 2016).

For the OUs evaluated in this Five-Year Remedy Review, the engineered cover system remedies were determined to be protective of human health and the environment (Table 8).

LUCs are part of all remedial actions where hazardous substances, pollutants, or contaminants remain on-site above levels that allow for unlimited use and unrestricted exposure. The type of LUCs and implementation and reference to OU-specific LUCIPs are described in detail in Section VII of the OU-specific appendices. For the OUs evaluated in this report, pathways for contaminants to reach human and ecological receptors have been successfully broken by the selected remedies including LUCs.

A protectiveness statement for the OUs evaluated in this report is included in the OU-specific remedy review located in Appendix C through Appendix L.

VIII. NEXT REVIEW

As established in Section 121 of CERCLA, as amended by the SARA and the NCP, periodic reviews are required at least every five years for sites where hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure following the completion of all remedial actions. Barring a change in the governing laws, another review for the remedies in this report should be completed within five years from the ~~signature~~ date of USEPA's concurrence letter of this document. The final ~~signature date~~ USEPA's concurrence letter for the last grouping of the Seventh Five-Year Remedy Review Report is due no later than December 31, 2028.

IX. OU-SPECIFIC FIVE-YEAR REMEDY REVIEW REPORTS

The OU-specific Five-Year Remedy Reviews for the remedies evaluated in this document are included in Appendix C through Appendix L.

X. REFERENCES

FFA, 1993. *Federal Facility Agreement for the Savannah River Site*, Administrative Docket Number 89-05-FF (Effective Date: August 16, 1993)

SCDES, 2025. *South Carolina Hazardous and Mixed Waste Permit, Permit Number SC1 890 008 989, 2025 RCRA Permit Renewal for the Savannah River Site, issued on October 27, 2025, Module III – Postclosure Care and Module IV - Groundwater Requirements, Section B, F-Area Hazardous Waste Management Facility*, South Carolina Department of Environmental Services, Division of Waste Management, Bureau of Land and Waste Management, Columbia, SC

SRNS, 2014. *Fourth Five-Year Remedy Review Report for the Savannah River Site (U) Aiken, South Carolina,* SRNS-RP-2012-00011, Revision 1.1, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

SRNS, 2015. *Fifth Five-Year Remedy Review Report for the Savannah River Site Operable Units with Native Soil Covers and/or Land Use Controls (U) Aiken, South Carolina,* SRNS-

RP-2014-00902, Revision 1, Savannah River Nuclear Solutions, Savannah River Site, Aiken, SC

SRNS, 2017. *Fifth Five-Year Remedy Review Report for the Savannah River Site Operable Units with Groundwater Remedies (U) Aiken, South Carolin*a, SRNS-RP-2015-00609, Revision 1, Savannah River Nuclear Solutions, Savannah River Site, Aiken, SC

SRNS, 2018a. *Fifth Five-Year Remedy Review Report for the Savannah River Site Operable Units with Engineered Cover Systems (U) Aiken, South Carolina*, SRNS-RP-2016-00609, Revision 1,1, Savannah River Nuclear Solutions, Savannah River Site, Aiken, SC

SRNS, 2018b. *Fifth Five-Year Remedy Review Report for the Savannah River Site Operable Units with Geosynthetic or Stabilization/Solidification Cover Systems (U) Aiken, South Carolina*, SRNS-RP-2016-00610, Revision 1,1, Savannah River Nuclear Solutions, Savannah River Site, Aiken, SC

SRNS, 2018c. *Fifth Five-Year Remedy Review Report for the Savannah River Site Operable Units with Operating Equipment (U) Aiken, South Carolina*, SRNS-RP-2017-00567, Revision 1, Savannah River Nuclear Solutions, Savannah River Site, Aiken, SC

SRNS, 2019. *Sixth Five-Year Remedy Review Report for Savannah River Site Operable Units with Native Soil Covers and/or Land Use Controls (U), Aiken, South Carolina*, SRNS-RP-2018-00811, Revision 1, Savannah River Nuclear Solutions, Savannah River Site, Aiken, SC

SRNS, 2020. *Sixth Five-Year Remedy Review Report for Savannah River Site Operable Units with Groundwater Remedies (U) Aiken, South Carolina*, SRNS-RP-2019-00511, Revision 1, Savannah River Nuclear Solutions, Savannah River Site, Aiken, SC

SRNS, 2021. *Sixth Five-Year Remedy Review Report for Savannah River Site Operable Units with Engineered Cover System (U)* Aiken, South Carolina, SRNS-RP-2020-00420, Revision 1, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

Table 8. Protectiveness Statements for the Seventh Five-Year Remedy Review Report for SRS OUs with Engineered Cover Systems

PROTECTIVENESS STATEMENT(S)		
Operable Unit: Central Shops Burning/Rubble Pits (631-1G and 631-3G) (CSBRP) OU SEMS # 50	***Protectiveness Determination:*** Protective	***Addendum Due Date (if applicable):*** N/A
Protectiveness Statement: The selected remedy for the CSBRP OU was institutional controls (i.e., LUCs) with enhanced stormwater as stated in the 2003 ROD. The remedy at the CSBRP OU is protective of human health and the environment. Exposure pathways that could result in unacceptable risks are being controlled by LUCs to prevent exposure to or ingestion of contaminated soil media.		
Operable Unit: D-Area Burning/Rubble Pits (431-D and 431-1D) (DBRP) OU SEMS # 15	***Protectiveness Determination:*** Protective	***Addendum Due Date (if applicable):*** N/A
Protectiveness Statement: The selected remedy for the DBRP OU was institutional controls (i.e., LUCs) as stated in the 1997 ROD. The remedy at the DBRP OU is protective of human health and the environment. Exposure pathways that could result in unacceptable risks are being controlled by LUCs to prevent exposure to or ingestion of contaminated soil media.		
Operable Unit: F-Area Hazardous Waste Management Facility (HWMF) (904-41G, 904-42G, and 904-43G) OU SEMS #6	***Protectiveness Determination:*** Protective	***Addendum Due Date (if applicable):*** N/A
Protectiveness Statement: The selected remedy for the FHWMF OU was in situ stabilization/solidification, RCRA soil cover, and institutional controls (i.e., LUCs) as stated in the 1993 ROD. The remedy at the F-Area HWMF OU is protective of human health and the environment. Exposure pathways that could result in unacceptable risks are being controlled by LUCs to prevent exposure to or ingestion of contaminated soil media and groundwater.		
Operable Unit: Ford Building Seepage Basin (904-91G) (FBSB) OU SEMS #58	***Protectiveness Determination:*** Protective	***Addendum Due Date (if applicable):*** N/A
Protectiveness Statement: The selected remedy for the FBSB OU was excavation, consolidation, soil cover, and institutional controls (i.e., LUCs) as stated in the 2002 ROD. The remedy at the FBSB OU is protective of human health and the environment. Exposure pathways that could result in unacceptable risks are being controlled by LUCs to prevent exposure to or ingestion of contaminated soil media.		
Operable Unit: H-Area HWMF (904-44G, 904-45G, 904-46G, and 904-56G) OU SEMS #7	***Protectiveness Determination:*** Protective	***Addendum Due Date (if applicable):*** N/A
Protectiveness Statement: The selected remedy for the HHWMF OU was in situ stabilization/solidification, RCRA soil cover, and institutional controls (i.e., LUCs) as stated in the 1993 ROD. The remedy at the H-Area HWMF OU is protective of human health and the environment. Exposure pathways that could result in unacceptable risks are being controlled by LUCs to prevent exposure to or ingestion of contaminated soil media and groundwater.		

Table 8. Protectiveness Statements for the Seventh Five-Year Remedy Review Report for SRS OUs with Engineered Cover Systems *(continued)*

Operable Unit: K-Area Burning/Rubble Pit (131-K) and K-Area Rubble Pile (631-20G) (KBRP/KRP) OU SEMS #40	***Protectiveness Determination:*** Protective	***Addendum Due Date (if applicable):*** N/A
Protectiveness Statement: The selected remedy for the KBRP/KRP OU was soil cover, groundwater mixing zone, and institutional controls (i.e., LUCs) as stated in the 2001 ROD. The remedy at the KBRP/RP is protective of human health and the environment. Exposure pathways that could result in unacceptable risks are being controlled by LUCs to prevent exposure to or ingestion of contaminated soil media.		
Operable Unit: M-Area HWMF (904-112G and 904-51G) OU SEMS #1	***Protectiveness Determination:*** Protective	***Addendum Due Date (if applicable):*** N/A
Protectiveness Statement: The selected remedy for the MHWMF OU was in situ stabilization/solidification, RCRA soil cover, and institutional controls (i.e., LUCs) as stated in the 1992 ROD. The remedy at the M-Area HWMF OU is protective of human health and the environment. Exposure pathways that could result in unacceptable risks are being controlled by LUCs to prevent exposure to or ingestion of contaminated soil media and groundwater.		
Operable Unit: Metallurgical Laboratory (Met Lab) HWMF (904-110G) OU SEMS #2	***Protectiveness Determination:*** Protective	***Addendum Due Date (if applicable):*** N/A
Protectiveness Statement: The selected remedy for the Met Lab HWMF OU was in situ stabilization/solidification, RCRA soil cover, and institutional controls (i.e., LUCs) as stated in the 1992 ROD. The remedy at the Met Lab HWMF OU is protective of human health and the environment. Exposure pathways that could result in unacceptable risks are being controlled by LUCs to prevent exposure to or ingestion of contaminated soil media and groundwater.		
Operable Unit: Mixed Waste Management Facility (643-28E) (MWMF) OU SEMS #33	***Protectiveness Determination:*** Protective	***Addendum Due Date (if applicable):*** N/A
Protectiveness Statement: The selected remedy for the MWMF OU was in situ stabilization/solidification, RCRA soil cover, and institutional controls (i.e., LUCs) as stated in the 1994 ROD. The remedy at the MWMF OU is protective of human health and the environment. Exposure pathways that could result in unacceptable risks are being controlled by LUCs to prevent exposure to or ingestion of contaminated soil media and groundwater.		

Table 8. Protectiveness Statements for the Seventh Five-Year Remedy Review Report for SRS OUs with Engineered Cover Systems *(continued/end)*

PROTECTIVENESS STATEMENT(S)		
Operable Unit: Savannah River Laboratory (SRL) Seepage Basins (904-53G1, 904-53G2, 904-54G, and 904-55G) (SRLSB) OU SEMS #47	***Protectiveness Determination:*** Protective	***Addendum Due Date (if applicable):*** N/A
Protectiveness Statement: The selected remedy for the SRLSB OU was excavation, offsite disposal, and institutional controls (i.e., LUCs) as stated in the 2000 ROD. The remedy at the SRLSB OU is protective of human health and the environment. Exposure pathways that could result in unacceptable risks are being controlled by LUCs to prevent exposure to or ingestion of contaminated soil media.		

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APPENDIX A. SEVENTH FIVE-YEAR REMEDY REVIEW REPORT PHASED REVIEWS

I. FIVE-YEAR REMEDY REVIEW PHASES

The size of the Savannah River Site (SRS) five-year remedy review reports has grown considerably since the first report was issued in 1997 with respect to the number of operable unit (OU) remedies evaluated and the level of detail required. Beginning with the Fifth Five-Year Remedy Review Report, the U.S. Department of Energy, U.S. Environmental Protection Agency (USEPA), and South Carolina Department of Environmental Services (SCDES) agreed to segregate the OUs into five groupings based on remedy similarity with a different group submitted annually on a five-year cycle. This phased approach not only reduces the volume of future remedy reports but is also more effective in identifying and resolving issues for similar remedies.

The SRS OUs are grouped by the following remedy types:

1. Native Soil Covers and/or Land Use Controls (LUCs);
2. Groundwater Remedies;
3. Engineered Cover Systems;
4. Geosynthetic or Stabilization/Solidification (S/S) Cover Systems; and
5. Operating Equipment.

The trigger date for submittal of the next five-year remedy review report to the regulatory agencies is based on the USEPA signature date of the previous report. The final signature for the last grouping of the ~~Sixth~~ Seventh Five-Year Remedy Review Report is due no later than December 31, 2028. The remedy reviews for the five OU remedy groups are issued in compliance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan to ensure the five-year limit between decision documents is not exceeded.

A list of the SRS OUs with remedy decision documents grouped into one of the five phased reviews is provided in Table A-1. Table A-1 will be updated in future remedy review

reports as additional remedy decision documents are approved. A general description of the five remedy types is provided below.

Phase 1: Native Soil Covers and/or LUCs

For purposes of the seventh five-year phased remedy review, SRS OUs with native soil covers and/or LUCs as the selected remedy are grouped under the Native Soil Covers and/or LUCs category.

Native soil covers are often implemented at SRS to protect against human and/or ecosystem exposure to waste or contaminated material left in place. Native soil covers are appropriate when water infiltration and leaching of contaminants to groundwater are not a concern. A typical soil cover is 0.30 to 0.61 m (12 to 24 in) thick and is usually vegetated to minimize erosion. Native soil covers are usually low in cost and construction materials are readily available from SRS local sources. Native soil covers may be combined with other remedial actions but require LUCs as a component of the remedy. For these units, native soil covers were in place prior to selection of the remedial action. For this reason, only LUCs were required as the final remedial action for the OUs with existing soil covers discussed in the Native Soil Covers and/or LUCs report.

LUCs are maintained for all OUs where residual hazardous substances, pollutants, or contaminants remain on-site or have been left in place above levels that are acceptable for unlimited use and unrestricted exposure. LUCs may be implemented as a stand-alone remedy when active measures are determined not to be practicable or combined with other remedial actions. LUCs involve institutional controls (i.e., administrative controls) and engineering controls and can include monitoring, maintenance, reporting, access restrictions, signage, fencing, and land use restrictions. In older SRS remedy documents, the term “institutional controls” was often used in place of the broader LUC term.

Phase 2: Groundwater Remedies

For purposes of the seventh five-year phased remedy review, SRS OUs that have monitoring activities associated with Monitored Natural Attenuation (MNA) or a Mixing Zone (MZ) permit, as well as interim remedial actions are grouped in the Groundwater

Remedies category. Groundwater remedies that include operating equipment are discussed in the remedy review report for operating equipment.

SRS uses a graded approach to groundwater remediation. The selection of groundwater remediation technologies for a specific contamination area is based on the size, contaminant type, contaminant concentration, and configuration of the plume. These attributes are the result of the nature and mass of the source of contamination and the subsurface characteristics in the area of the plume. Many large plumes consist of several zones that are most efficiently addressed with separate complementary corrective action/ remedial technologies. The highest concentrations of contaminants are found in the source zone. The most robust, high-mass-removal technologies, for example electrical resistance ~~heading~~heating, are best suited for remediation of the source zone. In the primary plume zone, active remedies such as pump-and-treat, or low-energy remedies such as in situ oxidation may be appropriate. In the dilute fringe zone, contaminants are generally low in concentration and can often be treated with passive techniques.

Low-energy-consumption, low-carbon emission systems are used at SRS to remediate vadose zone soils for the purpose of preventing groundwater contamination. These "green" technologies leverage natural systems to protect and remediate groundwater. Many existing soil vapor extraction (SVE) systems have been converted from active vacuum extraction to low-energy MicroBlower™ and/or passive BaroBalls™ systems. BaroBall™ and MicroBlower™ systems are two types of SVE systems currently in operation at SRS. BaroBalls™ rely on natural fluctuations in barometric pressure to pump volatile organic compounds (VOCs) from the subsurface to the atmosphere at individual SVE wells. SVE wells with MicroBlowers™ are designed to use solar power to generate a vacuum that exhausts VOC vapors from individual wells. Both MicroBlowers™ and BaroBalls™ are low-energy-consumption, low-carbon-emission devices that remove VOC contaminants from the subsurface.

MNA is a passive groundwater remedial action where the fringe and dilute areas of a plume degrade by natural biogeochemical or physical processes such as biodegradation, radioactive decay, dilution, and simple dispersion. MNA remedies must be accompanied

by source control, such as those discussed above, and a technical justification that conditions are favorable for natural attenuation. The groundwater plume should not be expanding significantly, and surface water standards cannot be exceeded at the groundwater discharge point. MNA remedy justifications are supported by groundwater modeling and a commitment to continued monitoring and reporting. When only the uppermost aquifer is impacted, SCDES may issue a MZ permit that is essentially a permit for an MNA remedy. SRS has a mixture of CERCLA Record of Decisions (RODs) that require MNA as the final action for groundwater under CERCLA, and RODs that require SCDES MZ permits to implement the MNA remedy.

Phase 3: Engineered Cover Systems

For purposes of the seventh five-year phased remedy review, SRS OUs that selected an engineered cover system or similar cover system as the remedy are grouped in the Engineered Cover Systems category.

The function of an engineered cover system is similar to that of a native soil cover: to protect against human and/or ecosystem exposure to waste or contaminated material left in place. Although engineered covers do not completely prevent infiltration, they can achieve very low permeabilities if well compacted. Compaction is important to reduce damage from differential settlement and is often used at SRS to remediate OUs that contain diverse waste material such as rubble pits/piles. Another objective of using engineered cover systems is to promote more effective surface drainage and to minimize infiltration.

SRS OUs were placed in this grouping if the selected cover features/performance requirements exceeded those of basic native soil cover. For example, an OU with a remedy that selected cover and/or fill material with a higher clay content to minimize infiltration or for drainage and slope contouring was included in this category even if the clay material did not have engineering compaction requirements.

Table A-4. Chronological Listing of SRS Issued Decision Documents

Document Title[a]	Document Number	Rev.	Issuance Date[b]
Consent Decree Signed			***May 26, 1988***
NPL Listing Effective Date			***December 21, 1989***
A/M Area Groundwater IROD (RCRA)	WSRC-RP-92-744	0	September 16, 1992
M-Area Hazardous Waste Management Facility (904-51G, 904-112G) IROD (RCRA)	**WSRC-RP-92-743**	**0**	**September 16, 1992**
Metallurgical Laboratory Hazardous Waste Management Facility (904-110G) IROD (RCRA)	**WSRC-RP-92-745**	**0**	**September 16, 1992**
Federal Facility Agreement Declared Effective			***August 16, 1993***
F-Area Hazardous Waste Management Facility (904-41G, 904-42G, and 904-43G) ROD (RCRA)	**WSRC-RP-93-1042**	**1**	**October 1, 1993**
H-Area Hazardous Waste Management Facility (904-44G, 904-45G, 904-46G, 904-56G) ROD (RCRA)	**WSRC-RP-93-1043**	**1**	**~~October 1~~ September 10, 1993**
Mixed Waste Management Facility (643-28E) ROD (RCRA)[c]	**WSRC-RP-93-1511**	**1**	**September 23, 1994**
Tank 105-C Hazardous Waste Management Facility ROD (RCRA)[c]	WSRC-RP-94-106	1	September 23, 1994
TNX Groundwater Operable Unit IROD[c]	WSRC-TR-94-0375	1	November 16, 1994
PAR Pond (685-G) IROD[c]	WSRC-RP-93-1549	0	February 16, 1995
D-Area Oil Seepage Basin (631-G) IROD[c]	WSRC-RP-93-1550	1	March 6, 1995
F-Area Groundwater Operable Unit (904-41G, 904-42G, and 904-43G) IROD (RCRA)[c]	WSRC-RP-94-1162	1	April 13, 1995
H-Area Groundwater Operable Unit (904-44G, 904-45G, 904-46G, and 904-56G) IROD (RCRA)[c]	WSRC-RP-94-1163	1	April 13, 1995
M-Area West Unit (631-21G) ROD[c]	WSRC-RP-95-626	0	September 29, 1995
Old Radioactive Waste Burial Ground (643-E) IROD	WRSC-RP-96-102	0	July 25, 1996
Burma Road Rubble Pit (231-4F) ROD	WSRC-RP-96-101	1	July 25, 1996
D-Area Burning/Rubble Pits (431-D, 431-1D) ROD	**WSRC-RP-96-867**	**1**	**July 3, 1997**
F-Area Burning/Rubble Pits (231-F, 231-1F, and 231-2F) ROD	WSRC-RP-96-868	1	July 3, 1997
Grace Road Site (631-22G) ROD	WSRC-RP-96-160	1	July 3, 1997
Gunsite 113 Access Road Unit (631-24G) ROD	WSRC-RP-96-833	1	July 3, 1997
Gunsite 720 Rubble Pit Unit (631-16G) ROD	WSRC-RP-96-832	1	July 3, 1997
Silverton Road Waste Unit (713-3A) ROD	WSRC-RP-96-171	1	July 3, 1997
Central Shops Burning/Rubble Pit (631-6G) ROD	WSRC-RP-96-873	1	July 3, 1997

Table A-4. Chronological Listing of SRS Issued Decision Documents *(continued)*

Document Title[a]	Document Number	Rev.	Issuance Date[b]
Old F-Area Seepage Basin (904-49G) ROD	WRSC-RP-96-872	1.1	July 3, 1997
First Five-Year Remedy Review	***WSRC-RP-97-403***	***0***	***August 27, 1997***
TNX Groundwater Operable Unit ESD	WSRC-RP-97-169	1	October 10, 1997
K-Area Bingham Pump Outage Pit (643-1G) ROD	WSRC-RP-97-178	1	June 11, 1998
C-, F-, K-, and P-Area Coal Pile Runoff Basins (189-C, 289-F, 189-K, 189-P) ROD[c]	WSRC-RP-97-850	1	November 10, 1998
L-Area Oil and Chemical Basin and L-Area Acid/Caustic Basin (904-83G, 904-79G) ROD	WSRC-RP-97-143	1	November 10, 1998
716-A Motor Shops Seepage Basin (904-101G) ROD	WSRC-RP-97-840	0	November 16, 1998
Fire Department Hose Training Facility (904-113G) ROD	WSRC-RP-97-171	1	November 16, 1998
Old F-Area Seepage Basin (904-49G) ESD	WSRC-RP-98-4123	1	December 16, 1998
D-Area Oil Seepage Basin (631-G) ROD	WSRC-RP-97-402	1	May 7, 1999
C-Area Burning/Rubble Pit (131-C) IROD	WSRC-RP-98-4039	0	May 7, 1999
F-Area Retention Basin (281-3F) ROD	WSRC-RP-97-145	1.1	May 19, 1999
Ford Building Waste Site (643-11G) ROD	WSRC-RP-98-4066	1	October 13, 1999
Chemicals, Metals, and Pesticides Pits (080-170G, 080-171G, 080-180G, 080-181G, 080-182G, 080-183G, and 080-190G) IROD	WSRC-RP-98-4192	1.1	January 19, 2000
SRL Seepage Basins (904-51G1, 904-52G2, 904-52G, and 904-55G) ROD	**WSRC-RP-97-848**	**1.1**	**April 26, 2000**
C-Reactor Seepage Basins (904-66G, 904-67G, and 904-68G) Plug-In ROD ESD	WSRC-RP-2000-4032	0	October 18, 2000
L & P Bingham Pump Outage Pits (643-2G, 643-3G, and643-4G) ROD	WSRC-RP-98-4015	1	October 18, 2000
Burma Road Rubble Pit, 231-4F ESD[c]	WSRC-RP-98-4170	1	February 6, 2001
A-Area Burning/Rubble Pits (731-A, 731-1A) and Rubble Pit (731-2A) IROD	WSRC-RP-2000-4001	1	February 9, 2001
Miscellaneous Chemical Basin/Metals Burning Pit (731-4A, 731-5A) IROD	WSRC-RP-98-4031	1.1	February 9, 2001
West of SRL "Georgia Fields" Site (631-19G) ROD	WSRC-RP-99-4164	0	February 22, 2001
F-Area Retention Basin (281-3F) ESD[c]	WSRC-RP-2000-4079	1	June 7, 2001
K-Area Burning/Rubble Pit (131-K) and K-Area Rubble Pile (631-20G) ROD[c]	**WSRC-RP-97-862**	**1**	**August ~~8~~20, 2001**
ORWBG Old Solvent Tanks (650-01E through 650-22E) IROD	WSRC-RP-2000-4193	1	September 27, 2001
Ford Building Seepage Basin ROD	**WSRC-RP-2000-4156**	**1**	**April 5, 2002**

Table A-4. Chronological Listing of SRS Issued Decision Documents *(continued)*

Document Title[a]	Document Number	Rev.	Issuance Date[b]
Chemical, Metals, and Pesticides Pits (080-170G, 080-171G, 080-180G, 080-181G, 080-182G, 080-183G, and 080-190G) IROD Amendment	WSRC-RP-2000-4158	1.2	April 8, 2002
K-Area Reactor Seepage Basin (904-65G) ESD[c]	WSRC-RP-99-4200	1.1	September 16, 2002
General Separations Area Consolidation Unit ROD	WSRC-RP-2002-4002	0	October 25, 2002
Central Shops Sludge Lagoon (080-24G) ROD	WSRC-RP-2000-4189	1	November 15, 2002
C-Area & L-Area Reactor Seepage Basin ROD Amendment	WSRC-RP-2002-4063	1	December 5, 2002
R-Area Acid/Caustic Basin (904-77G) ROD	WSRC-RP-2002-4015	1	February 10, 2003
L-Area Burning/Rubble Pit (131-L) and Rubble Pile (131-3L) and Gas Cylinder Disposal Facility (131-2L) ROD	WSRC-RP-98-4195	1.1	February 17, 2003
A-Area Burning/Rubble Pits (731-A, 731-1A) and Rubble Pit (731-2A) ESD	WSRC-RP-2001-4281	1	March 10, 2003
R-Area Bingham Pump Outage Pits (643-8G, 643-9G and 643-10G) and R-Area Unknown Pits #1, #2, and #3 ROD	WSRC-RP-2001-4129	1.1	April 28, 2003
TNX Area Groundwater Operable Unit ESD[c]	WSRC-RP-2001-00764	0	May 19, 2003
Central Shops Burning/Rubble Pits (631-1G and 631-3G) ROD	**WSRC-RP-2001-4265**	**1.1**	**June 30, ~~2023~~2003**
P-Area Burning/Rubble Pit (131-P) ROD	WSRC-RP-2000-4197	1	August 8, 2003
A-Area Miscellaneous Rubble Pile (731-6A) ROD	WSRC-RP-2001-4197	1.3	August 11, 2003
P-Area Reactor Seepage Basin (904-61G, 904-62G, and 904-63G) Plug-In ROD ESD	WSRC-RP-2002-4105	1.1	October 2, 2003
Chemical, Metals, and Pesticides Pits (080-170G, 080-171G, 080-180G, 080-181G, 080-182G, 080-183G, and 080-190G) Second IROD Amendment	WSRC-RP-2001-4232	1.1	October 21, 2003
L-Area Hot Shop (717-G) ROD	WSRC-RP-2002-4025	1.1	November 3, 2003
Road A Chemical Basin (904-111G) ROD	WSRC-RP-2002-4153	0	November 3, 2003
Second Five-Year Remedy Review[c]	***WSRC-RP-2001-4163***	***1.1***	***February 12, 2004***
R-Area Reactor Seepage Basins (904-57G, 904-58G, 904-59G, 904-60G, 904-103G, and 904-104G) and 108-4R Overflow Basin ROD	WSRC-RP-2003-4093	1	March 18, 2004
TNX Burying Ground (643-G), New TNX Seepage Basin, Old TNX Seepage Basin and TNX Groundwater (082-G) ROD	WSRC-RP-2003-4017	1	April 7, 2004
SRL Oil Test Site (808-16G) ROD	WSRC-RP-2003-4164	1	September 20, 2004
R-Area Burning/Rubble Pits (131-R and 131-1R) and Rubble Pile (631-25G) ROD	WSRC-RP-2004-4004	1	September 28, 2004
C-Area Reactor Groundwater IROD	WSRC-RP-2004-4022	1	October 15, 2004
D-Area Expanded Operable Unit (Consisting of D-Area Ash Basin [488-D] and D-Area Rubble Pit [431-2D]) ROD	WSRC-RP-2004-4007	1	December 17, 2004
Old F-Area Seepage Basin (904-49G) ROD Amendment	WSRC-RP-2003-4136	1	December 17, 2004
Heavy Equipment Wash Basin and Central Shops Burning/Rubble Pit (631-5G) ROD	WSRC-RP-2003-4185	1.1	January 28, 2005
Chemical, Metals, and Pesticides Pits (080-170G, 080-171G, 080-180G, 080-181G, 080-182G, 080-183G, and 080-190G) ROD	WSRC-RP-2004-4090	1	May 10, 2005

