SAVANNAH RIVER SITE FACT SHEET

SEVENTH FIVE-YEAR REMEDY REVIEW REPORT FOR SRS OPERABLE UNITS WITH GROUNDWATER REMEDIES

SRNS-RP-2024-00936

Savannah River Site, Aiken, SC
June 2025

The United States Department of Energy (USDOE), the United States Environmental Protection Agency (USEPA), and the South Carolina Department of Environmental Services (SCDES)[1] have prepared the Seventh Five-Year Remedy Review Report for Savannah River Site (SRS) Operable Units (OUs) with Groundwater Remedies. This report documents the methods, findings, and conclusions for remedy decision document reviews for the SRS OUs that selected groundwater remediation as the interim or final remedy.

What is a Five-Year Remedy Review?

The Comprehensive Environmental Response, Compensation, and Liability Act requires that a remedy review be conducted every five years for sites where any hazardous substances, pollutants, or contaminants remain following a remedial or cleanup action. The remedies are evaluated to determine whether they are functioning as designed and whether they are protective of human health and the environment. The methods, findings, and conclusions of remedy reviews are documented in a five-year remedy review report.

The SRS Seventh Five-Year Remedy Review report will be conducted in five phases with OUs 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/solidify-cation cover systems (S/S); and (5) operating equipment.

This report documents the Seventh Five-Year Remedy review for SRS OUs that selected groundwater remedies as the interim or final remedy.

Three Major Questions:

1) Is the remedy functioning as intended by the decision documents?
2) Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of remedy selection still valid?
3) Has any other information come to light that could call into question the protectiveness of the remedy?

Figure 1. SRS General

SRS History

SRS occupies approximately 310 square miles of land adjacent to the Savannah River, principally in Aiken and Barnwell counties of South Carolina.

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

SRS is located approximately 25 miles southeast of Augusta, Georgia, and 20 miles south of Aiken, South Carolina (Figure 1). Approximately 90 percent of SRS land consists of natural and managed forests.

The SRS was constructed during the 1950s to produce the basic 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. 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.

Site Chronology	
1989	*SRS included on the National Priorities List as needing a long-term cleanup plan.*
1993	*Federal Facility Agreement established with the USDOE, USEPA – Region 4, and the SCDES to coordinate remedial actions at SRS into one comprehensive regulatory program.*
1997	*First SRS Five-Year Remedy Review is issued.*
2004	*Second SRS Five-Year Remedy Review is issued.*
2009	*Third SRS Five-Year Remedy Review is issued.*
2014	*Fourth SRS Five-Year Remedy Review is issued.*
2015	*Fifth Five-Year Remedy Review for SRS OUs with Native Soil Covers and/or LUCs (Phase I) is issued.*
2017	*Fifth Five-Year Remedy Review for SRS OUs with Groundwater Remedies (Phase 2) is issued.*
2018	*Fifth Five-Year Remedy Review for SRS OUs with Engineered Cover Systems (Phase 3) is issued.*
2018	*Fifth Five-Year Remedy Review for SRS OUs with Geosynthetic or S/S Cover Systems (Phase 4) is issued.*
2018	*Fifth Five-Year Remedy Review for SRS OUs with Operating Equipment (Phase 5) is issued.*
2019	*Sixth Five-Year Remedy Review for SRS OUs with Native Soil Covers and/or LUCs (Phase 1) is issued.*
2020	*Sixth Five-Year Remedy Review for SRS OUs with Groundwater Remedies (Phase 2) is issued.*
2021	*Sixth Five-Year Remedy Review for SRS OUs with Engineered Cover Systems(Phase 3) is issued.*
2022	*Sixth Five-Year Remedy Review for SRS OUs with Geosynthetic or Stabilization/Solidification Cover Systems (Phase 4) is issued.*
2023	*Sixth Five-Year Remedy Review for SRS OUs with Operating Equipment (Phase 5) is issued.*
2024	*Seventh Five-Year Remedy Review for SRS OUs with Native Soil Covers and/or LUCs (Phase 1) is issued.*

What are the Cleanup Objectives?

Remedial goals are defined for individual OUs, but generally support the following cleanup objectives:

- To prevent unacceptable exposure of human receptors and ecological receptors to contaminants in soils, surface water, and groundwater.
- To prevent or minimize the migration of contaminants from soils to groundwater at levels

that exceed groundwater maximum contaminant levels (MCLs)/cleanup levels.
- To prevent or minimize the discharge of contaminated groundwater to surface water at levels that exceed MCLs/cleanup levels.

Remedial Actions

Primary soil contaminants at SRS are cesium-137 and other radionuclides, organic chemicals, metals, polychlorinated biphenyls, and pesticides. The primary contaminants in groundwater are volatile organic compounds, tritium, strontium-90, iodine-129, and metals to a lesser extent. Surface water has been impacted by the discharge of contaminated groundwater to site streams.

Groundwater remedies were implemented for SRS OUs that included groundwater monitoring activities associated with Monitored Natural Attenuation (MNA) or a Mixing Zone permit as well as interim remedial actions. Groundwater remedies that include operating equipment are discussed in the remedy review report for operating equipment.

In general, SRS uses a graded approach for 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. 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 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.

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 should not be exceeded at the groundwater discharge point.

Table 1 identifies the SRS OUs and associated remedial actions included in the Seventh Five-Year Remedy Review Report for SRS OUs with Groundwater Remedies. Figure 2 shows the location of the OUs that correspond to Table 1.

Major Developments Since Last Five-Year Remedy Review

No new developments have occurred since the last five-year remedy review. Five-year remedy reviews have been previously conducted for all the OUs listed in Table 1.

Protectiveness Summary

All remedies were determined to be protective of human health and the environment.

