

# Facts

from the **Savannah River Site**

ENVIRONMENTAL STEWARDSHIP • NATIONAL SECURITY • SCIENCE AND ENERGY

## Operational Closure of Radioactive Liquid Waste Tanks

The Savannah River Site (SRS) is home to the first operational closure of a high-level radioactive liquid waste tank in the nation, a major milestone toward stabilizing Cold War legacy facilities. Operational closure is defined as:

- The U.S. Department of Energy (DOE), South Carolina Department of Health and Environmental Control (SCDHEC), and the U.S. Environmental Protection Agency (EPA) mutually agree that waste has been removed to the extent practicable from an engineering perspective;
- The waste tank has been isolated from the associated tank farm's Waste Transfer System, Chemical Addition System and support systems; and
- The waste tank has been stabilized by filling with grout.

Tank 20, the first high level waste tank operationally closed, was certified closed by the South Carolina Department of Health and Environmental Control (SCDHEC) on July 31, 1997. SCDHEC certified operational closure of Tank 17 in December 1997. Both tanks, located in the Site's F Tank Farm, were constructed in 1958 with Tank 17 placed into service in 1961 and Tank 20 in 1960. These closed tanks are part of the 51 total underground tanks built in the Site's F- and H-Tank Farms to store radioactive liquid waste generated from the production of special nuclear material. Tanks 18 and 19, operationally

closed in 2012, were F-Area tanks built at the same time as Tanks 17 and 20 and had a similar service history.

Tanks 5 and 6, operationally closed in 2013, were also F-Area waste tanks built in the mid-1950s with Tank 5 placed into service in 1959 and Tank 6 in 1964. Tanks 12 and 16 are located in H Tank farm and were operationally closed in 2016 and 2015, respectively. Tank 12 was placed into service in September 1956. Tank 16 was placed into service in May 1959.

The DOE, SCDHEC, EPA, U.S. Nuclear Regulatory Commission, SRS workers, and SRS stakeholders worked closely together to implement strict closure requirements that support all state and federal regulations for operational tank closure and protect people and the environment long into the future.

Before the operational closing of the tanks can begin, the bulk of the radioactive waste must be removed for treatment and stabilization using SRS processing facilities.

Following completion of bulk waste removal in a tank, operational closure activities continue with removal of the remaining heel waste material using either mechanical or chemical cleaning methods to the extent practical in accordance with federal requirements and closure plans established with SCDHEC. The small amount of waste that remains is characterized and documented.



The Site's F and H Tank Farms store radioactive liquid waste left over from Cold War nuclear material production.



The final operational closure activity begins with workers pouring specially formulated grout (a cement-like substance) into the approximately one million-gallon capacity tank.



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The Savannah River Site is owned by the U.S. Department of Energy. Savannah River Nuclear Solutions is the management and operations contractor at the Savannah River Site. Savannah River Remediation is the current liquid waste contractor at the Savannah River Site.

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The final operational closure activity begins with workers pouring specially formulated grout (a cement-like substance) into the tank. Over the course of several months, the tank fills with grout, and tank top openings are sealed. This special grout stabilizes the tank and its surroundings, as it fills the tank with a solid material that will not collapse. The solidified grout also impedes the migration of any residual waste, which reduces risks to people and the environment by securing any residual waste in the tank minimizing the potential for groundwater contamination in the future.

Radioactive liquid waste in the SRS tank farms is concentrated to reduce its volume. Approximately 35 million gallons of radioactive liquid waste is stored currently in the remaining 43 underground carbon-steel waste tanks.

New technology and tools continue to be built, tested, and deployed to remove waste from the tanks. In addition, special grout testing has helped determine how to best add the grout into the tanks to secure the remaining residual material and protect the tank structure.

Radioactive sludge waste removed from tanks is washed and treated, then sent to the SRS Defense Waste Processing Facility (DWPF), where it is immobilized in a glass form for safe storage and eventual long-term disposal in a federal repository. Approximately 92 percent of the waste in the tanks is salt waste, which is also removed as part of the operational tank closure process.

Previously, interim salt waste processing was conducted at the Actinide Removal Process and the Modular Caustic Side Solvent Extraction Unit (ARP/MCU), two pilot projects that were built with the intention of processing waste while awaiting construction of the Salt Waste Processing Facility (SWPF). The

removed radioactive material was then transferred to DWPF for immobilization into glass. Both facilities were removed from service in May 2019 and waste feed lines were re-routed to SWPF.

In addition to ARP and MCU, salt processing has been achieved through Tank Closure Cesium Removal (TCCR), a demonstration of innovative technology to assist in the acceleration of operational tank closure at SRS. TCCR is a supplemental at-tank process that is removing radioactive cesium from the salt waste.

The decontaminated salt solution from SWPF and TCCR is transferred to the Saltstone Production Facility for treatment by mixing with dry materials, forming a cementitious grout that is sent to the Saltstone Disposal Facility and placed into Saltstone Disposal Units for permanent disposal as low-level waste.

Savannah River Remediation, the current liquid waste contractor, is continuing a broad range of efforts to operationally close the waste tanks per agreements with SCDHEC and EPA. Currently, 10 additional waste tanks are in various stages of preparations for the bulk waste and heel removal processes with priority being placed on those tanks with leak history or those that reside in or near the water table.

SRS waste tanks have provided over 60 years of safe storage for radioactive liquid waste. The Site's mission is to eventually operationally close all waste tanks.

For more information about tank closure at SRS, please visit:  
[https://www.youtube.com/watch?v=tfegYt1KX\\_o](https://www.youtube.com/watch?v=tfegYt1KX_o)  
<https://www.youtube.com/watch?v=vHoOu8MLsCc>



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