Table A-4. Chronological Listing of SRS Issued Decision Documents *(continued)*

Document Title[a]	Document Number	Rev.	Issuance Date[b]
Silverton Road Waste Unit (731-3A) ESD	WSRC-RP-2004-4092	1.1	June 16, 2005
TNX Area OU ESD	WSRC-RP-2005-4030	1	November 7, 2005
Hydrofluoric Acid Spill (631-4G) ROD	WSRC-RP-2005-4000	0	December 28, 2005
T-Area OU ROD	WSRC-RP-2004-4070	1	January 4, 2006
K-Area Sludge Land Application Site (761-4G) and PAR Pond Sludge Land Application Site (761-5G) ROD	WSRC-RP-2005-4064	1	June 30, 2006
211-FB Pu-239 Release (081-F) ROD	WSRC-RP-2005-4090	1	September 18, 2006
M-Area Inactive Process Sewer Lines (081-M) ROD	WSRC-RP-2006-4001	1	April 26, 2007
L-Area Southern Groundwater ROD	WSRC-RP-2006-4052	1.1	May 9, 2007
A-Area Burning/Rubble Pits (731-A, 731-1A) and Rubble Pit (731-2A) and the Miscellaneous Chemical Basin/Metals Burning Pit (731-4A, 731-5A) ROD	WSRC-RP-2005-4095	1.1	August 2, 2007
C-Area Burning/Rubble Pit (131-C) and Old C-Area Burning/Rubble Pit (NBN) ROD	WSRC-RP-2007-4082	1	July 9, 2008
Third Five-Year Remedy Review	***WSRC-RP-2007-4063***	***1.1***	***January 28, 2009***
P-Area Operable Unit Early Action ROD	WSRC-RP-2008-4037	1.1	January 29, 2009
M-Area Operable Unit ROD	WSRC-RP-2008-4030	1	February 5, 2009
M-Area Operable Unit ESD	SRNS-RP-2009-00406	1	July 9, 2009
P-Area Operable Unit Early Action ROD ESD	SRNS-RP-2009-00704	1	October 27, 2009
C-, K-, L- and R-Reactor Complexes Early Action ROD	SRNS-RP-2009-00707	1	December 8, 2009
E-Area Low Level Waster Facility (Slit Trench Disposal Units 1 and 2) IROD	SRNS-RP-2009-00538	1	January 22, 2010
Early Construction and Operational Disposal Site L-1, N-2, P-2, R-1A, R-1B, R-1C ROD	SRNS-RP-2009-00072	1	March 30, 2010
E-Area Low Level Waste Facility (Slit Trench Disposal Units 1 and 2) ESD	SRNS-RP-2009-01128	1	April 22, 2010
P-Area Operable Unit ROD	SRNS-RP-2009-01368	1	July 22, 2010
Gunsite 218 Rubble Pile ROD	SRNS-RP-2010-00051	1	October 22, 2010
R-Area Operable Unit ROD	SRNS-RP-2010-01062	1	April 20, 2011
L-Area Northern Groundwater ROD	SRNS-RP-2011-00134	1	June 20, 2011
Gunsite 012 (including ECODS G-3) ROD	SRNS-RP-2010-01232	1	June 27, 2011
D-Area Operable Unit Early Action ROD	SRNS-RP-2010-00162	1.2	September 26, 2011
PAR Pond Unit: Lower Three Runs IOU Tail Portion (Middle and Lower Subunits) ESD	SRNS-RP-2012-00121	1	September 13, 2012

Table A-4. Chronological Listing of SRS Issued Decision Documents *(continued)*

Document Title[a]	Document Number	Rev.	Issuance Date[b]
B-Area Operable Unit ROD	SRNS-RP-2012-00354	1	April 16, 2013
F-Area Tank Farm (Waste Tanks 17 and 20) IROD	SRR-CWDA-2013-00111	1	April 30, 2013
TNX Area Operable Unit (Second ESD to the ROD)	SRNS-RP-2012-00205	1	June 12, 2013
F-Area Tank Farm (Waste Tanks 18 and 19) ESD to the IROD	SRR-CWDA-2013-00007	1.1	September 23, 2013
Fourth Five-Year Remedy Review	***SRNS-RP-2012-00011***	***1.1***	***February 4, 2014***
L-Area Southern Groundwater Operable Unit (ESD to the ROD)	SRNS-RP-2012-00736	1	September 10, 2014
F-Area Tank Farm (Waste Tanks 5 and 6) ESD to the IROD	SRR-CWDA-2014-00008	1	September 11, 2014
C-Area Operable Unit Early Action ROD	SRNS-RP-2014-00836	1	September 2, 2015
Fifth Five-Year Remedy Review for SRS OUs with Native Soil Covers and/or LUCs	***SRNS-RP-2014-00902***	***1***	***November 30, 2015***
H-Area Tank Farm (Waste Tank 16) IROD	SRR-CWDA-2015-00157	1	August 16, 2016
Fifth Five-Year Remedy Review for SRS OUs with Groundwater Remedies	***SRNS-RP-2015-00419***	***1***	***February 2, 2017***
H-Area Tank Farm (Waste Tank 12) ESD to the IROD	SRR-CWDA-2016-00107	0	April 20, 2017
Fifth Five-Year Remedy Review for SRS OUs with Engineered Covers	***SRNS-RP-2016-00609***	***1***	***February 21, 2018***
Fifth Five-Year Remedy Review for SRS OUs with Geosynthetic or S/S Cover Systems	***SRNS-RP-2016-00610***	***1.1***	***March 27, 2018***
Wetland Area at Dunbarton Bay in Support of Steel Creek Integrator Operable Unit ROD	SRNS-RP-2013-00730	1	June 20, 2018
Fifth Five-Year Remedy Review Report for SRS OUs with Operating Equipment	***SRNS-RP-2017-00567***	***1***	***December 5, 2018***
G-Area Oil Seepage Basin (761-13G) Operable Unit ROD	SRNS-RP-2018-01050	1	June 26, 2019
Sixth Five-Year Remedy Review Report for SRS OUs with Native Soil Covers and/or LUCs	***SRNS-RP-2018-00811***	***1***	***November 5, 2019***
D-Area Operable Unit Second EAROD	SRNS-RP-2018-00461	1	September 24, 2020
Sixth Five-Year Remedy Review Report for SRS OUs with Groundwater Remedies	***SRNS-RP-2019-00511***	***1***	***December 9, 2020***

Table A-4. Chronological Listing of SRS Issued Decision Documents *(continued/end)*

Document Title[a]	Document Number	Rev.	Issuance Date[b]
Stormwater Outfall A-013 (NBN) ROD	SRNS-RP-2020-00904	1	September 30, 2021
Sixth Five-Year Remedy Review Report for SRS OUs with Engineered Cover Systems	***SRNS-RP-2020-00420***	***1***	***December 21, 2021***
Lower Three Runs Integrator Operable Unit ROD	SRNS-RP-2020-00542	1	December 21, 2021
Sixth Five-Year Remedy Review Report for SRS OUs with Geosynthetic or Solidification/Stabilization Cover Systems	***SRNS-RP-2021-04229***	***1***	***December 28, 2022***
Wetland Area at Dunbarton Bay in Support of Steel Creek IOU ESD to the ROD	SRNS-RP-2022-00982	1	August 10, 2023
Early Construction and Operational Disposal Site N-1 (South of N Area) (NBN), Central Shops Scrap Lumber Pile (631-2G), and Building 690-N, Process Heat Exchanger Repair Facility (AKA Ford Building) Operable Unit ROD[d]	SRNS-RP-2022-01284	1	October 12, 2023
F-Area Tank Farm (F-Area Diversion Boxes 5 and 6) ESD to the IROD	SRMC-CWDA-2023-00006	1	October 12, 2023
Sixth Five-Year Remedy Review Report for SRS OUs with Operating Equipment	***SRNS-RP-2022-00468***	***1***	***December 22, 2023***
Seventh Five-Year Remedy Review Report for SRS OUs with Native Soil Covers and/or LUCs	***SRNS-RP-2023-00715***	***1***	***January 7, 2025***
Seventh Five-Year Remedy Review Report for SRS OUs with Groundwater Remedies	***SRNS-RP-2024-00934***	***1***	***January 15, 2026***

a Shaded text identifies the SRS OUs evaluated in this report for the ~~second~~ third phase of the seventh five-year remedy review (i.e., ~~groundwater remedies~~engineered cover systems).

b Unless otherwise noted, the Issuance Date represents the date that the public was notified that the Three-Party signed document was available.

c This is the last signature date instead of the Issuance Date.

d Early Construction and Operational Disposal Site N-1 (NBN) (ECODS N-1), Central Shops Scrap Lumber Pile (631-2G) (CSSLP), and Building 690-N, Process Heat Exchanger Repair Facility (also known as Ford Building) Operable Unit is included in the native soil covers and/or LUCs phase. However, since the seventh five-year remedy review document development occurred before completion of the remedy implementation, ECODS N-1, CSSLP, and Ford Building OU was not discussed in this review cycle.

Table A-6. List of OU Subunits with Remedial Actions *(continued)*

#	OU Subunits[a,b]	SEMS #
39	M-Area Hazardous Waste Management Facility: Lost Lake, 904-112G	1
	M-Area Hazardous Waste Management Facility: M-Area Settling Basin, 904-51G	
40	M-Area Settling Basin Inactive Process Sewers to Manhole 1, 081-M	19
41	Inactive Clay Process Sewer Lines (Including Potential Release of TCT, TET, TCE, HNO_3, U, Heavy Metals from 321-M Abandoned Sewer Line), NBN	92
	Salvage Yard, 741-A	
	M-Area Underground Sump 321-M #001	
	M-Area Underground Sump 321-M #002	
	M-Area Test Pile Facility, 305-A	
42	Metallurgical Laboratory Hazardous Waste Management Facility, 904-110G	2
43	Mixed Waste Management Facility, 643-28E	33
44	Old F-Area Seepage Basin, 904-49G	16
45	P-Area Burning/Rubble Pit, 131-P	59
46	P-Area Ash Basin (including Outfall P-007), 188-P	94
	Potential Release from P-Area Disassembly Basin, NBN	
	Potential Release from P-Area Reactor Cooling Water System, 186/190-P	
	P-Area Reactor Area Cask Car Railroad Tracks as Abandoned, NBN	
	P-Area Process Sewer Lines as Abandoned, NBN and Spill on 3/15/79 of 5500 Gallons of Contaminated Water, NBN	
47	P-Area Reactor Seepage Basin, 904-61G	66
	P-Area Reactor Seepage Basin, 904-62G	
	P-Area Reactor Seepage Basin, 904-63G	
48	R-Area Bingham Pump Outage Pit, 643-10G	38
	R-Area Bingham Pump Outage Pit, 643-8G	
	R-Area Bingham Pump Outage Pit, 643-9G	
	R-Area Unknown Pit #1 (Runk-1), NBN	
	R-Area Unknown Pit #2 (Runk-2), NBN	
	R-Area Unknown Pit #3 (Runk-3), NBN	
49	R-Area Burning/Rubble Pit, 131-1R	43
	R-Area Burning/Rubble Pit, 131-R	
	R-Area Rubble Pit, 631-25G	
50	Area on the North Side of Building 105-R	95
	Laydown Area North of 105-R	
	R-Area Cooling Water Effluent Sump, 107-R	
	Potential Release of $NaOH/H_2SO_4$ from 183-2R, NBN	
	R-Area Ash Basin, 188-R	
	Potential Release from R-Area Disassembly Basin, NBN	
	R-Area Reactor Area Cask Car Railroad Tracks as Abandoned, NBN	
	Release from the Decontamination of R-Reactor Disassembly Basin, NBN	
	Combined Spills North of Building 105-R, NBN	
	R-Area Process Sewer Lines as Abandoned, NBN	
	R-Area Reactor Building, 105-R	

Table A-6. List of OU Subunits with Remedial Actions *(continued/end)*

#	OU Subunits[a,b]	SEMS #
51	R-Area Reactor Seepage Basin, 904-103G	25
	R-Area Reactor Seepage Basin, 904-104G	
	R-Area Reactor Seepage Basin, 904-57G	
	R-Area Reactor Seepage Basin, 904-58G	
	R-Area Reactor Seepage Basin, 904-59G	
	R-Area Reactor Seepage Basin, 904-60G	
52	Silverton Road Waste Unit, 731-3A	13
53	SRL Seepage Basin, 904-53G1	47
	SRL Seepage Basin, 904-53G2	
	SRL Seepage Basin, 904-54G	
	SRL Seepage Basin, 904-55G	
54	Neutralization Sump, 678-T	96
	X-001 Outfall Drainage Ditch, NBN	
	TNX Outfall Delta, Lower Discharge Gully and Swamp, NBN	
	TNX-Area Process Sewer Lines and Tile Fields as Abandoned, NBN	
55	TNX Groundwater, 082G	21
	New TNX Seepage Basin, 901-102G	29
	Old TNX Seepage Basin, 904-76G	
	TNX Burying Ground, 643-5G (Including Spill on 1/12/53 of ½ Ton of Uranyl Nitrate, NBN)	
56	Wetland Area at Dunbarton Bay[c]	71

a OU subunits include RCRA/CERCLA units and RCRA regulated units. Deactivation & Decommissioning facilities are not represented.

b Shaded text identifies the SRS OUs evaluated in this report for the ~~second~~ third phase of the ~~sixth~~ seventh five-year remedy review (i.e., ~~groundwater remedies~~engineered cover systems).

c ECODS N-1, CSSLP, and Ford Building OU is included in the native soil covers and/or LUCs phase. However, since the seventh five-year remedy review document development occurred before the remedy implementation, this OU was not included in this review cycle.

APPENDIX C. CENTRAL SHOPS BURNING/RUBBLE PITS (631-1G AND 631-3G) OPERABLE UNIT

I. INTRODUCTION

This report is the fifth five-year review for Central Shops Burning/Rubble Pits (631-1G and 631-3G) (CSBRP) Operable Unit (OU). This review was conducted from July 2025 through December 2025. Contaminants have been left in place at the CSBRP OU at levels that do not allow for unlimited use and unrestricted exposure. The purpose of this review is to determine whether the remedy in place at the CSBRP OU is protective of human health and the environment. This report documents the results of the review.

II. OU CHRONOLOGY

Table C-1 lists the chronology of site events for the CSBRP OU.

III. BACKGROUND

The CSBRP OU is listed as a Resource Conservation and Recovery Act (RCRA)/ Comprehensive Environmental Response, Compensation, and Liability Act unit in Appendix C of the Federal Facility Agreement (FFA) for Savannah River Site (SRS) (FFA 1993). The media associated with CSBRP OU include soil and groundwater beneath the OU.

The results of the remedial investigation contained in the RCRA Facility Investigation (RFI)/Remedial Investigation (RI) with Baseline Risk Assessment (BRA) for CSBRP (631-1G and 631-3G) OU (WSRC 2001) included an evaluation of the soil, surface water, and groundwater. Polyaromatic hydrocarbons (PAHs) were detected in pit subsurface soils (0.3-1.2 m [1-4 ft]) as a result of burning activities. However, the conclusion of the evaluation was that the CSBRP OU has not contributed to groundwater contamination adjacent to or beneath the CSBRP OU. No other constituents of concern (COCs) were identified for any of the subunits of CSBRP OU, including soil, surface water, and groundwater. However, unacceptable exposure to future human receptors could occur if contaminated subsurface soils are excavated and brought to the surface. Therefore, it was

determined that perched/trapped water associated with existing drainage conditions required mitigation to reduce the uncertainty of future contaminant migration.

Physical Characteristics

The CSBRP OU is located in the central part of the SRS, approximately 10.5 km (6.5 mi) from the nearest site boundary. It is in the northern part of N Area (Central Shops). Figure C-1 shows the location of the CSBRP OU within SRS. Figure C-2 depicts the layout of the CSBRP OU. The water table is approximately 4.6 m (15 ft) below land surface and flows to the west. Prior to 1951, the CSBRP OU area was farmland in an area of moderate relief. The pits are located in cleared areas adjacent to wooded lands.

Initially, the CSBRP OU was composed of two inactive burning/rubble pits, Pit 631-1G and Pit 631-3G, located along the northern and western sides of the Active Burning Area (631-2G) (Figure C-2). However, trenching performed during characterization activities identified that Pit 631-3G was composed of two adjacent pits, which were subsequently named 631-3G and 631-3GA.

Land and Resource Use

According to the *Savannah River Site Future Use Project Report* (USDOE 1996), residential uses of SRS land should be prohibited. The *Land Use Control Assurance Plan for the Savannah River Site* (WSRC 1999) designates CSBRP OU as being within an industrial area. The future land use for CSBRP OU is reasonably anticipated to remain industrial with the U.S. Department of Energy (USDOE) maintaining control of the land.

History of Contamination

CSBRP OU was in operation from the 1950s to about 1985. In 1973, periodic burning of waste ceased, and a layer of soil was placed over the ashes. Pit 631-1G received an estimated 884 m^3 (1,156 yd^3) of asbestos, empty paint cans, ash, paper, and glass. Pit 631-3G received an estimated 10,224 m^3 (13,372 yd^3) of debris consisting of asbestos, empty paint cans, fluorescent light fixtures, paper, cans, lumber, barrels, metal pipes, metal shavings, and electrical switch gear. Additional investigations within Pit 631-3G identified

as designed. Data from two piezometers (CSR 14PZ and CSR 17PZ) sampled at CSBRP OU are shown in Figure C-7. Piezometer CSR 14PZ results indicate that water elevation was last above the bottom of the basin (3 m [10 ft]) due to 25.3 cm (10 in) of rain that fell in February 2020. Piezometer CSR 17PZ has no water elevation measurements above the bottom of the basin. The water level criteria which consist of three consecutive years of decreasing water level in Pit 3G below the basin bottom set by the PCR/CMIR/FRR (WSRC 2005) has been met (2021-present). The water level in the piezometers has been decreasing despite the fact that rainfall amounts have fluctuated from year to year. Average yearly rainfall amounts from 1952 through 2024 are 139.3 cm (54.8 in); the previous ten year rainfall average is 133 cm (52.4) in. Average monthly rainfall amounts from 1952 through 2024 are 11.6 cm (4.6 in); the previous ten year monthly rainfall average is 11.1 cm (4.4 in). Total rainfall amounts for the last five years are 141.4 cm (55.7 in) (2020; monthly average 11.8 cm [4.6 in]), 117.2 cm (46.1 in) (2021, monthly average 9.8 cm [3.84 in]), 106 cm (41.8 in) (2022; monthly average 8.8 cm [3.48 in]), 157.6 cm (62 in) (2023; monthly average 13.1 cm [5.2 in]), and 139.4 cm (54.9 in) (2024; monthly average 11.6 cm [4.6 in]). Piezometer water levels changed minimally, decreased slightly overall, and remained well below the basin bottom elevation despite above average rainfall in 2023 and 2024. The overall decrease in water elevation despite the rainfall fluctuations can be attributed to the stormwater management improvements that were made.

Summary of Inspections and Interviews

Scheduled annual site inspections were conducted from FY2021 through FY2025 (Various). Tasks included on the field inspection checklists (WSRC 2005) include:

- Verifying roads are accessible;
- Verify that the waste unit signs are in acceptable condition;
- Checking the survey benchmarks for damage and visibility;
- Verifying that there are no unauthorized excavations, digging, or construction activities on the soil cover;

- Checking the integrity of vegetative covers and drainage ditches for the presence of excessive erosion, sediment buildup, and any debris restricting water flow;
- Verifying that no woody vegetation is growing on the soils cover;
- Visually checking vegetative cover for grass density with no bare spots more than 0.9 m x 0.9 m (3 ft by 3 ft) in area and that the height of the vegetative cover is not impairing the visual inspection of the soil cover;
- Checking the soil cover for signs of erosion or depressions;
- Checking for evidence of burrowing animals; and
- Noting any other issues that need to be addressed.

The field inspections identified the following issues: active ant mounds on the soil cover. These findings were documented on the field inspection checklists and resolved soon after discovery.

The CSBRP OU was inspected by Savannah River Nuclear Solutions, LLC (SRNS) Environmental Compliance and Area Completion Projects (EC&ACP) on August 19, 2025 and included taking current photographs of the CSBRP OU and reviewing the field inspection checklists. No issues were identified during this inspection. Interviews were conducted with Donny Sahm, Inspection/Maintenance Lead, and Brian Hanshew, O&M Site Manager, on September 09, 2025 at the O&M organization offices. No issues were identified for the CSBRP OU during these interviews. However, SRS was greatly impacted by Hurricane Helene and closed in response during the period of September 27, 2024 through October 6, 2024 with the exception of emergency and essential personnel. The site resumed normal operations on October 7, 2024. EC&ACP O&M personnel evaluated the impacts of Hurricane Helene. No storm damages were identified at the CSBRP OU that would affect the protectiveness of the remedy.

The CSBRP OU was inspected by SRNS EC&ACP and USDOE personnel on October 29, 2025. No issues were identified for the CSBRP OU during this inspection that would affect the protectiveness of the remedy.

A regulatory site inspection ~~will be conducted by~~ with USDOE, U.S. Environmental Protection Agency (USEPA) and South Carolina Department of Environmental Services (SCDES) personnel ~~will be scheduled after submittal of the Revision 0 of this document~~was held on March 19, 2026. SRNS personnel ~~will~~ were also ~~be~~ present in the meeting During the meeting, the participants ~~will~~ viewed drone footage of CSBRP OU and ~~will be~~were provided with an opportunity to walk down the OU. The USEPA and SCDES elected not to perform a walk down because the drone video provided them with better views of the OU. No significant problems regarding the protection of the remedy for this OU as implemented ~~are anticipated to be~~were identified during the inspection.

~~Scheduled annual site inspections conducted from FY2021 through FY2025 identified the following issues: active ant mounds on the soil cover. The findings were documents on the field inspection checklists and resolved soon after discovery.~~

VII. TECHNICAL ASSESSMENT

Is the Remedy Functioning as Intended by the Decision Document?

The selected remedy, stormwater management with LUCs is effective in preventing human exposure to contaminants above the 1E-06 risk level and is functioning as intended.

LUCs are meeting the remedial goals established for the CSBRP OU as discussed in Section IV, by eliminating or controlling all routes of exposure to human health.

LUCs have been effective in maintaining restricted (industrial) land use. Annual site inspections and site maintenance have been effective in maintaining the integrity of the soil cover. Based on the site inspections, there is no indication of potential remedy failure that could place protectiveness at risk.

The Land Use Control Implementation Plan (LUCIP) for the CSBRP OU, located in Appendix F of the PCR/CMIR/FRR, governs LUC implementation, maintenance, monitoring, reporting and enforcement of LUCs (WSRC 2005). The LUCs that are in place include physical access controls to prevent unauthorized contact, removal or excavation of subsurface soils, and restrictions to prevent disturbance of the CSBRP OU. Warning signs

are in good condition (Figure C-5), and no activities were observed that would have violated the LUCs. All LUC objectives are being met.

The LUCIP is available on the SRS external webpage in the Administrative Record File (**https://public.srs.gov/missions-and-programs/environmental-stewardship/arf-irf-index/**) and the Land Use Control Assurance Plan webpage (**https://public.srs.gov/missions-and-programs/environmental-stewardship/lucap/**).

Are Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives still valid?

The exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of final remedy selection are still valid. There have been no changes in standards or physical conditions of the CSBRP OU that would affect the protectiveness of the remedy.

The USEPA standards and toxicity values have been updated since submittal of the five-year remedy review as shown in Appendix B. The changes to the values for COCs at the CSBRP OU were not significant, and the RAOs continue to be met by the remedial action. No new standards or to-be-considered guidance have been identified that call into question the protectiveness of the remedy.

Fact sheets provided on the USEPA webpage (https://19january2021snapshot.epa.gov/fedfac/emerging-contaminants-and-federal-facility-contaminants-concern_.html) regarding emerging contaminants were reviewed for applicability to this site. The USEPA webpage provides a link to fact sheets for the following emerging contaminants: 1,2,3-trichloropropane (TCP), 1,4-dioxane, 2,4,6-trinitrotoluene (TNT), 2,4-dintrotoluene (DNT), hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX), nanomaterials, N-nitroso-dimethylamine (NDMA), perchlorate, perfluorooctane sulfonic acid (PFOS) and other per- and polyfluoroalkyl substances (PFAS), polybrominated biphenyls, polybrominated diphenyl ethers (PBDEs), and tungsten. None of these emerging contaminants were identified as applicable to this OU based on the OU history of contamination. Table C-4 provides the screening results of PFOS and PFAS for the CSBRP OU.

Has any Other Information Come to Light that Could Call into Question the Protectiveness of the Remedy?

No other information has come to light that could call into question the protectiveness of the remedy.

VIII. ISSUES

There are no issues related to current site conditions or activities that prevent the remedy from being protective of this OU.

IX. RECOMMENDATIONS AND FOLLOW-UP ACTIONS

It is recommended that water-level measurements at the CSBRP OU be discontinued since the water-level measurements have remained well below the bottom of the basin for more than five years and meets the requirement of three consecutive years of decreasing water-level in Pit 631-3G (Table C-5).

X. PROTECTIVENESS STATEMENT(S)

The remedy at CSBRP OU is protective of human health and the environment.

Exposure pathways that could result in unacceptable risks are being controlled by LUCs to prevent exposure to or ingestion of contaminated soil media. All threats to the CSBRP OU are being addressed through physical access controls to prevent unauthorized entry to SRS (fences, guards, security patrols, etc.), administrative controls that maintain the CSBRP OU for industrial use only, and warning signs and land use restrictions via the SRS Site Use/Site Clearance Program.

XI. NEXT REVIEW

The eighth five-year review for SRS OUs with Engineered Cover Systems is scheduled for December 2031.

