

The Savannah River Site Environmental Bulletin

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U.S. Department of Energy Conducts Phased Submittals of the Seventh Five-Year Remedy Review at Savannah River Site

Second Phase: Savannah River Site Operable Units with Groundwater Remedies

The U. S. Department of Energy (DOE) has begun conducting the Seventh Five-Year Remedy Review for remedial actions implemented at the Savannah River Site (SRS). The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requires that remedial actions that result in residual hazardous substances, pollutants, or contaminants remaining at an operable unit (OU) at levels unsuitable for unrestricted exposure be subject to a five-year remedy review. The purpose of this review is to determine whether the remedies remain protective of human health and the environment and to evaluate the implementation and performance of the selected remedies. The U. S. Environmental Protection Agency (EPA) and South Carolina Department of Environmental Services (SCDES) will review and approve whether the five-year remedy review adequately addresses the protectiveness of each remedy. The methods, findings, and conclusions of the five-year remedy review will be documented in a report that will be made available to the public.

SRS occupies approximately 310 square miles of land adjacent to the Savannah River, principally in Aiken and Barnwell counties of South Carolina. SRS is located approximately 25 miles southeast of Augusta, Georgia, and 20 miles south of Aiken, South Carolina. During the early 1950s, SRS began to produce materials used in nuclear weapons. 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. Hazardous substances, as defined by CERCLA, are currently present in the environment at SRS, with past disposal practices resulting in soil and groundwater contamination.

Each SRS OU is unique in size, location, environmental factors, and contaminant type. Contaminants may include chemicals (e.g., trichloroethylene, tetrachloroethylene, etc.), metals, pesticides, polychlorinated biphenyls, and radionuclides (e.g., tritium, cesium-137, etc.). Contaminants may be found in surface soils, subsurface soils, sediment, surface water, and/or groundwater. Operable unit-specific remedial actions are designed to address the contaminants for the protection of human health and the environment. In general, contaminated media are either covered, stabilized in place, treated, removed, or managed with land use controls (LUCs). Common remedies implemented at SRS include LUCs, cover systems (i.e., soil covers, geosynthetic covers), excavation and disposal actions, removal systems (i.e., soil vapor extraction, electrical resistance heating, dynamic underground stripping), treatment systems (i.e., enhanced bioremediation, air stripping, chemical oxidation), stabilization (i.e., in situ grouting), groundwater mixing zones, and monitored natural attenuation.

DOE, EPA, and SCDES previously agreed to conduct phased remedy reviews for OU groupings based on remedy similarity rather than combining all OU reviews in a single report. The OUs are grouped in five phases by the following remedy types: (1) native soil covers and/or LUCs, (2) groundwater, (3) engineered cover systems, (4) geosynthetic or stabilization/solidification cover systems, and (5) operating equipment. These groupings were chosen to provide the opportunity to effectively identify and resolve issues for similar remedies simultaneously and efficiently implement optimization initiatives for similar projects.

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The five-year remedy review will address three major questions:

- Are the remedies functioning as intended by the decision document?
- Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of remedy selection still valid?
- Has any other information emerged that could call into question the protectiveness of the remedy?

The second phased submittal of the Seventh Five-Year Remedy Review Report will focus on SRS OUs with groundwater remedies. The implemented remedies for these OUs include 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. 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 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.

The Seventh Five-Year Remedy Review Report for SRS OUs with Groundwater Remedies will include a review of the following OUs:

- C-Area Groundwater;
- Chemicals, Metals, and Pesticides Pits (080-170G, 080-171G, 080-180G, 080-181G, 080-182G, 080-183G, and 080-190-G);
- D-Area Oil Seepage Basin (631-G);
- L-Area Southern Groundwater;
- R-Area OU; and
- R-Area Reactor Seepage Basins (904-57G, 904-58G, 904-59G, 904-60G, 904-103G, 904-104G) and 108-4R Overflow Basin.

DOE will notify the public when the Seventh Five-Year Remedy Review Report for Savannah River Site Operable Units with Groundwater Remedies is complete and is available to the public. The report is currently planned to be available to the public in December 2025.

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