Table 1. SRS OUs with Groundwater Remedies

#	SEMS No.[a]	Operable Unit	Remedial Action[b]
1	82	C-Area Groundwater (CAGW)	Electrical Resistance Heating (ERH) with Soil Vapor Extraction (SVE)[c]
2	24	Chemicals, Metals, and Pesticides Pits (080-170G, 080-171G, 080-180G, 080-181G, 080-182G, 080-183G)	Enhanced Bioremediation, ERH, SVE, Passive SVE, Soil Cover, MNA, and LUCs
3	27	D-Area Oil Seepage Basin (631-G) (DOSB)	Interim Remedial Action (Excavation), Final Action (Groundwater Mixing Zone [GWMZ], LUCs)
4	77	L-Area Southern Groundwater	MNA, LUCs
5	95	R-Area Operable Unit (RAOU)	Removal Actions (In-situ decommissioning of R-Reactor Building [105-R], Excavation, Cover), MNA, LUCs
6	25	R-Area Reactor Seepage Basins (904-57G, 904-58G, 904-59G, 904-60G, 904-103G, 904-104G) and 108-4R Overflow Basin	Concrete Intruder Barrier, Excavation, On-Site Disposal, GWMZ, LUCs

a Superfund Enterprise Management System
b In addition to groundwater remedies, OUs may also include subunits with contaminants in soils or building material (i.e., concrete) that are addressed by the remedy decision document.
c LUCs are not a component of the interim remedy for CAGW OU and will be addressed (if needed) by the final action.

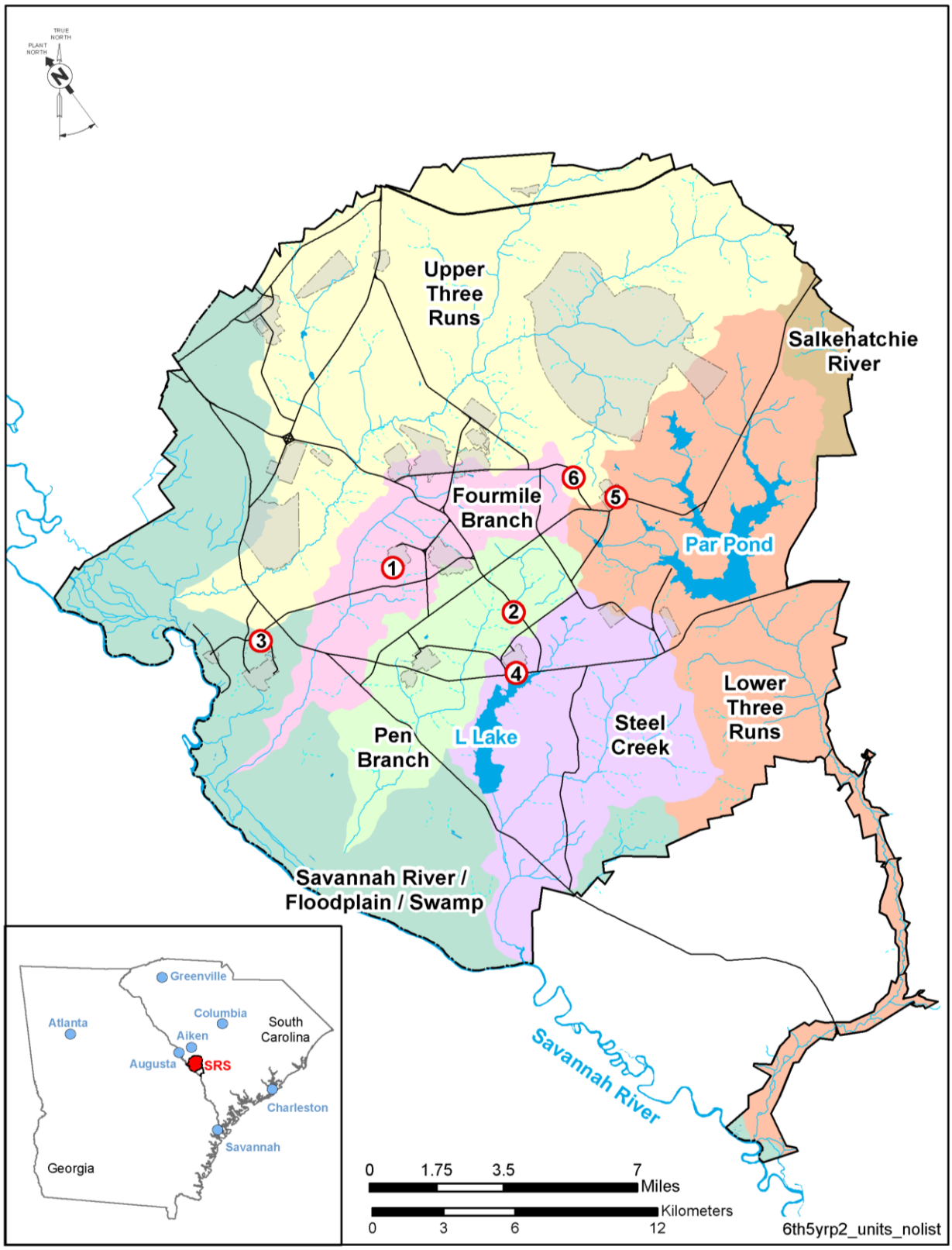

Figure 2. Location Map for SRS OUs with Groundwater Remedies

Next Five-Year Remedy Review

The Eighth Five-Year Remedy Review Report for SRS OUs with Groundwater Remedies is due in December 2030.

Issues and Recommendations

No issues or recommendations were identified during this remedy review.

For More Information

For more information regarding the complete SRS Seventh Five-Year Remedy Report for SRS OUs with Groundwater Remedies, please contact:

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