XII. DOCUMENTS REVIEWED

FFA, 1993. *Federal Facility Agreement for the Savannah River Site,* Administrative Docket No. 89-05-FF (Effective Date: August 16, 1993)

USDOE, 1996. *Savannah River Site Future Use Project Report*, U.S. Department of Energy, Savannah River Operations Office, Savannah River Site, Aiken, SC

USDOE, 2014. Letter, B. T. Hennessey (USDOE) to S. B. Fulmer (SCDHEC) and R. H. Pope (USEPA), *Request to Change the Inspection Frequency for Central Shops Burning/Rubble Pits (631-1G and 631-3G) and Ford Building Seepage Basin (904-19G) Operable Units*, CERCLIS Numbers: 50 and 58, IACD-14-186, dated August 20, 2014, Department of Energy, Savannah River Operations Office, Aiken, SC

WSRC, 1999. *Land Use Control Assurance Plan for the Savannah River Site*, WSRC-RP-98-4125, Revision 1.1, latest revision, Savannah River Nuclear Solutions, LLC Savannah River Site, Aiken, SC

WSRC, 2001. *RCRA Facility Investigation/Remedial Investigation with Baseline Risk Assessment for the Central Shops Burning/Rubble Pits (631-1G and 631-3G) (U)*, WSRC-RP-98-4043, Revision 1.2, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 2002. *Record of Decision Remedial Alternative Selection for the Central Shops Burning/Rubble Pits (CSBRP) (631-1G and 631-3G) Operable Unit (U)*, WSRC-RP-2001-4265, Revision 1.1, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 2005. *Post-Construction Report (PCR)/Corrective Measures Implementation Report (CMIR) /Final Remediation Report (FRR) for the Central Shops Burning/Rubble Pits (631-1G and 631-3G/3GA Operable Unit (U)*, WSRC-RP-2004-4014, Revision 1, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC



Figure C-5. Current Photograph of CSBRP OU (2025)

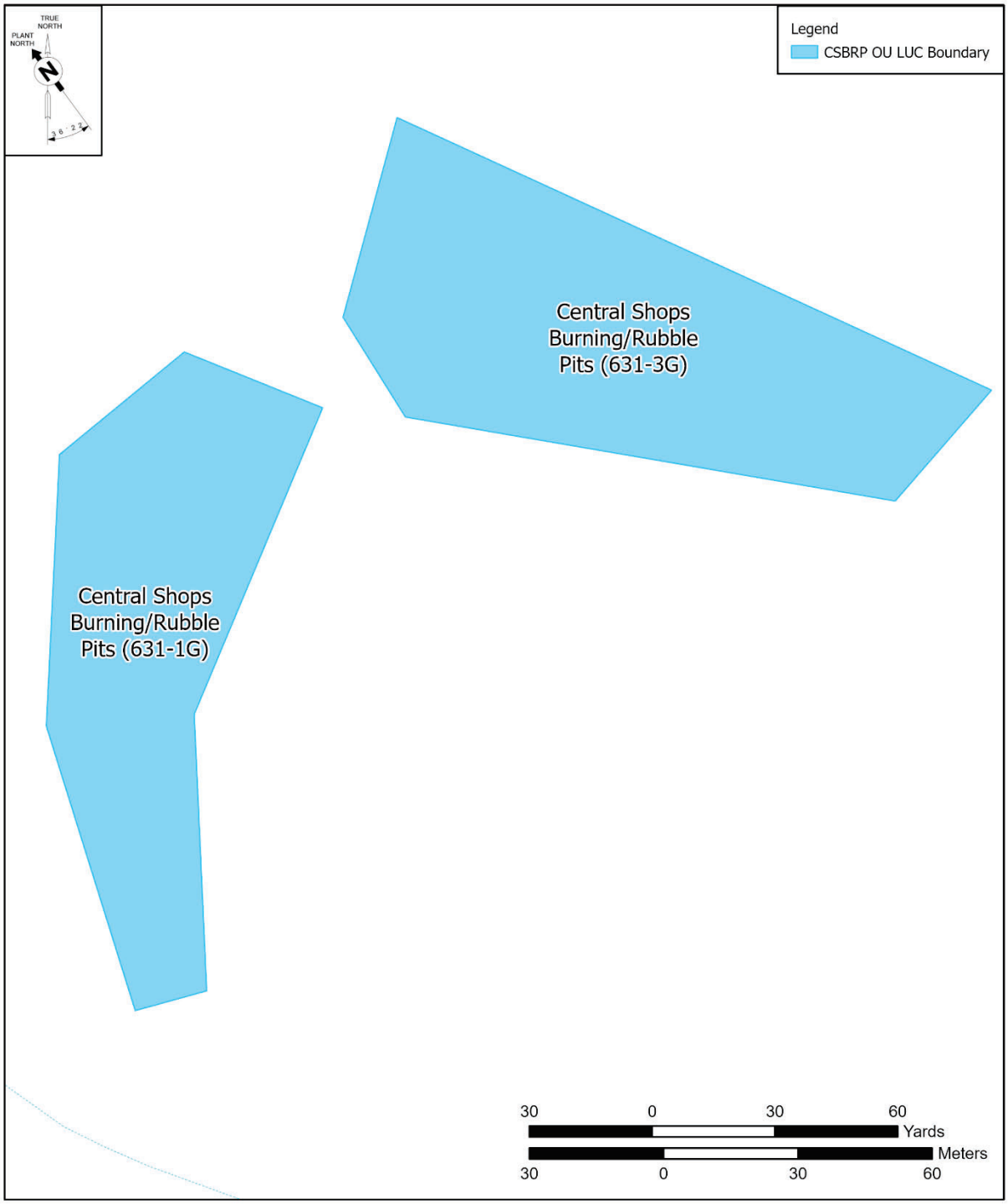


Figure C-6. ~~Current Photograph of~~ CSBRP OU ~~(2025)~~LUC Boundary

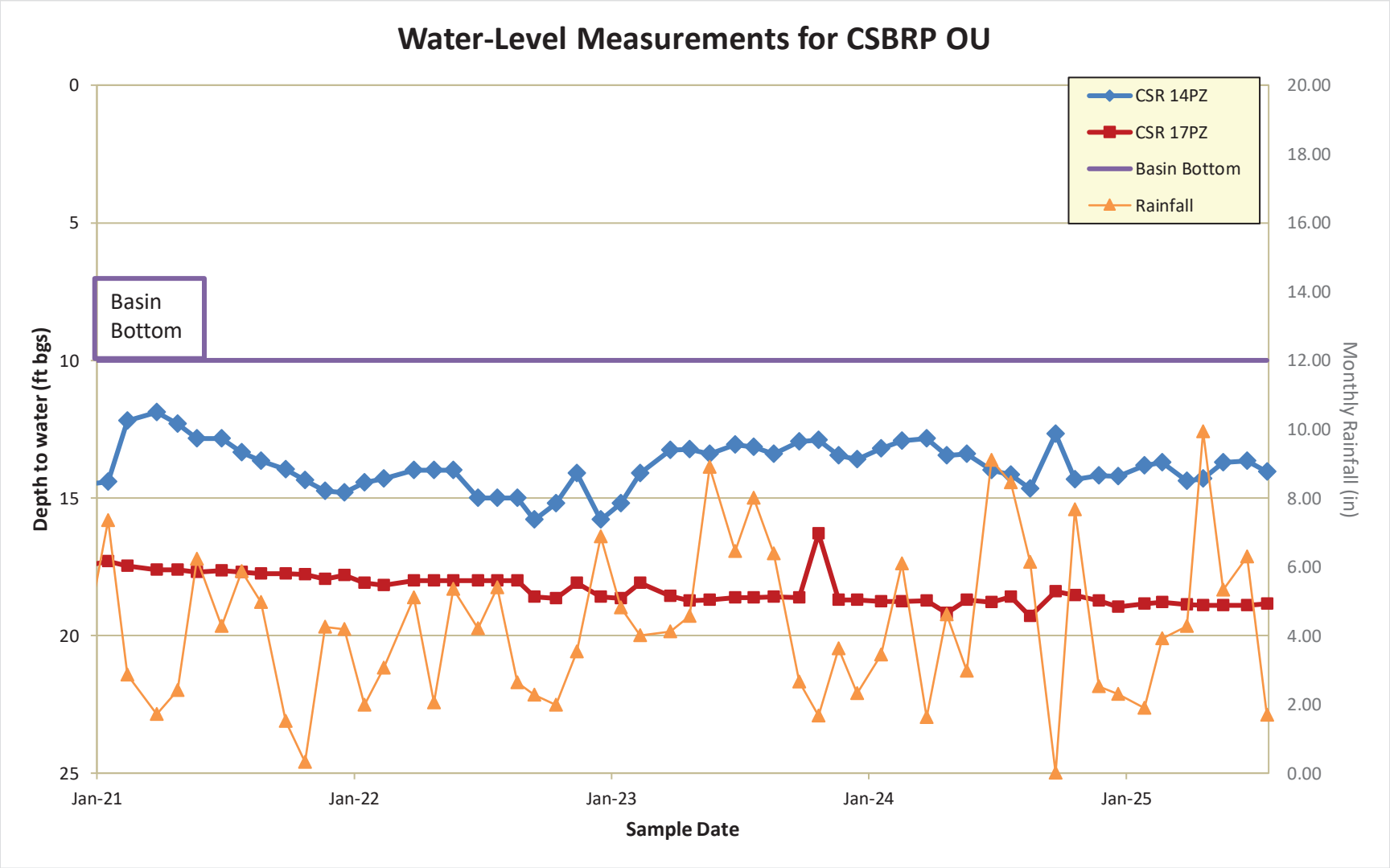


Figure C-7. Water Level Measurements from CSR 14PZ and CSR 17PZ (2021-2025)

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Table C-1. Chronology of OU Events

Event	Date
RFI/RI Field Start/Complete	June 1996 / June 4, 2001
ROD Issuance	June 30, 2003
Remedial Action Start/Complete	November 17, 2003 / November 3, 2004
Previous Five-Year Reviews Issuance	January 29, 2009 / February 4, 2014 / February 21, 2018 / December 21, 2021

Table C-2. Constituents of Concern for Future Industrial Worker at CSBRP OU

Subunit	Medium	COC	Total Carcinogenic Risk
Pit 631-1G	0-4 ft Soil	Benzo[a]pyrene	2.1E-06
			Total Cumulative Risk = 2.1E-06
Pit 631-3G	0-4 ft Soil	Benzo[a]anthracene	3.0E-06
		Benzo[a]pyrene	1.8E-05
		Benzo[b]fluoranthene	3.8E-06
		Dibenzo[a,h]anthracene	8.9E-06
		Indeno[1,2,3-cd]pyrene	1.9E-06
			Total Cumulative Risk = 3.6E-05

Table C-3. Actual versus Estimated O&M Costs

	FY2021	FY2022	FY2023	FY2024	FY2025	Five-Year Total
Total Actual O&M Costs ($)	31,508	25,670	29,26`7	33,349	42,483	160,629
Total ROD Estimated Direct O&M Costs* ($)	20,000	5,000	5,000	5,000	5,000	40,000

*Costs for preparation of the Sixth Five-Year Remedy Review were accounted for in FY2021.

Table C-4. PFOS/PFAS Screening Results for the CSBRP OU

Operable Unit Name:	**CSBRP**	
Use/Category	Known Use at Facility (Yes/No)	Notes/Comments
Fire Training Facility/Fire Department Location	No	
Wastewater Treatment Plant/ Centralized Waste Treatment Landfill	No	
Uranium Enrichment/Plutonium Production/Nuclear Operations	No	
Metal Plating Processing	No	
Explosives/Munitions/Weapons	No	
Electronics Manufacturing	No	
Equipment Fuel/Maintenance (large fuel storage areas; industrial waste lines or maintenance)	No	
Well Drilling	No	Data from site groundwater wells indicate that there have been no installation or operational impacts from PFAS.
Pesticides	No	
Laboratory	No	
Consumer Product Manufacturing	No	
Operable Unit Conclusion:	**Based on the operational history and known uses, including a review of historical PFAS applications and categories, PFAS are not expected to be present at this operable unit.**	

intended by the decision documents. Groundwater monitoring results over the five-year period between 1998 and 2003 indicated that there were no exceedances of MCLs, indicating no appreciable leaching to groundwater of these chemicals.

There were no recommendations or follow-up actions from the last five-year review.

VI. FIVE-YEAR REVIEW PROCESS

The following tasks were performed as part of the review:

- Reviewed documents listed in Section XII. Documents Reviewed;
- Confirmed implementation of the remedial action;
- Inspected the OU, interviewed maintenance personnel; and documented the results on the Inspection Checklist provided in Attachment D-1 with the purpose of assessing the protectiveness of the remedy and the functionality of the access controls; and
- Reviewed changes in standards and to-be-considered guidance.

Data Review

A review of the groundwater monitoring program for the five-year period between 1998 and 2003, as summarized in Table D-4, indicated there were no exceedance of MCLs by any of the risk and hazard drivers. The data provides evidence of no appreciable leaching to groundwater of these chemicals. Based on the results of sampling over that five-year period, the U.S. Environmental Protection Agency (USEPA) and the South Carolina Department of Environmental Services (SCDES) approved discontinuing sampling of groundwater for this OU in 2004.

Summary of Inspections and Interviews

Scheduled annual inspections were conducted at the DBRP OU from FY2021 through FY2025 (Various). Tasks included on the field inspection checklists include:

- Verifying roads to waste unit are accessible;

- Verifying that the waste unit signs (4) are in acceptable condition, have the correct information, and are legible from a distance of 7.6 m (25 ft);
- Verifying that there are no excavations, digging, or construction activity on the soil cover;
- Verifying that no woody vegetation is growing on the soils cover and remove or identify as needed;
- Visually checking vegetative cover for grass density with no bare spots more than 0.9 m x 0.9 m (3 ft by 3 ft) in area. (The height of the vegetation should not impair the visual inspection of the soil cover. This will be determined by the inspector.);
- Checking the soil cover for signs of erosion or depressions (subsidence);
- Checking for signs of burrowing animals; and
- Other.

The field inspections identified the following issues: active ant mounds, fallen tree on hog fence, and woody vegetation growing on the soil cover. These findings were documented on the field inspection checklists and resolved soon after discovery.

The DBRP OU was inspected by SRNS Environmental Compliance and Area Completion Projects (EC&ACP) on September 2, 2025 and included taking current photographs of the DBRP OU and reviewing the field inspection checklists. No issues were identified during this inspection. Interviews were conducted with Eric Barron, O&M staff member, and Brian Hanshew, O&M Site Manager, on September 9, 2025 at the O&M organization offices. No issues were identified for the DBRP OU during these interviews. However, SRS was greatly impacted by Hurricane Helene and closed in response during the period of September 27, 2024 through October 6, 2024 with the exception of emergency and essential personnel. The site resumed normal operations on October 7, 2024. EC&ACP O&M personnel evaluated the impacts of Hurricane Helene. No storm damages were identified at the DBRP OU that would affect the protectiveness of the remedy.

The DBRP OU was inspected by SRNS EC&ACP and USDOE personnel on November 20, 2025. No issues were identified for the DBRP OU during this inspection that would affect the protectiveness of the remedy.

A regulatory site inspection with USDOE, USEPA and SCDES personnel ~~will be scheduled after submittal of the revision 0 of this document~~ was held on March 19, 2026. SRNS personnel ~~will~~ were also ~~be~~ present in the meeting. During the meeting, the participants ~~will~~ viewed drone footage of DBRP OU and ~~will be~~were provided with an opportunity to walk down the OU. The USEPA and SCDES elected not to perform a walk down because the drone video provided them with better views of the OU. No significant problems regarding the protection of the remedy for this OU as implemented ~~are anticipated to be~~were identified during the inspection.

The field inspection frequency for the DBRP OU was changed from semiannual to annual in 2015. Scheduled annual inspections performed at the DBRP OU from FY2021 through FY2025 identified the following issues: active ant mounds, fallen tree on hog fence, and woody vegetation growing on the soil cover. These findings were documented on the field inspection checklists and resolved soon after discovery.

VII. TECHNICAL ASSESSMENT

Is the Remedy Functioning as Intended by the Decision Document?

The remedy, LUCs, is effective in preventing exposure to contaminants above 1E-06 risk level and is functioning as intended.

LUCs have been effective in maintaining restricted (industrial) land use. Annual site inspections and site maintenance have been effective in maintaining the integrity of the soil cover. Based on the site inspections, there is no indication of potential remedy failure that could place protectiveness at risk.

The Land Use Control Implementation Plan (LUCIP) for the DBRP OU, located in Section 2.0 of the FRR, governs LUC implementation, maintenance, monitoring, reporting, and enforcement of LUCs (WSRC 1998). The LUCs that are in place include physical access controls to prevent unauthorized contact, removal or excavation of subsurface soils, and

restrictions to prevent disturbance of the DBRP OU. Warning signs are in good condition, and no activities were observed that would have violated the LUCs. All LUC objectives are being met.

The LUCIP is available on the SRS external webpage in the Administrative Record File (**https://public.srs.gov/missions-and-programs/environmental-stewardship/arf-irf-index/**) and the Land Use Control Assurance Plan webpage (**https://public.srs.gov/missions-and-programs/environmental-stewardship/lucap/**).

Are Exposure Assumptions, Toxicity Data, Cleanup Levels, and RAOs still valid?

The exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of final remedy selection are still valid. There have been no changes in standards or physical conditions at the DBRP OU that would affect the protectiveness of the remedy.

The USEPA standards and toxicity values have been updated since submittal of the five-year remedy review as shown in Appendix B. The changes to the values for COCs at the DBRP OU were not significant, and the RAOs continue to be met by the remedial action. No new standards or to-be-considered guidance have been identified that call into question the protectiveness of the remedy.

Fact sheets provided on the USEPA webpage (https://19january2021snapshot.epa.gov/fedfac/emerging-contaminants-and-federal-facility-contaminants-concern_.html) regarding emerging contaminants were reviewed for applicability to this site. The USEPA webpage provides a link to fact sheets for the following emerging contaminants: 1,2,3-trichloropropane (TCP), 1,4-dioxane, 2,4,6-trinitrotoluene (TNT), 2,4-dintrotoluene (DNT), hexahydro-1,3,5-tri-nitro-1,3,5-triazine (RDX), nanomaterials, N-nitroso-dimethylamine (NDMA), perchlorate, perfluorooctane sulfonic acid (PFOS) and other per- and polyfluoroalkyl substances (PFAS), polybrominated biphenyls, polybrominated diphenyl ethers (PBDEs), and tungsten. None of these emerging contaminants were identified as applicable to this OU based on the OU history of contamination. Table D-5 provides the screening results of PFOS and PFAS for the DBRP OU.

Table D-5. PFOS/PFAS Screening Results for the DBRP OU

Operable Unit Name:	**DBRP**	
Use/Category	Known Use at Facility (Yes/No)	Notes/Comments
Fire Training Facility/Fire Department Location	No	
Wastewater Treatment Plant/ Centralized Waste Treatment Landfill	No	
Uranium Enrichment/Plutonium Production/Nuclear Operations	No	
Metal Plating Processing	No	
Explosives/Munitions/Weapons	No	
Electronics Manufacturing	No	
Equipment Fuel/Maintenance (large fuel storage areas; industrial waste lines or maintenance)	No	
Well Drilling	No	Data from site groundwater wells indicate that there have been no installation or operational impacts from PFAS.
Pesticides	No	
Laboratory	No	
Consumer Product Manufacturing	No	
Operable Unit Conclusion:	**Based on the operational history and known uses, including a review of historical PFAS applications and categories, PFAS are not expected to be present at this operable unit.**	

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History of Contamination

The FHWMF operated from 1955 until November 7, 1988. During that time, the FHWMF received waste effluents from F-Area chemical separation facilities processes such as the nitric acid recovery unit, waste storage system evaporator overheads, and general-purpose evaporator overheads.

Significant amounts of nitrate and caustic were received in the basins. Radioactive releases were greater than 99% tritium (SRNS 2022). The first soil samples at the FHWMF were collected in Basin F-3 in 1971, a year after the U.S. Environmental Protection Agency (USEPA) was formed, and five years before RCRA was enacted in 1976. A 1984 soil coring study of all three basins indicated that approximately 90% of the radionuclides, cations, and anions were concentrated within the top 0.3 m (1 ft) of basin soil.

Initial Response

Preventative actions at FHWMF were conducted pursuant to the requirements of RCRA per Settlement Agreement 87-27-SW.

Closure of the three basins began in 1989 and was completed in February 1991. The three basins were closed by dewatering; physically and chemically stabilizing the remaining sludges with a layer of granite, limestone, and blast furnace slag; and placing a protective multi-layer cover system over them to reduce rainwater contact with basin bottoms.

The FHWMF was certified closed in February 1991 and was accepted by the South Carolina Department of Environmental Services (SCDES) in April 1991 as being in compliance with RCRA requirements.

Basis for Taking Action

The FHWMF OU was subject to closure under South Carolina Hazardous Waste Management Regulations (SCHWMR) R.61-79-265 Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities (SRNS 2022). Per the approved 2025 RCRA Hazardous Waste Permit Renewal (SCDES 2025), post-closure care is regulated under SCHWMR R.61-79-264. In addition, an ongoing

corrective action and monitoring program at the FHWMF is administered through the 2025 RCRA Hazardous and Mixed Waste Permit Renewal (SCDES 2025). The monitoring program consists of monitoring for impacts to groundwater, seepline surface water, and surface water of Fourmile Branch.

Characterization efforts prior to the ROD (WSRC 1993) indicated contamination was present in basin surface water, basin soil, basin sludge and the Floridian Aquifer System soils/sediments (SRNS 2022). The constituents of concern (COCs) ~~at the FHWMF are~~ identified were barium, cadmium, chromium, lead, mercury, copper, cyanide, nickel, zinc, gross alpha, gross beta, nitrate, radium-226, radium-228, tritium, americium-241, cesium-137, curium-243/244, curium-246, cobalt-60, strontium-90, technetium-99, uranium-233/234, uranium-238 tetrachloroethylene, and trichlorofluoromethane. No remedial goals were established in the ROD for soils (WSRC 1993).

IV. REMEDIAL ACTIONS

Remedy Selection

Preventative alternatives were developed for the FHWMF within the RCRA closure process in 1988. The FHWMF closure was begun in 1989 and completed in July 1991. Preventative activities at the FHWMF became subject to CERCLA when SRS was placed on the National Priorities List in December 1989. As documented in the ROD, the RCRA closure was selected as the final action under CERCLA. Therefore, no further action under CERCLA was necessary for the FHWMF (WSRC 1993).

The remedial action objectives (RAOs) are to prevent the physical exposure to contaminants and to mitigate further migration of contaminants to the groundwater by minimizing a liquid medium pathway (rainwater percolation) for transport. The FHWMF RCRA preventative action of stabilization and placement of all contaminated materials under a low-permeability cap satisfied both RAOs.

Post-closure requirements will be met by:

- Maintaining the integrity and effectiveness of the final cover, including making repairs to the RCRA cap as necessary to correct the effects of settling, subsidence, erosion, or other events;
- Maintaining and controlling the groundwater monitoring system and complying with all other applicable requirements;
- Taking measures to prevent run-on and runoff from eroding or otherwise damaging the final cover; and
- Repairing security control devices.

Remedy Implementation

Implementation of the selected final action remedy (i.e., the RCRA preventative action) included the following activities:

- Dewatering the basins to eliminate free liquids and to solidify the remaining waste and residues;
- Stabilizing the remaining waste by using 0.9 to 1.8 m (3-6 ft) of granite aggregate, 0.3 m (1 ft) of limestone and blast furnace slag to provide a load bearing capacity sufficient to support the cover system; and
- Placing a 2.7-hectare (6.8-acre) low permeability cover system consisting of a layer of backfill, a 0.6-m (2-ft) layer of low-permeability compacted kaolin clay (1.0E-07 cm/s), a 22.5-cm (9-in) drainage layer of sand, a geotextile fabric filter, topped with 0.6 m (2 ft) of topsoil to support a vegetative cover.

Figures E-3 and E-4 provides current photographs of the FHWMF OU. Figure E-5 presents the FHWMF OU RCRA Boundary.

Systems Operations/Operation and Maintenance

There are no system operational requirements associated with the cover system and land use controls (LUCs).

The following maintenance activities are ongoing:

- Post-closure groundwater monitoring is required as a condition of the RCRA Hazardous and Mixed Waste Permit Renewal (SCDES 2025) to verify that no unacceptable exposure to potential hazards posed by conditions at the OU occur in the future.
- Quarterly site inspections to verify the integrity of the cover system, OU-specific perimeter fencing, signs, etc. Any necessary repairs will be made as part of the maintenance program.
- Institutional controls (i.e., LUCs) are being enforced to preclude unauthorized access or intrusive activities through the SRS Site Use/Site Clearance program and SRS site security.

Costs associated with the selected remedy for FHWMF include operation and maintenance (O&M) costs of the soil cover and institutional controls (i.e., LUCs). The actual O&M cost during fiscal year (FY) 2021 to FY2025 is $402,576 (Table E-2). RCRA documentation does not require estimated project costs to be prepared. Therefore, a cost data comparison is not provided in this remedy review.

V. PROGRESS SINCE LAST REVIEW

This is the seventh five-year remedy review for the FHWMF. The previous protectiveness statement from the last five-year review concluded that because the remedial actions at FHWMF are protective, the site is protective of human health and the environment. Exposure pathways that could result in unacceptable risks are controlled through a maintained cover system and institutional controls (i.e., LUCs) in place while USDOE controls the OU.

Per recommendation from a previous five-year review, the field inspection frequency for the FHWMF OU was changed from monthly to quarterly (Q) in 2018.

VI. FIVE-YEAR REVIEW PROCESS

The following tasks were performed as part of the review:

- Reviewed the documents listed in Section XII. Documents Reviewed;

- Confirmed the implementation of the remedial action;
- Inspected the OU, interviewed maintenance personnel, and documented the results on the Inspection Checklist provided in Attachment E-1 with the purpose of assessing the protectiveness of the remedy and the functionality of the access controls;
- Ensured that all actions required under the RCRA Hazardous and Mixed Waste Permit Renewal (SCDES 2025) were implemented (i.e., routine inspections and maintenance to the soil covers and groundwater monitoring); and
- Reviewed changes in standards and to-be-considered guidance.

Summary of Inspections and Interviews

Scheduled quarterly site inspections were conducted from FY2021 through FY 2025 (Various). The field inspection checklists are approved as part of the closure/post-closure/permit application process and are governed by the RCRA Permit Renewal for SRS. They are available in the Administrative Record File (**https://public.srs.gov/missions-and-programs/environmental-stewardship/arf-irf-index/**). Tasks included on the field inspection checklists include:

- Verifying roads to waste units are accessible;
- Verifying waste unit signs are in acceptable condition, have correct information, and are legible from a distance of 7.6 m (25 ft);
- Checking the closure cover drainage system integrity and function;
- Inspecting closure cover for erosion, abnormal soil cracks, depressions or ponding indicating subsidence;
- Checking for signs of burrowing animals;
- Checking integrity of run on and run off control measures for excessive erosion and sediment build up or debris restricting water flow;
- Visually checking vegetative cover for grass density with no bare spots more than 0.9 m (3 ft) by 0.9 m (3 ft). There should be no woody vegetation or shrubs growing within

the perimeter fence. The height of the vegetative cover should not impair the visual inspection of the closure. This will be determined by the Post Closure Inspector;

- Visually checking subsidence monitors for damage;
- Checking for the survey benchmarks for damage and visibility;
- Checking the side slopes for signs of slumping and ditches for signs of excessive erosion;
- Verifying the annual elevation surveys of the subsidence monitors have been performed for the current year and that the results have been submitted to the Document Control Center; and
- Other.

The field inspections performed at the FHWMF OU identified the following issues: active ant mounds, overhanging limbs on road, small woody vegetation growing on soil cover, small animals burrowing under fencing, and buildup of thatch in drainage gates. These findings were documented on the field inspection checklists and resolved soon after discovery.

The FHWMF OU was inspected by SRNS Environmental Compliance and Area Completion Projects (EC&ACP) on September 2, 2025 and included taking current photographs of the FHWMF OU and reviewing the field inspection checklist. No issues were identified during this inspection. Interviews were conducted with Eric Barron, O&M staff member, and Brian Hanshew, O&M Site Manager, on September 9, 2025 at the O&M organization offices. No issues were identified for the FHWMF OU during these interviews. However, SRS was greatly impacted by Hurricane Helene and closed in response during the period of September 27, 2024 through October 6, 2024 with the exception of emergency and essential personnel. The site resumed normal operations on October 7, 2024. EC&ACP O&M personnel evaluated the impacts of Hurricane Helene. No storm damages were identified at the FHWMF OU that would affect the protectiveness of the remedy.

The FHWMF OU was inspected by SRNS EC&ACP and USDOE personnel on October 29, 2025. No issues were identified for the FHWMF during this inspection that would affect the protectiveness of the remedy.

A regulatory site inspection m~~eeting will be conducted~~ with USDOE, USEPA and SCDES personnel ~~after submittal of the Revision 0 of this document~~was held on March 19, 2026. SRNS ~~and USDOE~~ personnel ~~will~~ were also ~~be~~ present at the meeting. During the meeting, the participants ~~will~~ viewed drone footage of FHWMF OU and ~~will be~~were provided with an opportunity to walk down the OU. The USEPA and SCDES elected not to perform a walk down because the drone video provided them with better views of the OU. No significant problems regarding the protection of the remedy for this OU as implemented ~~are anticipated to be~~were identified during the inspection.

~~The field inspection frequency for the FHWMF OU was changed from monthly to quarterly in 2018. Schedule quarterly inspections (FY2021-FY2025) performed at the FHWMF OU identified the following issues: active ant mounds, overhanging limbs on road, small woody vegetation growing on soil cover, small animals burrowing under fencing, and buildup of thatch in drainage grates. These findings were documented on the field inspection checklists and resolved soon after discovery~~

The FHWMF OU was inspected by SCDES on September 4, 2025, as part of the RCRA annual comprehensive groundwater monitoring evaluation. The basins were observed to be in good condition and no issues were identified.

VII. TECHNICAL ASSESSMENT

Is the Remedy Functioning as Intended by the Decision Document?

The remedy, in situ stabilization/solidification, RCRA soil cover with institutional controls (i.e., LUCs) is effective in preventing exposure to contaminant risk above 1E-06 risk levels and mitigating further migration of contaminants to groundwater and is functioning as intended.

Institutional controls (i.e., LUCs) have been effective in maintaining restricted (industrial) land use. Quarterly site inspections and site maintenance have been effective in

maintaining integrity of the soil cover. Based on the site inspections, there is no indication of potential remedy failure that could place protectiveness at risk.

The LUC requirements are discussed and approved as part of the closure/post-closure/ permit application process and are governed by the RCRA Permit Renewal for the SRS (SCDES 2025). The closure/post-closure requirements are discussed in the RCRA Permit Renewal Application for the F-Area Hazardous Waste Management Facility (F-Area HWMF) Postclosure (SRNS 2022). Therefore, a Land Use Control Implementation Plan is not required for this OU. The LUCs (i.e. RCRA closure/post-closure care requirements) that are in place include physical access controls to prevent unauthorized contact (i.e., OU-specific fencing with locked gates and warning signs posted on the fences), removal or excavation of subsurface soils, and restrictions to prevent disturbance of the FHWMF OU. Warning signs are in good condition, and no activities were observed that would have violated the LUCs. All LUC objectives are being met.

Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives still valid?

The exposure assumptions, toxicity data, and cleanup levels used at the time of final remedy selection are still valid. There have been no changes in the standards or physical conditions of the FHWMF OU that would affect the protectiveness of the remedy.

