

Burial Ground Complex

Background

The Burial Ground Complex (BGC) occupies approximately 195 acres in the central section of the Savannah River Site (SRS). The BGC is composed of several contiguous facilities that served as disposal locations for radioactive and hazardous waste. It is divided into three distinct waste burial locations: the Old Radioactive Waste Burial Ground (ORWBG), Low-Level Radioactive Waste Disposal Facility (LLRWDF), and the Mixed Waste Management Facility (MWMF). Each of these locations has contaminated the underlying groundwater systems.

The ORWBG occupies approximately 76 acres in the southern area of the BGC. The ORWBG received waste from 1952 to 1972 with a small quantity of waste being disposed in 1974. The waste disposal facility is composed of earthen trenches designed for low-level radioactive waste disposal. In 1998, SRS installed an interim soil cover over a majority of the ORWBG to reduce surface radiation levels, stormwater infiltration to the waste layer, and to mitigate contaminant migration to the groundwater. An area that contains 22 empty underground tanks, formerly used to store radioactive solvents, was not included in the interim soil cover action. These steel tanks were filled with grout and verified closed by an interim remedial action in February 2003. The tanks were used until the mid-1970s to store spent radioactive solvent and aqueous wastes generated from the plutonium/uranium extraction process. The ORWBG is the last major surface unit requiring final remedial action at the BGC.

The LLRWDF occupies approximately 119 acres in the northern portion of the BGC. The LLRWDF started receiving low-level radioactive waste in 1970, and by 1972, all radioactive waste disposal activities had moved to the northern area. Low-level radioactive waste was placed in unlined trenches, engineered trenches, boreholes, surface storage pads and buildings. Spent solvents were stored in underground tanks. In September 1999, SRS completed the installation of one of the first, state-approved, geosynthetic caps at the LLRWDF. The LLRWDF is currently regulated for post-closure care under the SRS Resource Conservation and Recovery Act (RCRA) Part B Permit.

The MWMF occupies 58 acres in LLRWDF. The MWMF was designated as a separate waste burial location in 1986 when SRS determined that some of the low-level radioactive waste buried at LLRWDF was also hazardous. A low-permeability clay cap was installed to reduce rainwater infiltration to the buried waste and to prevent the further spread of contamination to the groundwater. The MWMF was closed in December 1990, and it also is currently regulated for post-closure care under the SRS RCRA Part B Permit.

Environmental Concerns

As a result of past waste disposal practices at the BGC, underlying groundwater systems are contaminated with RCRA regulated metals, volatile organic compounds (VOCs), tritium and other radionuclides. SRS has identified four BGC-related contaminant plumes: the southwest, southeast, northwest, and northeast plumes. The southwest and southeast plumes emanate from the ORWBG, and the northwest and northeast plumes originate from the LLRWDF/MWMF.

Currently, an extensive system of more than 150 wells monitors groundwater quality in the uppermost aquifer beneath the BGC. Plume cleanup activities are time-phased and prioritized according to their relative risk to human health and the environment. All BGC groundwater remediation activities are managed under the SRS RCRA Part B Permit.

The southwest plume poses the greatest impact to surface water since groundwater springs discharge their tritium-contaminated groundwater into a small tributary that eventually feeds Fourmile Branch. Tritium concentrations from these seeps currently exceed Federal Water Quality Standards at Fourmile Branch. All other southwest plume contaminants are below detection limits or health-based standards.

Monitoring of the other three plumes is ongoing while cleanup plans are being developed. Monitoring and characterization information was included in the 2000 RCRA Part B Permit Renewal Application.

Environmental Actions and Plans

Groundwater

SRS is currently addressing the southwest plume contamination. As an interim measure, a series of relatively simple, passive actions are being performed to reduce the amount of tritium contaminated water discharging to Fourmile Branch.

The scope of the actions involves three major components. A small sheet pile dam was constructed over the portion of the seeps having the highest tritium concentration. This dam intercepts and prevents the tritiated water from reaching Fourmile Branch. An irrigation system was then installed to help manage the level of water impounded behind the dam and to pump and distribute the water to

predetermined areas upstream. The water is used to irrigate the naturally forested areas where trees and other vegetation consume the water by absorption and evapotranspiration. This remediation process is commonly referred to as phytoremediation.

The interim measures, known as the Tritium Phytoremediation Project, began full operation in March 2001. This project serves as the first component of a more comprehensive Corrective Action Plan (CAP), which has been submitted to the South Carolina Department of Health and Environmental Control (SCDHEC) for review and approval. The CAP for the southwest plume is included in the RCRA Part B Renewal Application that was also submitted to SCDHEC. For additional information, refer to the Tritium Phytoremediation Project: BGC Southwest Plume Clean-up Fact Sheet.

Surface Units

Final closure action for the ORWBG is being planned under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as agreed to in the SRS Federal Facility Agreement (FFA). The U.S. Environmental Protection Agency (EPA) and SCDHEC approved the final Record of Decision in September 2002 under a renamed unit called the General Separations Area Consolidation Unit (GSACU). The GSACU consolidates four waste sites into one and is the largest, most challenging, and highest risk project in the Soil and Groundwater Closure Program.

Materials constituting industrial principal threat source material and soils containing contamination at H Area Retention Basin, Warner's Pond, and HP-52 Ponds will be excavated and consolidated at the ORWBG. H Area Retention Basin, Warner's Pond and HP-52 Ponds will be backfilled with clean soil and institutional controls implemented. Portions of the H Area Inactive Process Sewer Line at Warner's Pond will be excavated with contaminated soil and placed at the ORWBG or managed by grouting in place. A low-permeability geosynthetic cover system will be constructed over the ORWBG and institutional controls implemented. The start of final remedial action is scheduled for December 2003 and is expected to be complete in 2008.