As the remedial work has been completed, the applicable standards set forth in the ROD (WSRC 1993) and the RCRA closure plan (WSRC 1991), associated with soils and basin sediments, have been met. Groundwater is being addressed by the F-Area Groundwater OU and will be discussed in the five-year remedy review reports for SRS OUs with operating equipment.

The USEPA standards and toxicity values have been updated since submittal of five-year remedy review as shown in Appendix B. The changes to the values for COCs at the FHWMF OU included some decreases in the regional screening levels (RSLs) due to updated input values used to calculate the RSLs. The residential soil screening level for lead decreased from 400 mg/kg to 200 mg/kg. If other sources of lead are present, the screening level is 100 mg/kg. However, these changes do not affect the protectiveness of

the remedy and the RAOs continue to be met by the remedial action. No new standards or to-be-considered guidance have been identified that call into question the protectiveness of the remedy.

Fact sheets provided on the USEPA webpage (https://19january2021snapshot.epa.gov/fedfac/emerging-contaminants-and-federal-facility-contaminants-concern_.html) regarding emerging contaminants were reviewed for applicability to this site. The USEPA webpage provides a link to fact sheets for the following emerging contaminants: 1,2,3-trichloropropane (TCP), 1,4-dioxane, 2,4,6-trinitrotoluene (TNT), 2,4-dintrotoluene (DNT), hexahydro-1,3,5-tri-nitro-1,3,5-triazine (RDX), nanomaterials, N-nitroso-dimethylamine (NDMA), perchllorate, perfluorooctane sulfonic acid (PFOS) and other per- and polyfluoroalkyl substances (PFAS), polybrominated biphenyls, polybrominated diphenyl ethers (PBDEs), and tungsten. None of these emerging contaminants, except for PFOS and other PFAS, were identified as applicable to this OU based on the OU history of contamination.

Based on the operational history and documented usage patterns, including a review of historical PFAS applications and categories, PFAS may be expected to be present at this waste unit (Table E-3). However, the engineered cover system in place serves as an effective and protective remedy, mitigating potential exposures and releases associated with PFAS.

Has any Other Information Come to Light that Could Call into Question the Protectiveness of the Remedy?

No other information has come to light that could call into question the protectiveness of the remedy.

VIII. ISSUES

There are no issues related to current site conditions or activities that prevent the remedy from being protective of this OU.

IX. RECOMMENDATIONS AND FOLLOW-UP ACTIONS

There are no recommendations or follow-up actions for the FHWMF OU under CERCLA.

X. PROTECTIVENESS STATEMENT(S)

The remedy at the FHWMF OU is protective of human health and the environment.

Exposure pathways that could result in unacceptable risks are being controlled by stabilization and placement of all contaminated materials under a low-permeability cap and institutional controls (i.e., LUCs) to prevent exposure to or ingestion of contaminated soil media and mitigating further migration of contaminants to groundwater. All threats to the FHWMF OU are being addressed through physical access controls to prevent unauthorized entry to SRS (fences, guards, security patrols, etc.), administrative controls that maintain the FHWMF OU for industrial use only, and warning signs and use restrictions via the SRS Site Use/Site Clearance Program.

XI. NEXT REVIEW

The eighth five-year review for SRS OUs with Engineered Cover Systems is scheduled for December 2031.

XII. DOCUMENTS REVIEWED

FFA, 1993. *Federal Facility Agreement for the Savannah River Site,* Administrative Docket No. 89-05-FF (Effective Date: August 16, 1993)

SCDES, 2025. South Carolina Hazardous and Mixed Waste Permit, Permit Number SC1 890 008 989, 2025 RCRA Permit Renewal for the Savannah River Site, issued on October 27, 2025, Module III – Postclosure Care and Module IV - Groundwater Requirements, Section B, F-Area Hazardous Waste Management Facility, South Carolina Department of Environmental Services, Division of Waste Management, Bureau of Land and Waste Management, Columbia, SC

Table E-1. Chronology of OU Events

Event	Date
RCRA Closure Plan Approved	June 1989
Corrective Action start	1989
RCRA Closure Certified	February 1991
Final ROD Issuance	October 1, 1993
Previous Five-Year Reviews Issuance	August 27, 1997 / February 12, 2004 / January 29, 2009 / February 4, 2014 / February 21, 2018 / December 21, 2021

Table E-2. Actual versus Estimated O&M Costs

	FY2021	FY2022	FY2023	FY2024	FY2025	Five-Year Total
Total Actual O&M Costs ($)	65,840	74,815	77,944	82,899	101,078	402,576
Total ROD Estimated Direct O&M Costs ($)	N/A	N/A	N/A	N/A	N/A	0

RCRA documentation does not require estimated project costs to be prepared.
N/A = not applicable

Table E-3. PFOS/PFAS Screening Results for the FHWMF OU

Operable Unit Name:	**FHWMF**	
Use/Category	Known Use at Facility (Yes/No)	Notes/Comments
Fire Training Facility/Fire Department Location	No	
Wastewater Treatment Plant/ Centralized Waste Treatment Landfill	No	
Uranium Enrichment/Plutonium Production/Nuclear Operations	**Yes**	
Metal Plating Processing	No	
Explosives/Munitions/Weapons	No	
Electronics Manufacturing	No	
Equipment Fuel/Maintenance (large fuel storage areas; industrial waste lines or maintenance)	No	
Well Drilling	No	Data from site groundwater wells indicate that there have been no installation or operational impacts from PFAS.
Pesticides	No	
Laboratory	No	
Consumer Product Manufacturing	No	
Waste Unit Conclusion:	**Based on the operational history and documented usage patterns, including a review of historical PFAS applications and categories, PFAS may be expected to be present at this operable unit.**	

Initial Response

A removal action taken in 1998 removed the retention tank, pumping station, and underground piping process sewer lines to an off-unit disposal area. Approximately 2.1 m^3 (2.8 yd^3) of radiologically contaminated soil was containerized and stored at the FBSB OU until final disposition per the remedial decision in the Record of Decision (ROD) (WSRC 2001). Figure F-3 presents photographs of the FBSB OU before remediation and Figures F-4 and F-5 present photographs of the FBSB OU in the current condition.

Basis for Taking Action

The field investigations and the operational records identified four potential primary sources of contamination: FBSB, Tank/Process Sewer Line, NPDES Ditch, and the fire hydrant line. The RFI/RI/BRA report concluded that cesium-137, cobalt-60, and europium-154 present in the surface soil in the Seepage Basin Area pose human exposure health risks (greater than 1.0E-06) to future industrial workers. Aroclor-1254 represents an ecological risk to insectivorous mammals in the Seepage Basin Area. Arsenic, cesium-137, cobalt-60, and europium-154 are present in the subsurface soil beneath the Seepage Basin Area and present human health risks (greater than 1.0E-06) to future industrial workers exposed to subsurface soil. Cesium-137 and cobalt-60 are also present in surface and subsurface soils at the Tank/Process Sewer at levels that pose human exposure health risks (greater than 1.0E-06) to future industrial worker. Results of the RFI/RI/BRA concluded that there were no refined contaminants of concern (RCOCs) for the FBSB OU vadose zone, fire hydrant line, NPDES Ditch, and groundwater. There are no contaminant migration RCOCs and no principal threat source material at the FBSB OU.

The soil that required remedial action ~~is~~ was located in the Seepage Basin Area (surface and subsurface) and Tank/Process Sewer Line Area (fully contained within a 1.2-m [4-ft] depth). Table F-2 provides the RCOCs and corresponding remedial goals (RGs) identified for the FBSB soils and Tank/Process Sewer Line soils.

IV. REMEDIAL ACTIONS

Remedy Selection

As stated in the ROD (WSRC 2001), the following are the remedial action objectives (RAOs) for the FBSB OU:

Seepage Basin Area Subunit

- Protect future industrial workers at the Seepage Basin Area from exposure to three RCOCs (cesium-137, cobalt-60, and europium-154) that exceed RGs in surface soils 0 to 0.3 m (0 to 1 ft) and four RCOCs (arsenic, cesium-137, cobalt-60, and europium-154) that exceed RGs in subsurface soils 0.3 to 1.2 m (1 to 4 ft deep) (Table F-2).
- Protect current terrestrial ecological receptors (insectivorous mammals) at the Seepage Basin Area from exposure to Aroclor 1254 at levels above the RG (0.0219 mg/kg) in surface soil.

Tank/Process Sewer Line Area Subunit

- Protect future industrial workers at the Tank/Process Line Area from exposure to cesium-137 and cobalt-60 that exceed RGs in surface and subsurface soils (Table F-2).

As stated in the ROD (WSRC 2001), the selected remedy for the FBSB OU was:

- Excavate all contaminated soil exceeding 1.0E-06 risk (for industrial worker) from the Tank/Process Sewer Line Area and disposition the soil into the seepage basin along with the vegetation existing in the basin;
- Remove the containerized soil (contaminated surface soil from the retention tank area) from two B-12 boxes and a 55-gallon drum and disposition the waste into the seepage basin;
- Backfill the remaining volume of the seepage basin and the excavated area of the Tank/Process Sewer Line Area with clean soil from an SRS borrow pit;
- Grade the clean soil to match the surrounding topography and cover the backfilled areas with vegetative cover to minimize erosion;
- Implement institutional controls (i.e., land use controls [LUCs]).

The following LUC objectives for the FBSB OU are necessary to ensure protectiveness of the remedy:

- Maintain the use of the OU for industrial activities only;
- Prevent unauthorized access to the closed FBSB OU as long as the waste remains a threat to human health and the environments; and
- Preserve the cover and prevent disturbance of the dispositioned soil.

Remedy Implementation

Implementation of the FBSB OU remedial action included the following activities:

- Consolidated approximately 183.6 m^3 (240 yd^3), 505.5 m^3 (1685 yd^3) and 2.14 m^3 (2.8 yd^3) of contaminated soil by excavating to a depth of 1.2 m (4 ft) in the Tank/Process Sewer Line Area and to a width of 0.6 m (2 ft) and a depth of 0.3 m (1 ft) at the bank of the basin, and removed containerized soil (one 55-gallon drum and two B-12 boxes) and transported the soil with the existing vegetation to the basin bottom, respectively;
- Installed soil covers over the seepage basin (0.09 hectare [0.22 acre]) and the excavated areas of the Tank/Process Sewer Area (0.09 hectare [0.21 acre]) consisting of a minimum of 1.2-m (4-ft) thick common fill layer covered by a 15-cm (6-in) thick vegetative layer for the seepage basin and a 15-cm (6-in) thick crusher run for the tank/process sewer area. The common fill and vegetative layers consisted of clean soil from an approved SRS borrow pit;
- Seeded the seepage basin soil cover for vegetation;
- Established LUCs for 0.11 hectares (0.28 acres) of the FBSB OU (Figure F-6), which include site inspections of the seepage basin cover and the installation of warning signs around the seepage basin. Site inspections of the tank/process sewer area cover are not required because all soils exceeding 1.0E-06 risk (industrial) were removed. Existing SRS access controls will be used to maintain the use of this site for industrial use only. Institutional controls (i.e., administrative measures) and use restrictions for on-site workers via the Site Use/Site Clearance Program. Other administrative controls to

ensure worker safety include work controls, worker training, and worker briefings of health and safety requirements.

System Operations/Operation and Maintenance

There are no system operational requirements.

The following maintenance activities are ongoing:

- Site inspections (semiannual through 2014; frequency reduced to annual thereafter [USDOE 2014]) and site maintenance (repair of erosion damage, cover maintenance, and warning signs) of the seepage basin cover; and
- Site controls (SRS Site Use and Site Clearance Programs, which restrict invasive and permanent installation activities at the waste unit).

Table F-3 compares the actual operation and maintenance (O&M) costs for the five-year remedy review period to the estimated direct O&M costs from the ROD (WSRC 2001). The estimated O&M cost for fiscal year (FY) 2021 to FY2025 was $50,000 for site inspections, maintenance of the cover, and LUCs. The actual O&M cost for FY2021 to FY2025 is $58,725. The actual O&M costs (Table F-3) are as expected.

V. PROGRESS SINCE LAST REVIEW

This is the seventh five-year remedy review for the FBSB OU. The previous protectiveness statement concluded that the remedial actions at FBSB OU are expected to be protective. The final remedial actions of excavation, consolidation, and backfilling of excavated areas along with LUCs have been functioning properly.

There were no recommendations or follow-up actions from the last five-year review.

VI. FIVE-YEAR REVIEW PROCESS

The following tasks were performed as part of the review:

- Reviewed the documents listed in Section XII. Documents Reviewed;
- Confirmed the implementation of the remedial action;

- Inspected the OU, interviewed maintenance personnel, and documented the results on the Inspection Checklist provided in Attachment F-1 with the purpose of assessing the protectiveness of the remedy and the functionality of the access controls; and
- Reviewed changes in standards and to-be-considered guidance

Summary of Inspections and Interviews

Scheduled annual inspections were conducted at the FBSB OU from FY2021 through FY2025 (Various). Tasks included on the field inspection checklists (WSRC 2003) include:

- Verifying roads are accessible;
- Verifying waste unit signs (4) are in acceptable condition, have correct information and are legible from a distance of 7.6 m (25 ft);
- Verifying there is no excavating, digging, or construction activity on soil cover;
- Verifying no woody vegetation is growing on the soil cover. Remove or identify as needed;
- Visually checking vegetative cover for grass density with no bare spots more than 0.9 m by 0.9 m (3 ft by 3 ft) in the area. The height of the vegetation should not impar visual inspection of the soil cover. This will be determined by the Inspector;
- Checking soil cover for signs of erosion or depressions (subsidence);
- Checking for signs of burrowing animals; and
- Other.

The field inspections identified the following issues: active ant mounds. These findings were documented on the field inspection checklists and resolved soon after discovery.

The FBSB OU was inspected by SRNS Environmental Compliance and Area Completion Projects (EC&ACP) on August 19, 2025 and included taking current photographs of the FBSB OU and reviewing the field inspection checklist. No issues were identified during this inspection. Interviews were conducted with Eric Barron, O&M staff member, and

Brian Hanshew, O&M Site Manager, on September 9, 2025, at the O&M organization offices. No issues were identified for the FBSB OU during these interviews. However, SRS was greatly impacted by Hurricane Helene and closed in response during the period of September 27, 2024 through October 6, 2024 with the exception of emergency and essential personnel. The site resumed normal operations on October 7, 2024. EC&ACP O&M personnel evaluated the impacts of Hurricane Helene. No storm damages were identified at the FBSB OU that would affect the protectiveness of the remedy.

The FBSB OU was inspected by SRNS EC&ACP and USDOE personnel on October 29, 2025. No issues were identified for the FBSB OU during this inspection that would affect the protectiveness of the remedy.

A regulatory site inspection with USDOE, U.S. Environmental Protection Agency (USEPA) and South Carolina Department of Environmental Services (SCDES) personnel ~~will be scheduled after submittal of the Revision 0 of this document~~was held on March 19, 2026. SRNS personnel ~~will~~ were also ~~be~~ present at the meeting. During the meeting, the participants ~~will~~ viewed drone footage of FBSB OU and ~~will be~~ were provided with an opportunity to walk down the OU. The USEPA and SCDES elected not to perform a walk down because the drone video provided them with better views of the OU. No significant problems regarding the protection of the remedy for this OU as implemented ~~are anticipated to be~~were identified during the inspections.

~~The field inspection frequency for the FBSB OU was changed from semiannual to annual in 2014. The USDOE submitted a letter (USDOE 2014) to USEPA and SCDES to reduce inspection frequencies from semiannual to annual for FBSB OU. USEPA and SCDES approved the request on October 2, 2014 and September 17, 2014, respectively. Scheduled annual inspections performed at the FBSB OU from FY2021 through FY2025 identified the following issues: active ant mounds. These findings were documented on the field inspection checklists and resolved soon after discovery.~~

VII. TECHNICAL ASSESSMENT

Is the Remedy Functioning as Intended by the Decision Documents?

The remedy, excavation, consolidation, common fill cover with LUCs, is effective in preventing exposure to contaminants above 1E-06 risk level and is functioning as intended.

LUCs have been effective in maintaining restricted (industrial) land use. Annual site inspections and site maintenance have been effective in maintaining the integrity of the soil cover. Based on the site inspections, there is no indication of potential remedy failure that could place protectiveness at risk.

The Land Use Control Implementation Plan (LUCIP) for the FBSB OU, located in Appendix A of the Post-Construction Report/Corrective Measures Implementation Report/Final Remediation Report, governs LUC implementation, maintenance, monitoring, reporting, and enforcement of LUCs (WSRC 2003). The LUCs that are in place include physical access controls to prevent unauthorized contact, removal or excavation or subsurface soils, and restrictions to prevent disturbance of the FBSB OU. Warning signs are in good condition, and no activities were observed that would have violated the LUCs. All LUC objectives are being met.

The LUCIP is available on the SRS external webpage in the Administrative Record File (**https://public.srs.gov/missions-and-programs/environmental-stewardship/arf-irf-index/**) and the Land Use Control Assurance Plan webpage (**https://public.srs.gov/missions-and-programs/environmental-stewardship/lucap/**).

Are Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives still valid?

The exposure assumptions, toxicity data, and cleanup levels used at the time of final remedy selection are still valid. There have been no changes in standard or physical conditions at the FBSB OU that would affect the protectiveness of the remedy.

The USEPA standards and toxicity values have been updated since submittal of the five-year remedy review as shown in Appendix B. The changes to the values for RCOCs at the FBSB OU were not significant, and the RAOs continue to be met by the remedial action.

No new standards or to-be-considered guidance have been identified that call into question the protectiveness of the remedy.

Fact sheets provided on the USEPA webpage (https://19january2021snapshot.epa.gov/fedfac/emerging-contaminants-and-federal-facility-contaminants-concern_.html) regarding emerging contaminants were reviewed for applicability to this site. The USEPA webpage provides a link to fact sheets for the following emerging contaminants: 1,2,3-trichloropropane (TCP), 1,4-dioxane, 2,4,6-trinitrotoluene (TNT), 2,4-dintrotoluene (DNT), hexahydro-1,3,5-tri-nitro-1,3,5-triazine (RDX), nanomaterials, N-nitroso-dimethylamine (NDMA), perchlorate, perfluorooctane sulfonic acid (PFOS) and other per- and polyfluoroalkyl substances (PFAS), polybrominated biphenyls, polybrominated diphenyl ethers (PBDEs), and tungsten. None of these emerging contaminants were identified as applicable to this OU based on the OU history of contamination. Table F-4 provides the screening results of PFOS and PFAS for the FBSB OU.

Has any Other Information Come to Light that Could Call into Question the Protectiveness of the Remedy?

No other information has come to light that could call into question the protectiveness of the remedy.

VIII. ISSUES

There are no issues related to current site conditions or activities that could call into question the protectiveness of the remedy.

IX. RECOMMENDATIONS AND FOLLOW-UP ACTIONS

There are no recommendations or follow-up actions for this OU.

X. PROTECTIVENESS STATEMENT(S)

The remedy at the FBSB OU is protective of human health and the environment.

Exposure pathways that could result in unacceptable risks are being controlled by LUCs to prevent exposure or ingestion of contaminated soil media. All threats to the FBSB OU are being addressed through physical access controls to prevent unauthorized entry to SRS

(fences, guards, security patrols, etc.), administrative controls that maintain the FBSB OU for industrial use only, and warning signs and land use restrictions via the SRS Site Use/Site Clearance Program.

XI. NEXT REVIEW

The eighth five-year review for SRS OUs with Engineered Cover Systems is scheduled for December 2031.

XII. DOCUMENTS REVIEWED

FFA, 1993. *Federal Facility Agreement for the Savannah River Site,* Administrative Docket No. 89-05-FF (Effective Date: August 16, 1993)

USDOE, 1996. *Savannah River Site Future Use Project Report*, U.S. Department of Energy, Savannah River Operations Office, Savannah River Site, Aiken, SC

~~USDOE, 2014. Letter, B. T. Hennessey (USDOE) to S. B. Fulmer (SCDHEC) and R. H. Pope (USEPA), *Request to Change the Inspection Frequency for Central Shops Burning/Rubble Pits (631-1G and 631-3G) and Ford Building Seepage Basin (904-19G) Operable Units*, CERCLIS Numbers: 50 and 58, IACD-14-186, dated August 20, 2014, Department of Energy, Savannah River Operations Office, Aiken, SC~~

WSRC, 1999. *Land Use Control Assurance Plan for the Savannah River Site*, WSRC-RP-98-4125, Revision 1.1, latest revision, Savannah River Nuclear Solutions, LLC Savannah River Site, Aiken, SC

WSRC, 2000. *RCRA Facility Investigation/Remedial Investigation with Baseline Risk Assessment for the Ford Building Seepage Basin (904-91G) Operable Unit (U)*, WSRC-RP-98-4096, Revision 1, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 2001. *Record of Decision Remedial Alternative Selection for the Ford Building Seepage Basin Operable Unit (904-91G) (U)*, WSRC-RP-2000-4156, Revision 1, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 2003. *Post-Construction Report (PCR)/Corrective Measures Implementation Report (CMIR)/Final Remediation Report (FRR) for the Ford Building Seepage Basin (904-91G) Operable Unit (U)*, WSRC-RP-2003-4038, Revision 1, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

Various - *Inspection Data Sheets – Field Inspection Checklist, Ford Building Seepage Basin (904-91G) (U)*, ER-IDS-019-024, Inspection period 2021 through 2025 (annually)

Table F-1. Chronology of OU Events

Event	Date
RFI/RI Field Start / Complete	October 20, 1997 / April 18, 2000
Removal Action Start / Complete	January 1, 1998 / December 31, 1998
ROD issuance	April 5, 2002
Remedial Action start/complete	January 27, 2003 / April 22, 2003
Previous Five-Year Reviews Issuance	January 29, 2009 / February 4, 2014 / February 21, 2018 / December 21, 2021

Table F-2. RCOCs and RGs Associated with Contaminated Media at FBSB OU

Subunit	Media	RCOC	Type of RCOC	RGs	Basis
FBSB Basin	Surface Soil	Aroclor 1254	ECO	0.0219 mg/kg	Insectivorous Mammal
	Surface/ Subsurface Soil	Cesium-137	HH	0.105 ρCi/g	On-Unit Industrial Worker (External)
	Surface/ Subsurface Soil	Cobalt-60	HH	0.0224 ρCi/g	On-Unit Industrial Worker (External)
	Surface/ Subsurface Soil	Europium-154	HH	0.0473 ρCi/g	On-Unit Industrial Worker (External)
	Subsurface Soil	Arsenic	HH	3.53 mg/kg	On-Unit Industrial Worker (Ingestion)
Tank/ Process Sewer	Surface/ Subsurface Soil	Cesium-137	HH	0.105 ρCi/g	On-Unit Industrial Worker (External)
	Surface/ Subsurface Soil	Cobalt-60	HH	0.0224 ρCi/g	On-Unit Industrial Worker (External)

RCOC Refined contaminants of concern
ECO ecological
HH human health (industrial worker)

Table F-3. Actual versus Estimated O&M Costs

	FY2021	FY2022	FY2023	FY204	FY2025	5-Year Total
Total Actual O&M Costs ($)	16,801	7,269	8,712	9,699	16,244	58,725
Total ROD Estimated Direct O&M Costs* ($)	30,000	5,000	5,000	5,000	5,000	50,000

*Cost for preparation of the Sixth Five-Year Remedy Review were accounted for in FY2021.

Table F-4. PFOS/PFAS Screening Results for the FBSB OU

Operable Unit Name:	**FBSB**	
Use/Category	Known Use at Facility (Yes/No)	Notes/Comments
Fire Training Facility/Fire Department Location	No	
Wastewater Treatment Plant/ Centralized Waste Treatment Landfill	No	
Uranium Enrichment/Plutonium Production/Nuclear Operations	No	
Metal Plating Processing	No	
Explosives/Munitions/Weapons	No	
Electronics Manufacturing	No	
Equipment Fuel/Maintenance (large fuel storage areas; industrial waste lines or maintenance)	No	
Well Drilling	No	Data from site groundwater wells indicate that there have been no installation or operational impacts from PFAS.
Pesticides	No	
Laboratory	No	
Consumer Product Manufacturing	No	
Operable Unit Conclusion:	**Based on the operational history and known uses, including a review of historical PFAS applications and categories, PFAS are not expected to be present at this operable unit.**	

Attachment F-1. Five-Year Review Site Inspection Checklist – Ford Building Seepage Basin (904-91G) OU *(continued)*

III. ONSITE DOCUMENTS & RECORDS VERIFIED *(Continued)*

2. Health and Safety Plans (HASPs):

☐ Site-Specific Health and Safety Plans	☐ Readily Available	☐ Up to Date	☒ N/A
☐ Contingency Plan/Emergency Response Plan	☐ Readily Available	☐ Up to Date	☒ N/A

Remarks: Routing O&M activities do not require a SSHASP under 29 CFR 1910.120, HAZWOPER.

3. O&M and OSHA Training Records: ☒ Readily Available ☒ Up to Date ☐ N/A

Remarks: Training Records are complete and up to date per EC&ACP training matrix.

4. Permits and Service Agreements:

☐ Air Discharge Permit	☐ Readily Available	☐ Up to Date	☒ N/A
☐ Effluent Discharge	☐ Readily Available	☐ Up to Date	☒ N/A
☐ Waste Disposal; POTW	☐ Readily Available	☐ Up to Date	☒ N/A
☐ Other Permits	☐ Readily Available	☐ Up to Date	☒ N/A

Remarks:

5. Gas Generation Records: ☐ Readily Available ☐ Up to Date ☒ N/A

Remarks:

6. Settlement Monument Records: ☐ Readily Available ☐ Up to Date ☒ N/A

Remarks:

7. Groundwater Monitoring Records: ☐☒ Readily Available ☐☒ Up to Date ☒☐ N/A

Remarks:

8. Leachate Extraction Records: ☐ Readily Available ☐ Up to Date ☒ N/A

Remarks:

9. Discharge Compliance Records:

☐ Air	☐ Readily Available	☐ Up to Date	☒ N/A
☐ Water (Effluent)	☐ Readily Available	☐ Up to Date	☒ N/A

Remarks:

10. Daily Access/Security Logs: ☐ Readily Available ☐ Up to Date ☒ N/A

Remarks:

Attachment F-1. Five-Year Review Site Inspection Checklist – Ford Building Seepage Basin (904-91G) OU *(continued)*

IV. O&M COSTS
1. O&M Organization: ☐ State In-House ☐ Contractor for State ☐ PRP In-House ☐ Contractor for PRP ☒ Other: SRS
2. O&M Cost Records: ☐ Readily Available ☐ Up to Date ☐ Funding mechanism/agreement in place ☒ Other: Project cost data is summarized in Section IV of this OU-specific review. **Total annual cost by year for review period, if available** From: _____ (Date) To: _____ (Date) _____ (Total Cost) ☐ Breakdown attached From: _____ (Date) To: _____ (Date) _____ (Total Cost) ☐ Breakdown attached From: _____ (Date) To: _____ (Date) _____ (Total Cost) ☐ Breakdown attached From: _____ (Date) To: _____ (Date) _____ (Total Cost) ☐ Breakdown attached From: _____ (Date) To: _____ (Date) _____ (Total Cost) ☐ Breakdown attached
3. Unanticipated or Unusually High O&M Costs During Review Period Describe costs and reasons:
V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A
A. Fencing
1. Fencing Damage: ☐ Location shown on site map ☐ Gates secured ☒ N/A Remarks: OU-specific perimeter fencing is not required by the remedial action.
B. Signs
1. Signs and Other Security Measures: ☐ Location shown on site map ☐ N/A Remarks: Signs are in good condition.

History of Contamination

The HHWMF operated from 1955 until November 1988. In 1962, Basin H-4 replaced Basin H-3. During the operating period, the HHWMF received waste effluents from H-Area chemical separation facilities such as the nitric acid recovery unit, waste storage system evaporator overheads, and general-purpose evaporator overheads.

Significant amounts of nitrate and caustic were received in the basins. Radioactive releases were greater than 99 percent tritium. A 1984 soil coring study showed that approximately 90 percent of the radionuclides and metals were concentrated within the top 0.3 m (1 ft) of basin soil (WSRC 2001).

Initial Response

Preventative actions at HHWMF OU were conducted pursuant to the requirements of RCRA per Settlement Agreement 87-27-SW.

Closure of the four basins began in 1989 and was completed in May 1991. The four basins were closed by dewatering; physically and chemically stabilizing the remaining sludge with a layer of granite, limestone, and blast furnace slag; and placing a protective multi-layer cover system over them to reduce rainwater contact with basin bottoms.

The HHWMF was certified closed in July 1991 and was accepted by the South Carolina Department of Environmental Services (SCDES) in October 1991 as being in compliance with RCRA requirements (SRNS 2022).

Basis for Taking Action

The HHWMF OU was subject to closure under South Carolina Hazardous Waste Management Regulations (SCHWMR) R.61-79-265 Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities (SRNS 2022). Per the approved 2025 RCRA Hazardous and Mixed Waste Permit Renewal (SCDES 2025), post-closure care is regulated under SCHWMR R.61-79-264. In addition, an ongoing corrective action and monitoring program at the HHWMF is administered through the 2025 RCRA Hazardous and Mixed Waste Permit Renewal (SCDES 2025).

The monitoring program consists of monitoring for impacts to groundwater, seepline surface water, and surface water of Fourmile Branch.

Characterization efforts prior to the ROD (WSRC 1993) indicated contamination was present in basin surface water, basin soil, basin sludge and the Floridian Aquifer System soils/sediments (SRNS 2022). The constituents of concern (COCs) ~~at the HHWMF are~~ identified were arsenic, barium, cadmium, copper, lead, mercury, nickel, vanadium, zinc, tetrachloroethylene, gross alpha, gross beta, tritium, nitrate, carbon-14, cobalt-60, iodine-129, radium-226, radium-227, strontium-90, technetium-99, and uranium-233/234. No remedial goals were established in the ROD for soils (WSRC 1993).

IV. REMEDIAL ACTIONS

Remedy Selection

Preventative alternatives were developed for the HHWMF within the RCRA closure process in 1988. Closure of the HHWMF began in 1989 and was completed in July 1991. Preventative activities at the HHWMF became subject to CERCLA when SRS was placed on the National Priorities List in December 1989. As documented in the ROD, the RCRA closure was selected as the final action under CERCLA. Therefore, no further action under CERCLA was necessary for the HHWMF (WSRC 1993).

The remedial action objectives (RAOs) for the HHWMF OU were to prevent the physical exposure to contaminants and to mitigate further migration of contaminants to the groundwater by minimizing a liquid medium pathway (rainwater percolation) for transport. The HHWMF RCRA preventative action of stabilization and placement of all contaminated materials under a low-permeability cap satisfied both RAOs.

Post-closure requirements will be met by:

- Maintaining the integrity and effectiveness of the final cover, including making repairs to the RCRA cap as necessary to correct the effects of settling, subsidence, erosion, or other events;

- Maintaining and controlling the groundwater monitoring system and complying with all other applicable requirements;
- Taking measures to prevent run-on and runoff from eroding or otherwise damaging the final cover; and
- Repairing security control devices.

Remedy Implementation

Implementation of the selected final action remedy (i.e., the RCRA preventative action) included the following activities:

- Dewatering the basins to eliminate free liquids and to solidify the remaining waste and residues;
- Stabilizing the remaining waste using 0.9-1.8 m (3-6 ft) of granite aggregate, 0.3 m (1 ft) of limestone and blast furnace slag to provide a load bearing capacity sufficient to support the cover system; and
- Placing a 9-hectare (22.1-acre) low permeability cover system consisting of a layer of backfill, a 0.6-m (2-ft) layer of low-permeability compacted kaolin clay, a 22.5-cm (9-in) drainage layer of sand, a geotextile fabric filter, topped with 0.6 m (2 ft) of topsoil to support a vegetative cover.

Figures G-4 and G-5 provide current photographs of the HHWMF. Figure G-6 presents the HHWMF RCRA Boundary.

Systems Operations/Operation and Maintenance

There are no operational requirements for the cover system and land use controls (LUCs).

The following maintenance activities are ongoing:

- Post-closure groundwater monitoring is required as a condition of the RCRA Hazardous and Mixed Waste Permit Renewal (SCDES 2025) to verify that no unacceptable exposure to potential hazards posed by conditions at the OU occur in the future.

- Quarterly site inspections will occur to verify the integrity of the cover system, OU-specific fencing, signs, etc. Any necessary repairs will be made as part of the maintenance program. Annual elevation surveys are conducted to monitor the long-term settlement of the cap.
- LUCs are being enforced to preclude unauthorized access or intrusive activities through the SRS Site Use/Site Clearance program and SRS site security.

Costs associated with the selected remedy for HHWMF include operation and maintenance (O&M) costs of the soil cover and LUCs. The actual O&M cost during fiscal year (FY) 2021 to FY2025 is $1,055,994. RCRA documentation does not require estimated project costs to be prepared. Therefore, a cost data comparison is not provided in this remedy review.

V. PROGRESS SINCE LAST REVIEW

This is the seventh five-year remedy review report for the HHWMF. The previous protectiveness statement from the last five-year review concluded that because the remedial actions at HHWMF are protective, the site is protective of human health and the environment. Exposure pathways that could result in unacceptable risks are controlled through a maintained cover system and LUCs in place while USDOE controls the OU.

Per recommendation from a previous five-year review, the field inspection frequency for the HHWMF OU was changed from monthly to quarterly (Q) in 2018.

VI. FIVE-YEAR REVIEW PROCESS

The following tasks were performed as part of the review:

- Reviewed the documents listed in Section XII. Documents Reviewed;
- Confirmed the implementation of the remedial action;
- Inspected the OU, interviewed maintenance personnel, and documented the results on the Inspection Checklist provided in Attachment G-1 with the purpose of assessing the protectiveness of the remedy and the functionality of the access controls; and

- Ensured that all actions required under the RCRA Hazardous and Mixed Waste Permit Renewal (SCDES 2025) were implemented (i.e., routine inspections, maintenance to the soil covers, groundwater monitoring).

Summary of Inspections and Interviews

Scheduled quarterly site inspections were conducted from FY2021 through FY2025 (Various). The field inspection checklists are approved as part of the closure/post-closure/permit application process and are governed by the RCRA Permit Renewal for SRS. They are available in the Administrative Record File (**https://public.srs.gov/missions-and-programs/environmental-stewardship/arf-irf-index/**). Tasks included on the field inspection checklists include:

- Verifying roads to waste unit are accessible;
- Verifying waste unit signs are in acceptable condition, have correct information, and are legible from a distance of 7.6 m (25 ft);
- Verifying fences, posts, gates, etc., are in good condition and unattended gates are locked;
- Checking for excessive vegetation growing over fences that may obstruct warning signs for visibility of the inspection area;
- Inspecting closure cover for erosion, abnormal soil cracks, depressions, or ponding indicating subsidence;
- Checking for signs of burrowing animals;
- Checking the integrity of drainage ditches inside and outside of the fence areas for excessive erosion and the presence of soil, sediment, or debris restricting water flow;
- Visually checking vegetative cover for grass density with no bare spots more than 0.9 m (3 ft) by 0.9 m (3 ft). (There should be no woody vegetation or shrubs growing within the perimeter fence. The height of the vegetative cover should not impair the visual inspection of the closure. This will be determined by the Post Closure Inspector);

- Visually checking subsidence monitors for damage;
- Checking the survey benchmarks for damage and visibility;
- Checking the side slopes for signs of slumping and ditches for signs of excessive erosion;
- Verifying the annual elevation surveys of the subsidence monitors have been performed for the current year and that the results have been submitted to the Document Control Center; and
- Other.

The field inspections identified the following issues: active ant mounds, evidence of small animals burrowing under fencing, shallow rutting caused by mowing equipment, and buildup of sediment and debris on drainage channels. These findings were documented on the field inspection checklists and resolved soon after discovery.

The HHWMF OU was inspected by SRNS Environmental Compliance and Area Completion Projects (EC&ACP) on September 2, 2025 and included taking current photographs of the HHWMF OU and reviewing the field inspection checklist. No issues were identified during this inspection. Interviews were conducted with Eric Barron, O&M staff member, and Brian Hanshew, O&M Site Manager, on September 9, 2025 at the O&M organization offices. No issues were identified for the HHWMF during these interviews. However, SRS was greatly impacted by Hurricane Helene and closed in response during the period of September 27, 2024 through October 6, 2024 with the exception of emergency and essential personnel. The site resumed normal operations on October 7, 2024. EC&ACP O&M personnel evaluated the impacts of Hurricane Helene. No storm damages were identified at the HHWMF OU that would affect the protectiveness of the remedy.

The HHWMF OU was inspected by SRNS EC&ACP and USDOE personnel on October 29, 2025. No issues were identified for the HHWMF during this inspection that would affect the protectiveness of the remedy.

A regulatory site inspection ~~meeting will be conducted~~ with USDOE, USEPA and SCDES personnel ~~after submittal of the Revision 0 of this document~~was held on March 19, 2026. SRNS ~~and USDOE~~ personnel ~~will~~ were also ~~be~~ present at the meeting. During the meeting, the participants ~~will~~ viewed drone footage of HHWMF OU and ~~will be~~were provided an opportunity to walk down the OU. The USEPA and SCDES elected not to perform a walk down because the drone video provided them with better views of the OU. No significant problems regarding the protection of the remedy for this OU as implemented ~~are anticipated to be~~ were identified during the inspections.

~~The field inspection frequency for the HHWMF was changed from monthly to quarterly in 2018. Scheduled quarterly inspections (FY2021 to FY2025) performed at the HHWMF OU identified the following issues: active ant mounds, evidence of small animals burrowing under fencing, shallow rutting caused by mowing equipment, and buildup of sediment and debris on drainage channels. These findings were documented on the field inspection checklists and resolved soon after discovery.~~

The HHWMF OU was inspected by SCDES on September 4, 2025, as part of the RCRA annual comprehensive groundwater monitoring evaluation. Overall, the basins were observed to be in good condition. There was a small amount of erosion observed on the edge of the H-Area Basin 4 cover along the northwest curve and in the vicinity opposite of monitoring well HSB 119D. On September 16, 2025, and September 23, 2025, SRS personnel conducted a visual inspection of the entire HHWMF OU cover system with emphasis on the areas noted during SCDES' inspection. SRS personnel also reviewed all design and as-built drawings of the closed HHWMF OU. The results of the evaluation, including recommendations, were documented in the HHWMF OU Perimeter Erosion Observation that was submitted to SCDES on October 24, 2025 (SRNS 2025). The cover system drainage is performing as designed and no repairs to the exposed drainage layer were required.

VII. TECHNICAL ASSESSMENT

Is the Remedy Functioning as Intended by the Decision Document?

The remedy, in situ stabilization/solidification, RCRA soil cover with LUCs is effective in preventing exposure to contaminant risk above 1E-06 risk levels and mitigating further migration of contaminants to groundwater and is functioning as intended.

LUCs have been effective in maintaining restricted (industrial) land use. Quarterly site inspections and site maintenance have been effective in maintaining integrity of the soil cover. Based on the site inspections, there is no indication of potential remedy failure that could place protectiveness at risk.

The LUC requirements are discussed and approved as part of the closure/post-closure/ permit application process and are governed by the RCRA Permit Renewal for the SRS (SCDES 2025). The closure/post-closure requirements are discussed in the RCRA Permit Renewal Application for the H-Area Hazardous Waste Management Facility (H-Area HWMF) Postclosure (SRNS 2022). Therefore, a Land Use Control Implementation Plan is not required for this OU. The LUCs (i.e., RCRA closure/post-closure care requirements) that are in place include physical access controls to prevent unauthorized contact (i.e., OU-specific fencing with locked gates and warning signs posted on the fences), removal or excavation of subsurface soils, and restrictions to prevent disturbance of the HHWMF OU. Warning signs are in good condition, and no activities were observed that would have violated the LUCs. All LUC objectives are being met.

Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives still Valid?

The exposure assumptions, toxicity data, and cleanup levels used at the time of final remedy selection are still valid. There have been no changes in the standards or physical conditions of the HHWMF OU that would affect the protectiveness of the remedy.

As the remedial work has been completed, the applicable standards set forth in the ROD (WSRC 1993) and RCRA closure plan (WSRC 2000) associated with soils and basin sediments have been met. Groundwater is being addressed by the H-Area Groundwater

OU and will be discussed in the five-year remedy review reports for SRS OUs with operating equipment.

The USEPA standards and toxicity values have been updated since submittal of five-year remedy review as shown in Appendix B. The changes to the values for COCs at the HHWMF OU included some decreases in the RSLs due to updated input values used to calculate the RSLs. The residential soil screening level for lead decreased from 400 mg/kg to 200 mg/kg. If other sources of lead are present, the screening level is 100 mg/kg. However, these changes do not affect the protectiveness of the remedy and the RAOs continue to be met by the remedial action. No new standards or to-be-considered guidance have been identified that call into question the protectiveness of the remedy.

Fact sheets provided on the USEPA webpage (https://19january2021snapshot.epa.gov/fedfac/emerging-contaminants-and-federal-facility-contaminants-concern_.html) regarding emerging contaminants were reviewed for applicability to this site. The USEPA webpage provides a link to fact sheets for the following emerging contaminants: 1,2,3-trichloropropane (TCP), 1,4-dioxane, 2,4,6-trinitrotoluene (TNT), 2,4-dintrotoluene (DNT), hexahydro-1,3,5-tri-nitro-1,3,5-triazine (RDX), nanomaterials, N-nitroso-dimethylamine (NDMA), perchlorate, perfluorooctane sulfonic acid (PFOS) and other per- and polyfluoroalkyl substances (PFAS), polybrominated biphenyls, polybrominated diphenyl ethers (PBDEs), and tungsten. None of these emerging contaminants, except for PFOS and other PFAS, were identified as applicable to this OU based on the OU history of contamination.

Based on the operational history and documented usage patterns, including a review of historical PFAS applications and categories, PFAS may be expected to be present at this waste unit (Table G-3). However, the engineered cover system in place serves as an effective and protective remedy, mitigating potential exposures and releases associated with PFAS.

Has any Other Information Come to Light that Could Call into Question the Protectiveness of the Remedy?

No other information has come to light that could call into question the protectiveness of the remedy.

VIII. ISSUES

There are no issues related to current site conditions or activities that currently prevent the remedy from being protective.

IX. RECOMMENDATIONS AND FOLLOW-UP ACTIONS

There are no recommendations for follow-up actions for the HHWMF OU under CERCLA.

X. PROTECTIVENESS STATEMENT(S)

The remedy at the HHWMF OU is protective of human health and the environment.

Exposure pathways that could result in unacceptable risks are being controlled by stabilization and placement of all contaminated materials under a low-permeability cap and LUCs to prevent exposure to or ingestion of contaminated soil media and mitigating further migration of contaminants to groundwater. All threats to the HHWMF OU are being addressed through physical access controls to prevent unauthorized entry to SRS (fences, guards, security patrols, etc.), administrative controls that maintain the HHWMF OU for industrial use only, and warning signs and land use restrictions via the SRS Site Use/Site Clearance Program.

XI. NEXT REVIEW

The eighth five-year review for SRS OUs with Engineered Cover Systems is scheduled for December 2031.

XII. DOCUMENTS REVIEWED

FFA, 1993. *Federal Facility Agreement for the Savannah River Site,* Administrative Docket No. 89-05-FF (Effective Date: August 16, 1993)

SCDES, 2025. *South Carolina Hazardous and Mixed Waste Permit, Permit Number SC1 890 008 989, 2025 RCRA Permit Renewal for the Savannah River Site, issued on October 27, 2025, Module III – Postclosure Care and Module IV - Groundwater Requirements, Section C, H-Area Hazardous Waste Management Facility*, South Carolina Department of Environmental Services, Division of Waste Management, Bureau of Land and Waste Management, Columbia, SC

SRNS, 2022. *2013 RCRA Part B Permit Renewal Application - H-Area Hazardous Waste Management Facility (H-Area HWMF) Postclosure*, SRNS-IM-2012-00002, Volume V, Revision 3, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

SRNS, 2025. *Submittal of the H-Area Hazardous Waste Management Facility Erosion Evaluation and Recommendation*, SRNS-J2000-2025-00750, dated October 24, 2025, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

USDOE, 1996. *Savannah River Site Future Use Project Report*, U.S. Department of Energy, Savannah River Operations Office, Savannah River Site, Aiken, SC

WSRC, 1993. *Final Record of Decision Remedial Alternative Selection for H-Area Hazardous Waste Management Facility (U)*, WSRC-RP-93-1043, Revision 1, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 1999. *Land Use Control Assurance Plan for the Savannah River Site*, WSRC-RP-98-4125, Revision 1.1, latest revision, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

WSRC, 2000. *H-Area HWMF Closure Plan (U)*, WSRC-RP-98-4024, Revision 0, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 2001. *H-Area Corrective Action Phase 1 Evaluation,* WSRC-RP-2001-4015, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

Various - *Post-Closure Inspection H-Area Hazardous Waste Management Facilities 904-45G, 904-46G, 904-56G*, ER-IDS-019-021, Inspection period FY2021 through FY2025 (quarterly)

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Table G-1. Chronology of OU Events

Event	Date
RCRA Closure Plan Approved	1989
Corrective Action Start	1989
RCRA Closure Certified	October 1, 1991
Final ROD Issuance	September 10, 1993
Previous Five-Year Reviews Issuance	August 27, 1997 / February 12, 2004 / January 29, 2009 / February 4, 2014 / February 21, 2018 / December 21, 2021

Table G-2. Actual versus Estimated O&M Costs

	FY2021	FY2022	FY2023	FY2024	FY2025	Five-Year Total
Total Actual O&M Costs ($)	113,508	194,374	210,241	233,653	304,217	1,055,994
Total ROD Estimated Direct O&M Costs ($)	N/A	N/A	N/A	N/A	N/A	0

RCRA documentation does not require estimated project costs to be prepared.
N/A = not applicable

Table G-3. PFOS/PFAS Screening Results for the HHWMF OU

Operable Unit Name:	**HHWMF**	
Use/Category	Known Use at Facility (Yes/No)	Notes/Comments
Fire Training Facility/Fire Department Location	No	
Wastewater Treatment Plant/ Centralized Waste Treatment Landfill	No	
Uranium Enrichment/Plutonium Production/Nuclear Operations	**Yes**	
Metal Plating Processing	No	
Explosives/Munitions/Weapons	No	
Electronics Manufacturing	No	
Equipment Fuel/Maintenance (large fuel storage areas; industrial waste lines or maintenance)	No	
Well Drilling	No	Data from site groundwater wells indicate that there have been no installation or operational impacts from PFAS.
Pesticides	No	
Laboratory	No	
Consumer Product Manufacturing	No	
Operable Unit Conclusion:	**Based on the operational history and documented usage patterns, including a review of historical PFAS applications and categories, PFAS may be expected to be present at this operable unit.**	

Attachment G-1. Five-Year Review Site Inspection Checklist – H-Area Hazardous Waste Management Facility (904-44G, 904-45G, 904-46G, and 904-56G) OU *(continued)*

VII. LANDFILL COVER/CONTAINMENT *(Continued)*		
G. Detention/Sedimentation Ponds	☐ Applicable	☒ N/A
H. Retaining Walls	☐ Applicable	☒ N/A
I. Perimeter Ditches/Offsite Discharge	☒ Applicable	☐ N/A

I. Siltation: ☐ Location shown on site map ☒ Siltation not evident
Areal extent_____ Depth_____
Remarks:_____

II. Vegetative Growth: ☐ Location shown on site map ☒ N/A
☐ Vegetation does not impede flow
Areal extent_____ Type_____
Remarks:_____

III. Erosion: ☐ Location shown on site map ☒ Erosion not evident
Areal extent_____ Depth_____
Remarks:_____

IV. Discharge Structure: ☐ Location shown on site map ☐ N/A
Remarks: The drainage ditches at Basin H4 (904-56G) have been relined with concrete.

VIII. VERTICAL BARRIER WALLS	☐ Applicable	☒ N/A
IX. GROUNDWATER/SURFACE WATER REMEDIES	☐ Applicable	☒ N/A

X. OTHER REMEDIES

If there are remedies applied at the site, which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

A. Stabilization ☒ Applicable ☐ N/A
Stabilization was performed at HHWMF OU. The remedy is performing as designed.

Attachment G-1. Five-Year Review Site Inspection Checklist – H-Area Hazardous Waste Management Facility (904-44G, 904-45G, 904-46G, and 904-56G) OU *(continued/end)*

XI. OVERALL OBSERVATIONS
1. Implementation of the Remedy
Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emissions, etc.). Closure of the four basins (904-44G, 904-45G, 904-46G, and 904-56G) by dewatering, physically and chemically stabilizing the remaining waste, and placement of a low permeability cap has met the remedial objectives of preventing physical exposure to contaminants and mitigating further migration of contaminants to the groundwater. Selected remedy for the HHWMF OU is functioning as intended. There are no issues requiring corrective actions for the cover system and LUCs.
2. Adequacy of O&M
Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy. The O&M procedures consisting of site inspections and site maintenance (repair of erosion damage, cover system, fencing and warning signs) and site controls (SRS Site Use and Site Clearance Programs, which restrict invasive and permanent installation activities at the waste unit) have been implemented. The O&M procedures are adequately maintaining the HHWMF OU and the condition of the warning signs is good. When maintenance activities are identified during inspections (e.g., treating ant mounds, filling holes burrowed under fencing, filling mowing ruts, and clearing drainage channels), repairs are scheduled and performed. Within a month after Hurricane Helene occurred all monitoring wells were re-inspected for damages and repaired as needed. No storm damages were identified at the HHWMF OU. There are no issues that impact the protectiveness of the remedy that require corrective actions.
3. Early Indicators of Potential Remedy Failure
Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future. N/A
4. Opportunities for Optimization
Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. N/A

End of Checklist

APPENDIX H. K-AREA BURNING/RUBBLE PIT (131-K) AND K-AREA RUBBLE PILE (631-20G) OPERABLE UNIT

I. INTRODUCTION

This report is the sixth five-year review for the K-Area Burning/Rubble Pit (131-K) (KBRP)/K-Area Rubble Pile (631-20G) (KRP) Operable Unit (OU). The review was conducted from July 2025 through December 2025. Contaminants and waste have been left in place at the KBRP/KRP OU at levels that do not allow for unlimited use and unrestricted exposure. The purpose of this review is to determine whether the remedy in place at the KBRP/KRP OU is protective of human health and the environment. This report documents the results of the review.

II. OU CHRONOLOGY

Table H-1 lists the chronology of site events for the KBRP/KRP OU.

III. BACKGROUND

The KBRP/KRP OU is a Resource Conservation Recovery Act (RCRA)/Comprehensive Environmental Response, Compensation, and Liability Act unit in Appendix C of the Federal Facility Agreement (FFA) for Savannah River Site (SRS) (FFA 1993). The KBRP/KRP OU consists of two soil waste units and groundwater beneath the OU.

Physical Characteristics

The KBRP/KRP OU is located approximately 9.4 km (5.9 mi) east of the nearest site boundary and 0.6 km (0.4 mi) east of the K-Reactor Area (Figure H-1). Figure H-2 shows the site layout of the KBRP/KRP OU. The KBRP was constructed from 1955 to 1956 as a shallow, unlined excavation measuring approximately 9 m (30 ft) wide, 72 m (240 ft) long, and approximately 2.4 m (8 ft) deep for waste burning and burial.

The KRP, constructed sometime between 1956 and 1961, consists of a general disposal area, semicircular in shape, measuring approximately 90 m (300 ft) long and 15 to 40.5 m

(50 to 135 ft) wide. Individual rubble piles within the area were 1.2 to 1.8 m (4 to 6 ft) high. Total estimated waste volume is 2,142 m^3 (2,800 yd^3).

The aquifer of concern at KBRP/KRP is the Upper Three Runs Aquifer Unit (UTRAU). The UTRAU is locally divided into informal, yet distinct, "lower' and "upper" aquifer zones separated by the "tan clay" semi-confining zone. Depth to groundwater at the unit is approximately 9 m (30 ft) below ground surface. In the Upper Aquifer Zone (UAZ) of the UTRAU, groundwater flow is towards the southwest (Figure H-2). The four wells screened in the lower aquifer zone (LAZ) of the UTRAU are currently suspended, and no water elevations were collected. Table H-2 provides the most recent water table elevations.

Land and Resource Use

According to the *Savannah River Site Future Use Project Report* (USDOE 1996), residential uses of SRS land should be prohibited. The *Land Use Control Assurance Plan for the Savannah River Site* (WSRC 1999a) designates KBRP/KRP OU as being within an industrial area. The future land use for KBRP/KRP OU is reasonably anticipated to remain industrial with the U.S. Department of Energy (USDOE) maintaining control of the land.

History of Contamination

KBRP was constructed for the disposal of combustible wastes. During operation, organic liquids of unknown use and origin, waste oils, paper, plastics, and rubber were disposed of in the pit and burned periodically. Disposal records, including composition, origin, and use of materials disposed, were not kept for this unit during its period of operation. The use of the KBRP for disposal of combustible wastes was discontinued in 1973. Only inert rubble was placed in the pit until it was backfilled with soil to grade level in 1981. The primary contaminants detected in soil were polyaromatic hydrocarbons (PAHs) formed by incomplete burning of organic materials.

The KRP was constructed as a general disposal area. KRP is composed primarily of soil matter, with some broken asphalt, broken concrete pieces, and gravel-sized coal. The coal and asphalt exist in a wide range of particle sizes and are dispersed in a highly

heterogeneous manner throughout the individual rubble piles. Disposal records were not kept for this unit during its period of operation. The primary contaminants detected in soil at the KRP were PAHs and metals.

A volatile organic carbon (VOC) groundwater plume originated beneath the KBRP/KRP OU and migrated southwestwardly from the KBRP/KRP OU. Tetrachloroethylene (PCE) and trichloroethylene (TCE) exceeded maximum contaminant levels (MCLs); however, the VOC plume is not located near a surface water discharge. No source material was identified in the KBRP/KRP OU soils. There are no contaminant migration constituents of concern (CMCOCs) for the KBRP/KRP OU soils that pose a risk to groundwater.

Figure H-3 presents a photograph of KBRP.KRP OU before remediation and Figures H-4 and H-5 present photographs of KBRP/KRP OU in the current condition.

Initial Response

The KBRP was backfilled with soil to grade level in 1981 when the disposal capacity was reached.

Basis for Taking Action

The potential exposure to or ingestion of contaminated soil and groundwater poses a potential increased risk of cancer to human receptors and is the basis for taking action at the KBRP/KRP OU.

The RCRA Facility Investigation (RFI) / Remedial Investigation (RI) collected soil samples within the KBRP and from soil within the KRP individual rubble piles and native soils beneath the piles (WSRC 1998). During unit screening, ground penetrating radar surveys were performed to define the pit and pile boundaries to locate any buried objects in order to avoid drilling into buried material. No restriction to drilling was encountered.

Final human health constituents of concern (COCs) were identified for the KBRP/KRP OU based on the results of the baseline risk assessment. PAHs are the predominant COCs in both KBRP and KRP soil. Arsenic was also identified as a COC for the KRP.

Groundwater immediately downgradient of KBRP was found to have PCE and TCE concentrations above MCLs. Groundwater and soil data indicate that the KBRP is no longer a source for groundwater contamination. This is based on the historical trends of analytical data in the adjacent monitoring wells and the results of the soil investigation. No CMCOCs were identified for the surface units. The soil and groundwater COCs are listed in Table H-~~2~~3.

IV. REMEDIAL ACTIONS

Remedy Selection

As stated in the Record of Decision (ROD) (WSRC 2000), the remedial action objectives (RAOs) for the unit are as follows:

- Protect future industrial workers from unacceptable exposures to PAHs in soil at the KBRP/KRP OU and arsenic in soil at the KRP;
- Protect future industrial workers from unacceptable exposures to PCE and TCE in groundwater; and
- Prevent further degradation of groundwater and return it to levels below MCL to allow beneficial uses.

As stated in the ROD, the selected remedial actions for the unit are as follows:

- Soil cover over the KBRP/KRP OU;
- Institutional controls (i.e., land use controls [LUCs]); and
- Monitored natural attenuation (MNA) for the water table aquifer groundwater.

Because the source of groundwater contamination is depleted and no CMCOCs were identified in the surface units, no source control actions were required for the unit. The following LUC objectives are necessary to ensure protectiveness of the remedy:

- Prevent contact, removal, or excavation of buried waste in the OU areas designated in the Land Use Control Implementation Plan (LUCIP) and preclude future residential or agricultural use of the area; and

Prevent unauthorized access to groundwater.

Remedy Implementation

The implementation of the selected remedy included the following activities:

- Consolidated 7,650 m^3 (10,000 yd^3) of contaminated soil (KRP soil from individual rubble piles), which was outside the planned cover area, into the KBRP. The soil removal area was expanded to include other rubble piles composed of gravel-size coal, rocks, and dirt that were discovered near the soil removal area. Confirmatory sampling verified no COCs remained in the soil removal area (WSRC 2002).

- Installed a 0.6 m (2-ft) thick minimum common fill soil cover over KBRP/KRP OU per South Carolina Regulation 61-107, 11, Part IV, Subtitle G using conventional and commercially available earth-moving equipment. The soil cover system covers 0.3 hectares (0.8 acres) per the Post Construction Report (PCR) (WSRC 2002).

- Implemented LUCs for 0.47 hectares (1.15 acres) (Figure H-6) and posted warning signs at the perimeter of KBRP/KRP OU (WSRC 2002). Existing SRS access controls will be used to maintain the use of this site for industrial use only. Institutional controls (i.e., administrative measures) and use restrictions for on-site workers via the Site Use/Site Clearance Program. Other administrative controls to ensure worker safety include work controls, worker training, and worker briefings of health and safety requirements.

- Installed groundwater monitoring wells and established a long-term groundwater monitoring program for MNA to ensure maximum groundwater mixing zone (GMZ) concentration limits are not exceeded per the groundwater mixing zone application (GMZA) (WSRC 1999b). The following changes listed below have been made to the

monitoring network and sampling since the development of the GMZA. Changes have been documented within the various annual groundwater reports.

- Additional cone penetrometer technology data collected in 2002 indicated that the compliance boundary well KRP 7 would likely exceed the MCLs for PCE and TCE and was not suitable as a compliance boundary well. The KRP cluster (KRP 14D and KRP 14C) was proposed and accepted as new compliance boundary wells installed further downgradient of KRP 7 (WSRC 2002).

- Later in 2002, PCE and TCE exceeded MCLs in one well (KRP 14D), a compliance boundary well. Since the number of exceedances was small; the USDOE, U.S. Environmental Protection Agency (USEPA), and South Carolina Department of Environmental Services (SCDES) directed SRS to do a moderate corrective action plan. The plan included continued quarterly sampling in the GMZ network and the installation of the KRP 15 well cluster (WSRC 2003).

- In 2004, it was again reported that well KRP 14D exceeded the MCL for TCE. The USDOE, USEPA, and SCDES agreed that it would not be feasible to pursue the contamination beyond KRP 14 because the plume was migrating toward the congested subsurface of the K-Reactor facility and could merge with the additional uncharacterized plumes associated with K Area. Per USEPA, SCDES and USDOE agreement, the KRP 14 cluster (KRP 14D and KRP 14C) was removed from the monitoring network. It was further agreed that the GMZA would not be modified, no additional modeling was needed, and no additional monitoring wells needed to be installed. Well KRP 7 was designated as the new compliance boundary well (WSRC 2005).

- In 2006, the USEPA, SCDES and USDOE agreed to reduce the sampling frequency from quarterly to semiannual due to steady or declining concentration trends, and compliance boundary wells being considerably below MCLs. USEPA, SCDES, and USDOE also approved the reduction of the analytical list from all of the Method 8260

analytes to only PCE, TCE, and their daughter products (vinyl chloride, 1,1-dichloroethene, cis-1,2-dichloroethene, and trans-1,2-dichloroethene) (WSRC 2007).

- In 2012, the USEPA, SCDES, and USDOE agreed to reduce the sampling frequency at KBRP/KRP OU from semiannually to annually due to steady or declining concentration trends and compliance boundary wells being considerably below MCLs. Sampling of the four Lower Aquifer Zone (LAZ) wells and three Transmissive Zone (TZ) wells was also suspended due to contamination remaining in one or two upper aquifer zone (UAZ) wells. It was also agreed that water levels will continue to be collected from the three suspended TZ wells to provide data for mapping the potentiometric surface of the TZ. Sampling of water levels in the LAZ wells will remain suspended (SRNS 2012).

- In 2021, with agreement from USEPA and SCDES on a comment response on the 2020 Combined Groundwater Monitoring Report (Sampling Summary), the project team initiated an increase in sampling frequency at well KRP 9, based on PCE and TCE exceeding the MCLs in 2018 (SRNS 2020). Sampling frequency at well KRP 9 was increased from annually to semiannually starting in the second quarter of 2021, to facilitate the team's understanding of the need for continued monitoring at this unit.

System Operations/Operation and Maintenance

There are no operational requirements.

The following maintenance activities are ongoing:

- Annual site inspections and site maintenance (repair of erosion damage, cover maintenance, and warning signs);

- Site controls (SRS Site Use and Site Clearance Programs, which restrict invasive and permanent installation activities at the waste unit); and

- Sampling of the GMZA monitoring wells. The MNA monitoring program verifies the natural decrease of contaminant concentrations in the groundwater to levels below

MCLs for PCE and TCE. Sampling will continue until MCLs have been attained, the MNA has achieved its RAOs, and the remedial action is complete. The results were reported via annual effectiveness monitoring reports since 2003. Starting in 2008, the monitoring results for KBRP/KRP OU were combined with the L-Area Burning Rubble Pit (131-L) (LBRP) OU and P-Area Burning/Rubble Pit (131-P) (PBRP) OU monitoring reports into a single abbreviated annual groundwater data summary, with full detailed reports every five years (USDOE 2008). For KBRP/KRP OU, the MNA remedy was expected to reduce groundwater concentrations to below MCLs by 2005 due to the processes of advection and dispersion (WSRC 1999c). However, contaminant concentrations did not decrease below MCLs until 2016 and have since fluctuated above and below the MCL at one well (KRP 9). Groundwater monitoring is still ongoing at KBRP/KRP OU to ensure concentrations remain below the MCLs.

Table H-~~3~~ 4 compares the actual operation and maintenance (O&M) costs for the five-year remedy review period to the estimated direct O&M costs from the ROD (WSRC 2000). The estimated O&M cost for fiscal year (FY) 2021 to FY2025 was $27,812 for inspections, maintenance, GMZA monitoring, and LUCs. The actual O&M cost for FY2021 until FY2025 is $187,695. The actual O&M costs are higher than expected because groundwater monitoring and reporting have continued longer than expected.

V. PROGRESS SINCE LAST REVIEW

This is the sixth five-year remedy review for the KBRP/KRP OU. The previous protectiveness statement concluded that the remedy of a soil cover over the KBRP/KRP OU with LUCs and MNA with GMZ for the groundwater at the KBRP/KRP OU is protective of human health and the environment. Since the last five-year remedy review for the KBRP/KRP OU, groundwater contaminants continue to remain below their respective MCLs except in one well, KRP 9. PCE concentrations in well KRP 9 increased above the MCL in 2023, however concentrations diminished below the MCL again in 2024 (Figure H-7). In 2024, concentrations in all wells were below their respective MCLs (SRNS 2025). Groundwater monitoring remains in place until it is agreed that the RGs have been met, and that groundwater is no longer a threat to human health and the

environment. The soil cover with LUCs also remains in place. The current remedy is functioning as intended.

VI. FIVE-YEAR REVIEW PROCESS

The following tasks were performed as part of the review:

- Reviewed the documents listed in Section XII. Documents Reviewed;
- Reviewed the groundwater monitoring data (Table H-45);
- Confirmed implementation of the remedial action;
- Inspected the OU, interviewed maintenance personnel, and documented the results on the Inspection Checklist provided in Attachment H-1 with the purpose of assessing the protectiveness of the remedy and the functionality of the access controls; and
- Reviewed changes in standards and to-be-considered guidance.

Data Review

Annual groundwater reports or data summaries have been submitted for the KBRP/KRP OU since 2003 and were thoroughly reviewed for this Five-Year Remedy Review. An agreement with the USEPA, SCDES, and USDOE was reached in 2008 to combine the reports for KBRP/KRP OU, LBRP OU, and PBRP OU into an annual groundwater monitoring data summary letter with a detailed groundwater report every fifth year beginning June 30, 2012 (USDOE 2008). LBRP OU was removed from the reports starting in 2018 due to achieving its RGs (SCDES 2018, USEPA 2018). The last detailed report was submitted in June 2022 (SRNS 2022). The report included time-series plots of PCE and TCE at each station, a plume map, and a comprehensive review of the monitoring activities and monitoring results from 2021. Contaminant concentrations in all KBRP/KRP OU wells were observed below MCLs as discussed in the last detailed report. Data summary letters submitted since the last five-year remedy review (SRNS 2023, SRNS 2024, SRNS 2025) show that concentrations continue to remain below the MCLs in all

wells except for a small increase in PCE at one well, KRP 9, in 2023 (Figure H-7). PCE concentrations in well KRP 9 were below MCLs in 2024.

Summary of Inspections and Interviews

Scheduled annual inspections were conducted from FY2021 through FY2025 (Various). Tasks included on the field inspection checklists (WSRC 2002) are as follows:

- Verifying roads to waste units are accessible;
- Verifying that the waste unit signs (4) are in acceptable condition, have correct information, and are legible from a distance of 7.6 m (25 ft);
- Verifying that there is no excavating, digging, or construction activity on the soil cover;
- Checking the integrity of drainage ditches for presence of excessive erosion, sediment buildup, and any debris restricting water flow;
- Verifying that no woody vegetation is growing on the soil cover, and remove or identify as needed;
- Visually checking vegetative cover for grass density with no bare spots more than 0.9 m by 0.9 m (3 ft by 3 ft) in area (The heigh of the vegetation should not impair the visual inspection of the soil cover. This will be determined by the Inspector.);
- Checking the soil cover for signs of erosion or depressions (subsidence);
- Checking for signs of burrowing animals; and
- Other.

The field inspections identified the following issues: active ant mounds. These findings were documented on the field inspection checklists and resolved soon after discovery.

The KBRP/KRP OU was inspected by Savannah River Nuclear Solutions, LLC (SRNS) Environmental Compliance and Area Completion Projects (EC&ACP) on August 19, 2025 and included taking current photographs of the KBRP/KRP OU and reviewing the field inspection checklist. During this inspection, overgrown vegetation and one missing

monument cap were identified. Repairs were promptly scheduled and performed. Interviews were conducted with Eric Barron, O&M staff member, and Brian Hanshew, O&M Site Manager, on September 9, 2025 at the O&M organization offices. No issues were identified for the KBRP/KRP OU during these interviews. However, SRS was greatly impacted by Hurricane Helene and closed in response during the period of September 27, 2024 through October 6, 2024 with the exception of emergency and essential personnel. The site resumed normal operations on October 7, 2024. EC&ACP O&M personnel evaluated the impacts of Hurricane Helene. No storm damages were identified at the KBRP/KRP OU that would affect the protectiveness of the remedy.

The KBRP/KRP OU was inspected by SRNS EC&ACP and USDOE personnel on October 30, 2025. No issues were identified for the KBRP/KRP OU during this inspection that would affect the protectiveness of the remedy.

A regulatory site inspection with USDOE, ~~was conducted by~~ USEPA and SCDES personnel ~~will be scheduled after submittal of the Revision 0 of this document~~was held on March 19, 2026. SRNS personnel ~~will~~ were also ~~be~~ present at the meeting. During the meeting, the participants ~~will~~ viewed drone footage of KBRP/KRP OU and ~~will be~~ were provided with an opportunity to walk down the OU. The USEPA and SCDES elected not to perform a walk down because the drone video provided them with better views of the OU. No significant problems regarding the protection of the remedy for this OU as implemented ~~are anticipated to be~~were identified during the inspection.

~~The field inspection frequency for the KBRP/KRP OU was changed from semiannual to annual in 2015. Scheduled inspections conducted from FY2021 through FY2025 identified the following issues: active ant mounds. These findings were documented on the field inspection checklists and resolved soon after discovery.~~

VII. TECHNICAL ASSESSMENT

Is the Remedy Functioning as Intended by the Decision Document?

The soil cover, groundwater mixing zone, and LUC remedy, is effective in preventing exposure to contaminants above 1E-06 risk level and is functioning as intended as demonstrated below:

- The soil cover continues to protect present and future industrial workers from unacceptable exposures to PAHs in soil at the KBRP/KRP OU, and arsenic in soil at the KRP;
- LUCs are continuing to prevent human exposure to contaminated soils and groundwater; and
- The MNA program and monitoring well network provides sufficient data to assess the progress of natural attenuation within the groundwater. MNA is preventing further degradation of groundwater and has returned it to levels below MCLs as of 2024. Core plume contaminant levels (PCE and TCE), as seen in well KRP 9, have remained below or just above the respective MCLs over the last several years, (Figures H-7 and H-8). Groundwater contamination persisted longer than originally expected due to reductions in dispersion and groundwater recharge, as well as possible increases in the sorption of contaminants. The VOC plume has not increased in areal size or migrated below the uppermost aquifer zone. Based on the annual monitoring reporting, the requirements of the GMZ are being satisfied. All groundwater monitoring results are below mixing zone contaminant levels (MZCLs) and MCLs as shown in Table H-~~4~~5.

LUCs have been effective in maintaining industrial land use. Annual site inspections and site maintenance have been effective in maintaining the integrity of the soil cover. Based on the site inspections, there is no indication of potential remedy failure that could place protectiveness at risk.

The ~~Land Use Control Implementation Plan (~~LUCIP~~)~~ for KBRP/KRP OU is located in Appendix D of the PCR and governs LUC implementation, maintenance, monitoring,

reporting, and enforcement of LUCs (WSRC 2002). The LUCs that are in place include physical access controls to prevent unauthorized contact, removal or excavation of subsurface soils, and restrictions to prevent disturbance of the KBRP/KRP OU. Warning signs are in good condition, and no activities were observed that would have violated the LUCs. All LUC objectives are being met.

The LUCIP is available on the SRS external webpage in the Administrative Record File (**https://public.srs.gov/missions-and-programs/environmental-stewardship/arf-irf-index/**) and the Land Use Control Assurance Plan webpage (**https://public.srs.gov/missions-and-programs/environmental-stewardship/lucap/**).

Are Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives still valid?

The exposure assumptions, toxicity data, and cleanup levels used at the time of final remedy selection are still valid. The MCLs for PCE and TCE have remained the same since the remedies were implemented (Appendix B). There have been no changes in standards or physical conditions of the KBRP/KRP OU that would affect the protectiveness of the remedy.

The USEPA standards and toxicity values have been updated since submittal of the five-year remedy review as shown in Appendix B. The changes to the values for the COCs at the KBRP/KRP OU were not significant, and the RAOs continue to be met by the remedial action. No new standards or to-be-considered guidance have been identified that call into question the protectiveness of the remedy.

Fact sheets provided on the USEPA webpage (https://19january2021snapshot.epa.gov/fedfac/emerging-contaminants-and-federal-facility-contaminants-concern_.html) regarding emerging contaminants were reviewed for applicability to this site. The USEPA webpage provides a link to fact sheets for the following emerging contaminants: 1,2,3-trichloropropane (TCP), 1,4-dioxane, 2,4,6-trinitrotoluene (TNT), 2,4-dintrotoluene (DNT), hexahydro-1,3,5-tri-nitro-1,3,5-triazine (RDX), nanomaterials, N-nitroso-dimethylamine (NDMA), perchlorate, perfluorooctane sulfonic acid (PFOS) and other per-

and polyfluoroalkyl substances (PFAS), polybrominated biphenyls, polybrominated diphenyl ethers (PBDEs), and tungsten. None of these emerging contaminants were identified as applicable to this OU based on the OU history of contamination. Table H-6 provides the screening results of PFOS and PFAS for the KBRP/KRP OU.

Has any Other Information Come to Light that Could Call into Question the Protectiveness of the Remedy?

No other new information has come to light that could call into question the protectiveness of the remedy.

VIII. ISSUES

There are no issues related to current site conditions or activities that prevent the remedy from being protective for this OU.

IX. RECOMMENDATIONS AND FOLLOW-UP ACTIONS

There are no recommendations or follow-up actions for this OU.

X. PROTECTIVENESS STATEMENT(S)

The remedy at KBRP/KRP OU is protective of human health and the environment. Exposure pathways that could result in unacceptable risks are being controlled by LUCs to prevent exposure to, or ingestion of, contaminated groundwater and soil media. All threats to the KBRP/KRP OU are being addressed through physical access controls to prevent unauthorized entry to SRS (fences, guards, security patrols, etc.), administrative controls that maintain the KBRP/KRP OU for industrial use only, and warning signs and land use restrictions via the SRS Site Use/Site Clearance Program.

XI. NEXT REVIEW

The eighth five-year review for SRS OUs with Engineered Cover Systems is scheduled for December 2031.

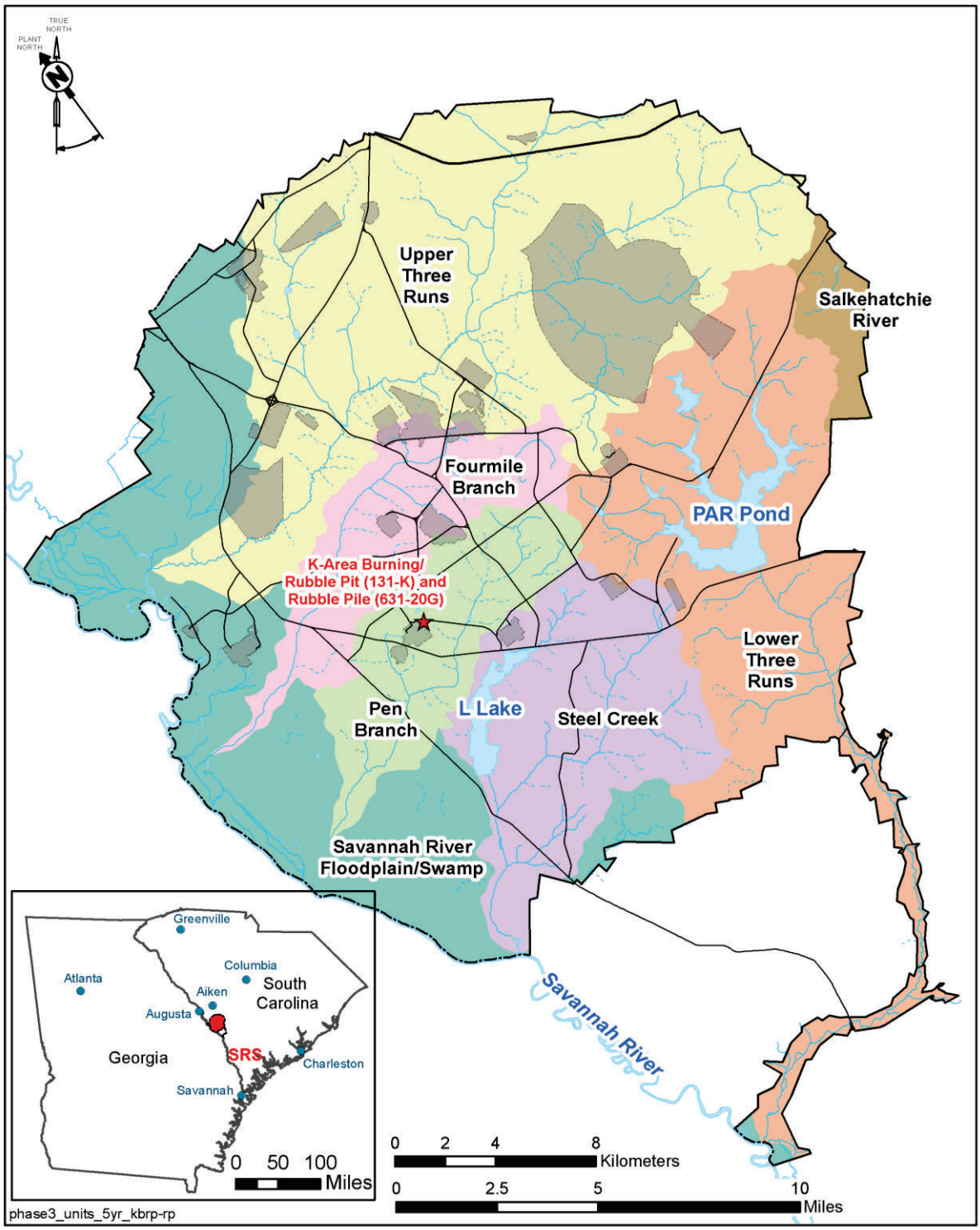


Figure H-1. Location of the KBRP/KRP OU at SRS

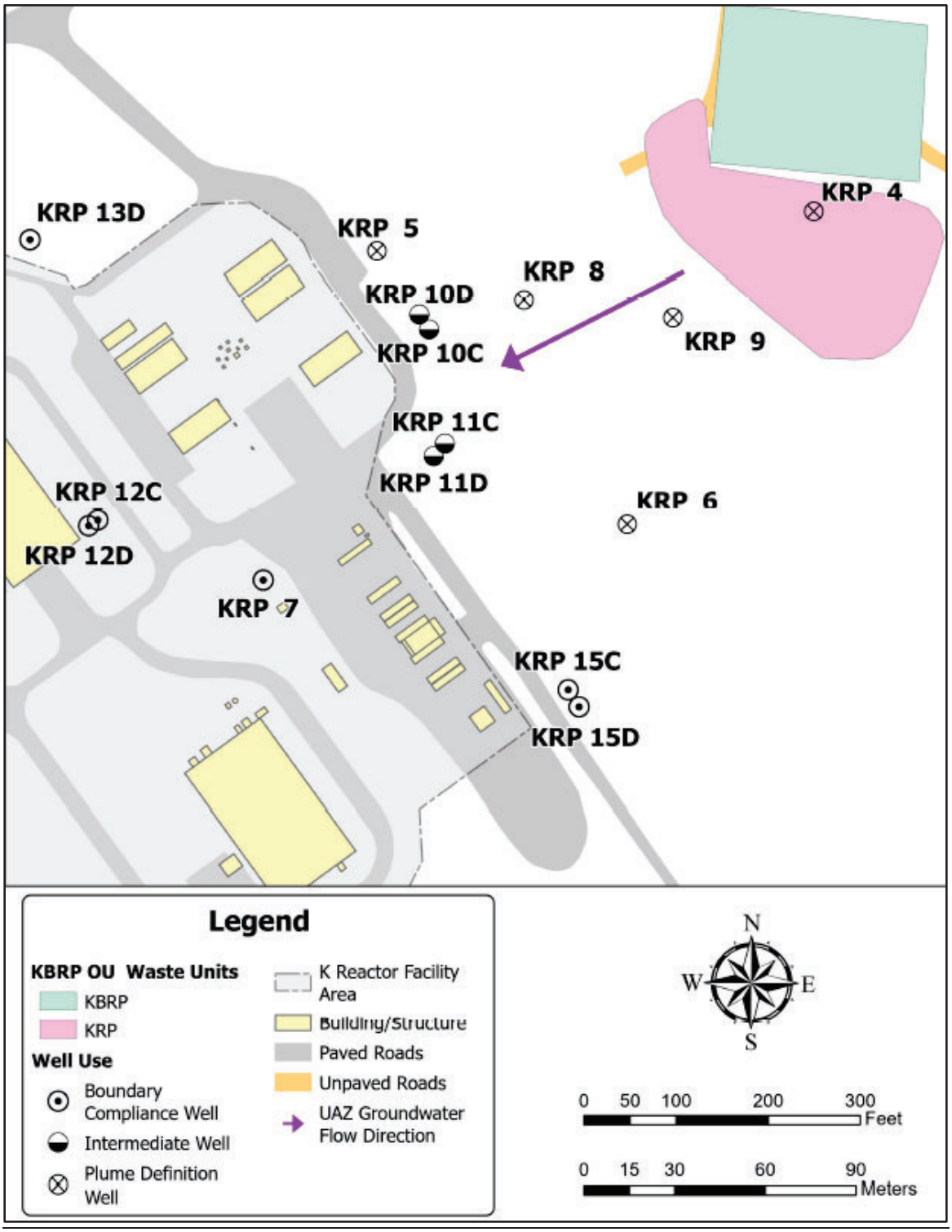


Figure H-2. Site Layout of KBRP/KRP and Well Locations

Table H-1. Chronology of Events

Event	Date
RFI/RI start/complete	1996 / December 1998
ROD issuance	August 20, 2001
Remedial Action start/complete	October 8, 2001 / March 27, 2002
Previous Five-Year Reviews Issuance	February 12, 2004 / January 29, 2009 / February 4, 2014 / February 21, 2018 / December 21, 2021

Table H-2. 2025 Groundwater Elevation Data for the KBRP/KRP

Station ID	Aquifer Zone	Groundwater Elevation (ft AMSL)
KRP 4	UAZ	214.53
KRP 5	UAZ	210.17
KRP 6	UAZ	214.03
KRP 7	UAZ	213.32
KRP 8	UAZ	214.91
KRP 9	UAZ	210.79
KRP 10C	LAZ	SS
KRP 10D	UAZ	211.19
KRP 11C	LAZ	SS
KRP 11D	UAZ	211.19
KRP 12C	LAZ	SS
KRP 12D	UAZ	210.46
KRP 13D	UAZ	210.92
KRP 15C	LAZ	SS
KRP 15D	UAZ	210.81

ft AMSL feet above mean sea level
LAZ Lower Aquifer Zone
SS Suspended Sampling
UAZ Upper Aquifer Zone

Table H-3. Remedial Goals for KBRP and KRP OU

Subunit	Media	COC	Type of COC	Remedial Goals	Basis
K-Area Burning/ Rubble Pit (131-K)	Soil	Benzo[a]anthracene	HH	6.24 mg/kg[a]	Future Industrial Worker
		Benzo[a]pyrene		0.624 mg/kg[a]	
		Benzo[b]fluoranthene		6.24 mg/kg[a]	
		Benzo[k]fluoranthene		62.4 mg/kg[a]	
		Dibenzo[a,h]anthracene		0.624 mg/kg[a]	
		Indeno[1,2,3-c,d]pyrene		6.24 mg/kg[a]	
K-Area Rubble Pile (631-20G)	Soil	Benzo[a]anthracene	HH	6.24 mg/kg[a]	Future Industrial Worker
		Benzo[a]pyrene		0.624 mg/kg[a]	
		Benzo[b]fluoranthene		6.24 mg/kg[a]	
		Indeno[1,2,3-c,d]pyrene		6.24 mg/kg[a]	
		Arsenic		7.96 mg/kg[c]	
K-Area Burning/ Rubble Pit (131-K) and K-Area Rubble Pile (631-20G)	Groundwater	Tetrachloroethylene (PCE)	HH	5.0 µg/L[b]	Future Industrial Worker and Exceedance of MCL
		Trichloroethylene (TCE)		5.0 µg/L[b]	

Chrysene, fluoranthene, and pyrene are residential COCs that exist at the KBRP/KRP OU at concentrations less than future industrial worker exposure concentrations.

a The remedial goal is based on the 1.0E-06 target cancer risk to the hypothetical, future, industrial worker.

b The remedial goal is based on the Water Quality Protection of Human Health as established by South Carolina Regulation 61-68 of the Pollution Control Act.

c The remedial goal is based on two times the mean concentration of arsenic in background soil at the KBRP and KRP.

mg/kg = milligrams per kilogram

µg/L = micrograms per liter

Table H-4. Actual versus Estimated O&M Costs

	FY2021	FY2022	FY2023	FY2024	FY2025	5-Year Total
Total Actual O&M Costs ($)	45,716	38,546	41,874	24,537	37,022	187,695
Total ROD Estimated Direct O&M Costs * ($)	16,212	2,900	2,900	2,900	2,900	27,812

* Costs for preparation of the Sixth Five-Year Remedy Review were accounted for in FY2021. The actual O&M costs are higher than expected because groundwater monitoring and reporting have continued longer than expected

Table H-5. Groundwater Monitoring Results Compared to MZCLs and MCLs

STATION ID	PCE (µg/L)		TCE(µg/L)	
	2024 Result	MZCL*/MCL	2024 Result	MZCL*/MCL
KRP 4	0.502 J	43*/5	ND	61*/5
KRP 5	ND	43*/5	ND	61*/5
KRP 6	ND	43*/5	ND	61*/5
KRP 7	ND	5	ND	5
KRP 8	1.62	43*/5	0.405 J	61*/5
KRP 9[a]	4.41	43*/5	2.32	61*/5
KRP 10C	SS	5	SS	5
KRP 10D	ND	5	ND	5
KRP 11C	SS	5	SS	5
KRP 11D	ND	5	ND	5
KRP 12C	SS	5	SS	5
KRP 12D	SS	5	SS	5
KRP 13D	SS	5	SS	5
KRP 15C	SS	5	SS	5
KRP 15D	SS	5	SS	5

a KRP 9 is sampled semi-annually. The posted result is the max result for the 2024 sampling events.
MZCL*=Mixing Zone Contaminant Level
MCL= Maximum Contaminant Level
ND= Non-detect
J= Estimated Value
SS= Sampling of well suspended under optimized sampling network

Table H-6. PFOS/PFAS Screening Results for the KBRP/KRP OU

Operable Unit Name:	**KBRP/KRP**	
Use/Category	Known Use at Facility (Yes/No)	Notes/Comments
Fire Training Facility/Fire Department Location	No	
Wastewater Treatment Plant/ Centralized Waste Treatment Landfill	No	
Uranium Enrichment/Plutonium Production/Nuclear Operations	No	
Metal Plating Processing	No	
Explosives/Munitions/Weapons	No	
Electronics Manufacturing	No	
Equipment Fuel/Maintenance (large fuel storage areas; industrial waste lines or maintenance)	No	
Well Drilling	No	Data from site groundwater wells indicate that there have been no installation or operational impacts from PFAS.
Pesticides	No	
Laboratory	No	
Consumer Product Manufacturing	No	
Operable Unit Conclusion:	**Based on the operational history and known uses, including a review of historical PFAS applications and categories, PFAS are not expected to be present at this operable unit.**	

(DUS) injected steam into a 1.2-hectare (3-acre) footprint with target depths of 13.5 to 49.5 m (45 to 165 ft) and an estimated 339,802 m^3 (12 million ft^3) of soil to remediate. Heated solvent vapors were removed by soil vapor extraction. During operation between 2005 and 2012, the DUS system, now known as the Western Sector Treatment System, removed 207,485 kg (457,426 lbs) of volatile organic compounds (VOC) contamination in the target area. In July 2013, post remediation soil samples were collected, and the VOC soil results indicated that > 99% of the solvent mass (including dense non-aqueous phase liquids [DNAPL]) was removed from the target zone. Elevated VOC concentrations are persistent in the vadose zone and groundwater outside of the target zone near the MASB. To address the vadose zone contamination, eight MicroBlowers™ and two BaroBalls™ were installed along the M-Area Abandoned Process Sewer Line in 2020 and passive soil vapor extraction continues at the Western Sector Treatment System. Additional characterization of the vadose zone to the east of the MASB was conducted in 2023 to determine the full extent of contamination. A new recovery well was installed southeast of the MASB to capture a high concentration VOC groundwater plume which became operational in 2020. In 2022, emulsified zero valent iron was injected into the groundwater northwest of the MASB to target and remediate the potential path of DNAPL migration from the MASB to Western Sector of A/M-Area Groundwater OU. An existing recovery well north of the MASB was replaced in 2025 based on diminishing pumping rates. These corrective actions were taken under the direction of the RCRA Hazardous and Mixed Waste Permit Renewal (SCDES 2025). These corrective actions are discussed as part of the A/M-Area Groundwater OU in the five-year remedy review reports for the SRS OUs with operating equipment.

There were no recommendations or follow-up actions from the last five-year review.

VI. FIVE-YEAR REVIEW PROCESS

The following tasks were performed as part of the review:

- Reviewed the documents listed in Section XII. Documents Reviewed;
- Confirmed implementation of the remedial action;

- Inspected the OU, interviewed maintenance personnel, and documented the results on the Inspection Checklist provided in Attachment I-1; and
- Ensured that all actions required under the RCRA Hazardous and Mixed Waste Permit Renewal (SCDES 2025) were implemented (i.e., quarterly inspections and maintenance to the soil covers and groundwater monitoring).

Summary of Inspections and Interviews

Scheduled quarterly site inspections were conducted from FY2021 through FY2025 (Various). The field inspection checklists are approved as part of the closure/post-closure/permit application process and are governed by the RCRA Permit Renewal for SRS. They are available in the Administrative Record File (**https://public.srs.gov/missions-and-programs/environmental-stewardship/arf-irf-index/**).

Tasks included on the field inspection checklists include:

- Verifying roads to waste units are accessible;
- Verifying fence, posts, and gates that surround M-Area Settling Basin are intact, in good condition, and unattended gates are locked;
- Verifying M-Area Settling Basin signs (10) and postings are in acceptable condition, have correct information, and are legible from a distance of 7.6 m (25 ft);
- Checking integrity of drainage ditches, drainpipes, and general area (including the drainage ditch to Lost Lake) for presence of excessive erosion, vegetation, standing water, sediment buildups, or any debris restricting water flow;
- Checking the soil cover for signs of erosion, abnormal soil cracks, depressions (subsidence), or physical impacts;
- Visually checking vegetative cover of M-Area Settling Basin for grass density, with no bare spots more than 0.9 m by 0.9 m (3 ft by 3 ft)in area and large weeds or woody vegetation on capped area. (The height of the vegetative cover should not impair the visual inspection of the soil cover. This will be determined by the Inspector.);

- Checking for excessive vegetation growing over fences which obstruct warning signs or visibility of inspected area;
- Checking M-Area Settling Basin cover for signs of burrowing animals;
- Checking side slopes for slumping and any observable signs of subsidence/depressions;
- Verifying annual Topographic/Subsidence Survey has been completed for current calendar year;
- Verifying copies of survey results are in EC&ACP Document Control Center;
- Checking around Lost Lake for evidence of any unauthorized activity in immediate area;
- Ensuring benchmark is visible and not damaged; and
- Other.

The field inspections identified the following issues: active ant mounds, evidence of small animals burrowing, broken barbed wire at gate, and overgrown vegetation in drainage ditch and pipes. These findings were documented on the field inspection checklists and resolved soon after discovery.

The MHWMF OU was inspected by Savannah River Nuclear Solutions, LLC (SRNS) Environmental Compliance and Area Completion Projects (EC&ACP) on August 27, 2025 and included taking current photographs of the MHWMF OU and reviewing the field inspection checklist. During this inspection, overgrown vegetation was identified. The issue was addressed soon after discovery. Interviews were conducted with Eric Barron, O&M staff member, and Brian Hanshew, O&M Site Manager, on September 9, 2025 at the O&M organization offices. No issues were identified for the MHWMF during these interviews. However, SRS was greatly impacted by Hurricane Helene and closed in response during the period of September 27, 2024 through October 6, 2024 with the exception of emergency and essential personnel. The site resumed normal operations on October 7, 2024. EC&ACP O&M personnel evaluated the impacts of Hurricane Helene.

No storm damages were identified at the MHWMF OU that would affect the protectiveness of the remedy.

The MHWMF OU was inspected by SRNS EC&ACP and USDOE personnel on October 28, 2025. No issues were identified for the MHWMF OU during this inspection that would affect the protectiveness of the remedy.

A regulatory site inspection with USDOE, ~~was conducted by~~ U.S. Environmental Protection Agency (USEPA) and SCDES personnel ~~will be scheduled after submittal of the Revision 0 of this document~~was held on March 19, 2026. SRNS personnel ~~will~~ were also ~~be~~ present at the meeting. During the meeting, the participants ~~will~~ viewed drone footage of MHWMF OU and ~~will be~~were provided with an opportunity to walk down the OU. The USEPA and SCDES elected not to perform a walk down because the drone video provided them with better views of the OU. No significant problems regarding the protection of the remedy for this OU as implemented ~~are anticipated to be~~were identified during the inspection.

~~Scheduled quarterly site inspections conducted from FY2021 to 2025 identified the following issues: active ant mounds, evidence of small animals burrowing, broken barbed wire at gate, and overgrown vegetation in drainage ditch and pipes. These findings were documented on the field inspection checklists and resolved soon after discovery.~~

The MHWMF OU was inspected by SCDES on September 4, 2025, as part of the RCRA annual comprehensive groundwater monitoring evaluation. The M-Area Settling Basin was observed to be in good condition and no issues were identified.

VII. TECHNICAL ASSESSMENT

Is the Remedy Functioning as Intended by the Decision Document?

The remedy, in situ stabilization/solidification, RCRA soil cover with LUCs, is effective in preventing exposure to contaminant risk above 1E-06 risk levels and mitigating further migration of contaminants to groundwater and is functioning as intended.

LUCs have been effective in maintaining restricted (industrial) land use. Quarterly site inspections and site maintenance have been effective in maintaining integrity of the soil cover. Based on site inspections, there is no indication of potential remedy failure that could place protectiveness at risk.

The LUC requirements are discussed and approved as part of the closure/post-closure/ permit application process and are governed by the RCRA Permit Renewal for the SRS (SCDES 2025). The closure/post-closure requirements are discussed in the RCRA Permit Renewal Application for the M-Area and Metallurgical Laboratory Hazardous Waste Management Facilities (M-Area and Met Lab HWMF) Postclosure (SRNS 2020). Therefore, a Land Use Control Implementation Plan is not required for this OU.

The LUCs (i.e., RCRA closure/post-closure care requirements) that are in place include physical access controls to prevent unauthorized contact (i.e., OU-specific fencing with locked gates and warning signs posted on the fences), removal or excavation of subsurface soils, and restrictions to prevent disturbance of the MHWMF OU. Warning signs are in good condition, and no activities were observed that would have violated LUCs. All LUC objectives are being met.

Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives still Valid?

The exposure assumptions, toxicity data, and cleanup levels used at the time of remedy selection are still valid. There have been no changes in the standards or physical conditions of the MHWMF OU that would affect the protectiveness of the remedy.

The applicable or relevant and appropriate requirements (ARARs) discussed in the IROD (WSRC 1992) for this limited action focus on the design and construction of the remedial action which was completed in 1990. Based on the review of this OU, the requirements of the ARAR that set forth the performance standards for the cover system (i.e., long-term minimization of migration of contaminants, function with minimum maintenance) continue to be met.

The USEPA standards and toxicity values have been updated since submittal of the last five-year remedy review as shown in Appendix B. The changes to the values for COCs at the MHWMF OU included some decreases in the regional screening levels (RSLs) due to updated input values used to calculate the RSLs. The residential soil screening level for lead decreased from 400 mg/kg to 200 mg/kg. If other sources of lead are present, the screening level is 100 mg/kg. However, these changes do not affect the protectiveness of the remedy and the RAOs continue to be met by the remedial action. No new standards or to-be-considered guidance have been identified that call into question the protectiveness of the remedy.

Fact sheets provided on the USEPA webpage (https://19january2021snapshot.epa.gov/fedfac/emerging-contaminants-and-federal-facility-contaminants-concern_.html) regarding emerging contaminants were reviewed for applicability to this site. The USEPA webpage provides a link to fact sheets for the following emerging contaminants: 1,2,3-trichloropropane (TCP), 1,4-dioxane, 2,4,6-trinitrotoluene (TNT), 2,4-dintrotoluene (DNT), hexahydro-1,3,5-tri-nitro-1,3,5-triazine (RDX), nanomaterials, N-nitroso-dimethylamine (NDMA), perchlorate, perfluorooctane sulfonic acid (PFOS) and other per- and polyfluoroalkyl substances (PFAS), polybrominated biphenyls, polybrominated diphenyl ethers (PBDEs), and tungsten. 1,4-Dioxane has been identified at the A/M-Area Groundwater OU and is being monitored under the RCRA Hazardous and Mixed Waste Permit Renewal (SCDES 2025). Future corrective action of 1,4-dioxane is discussed as part of the A/M-Area Groundwater OU in the five-year remedy review reports for the SRS OUs with operating equipment.

Based on the operational history and documented usage patterns, including a review of historical PFAS applications and categories, PFAS may be expected to be present at this waste unit (Table I-3). However, the engineered cover system in place serves as an effective and protective remedy, mitigating potential exposures and releases associated with PFAS.

The remaining emerging contaminants were not identified as applicable to this OU based on the OU history of contamination.

Has any Other Information Come to Light that Could Call into Question the Protectiveness of the Remedy?

No other information has come to light that could call into question the protectiveness of the remedy.

VIII. ISSUES

There are no issues related to current site conditions or activities that currently prevent the remedy from being protective.

IX. RECOMMENDATIONS AND FOLLOW-UP ACTIONS

There are no recommendations or follow-up actions for the MHWMF OU under CERCLA.

X. PROTECTIVENESS STATEMENT(S)

The remedy at the MHWMF OU is protective of human health and the environment.

Exposure pathways that could result in unacceptable risks are being controlled by stabilization and placement of all contaminated materials under a low-permeability cap and LUCs to prevent exposure to or ingestion of contaminated soil media and mitigating further migration of contaminants to groundwater. All threats to the MHWMF OU are being addressed through physical access controls to prevent unauthorized entry to SRS (fences, guards, security patrols, etc.), administrative controls that maintain the MHWMF OU for industrial use only, and warning signs and land use restrictions via the SRS Site Use/Site Clearance Program.

XI. NEXT REVIEW

The eighth five-year review for SRS OUs with Engineered Cover Systems is scheduled for December 2031.

XII. DOCUMENTS REVIEWED

Du Pont, 1990. *Closure Plan for the M-Area Settling Basin and Vicinity at the Savannah River Plan*, DPSPU 94-11-11, E.I. du Pont de Nemours & Company, Savannah River Plant, Aiken, SC

FFA, 1993. *Federal Facility Agreement for the Savannah River Site,* Administrative Docket No. 89-05-FF (Effective Date: August 16, 1993)

SCDES, 2025. *South Carolina Department of Health and Environmental Control Hazardous and Mixed Waste Permit, Permit Number SC1 898 008 989, 2025 RCRA Permit Renewal for the Savannah River Site, issued on October 27, 2025, Module III - Postclosure Care and Module IV – Groundwater Requirements, Section A, M-Area and Metallurgical Laboratory Hazardous Waste Management Facilities*, South Carolina Department of Environmental Services, Division of Waste Management, Bureau of Land and Waste Management, Columbia, SC

SRNS, 2020. *2013 RCRA Permit Renewal Application (U), Volume III, M-Area Metallurgical Laboratory Hazardous Waste Management Facilities (M-Area and Met Lab HWMFs) Postclosure*, SRNS-IM-2012-00002, ~~latest r~~Revision 4, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

USDOE, 1996. *Savannah River Site Future Use Project Report*, U.S. Department of Energy, Savannah River Operations Office, Savannah River Site, Aiken, SC

WSRC, 1992. *Interim Action Record of Decision Remedial Alternative Selection M-Area Hazardous Waste Management Facility Operable Unit*, WSRC-RP-92-743, Revision 0, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 1999. *Land Use Control Assurance Plan for the Savannah River Site*, WSRC-RP-98-4125, Revision 1.1, latest revision, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

Various - *Inspection Data Sheets – Field Inspection Checklist, M-Area HWMF Post Closure Inspection (U)*, ER-IDS-019-022, Inspection period FY2021 through FY2025 (quarterly)

Table I-1. Chronology of OU Events

Event	Date
RCRA Closure Plan Approved	1987
Corrective Action Start	1988
RCRA Closure Completed	1990
IROD Issuance	September 6, 1992
Previous Five-Year Reviews Issuance	June 30, 1997 / * / January 29, 2009 / February 4, 2014 / February 21, 2018 / December 21, 2021

*No review was conducted in 2004 due to an administrative oversight.

Table I-2. Actual versus Estimated O&M Costs

	FY2021	FY2022	FY2023	FY2024	FY2025	Five-Year Total
Total Actual O&M Costs ($)	54,004	27,035	28,166	29,956	47,640	186,800
Total ROD Estimated Direct O&M Costs ($)	20,000	20,000	20,000	20,000	20,000	100,000

RCRA documentation does not require estimated project costs to be prepared. However, an estimated cost was provided in the M-Area HWMF IROD (WSRC 1992).

Table I-3. PFOS/PFAS Screening Results for the MHWMF OU

Operable Unit Name:	**MHWMF**	
Use/Category	Known Use at Facility (Yes/No)	Notes/Comments
Fire Training Facility/Fire Department Location	No	
Wastewater Treatment Plant/ Centralized Waste Treatment Landfill	No	
Uranium Enrichment/Plutonium Production/Nuclear Operations	No	
Metal Plating Processing	**Yes**	
Explosives/Munitions/Weapons	No	
Electronics Manufacturing	No	
Equipment Fuel/Maintenance (large fuel storage areas; industrial waste lines or maintenance)	No	
Well Drilling	No	Data from site groundwater wells indicate that there have been no installation or operational impacts from PFAS.
Pesticides	No	
Laboratory	No	
Consumer Product Manufacturing	No	
Operable Unit Conclusion:	**Based on the operational history and documented usage patterns, including a review of historical PFAS applications and categories, PFAS may be expected to be present at this operable unit.**	

VI. FIVE-YEAR REVIEW PROCESS

The following tasks were performed as part of the review:

- Reviewed the documents listed in Section XII. Documents Reviewed;
- Confirmed the implementation of the remedial action;
- Inspected the OU, interviewed maintenance personnel and documented the results on the Inspection Checklist provided in Attachment J-1; and
- Ensured that all actions required under the RCRA Hazardous and Mixed Waste Permit Renewal (SCDES 2025) were implemented (i.e., quarterly inspections, annual subsidence survey reports and maintenance to the soil covers).

Summary of Inspections and Interviews

Scheduled quarterly site inspections were conducted from FY2021 through FY2025 (Various). The field inspection checklists are approved as part of the closure/post-closure/permit application process and are governed by the RCRA Permit Renewal for SRS.. They are available in the Administrative Record File (**https://public.srs.gov/missions-and-programs/environmental-stewardship/arf-irf-index/**).

Tasks included on the field inspection checklists include:

- Verifying roads to waste units are accessible;
- Verifying signs on the fence are in acceptable condition and are legible from a distance of 7.6 m (25 ft). Signs must include “Danger Unauthorized Personnel Keep Out” and include Post Closure Manager and Savannah River Site Operations Center contact information;
- Verifying fence is in good condition (e.g., shows no signs of serious wear);
- Checking the soil cover and side slopes for signs of erosion, depression (subsidence) and evidence of burrowing animals;

- Checking the integrity of drainage ditches for the presence of excessive erosion, sediment buildup, and any debris restricting water flow;
- Verifying that no woody vegetation is growing on the soil cover, and remove or identify as needed;
- Visually checking vegetative cover for grass density with no bare spots more than 0.9 m by 0.9 m (3 ft by 3ft) in area. The height of the vegetation should not impair visual inspection of the soil cover. This will be determined by the Inspector;
- Visually performing a condition check of the survey benchmarks for damage and visibility;
- Verifying annual topographic/subsidence survey has been performed by end of June for current year, and verify copies of survey results are in EC&ACP Document Control Center;
- Inspecting A-08 Outfall Diversion Ditch for the presence and debris restricting water flow; and
- Other.

The field inspections identified the following issues: overgrown vegetation, active ant mounds, signs needed to be replaced, minor fencing repairs needed. These findings were documented on the field inspection checklists and resolved soon after discovery.

The Met Lab HWMF OU was inspected by Savannah River Nuclear Solutions, LLC (SRNS) Environmental Compliance and Area Completion Projects (EC&ACP) on August 27, 2025 and included taking current photographs of the Met Lab OU and reviewing the field inspection checklist. No issues were identified during this inspection. Interviews were conducted with Eric Barron, O&M staff member, and Brian Hanshew, O&M Site Manager, on September 9, 2025 at the O&M organization offices. No issues were identified for the Met Lab OU during these interviews. However, SRS was greatly impacted by Hurricane Helene and closed in response during the period of September 27, 2024 through October 6, 2024 with the exception of emergency and essential personnel. The site resumed normal

operations on October 7, 2024. EC&ACP O&M personnel evaluated the impacts of Hurricane Helene. No storm damages were identified at the Met Lab HWMF OU that would affect the protectiveness of the remedy.

The Met Lab OU was inspected by SRNS EC&ACP and USDOE personnel on October 28, 2025. No issues were identified for the Met Lab HWMF OU during this inspection that would affect the protectiveness of the remedy.

A regulatory site inspection with USDOE, ~~will be conducted by~~ USEPA and SCDES personnel ~~and will be scheduled after submittal of Rvision 0 of this document~~was held on March 19, 2026. SRNS personnel ~~will~~ were also ~~be~~ present at the meeting. During the meeting, the participants ~~will~~ viewed drone footage of Met Lab OU and ~~will be~~ were provided with an opportunity to walk down the OU. The USEPA and SCDES elected not to perform a walk down because the drone video provided them with better views of the OU. No significant problems regarding the protection of the remedy for this OU as implemented ~~are anticipated to be~~were identified during the inspection.

~~Scheduled quarterly site inspections conducted from FY2021 to FY2025 identified the following issues: overgrown vegetation, active ant mounds, signs needing to be replaced, minor fencing repairs needed. These findings were documented on the field inspections checklists and resolved soon after discovery.~~

The Met Lab HWMF OU was inspected by SCDES on September 4, 2025, as part of the RCRA annual comprehensive groundwater monitoring evaluation. The Met Lab Settling Basin was observed to be in good condition and no issues were identified.

VII. TECHNICAL ASSESSMENT

Is the Remedy Functioning as Intended by the Decision Document?

The remedy, in situ stabilization/solidification, RCRA soil cover with LUCs, is effective in preventing exposure to contaminant risk above 1E-06 risk levels and mitigating further migration of contaminants to groundwater and is functioning as intended.

LUCs have been effective in maintaining restricted (industrial) land use. Quarterly site inspections and site maintenance have been effective in maintaining integrity of the soil cover. Based on site inspections, there is no indication of potential remedy failure that could place protectiveness at risk.

The LUC requirements are discussed and approved as part of the closure/post-closure/ permit application process and are governed by the RCRA Hazardous and Mixed Waste Permit Renewal for the SRS (SCDES 2025). The closure/post-closure requirements are discussed in the RCRA Permit Renewal Application for the M-Area and Metallurgical Laboratory Hazardous Waste Management Facilities (M-Area and Met Lab HWMF) Postclosure (SRNS 2020). Therefore, a Land Use Control Implementation Plan is not required for this OU.

The LUCs (i.e., RCRA closure/post-closure care requirements) that are in place include physical access controls to prevent unauthorized contact (i.e., OU-specific fencing with locked gates and warning signs posted on the fences), removal or excavation of subsurface soils, and restrictions to prevent disturbance of the Met Lab HWMF OU. Warning signs are in good condition, and no activities were observed that would have violated LUCs. All LUC objectives are being met.

Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives still Valid?

The exposure assumptions, toxicity data, and cleanup levels used at the time of remedy selection are still valid. There have been no changes in the standards or physical conditions of the Met Lab HWMF OU that would affect the protectiveness of the remedy.

Two applicable or relevant and appropriate requirements (ARARs) were identified in the IROD (WSRC 1992). The first ARAR, a NPDES permit modification for discharge of basin rainwater to an outfall to surface water, has been met as the construction of the cover system is completed. The second ARAR includes SCHWMR R.61-79.265 for RCRA equivalent performance standards for the cap design. The cap was designed to meet the ARAR. Based on the review of this OU, the requirements of the ARAR (i.e. long-term

minimization of migration of contaminants, function with minimum maintenance) continue to be met. There have been no changes in standards or to-be-considered guidance identified in the IROD that call into question the protectiveness of the remedy.

The USEPA standards and toxicity values have been updated since submittal of the last five-year remedy review as shown in Appendix B. The changes to the values for COCs at the Met Lab HWMF OU were not significant, and the RAOs continue to be met by the remedial action. No new standards or to-be-considered guidance have been identified that call into question the protectiveness of the remedy.

Fact sheets provided on the USEPA webpage (https://19january2021snapshot.epa.gov/fedfac/emerging-contaminants-and-federal-facility-contaminants-concern_.html) regarding emerging contaminants were reviewed for applicability to this site. The USEPA webpage provides a link to fact sheets for the following emerging contaminants: 1,2,3-trichloropropane (TCP), 1,4-dioxane, 2,4,6-trinitrotoluene (TNT), 2,4-dintrotoluene (DNT), hexahydro-1,3,5-tri-nitro-1,3,5-triazine (RDX), nanomaterials, N-nitroso-dimethylamine (NDMA), perchlorate, perfluorooctane sulfonic acid (PFOS) and other per- and polyfluoroalkyl substances (PFAS), polybrominated biphenyls, polybrominated diphenyl ethers (PBDEs), and tungsten. None of these emerging contaminants, except for PFOS and other PFAS, were identified as applicable to this OU based on the OU history of contamination.

Based on the operational history and documented usage patterns, including a review of historical PFAS applications and categories, PFAS may be expected to be present at this waste unit (Table J-3). However, the engineered cover system in place serves as an effective and protective remedy, mitigating potential exposures and releases associated with PFAS.

Has any Other Information Come to Light that Could Call into Question the Protectiveness of the Remedy?

No other information has come to light that could call into question the protectiveness of the remedy.

VIII. ISSUES

There are no issues that prevent the remedy for the Met Lab HWMF OU from being protective.

IX. RECOMMENDATIONS AND FOLLOW-UP ACTIONS

There are no recommendations or follow-up actions for the Met Lab HWMF OU under CERCLA.

X. PROTECTIVENESS STATEMENT(S)

The remedy at the Met Lab HWMF OU is protective of human health and the environment.

Exposure pathways that could result in unacceptable risks are being controlled by stabilization and placement of all contaminated materials under a lower permeability cap and LUCs to prevent exposure to or ingestion of contaminated soil media and mitigating further migration of contaminants to groundwater. All threats to the Met Lab HWMF OU are being addressed through physical access controls to prevent unauthorized entry to SRS (fences, guards, security patrols, etc.), administrative controls that maintain the Met Lab HWMF OU for industrial use only, and warning signs and land use restrictions via the SRS Site Use/Site Clearance Program.

XI. NEXT REVIEW

The eighth five-year review for SRS OUs with Engineered Cover Systems is scheduled for December 2031.

XII. DOCUMENTS REVIEWED

FFA, 1993. *Federal Facility Agreement for the Savannah River Site,* Administrative Docket No. 89-05-FF (Effective Date: August 16, 1993)

SCDES, 2025. *South Carolina Department of Health and Environmental Control Hazardous and Mixed Waste Permit, Permit Number SC1 898 008 989, 2025 RCRA Permit Renewal for the Savannah River Site, issued on October 27, 2025, Module III - Postclosure Care and Module IV – Groundwater Requirements, Section A, M-Area and Metallurgical*

Laboratory Hazardous Waste Management Facilities, South Carolina Department of Environmental Services, Division of Waste Management, Bureau of Land and Waste Management, Columbia, SC

SRNS, 2020. *2013 RCRA Permit Renewal Application (U), Volume III, M-Area and Metallurgical Laboratory Hazardous Waste Management Facilities (M-Area and Met Lab HWMFs) Postclosure*, SRNS-IM-2012-00002, ~~latest r~~Revision 4, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

USDOE, 1996. *Savannah River Site Future Use Project Report*, U.S. Department of Energy, Savannah River Operations Office, Savannah River Site, Aiken, SC

WSRC, 1991. *Metallurgical Laboratory Hazardous Waste Management Facility Closure Plan* WSRC-RP-92-423, Revision 5, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 1992. *Interim Action Record of Decision Remedial Alternative Selection, Metallurgical Laboratory Hazardous Waste Management Facility Operable Unit (U),* WSRC-RP-92-745, Revision 0, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 1999. *Land Use Control Assurance Plan for the Savannah River Site*, WSRC-RP-98-4125, Revision 1.1, latest revision, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

Various - Inspection Data Sheets – *Field Inspection Checklist, Metallurgical Laboratory HWMF Post Closure Inspection (U)*, ER-IDS-019-020, Inspection Period FY2021 to FY2025 (quarterly)

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Table J-1. Chronology of OU Events

Event	Date
Corrective Action Start	1991
RCRA Closure Certified	June 1991
IROD Issuance	September 16, 1992
Previous Five-Year Reviews Issuance	August 27, 1997 / February 12, 2004 / January 29, 2009 / February 4, 2014 / February 21, 2018 / December 21, 2021

Table J-2. Actual versus Estimate Costs

	FY2021	FY2022	FY2023	FY2024	FY2025	Five-Year Total
Total Actual O&M Costs ($)	51,514	23,609	24,596	26,160	43,204	169,083
Total ROD Estimated Direct O&M Costs ($)	20,000	20,000	20,000	20,000	20,000	100,000

RCRA documentation does not require estimated project costs to be prepared. However, an estimated cost was provided in the Met Lab HWMF IROD (WSRC 1992).

Table J-3. PFOS/PFAS Screening Results for the Met Lab OU

Operable Unit Name:	**Met Lab**	
Use/Category	Known Use at Facility (Yes/No)	Notes/Comments
Fire Training Facility/Fire Department Location	No	
Wastewater Treatment Plant/ Centralized Waste Treatment Landfill	No	
Uranium Enrichment/Plutonium Production/Nuclear Operations	No	
Metal Plating Processing	**Yes**	
Explosives/Munitions/Weapons	No	
Electronics Manufacturing	No	
Equipment Fuel/Maintenance (large fuel storage areas; industrial waste lines or maintenance)	No	
Well Drilling	No	Data from site groundwater wells indicate that there have been no installation or operational impacts from PFAS.
Pesticides	No	
Laboratory	**Yes**	
Consumer Product Manufacturing	No	
Operable Unit Conclusion:	**Based on the operational history and documented usage patterns, including a review of historical PFAS applications and categories, PFAS may be expected to be present at this operable unit.**	

APPENDIX K. MIXED WASTE MANAGEMENT FACILITY (643-28E) OPERABLE UNIT

I. INTRODUCTION

This report is the seventh five-year review for the Mixed Waste Management Facility (643-28E) (MWMF) Operable Unit (OU). The review was conducted from July 2025 through December 2025. Contaminants have been left in place at the MWMF OU at levels that do not allow for unlimited use and unrestricted exposure. The purpose of this review is to determine whether the remedy in place at the MWMF OU is protective of human health and the environment. This report documents the results of the review.

The remedy for this unit is conducted under the Savannah River Site (SRS) Resource Conservation and Recovery Act (RCRA) program. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) remediation requirements are met by the RCRA program; therefore, no further remedial action is necessary under CERCLA.

II. OU CHRONOLOGY

Table K-1 lists the chronology of site events for the MWMF OU.

III. BACKGROUND

MWMF OU is listed as a RCRA Unit in Appendix C of the Federal Facility Agreement (FFA) for SRS (FFA 1993). The media associated with the MWMF OU is soil.

The groundwater is being addressed by the MWMF Groundwater OU. Groundwater corrective actions are performed under the RCRA Hazardous and Mixed Waste Permit Renewal for SRS.

Physical Characteristics

The MWMF OU is located in the central portion of SRS between F- and H-Areas, approximately 8 km (5 mi) from the nearest site boundary (Figures K-1 and K-2). The MWMF is a source-specific OU within the Burial Ground Complex and within the Upper Three Runs Watershed. The MWMF consists of 118 slit trenches, one engineered low-

level trench (ELLT), and a naval core barrel mound. This facility comprises approximately 23.5 hectares (58 acres).

The slit trenches are generally 6 m (20 ft) deep and 6 m (20 ft) wide with varying lengths up to 360 m (1200 ft). The trenches were spaced approximately 3 m (10 ft) apart. The trenches were backfilled with natural soil during landfilling operations to minimize the potential for fire and airborne releases. This practice was modified in 1985 with the initiation of ELLT operation, which consisted of stacking waste containerized in B-25 boxes (metal disposal containers, 1.2 m x 1.2 m x 1.8 m [4 ft x 4 ft x 6 ft] in dimension) in the trench completely before backfilling the trench. The dimensions of the ELLT are 40.2 m (134 ft) by 150 m (500 ft) by 6.6 (22 ft) deep. Approximately 9,600 B-25 boxes were placed in ELLT-1. An earthen mound was used for the disposal of naval reactor equipment.

Land and Resource Use

According to the *Savannah River Site Future Use Project Report* (USDOE 1996), residential uses of SRS land should be prohibited. The *Land Use Control Assurance Plan for the Savannah River Site* (WSRC 1999a) designates the MWMF OU as being within an industrial area. The future land use for the MWMF OU is reasonably anticipated to remain industrial with U.S. Department of Energy (USDOE) maintaining control of the land.

History of Contamination

The MWMF operated from 1969 until March 11, 1986. During that time, this facility received low-level radioactive waste materials produced at SRS. Some of these materials are classified under RCRA as mixed waste containing both hazardous and radioactive components. Waste from SRS was disposed of in the form of job control waste and sent to the MWMF (e.g., rags, gloves and coveralls, soil, construction debris, failed equipment, spent air filters, spent lithium-aluminum targets, irradiated scrap metal, naval reactor hardware, lead shielding, waste oil, scintillation fluids, cadmium, and silver-coated beryl saddles). ~~The primary constituents of concern (COCs) are tritium, lead, trichloroethylene (TCE), and uranium.~~

Initial Response

RCRA preventive actions at the MWMF were conducted pursuant to the requirements of the RCRA per Settlement Agreement 87-27-SW.

Closure of the MWMF began in 1988, per the South Carolina Department of Environmental Services (SCDES) approved closure plan (WSRC 1991) and was completed in December 1990. The MWMF was closed by compaction of the waste in place via dynamic compaction followed by placement of a protective low-permeability multi-layer cover system over the waste trenches to reduce rainwater contact with wastes.

The MWMF was certified closed in 1991 and was accepted by SCDES in April 1991 as being in compliance with RCRA requirements.

Basis for Taking Action

In 1984, SRS made an administrative decision to determine the extent of mixed waste deposited in the Low-Level Radioactive Waste Disposal Facility (LLRWDF). Through researching records and analysis of mixed wastes against RCRA regulations, SRS determined that the area within LLRWDF referred to as the MWMF contained mixed wastes.

A RCRA Closure Plan was submitted to SCDES in 1985 with approval in 1987. The RCRA closure of the MWMF began in 1988 and was completed in December 1990. The RCRA preventive activities at the MWMF became subject to CERCLA when the entire SRS facility was placed on the National Priorities List in December 1989. ~~A Part B Permit Application for Post-Closure Care was submitted in November 1992.~~

Per the approved 2025 RCRA Hazardous and Mixed Waste Permit Renewal (SCDES 2025), post-closure care is regulated under SCHWMR R.61-79-264. In addition, an ongoing corrective action and monitoring program at the MWMF is administered through the 2025 RCRA Hazardous and Mixed Waste Permit Renewal (SCDES 2025). The monitoring program consists of monitoring for impacts to groundwater, seepline surface water, and surface water of Fourmile Branch and Upper Three Runs.

Statistical analyses on data collected since 1991 were performed to determine COCs. The COCs identified at the MWMF OU are barium, chloroform, cadmium, 1,1-dichloroethane, vinyl chloride, trans-1,2-dichloroethylene, phenol, aluminum, iron, manganese, carbon-14, lead, tritium, nickel, tetrachloroethylene, TCE, zinc, uranium-234/235, and uranium-238 (WSRC 1994). No remedial goals (RGs) were identified in the Record of Decision (ROD) for these constituents.

IV. REMEDIAL ACTIONS

Remedy Selection

Preventative alternatives were developed for the MWMF within the RCRA closure process in 1988. As documented in the MWMF OU ROD, the RCRA closure was selected as the final action under CERCLA. Therefore, no further action under CERCLA was necessary for the MWMF OU (WSRC 1994).

The closure design for the MWMF was consistent with requirements of: RCRA, 40 Code of Federal Regulation 265, South Carolina Hazardous Waste Management Regulations R.61-79.265, and USDOE Order 5820.2 Radioactive Waste Management.

The MWMF was closed according to the approved Closure Plan (WSRC 1991).

The remedial action objectives (RAOs) were to prevent the physical exposure to contaminants and to mitigate further migration of contaminants to the groundwater by minimizing a liquid medium pathway (rainwater percolation) for transport. The MWMF RCRA preventative action of placement of all contaminated materials under a low-permeability cap and institutional controls (i.e., Land Use Controls [LUCs]) satisfied both RAOs.

Post-closure requirements will be met by:

- Maintaining the integrity and effectiveness of the final cover, including making repairs to the RCRA cap as necessary to correct the effects of settling, subsidence, erosion, or other events;

- Inspected the OU, interviewed maintenance personnel, and documented the results on the Inspection Checklist provided in Attachment K-1 with the purpose of assessing the protectiveness of the remedy and the functionality of the access controls; and
- Ensured that all actions required under the RCRA Hazardous and Mixed Waste Permit Renewal (SCDES 2025) were implemented (i.e., quarterly inspections and maintenance to the soil covers and groundwater monitoring).

Data Review

Groundwater

Fact sheets provided on the U.S. Environmental Protection Agency (USEPA) webpage regarding emerging contaminants were reviewed for applicability to this site. Due to the presence of chlorinated solvents at MWMF, 1,4-dioxane was identified as a potential contaminant for the groundwater and has been sampled dating back to 1992. As shown in Figure K-5, 1,4-dioxane has been detected in the Southwest Plume (SWP), comingled with the tritium plume, both are sourced from the ORWBG. As previously stated, groundwater is regulated by the RCRA Hazardous Waste Permit Renewal (SCDES 2025) and is addressed in the MWMF Groundwater OU.

The low permeability cap over the Old Radiological Waste Burial Ground (ORWBG) has reduced the tritium concentration in the SWP by approximately 40%. Source term control from the cap and advective depletion of the aquifer should cause the concentration of the 1,4-dioxane in the aquifers and pond to be significantly reduced with time (SRNS ~~2024~~2025). The current phytoremediation/spray irrigation system operating in the SWP to address the tritium appears to be curtailing expansion of the 1,4-dioxane plume. 1,4-dioxane is prone to volatilization and photo-oxidation in air (7 to 10-hour half-life, maximum lifetime of 23 hours) in a spray irrigation setting (SRNS 2025). The remedial approach for the 1,4-dioxane is described in the ~~2013~~ 2023 RCRA Permit Renewal Application for the MWMF (SRNS 2024).

Summary of Inspections and Interviews

Scheduled quarterly site inspections were conducted from FY2021 through FY2025 (Various). The field inspection checklists are approved as part of the closure/post-closure/permit application process and are governed by the RCRA Permit Renewal for SRS. They are available in the Administrative Recored File (**https://public.srs.gov/missions-and-programs/environmental-stewardship/arf-irf-index/**).

Tasks included on the field inspection checklists include:

- Verifying roads to waste units are accessible;
- Verifying waste unit signs (24) are in acceptable condition, have correct information and are legible from a distance of 7.6 m (25 ft) and refer to Manual C.3, Vol. 1, ER-SOP-019, for source document;
- Verifying fence wire, posts, gates, other areas of fence are intact and in good condition, both inside and outside the perimeter fence;
- Checking for excessive vegetation growing over fences which may obstruct warning signs or visibility of the closure cover;
- Inspecting closure cover and check for erosion, uncovered buried waste, abnormal soil cracks, and presence of burrowing animals;
- Checking integrity of concrete-lined drainage channels inside and outside fenced areas for the presence of erosion or debris restricting water flow. Build-up of debris/ sedimentation in drainage ditches is not to exceed 5 cm (2 in). Ditches are designed to collect run-off and divert run-on. Standing water in the ditches or on the cover is not exceed defined limits;
- Visually checking the cover and side slopes for signs of ponding, slumping, excessive erosion, and any observable depressions indicating subsidence;
- Visually checking vegetative cover for grasses density with no bare spots more than 0.9 m by 0.9 m (3 ft by 3 ft) in diameter. There should be no woody vegetation or shrubs growing on the closure covers. The height of vegetative cover should not impair

visual inspection of closure. This will be determined by the EC&ACP Post Closure Inspector;

- Visually checking subsidence monitors for damage visibility;
- Visually performing a condition check of survey benchmarks for damage and visibility;
- Verifying unattended gates are locked to prevent unauthorized entry;
- Verifying annual elevation surveys of the subsidence monitors have been performed by end of November for the current year. Verifying copies of survey results are in the EC&ACP Document Control Center;
- (Inspector) Verifying in January, April, July, and October, previous "Quarterly Monitoring Well inspector Report" has been sent to EC&ACP Document Control Center. This report can be obtained from EC&ACP Post-Closure Well Maintenance Group;
- Checking gas vents for signs of damage for obstructions; and
- Other.

The field inspections identified the following issues: active ant mounds, a sign needing to be replaced, minor rutting from mowing equipment, cracked, chipped, and/or failing concrete, and clearing of debris and repairs to drainage channels. These findings were documented on the field inspection checklists and resolved soon after discovery.

The MWMF OU was inspected by Savannah River Nuclear Solutions, LLC (SRNS) Environmental Compliance and Area Completion Projects (EC&ACP) on August 27, 2025 and included taking current photographs of the MWMF OU and reviewing the field inspection checklist. No issues were identified for the MWMF during this inspection that would affect the protectiveness of the remedy. Interviews were conducted with Eric Barron, O&M staff member, and Brian Hanshew, O&M Site Manager, on September 9, 2025 at the O&M organization offices. No issues were identified for the MWMF OU during these interviews. However, SRS was greatly impacted by Hurricane Helene and closed in response during the period of September 27, 2024 through October 6, 2024 with

the exception of emergency and essential personnel. The site resumed normal operations on October 7, 2024. EC&ACP O&M personnel evaluated the impacts of Hurricane Helene. No storm damages were identified at the MWMF OU that would affect the protectiveness of the remedy.

The MWMF OU was inspected by SRNS EC&ACP and USDOE personnel on October 29, 2025. No issues were identified for the MWMF during this inspection that would affect the protectiveness of the remedy.

A regulatory site inspection ~~meeting will be conducted~~ with USDOE, USEPA and SCDES personnel ~~after submittal of the Revision 0 of this document~~was held on March 19, 2026. SRNS and USDOE personnel ~~will~~ were also ~~be~~ present at the meeting. During the meeting, the participants ~~will~~ viewed drone footage of MWMF OU and ~~will be~~ were provided with an opportunity to walk down the OU. The USEPA and SCDES elected not to perform a walk down because the drone video provided them with better views of the OU. No significant problems regarding the protection of the remedy for MWMF OU as implemented ~~are anticipated to be~~were identified during the inspection.

~~Scheduled quarterly site inspections conducted from FY2021 through FY2025 identified the following issues: active ant mounds, a sign needed to be replaced, minor rutting from mowing equipment, cracked, chipped, and/or failing concrete, and clearing of debris and repairs to drainage channels. These findings were documented on the field inspection checklists and resolved soon after discovery.~~

The MWMF OU was inspected by SCDES on September 4, 2025, as part of the RCRA annual comprehensive groundwater monitoring evaluation. The MWMF OU was observed to be in good condition and no issues were identified.

VII. TECHNICAL ASSESSMENT

Is the Remedy Functioning as Intended by the Decision Document?

The remedy, in-situ stabilization/solidification, RCRA soil cover with LUCs, is effective in preventing exposure to contaminant risk above 1E-06 risk levels and mitigating further migration of contaminants to groundwater and is functioning as intended.

LUCs have been effective in maintaining restricted (industrial) land use. Quarterly site inspections and site maintenance have been effective in maintaining integrity of the soil cover. Based on site inspections, there is no indication of potential remedy failure that could place protectiveness at risk.

The LUC requirements are discussed and approved as part of the closure/post-closure/ permit application process and are governed by the RCRA Hazardous and Mixed Waste Permit Renewal for the SRS (SCDES 2025). The closure/post-closure requirements are discussed in the 2023 RCRA Permit Renewal Application for the MWMF Postclosure (SRNS 2024). Therefore, a Land Use Control Implementation Plan is not required for this OU.

The LUCs (i.e., RCRA closure/post-closure care requirements) that are in place include physical access controls to prevent unauthorized contact (i.e., OU-specific fencing with locked gates and warning signs posted on the fences), removal or excavation of subsurface soils, and restrictions to prevent disturbance of the MWMF OU. Warning signs are in good condition, and no activities were observed that would have violated LUCs. All LUC objectives are being met.

Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives still Valid?

The exposure assumptions, toxicity data, and cleanup levels used at the time of final remedy selection are still valid. There have been no changes in the standards or physical conditions of the MWMF OU that would affect the protectiveness of the remedy.

As the remedial work has been completed, the applicable standards, set forth in the ROD (WSRC 1994) and RCRA closure plan (WSRC 1991), have been met. All standards and

to-be-considered values associated with groundwater will be addressed as part of the MWMF Groundwater OU. Groundwater corrective actions are performed under the RCRA Hazardous and Mixed Waste Permit Renewal for SRS.

The USEPA standards and toxicity values have been updated since submittal of the last five-year remedy review as shown in Appendix B. The changes to the values for COCs at the MWMF OU included some decreases in the RSLs due to updated input values used to calculate the RSLs. The residential soil screening level for lead decreased from 400 mg/kg to 200 mg/kg. If other sources of lead are present, the screening level is 100 mg/kg. However, these changes do not affect the protectiveness of the remedy and RAOs continue to be met by the remedial action. No new standards or to-be-considered guidance have been identified that call into question the protectiveness of the remedy.

Fact sheets provided on the USEPA webpage (https://19january2021snapshot.epa.gov/fedfac/emerging-contaminants-and-federal-facility-contaminants-concern_.html) regarding emerging contaminants were reviewed for applicability to this site. The USEPA webpage provides a link to fact sheets for the following emerging contaminants: 1,2,3-trichloropropane (TCP), 1,4-dioxane, 2,4,6-trinitrotoluene (TNT), 2,4-dintrotoluene (DNT), hexahydro-1,3,5-tri-nitro-1,3,5-triazine (RDX), nanomaterials, N-nitroso-dimethylamine (NDMA), perchlorate, perfluorooctane sulfonic acid (PFOS) and other per- and polyfluoroalkyl substances (PFAS), polybrominated biphenyls, polybrominated diphenyl ethers (PBDEs), and tungsten. 1,4-dioxane was identified in 1992 and was added to the Groundwater Protection Standards for the SWP emanating from the MWMF (SRNS 2024). The ~~2013~~ 2023 RCRA Renewal Application (SRNS 2024) describes the corrective action for 1,4-dioxane.

Based on the operational history and documented usage patterns, including a review of historical PFAS applications and categories, PFAS may be expected to be present at this waste unit (Table K-3). However, the engineered cover system in place serves as an effective and protective remedy, mitigating potential exposures and releases associated with PFAS.

None of the other listed emerging contaminants were identified as applicable to this OU.

Table K-1. Chronology of Site Events

Event	Date
RCRA Closure Plan Approved	December 1987
Corrective Action start	1988
RCRA Closure Certified	1991
Final ROD issuance	September 23, 1994
Previous Five-Year Reviews Issuance	August 27, 1997 / February 12, 2004 / January 29, 2009 / February 4, 2014 / February 21, 2018 / December 21, 2021

Table K-2. Actual versus Estimated O&M Costs

	FY2021	FY2022	FY2023	FY2024	FY2025	Five-Year Total
Total Actual O&M Costs ($)	207,405	269,541	280,816	298,667	353,197	1,409,626
Total ROD Estimated Direct O&M Costs ($)	N/A	N/A	N/A	N/A	N/A	N/A

RCRA documentation does not require estimated project costs to be prepared.
N/A = not applicable

Table K-3. PFOS/PFAS Screening Results for the MWMF OU

Operable Unit Name:	**MWMF**	
Use/Category	Known Use at Facility (Yes/No)	Notes/Comments
Fire Training Facility/Fire Department Location	No	
Wastewater Treatment Plant/ Centralized Waste Treatment Landfill	**Yes**	
Uranium Enrichment/Plutonium Production/Nuclear Operations	**Yes**	
Metal Plating Processing	No	
Explosives/Munitions/Weapons	No	
Electronics Manufacturing	No	
Equipment Fuel/Maintenance (large fuel storage areas; industrial waste lines or maintenance)	No	
Well Drilling	No	Data from site groundwater wells indicate that there have been no installation or operational impacts from PFAS.
Pesticides	No	
Laboratory	No	
Consumer Product Manufacturing	No	
Operable Unit Conclusion:	**Based on the operational history and documented usage patterns, including a review of historical PFAS applications and categories, PFAS may be expected to be present at this operable unit.**	

Summary of Inspections and Interviews

Scheduled annual site inspections were conducted from FY2021 through FY2025 (Various).

Tasks included on the field inspection checklists include:

- Verifying roads are accessible;
- Verifying waste unit signs (20) are in acceptable condition, have the correct information and are legible from a distance of 7.6 m (25 ft);
- Verifying fence is locked and in good condition;
- Verifying there is no excavating, digging, or construction activity on the soil cover;
- Checking integrity of drainage ditches for presence of excessive erosion, sediment buildup and any debris restricting water flow;
- Verifying no woody vegetation is growing on the soil cover, and remove or identify as needed;
- Visually checking vegetative cover for grass density with no bare spots more than 0.9 m by 0.9 m (3 ft by 3ft) in area. (The height of the vegetation should not impair the visual inspection of the soil cover. This will be determined by the Inspector.);
- Checking soil cover for signs of erosion or depressions (subsidence);
- Checking for signs of burrowing animals; and
- Other.

The field inspections identified the following issues: active ant mounds, evidence of burrowing animals, and trees on fence and blown over dur to a hurricane. These findings were documented on the field inspection checklists and resolved soon after discovery.

The SRLSB OU was inspected by Savannah River Nuclear Solutions, LLC (SRNS) Environmental Compliance and Area Completion Project (EC&ACP) on August 19, 2025 and included taking current photographs of the SRLSB OU and reviewing the field

inspection checklist. No issues were identified during this inspection. Interviews were conducted with Eric Barron, O&M staff member, and Brian Hanshew, O&M Site Manager, on September 9, 2025 at the O&M organization offices. No issues were identified as an outcome of these interviews. However, SRS was greatly impacted by Hurricane Helene and closed in response during the period of September 27, 2024 through October 6, 2024 with the exception of emergency and essential personnel. The site resumed normal operations on October 7, 2024. EC&ACP O&M personnel evaluated the impacts of Hurricane Helene. No storm damages were identified at the SRLSB OU that would affect the protectiveness of the remedy.

The SRLSB OU was inspected by SRNS EC&ACP and USDOE personnel October 28, 2025. No issues were identified for the SRLSB OU during this inspection that would affect the protectiveness of the remedy.

A regulatory site inspection with USDOE, ~~will was conducted by~~ U.S. Environmental Protection Agency (USEPA) and South Carolina Department of Environmental Services (SCDES) personnel ~~and will be scheduled after submittal of the Revision 0 of this document~~was held on March 19, 2026. SRNS personnel ~~will~~ were also ~~be~~ present at the meeting. During the meeting, the participants ~~will~~ viewed drone footage of SRLSB OU and ~~will be~~ were provided with an opportunity to walk down the OU. The USEPA and SCDES elected not to perform a walk down because the drone video provided them with better views of the OU. No significant problems regarding the protection of the remedy for this OU as implemented ~~are anticipated to be~~were identified during the inspection.

~~Schedule annual site inspections conducted from FY2021 through FY2025 identified the following issues: active ant mounds, evidence of burrowing animals, and trees on fence and blown over due to a hurricane. These findings were documented on the field inspection checklists and resolved soon after discovery.~~

VII. TECHNICAL ASSESSMENT

Is the Remedy Functioning as Intended by the Decision Document?

The remedy, excavation, off-site disposal, and LUCs is effective in preventing exposure to contaminants above 1E-06 risk levels and is functioning as intended.

LUCs have been effective in maintaining restricted (industrial) land use. Annual site inspection and site maintenance have been effective in maintaining the integrity of the soil cover. Based on site inspections, there is no indication of potential remedy failure that could place protectiveness at risk.

The Land Use Control Implementation Plan (LUCIP) for SRLSB OU is included as Appendix A of the Corrective Measure Implementation Report / Post-Construction Report / Final Remediation Report and governs LUC implementation, maintenance, monitoring, reporting, and enforcement of LUCs (WSRC 2001). The LUCs that are in place include physical access controls to prevent unauthorized contact, removal or excavation of subsurface soils, and restrictions to prevent disturbance of the SRLSB OU. Warning signs are in good condition, and no activities were observed that would have violated the LUCs. All LUC objectives are being met.

The LUCIP is available on the SRS external webpage in the Administrative Record File (**https://public.srs.gov/missions-and-programs/environmental-stewardship/arf-irf-index/**) and the Land Use Control Assurance Plan webpage (**https://public.srs.gov/missions-and-programs/environmental-stewardship/lucap/**).

Are Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives still valid?

The exposure assumptions, toxicity data, and cleanup levels used at the time of final remedy selection are still valid. There have been no changes in the standards or physical condition of the SRLSB OU that would affect the protectiveness of the remedy.

The USEPA standards and toxicity values have been updated since submittal of the last five-year remedy review as shown in Appendix B. The changes to the values for COCs at

the SRLSB OU were not significant, and the RAOs continue to be met by the remedial action. No new standards or to-be-considered guidance have been identified that call into question the protectiveness of the remedy.

Fact sheets provided on the USEPA webpage (https://19january2021snapshot.epa.gov/fedfac/emerging-contaminants-and-federal-facility-contaminants-concern_.html) regarding emerging contaminants were reviewed for applicability to this site. The USEPA webpage provides a link to fact sheets for the following emerging contaminants: 1,2,3-trichloropropane (TCP), 1,4-dioxane, 2,4,6-trinitrotoluene (TNT), 2,4-dintrotoluene (DNT), hexahydro-1,3,5-tri-nitro-1,3,5-triazine (RDX), nanomaterials, N-nitroso-dimethylamine (NDMA), perchlorate, perfluorooctane sulfonic acid (PFOS) and other per- and polyfluoroalkyl substances (PFAS), polybrominated biphenyls, polybrominated diphenyl ethers (PBDEs), and tungsten. None of these emerging contaminants, except for PFOS and other PFAS, were identified as applicable to this OU based on the OU history of contamination.

Based on the operational history and documented usage patterns, including a review of historical PFAS applications and categories, PFAS may be expected to be present at this waste unit (Table L-4). However, the engineered cover system in place serves as an effective and protective remedy, mitigating potential exposures and releases associated with PFAS.

Has any Other Information Come to Light that Could Call into Question the Protectiveness of the Remedy?

No other information has come to light that would call into question the protectiveness of the remedy.

VIII. ISSUES

There are no issues related to current site conditions or activities that prevent the remedy from being protective of this OU.

Table L-1. Chronology of OU Events

Event	Date
RFI/RI Field Start / Complete	September 25, 1996 / May 27, 1997
Removal Action Start / Complete (Trees Only)	July 28, 1997 / December 9, 1997
CERCLA Removal Action Start / Complete	August 22, 1997 / October 15, 1997
ROD Issuance	April 26, 2000
Remedial Action Start / Complete	December 8, 1999 / August 20, 2003
Previous Five-Year Reviews Issuance	February 12, 2004 / January 29, 2009 / February 4, 2014 / February 21, 2018 / December 21, 2021

Table L-2. COCs for SRLSB OU

Unit	Media	COC	Type of COC	RG	Units	Basis
SRL Seepage Basin	Soil	Actinium-228	HH	7.0E-02	pCi/g	Future Industrial Worker
		Americium-241		8.1E+00	pCi/g	
		Cesium-137		1.1E-01	pCi/g	
		Cobalt-60		2.0E-02	pCi/g	
		Curium-243/244		1.6E+00	pCi/g	
		Lead-212		7.0E-01	pCi/g	
		Neptunium-239		9.0E-01	pCi/g	
		Plutonium-238		1.1E+01	pCi/g	
		Plutonium-239/240		1.0E+01	pCi/g	
		Potassium-40		4.0E-01	pCi/g	
		Radium-228		6.7E-02	pCi/g	
		Strontium-90		5.7E+01	pCi/g	
		Thorium-228		3.5E-02	pCi/g	
		Thorium-230		8.5E+01	pCi/g	
		Thorium-232		9.8E+01	pCi/g	
		Uranium-233/234		7.1E+01	pCi/g	
		Uranium-235		8.3E-01	pCi/g	
		Uranium-238		3.1E+00	pCi/g	
		Hexavalent Chromium		1.5E+03	mg/kg	
		Mercury		4.7E+01	mg/kg	
		Chromium	ECO	2.0E+02	mg/kg	Soil invertebrates

HH = Human Health
ECO = Ecological

Table L-3. Actual versus Estimated O&M Costs

	FY2021	FY2022	FY2023	FY2024	FY2025	5-Year Total
Total Actual O&M Costs ($)	25,037	18,622	20,228	21,827	30,224	115,938
Total ROD Estimated Direct O&M Costs* ($)	25,000	0	0	0	0	25,000

*Costs for preparation of the Sixth Five-Year Remedy Review were accounted for in FY2021. Annual O&M costs were not included in the original estimate.

Table L-4. PFOS/PFAS Screening Results for the SRL SB OU

Operable Unit Name:	**SRL SB**	
Use/Category	Known Use at Facility (Yes/No)	Notes/Comments
Fire Training Facility/Fire Department Location	No	
Wastewater Treatment Plant/ Centralized Waste Treatment Landfill	No	
Uranium Enrichment/Plutonium Production/Nuclear Operations	No	
Metal Plating Processing	No	
Explosives/Munitions/Weapons	No	
Electronics Manufacturing	No	
Equipment Fuel/Maintenance (large fuel storage areas; industrial waste lines or maintenance)	No	
Well Drilling	No	Data from site groundwater wells indicate that there have been no installation or operational impacts from PFAS.
Pesticides	No	
Laboratory	**Yes**	
Consumer Product Manufacturing	No	
Operable Unit Conclusion:	**Based on the operational history and documented usage patterns, including a review of historical PFAS applications and categories, PFAS may be expected to be present at this operable unit.**	