

# Facts

from the **Savannah River Site**

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## Salt Waste Processing Facility

Nuclear material production operations in the 1950s at Savannah River Site (SRS) generated liquid radioactive waste currently stored, on an interim basis, in the remaining 43 underground waste tanks in the F- and H-Area Tank Farms. The Salt Waste Processing Facility (SWPF) is the key facility at SRS to process about 90% of this waste.

The salt waste contains soluble metal ions, including most of the soluble radioactive cesium and some trace quantities of entrained sludge. The salt waste in the tanks includes a solid saltcake that has crystallized out of solution and a concentrated salt supernate. The supernate contains most of the soluble cesium and limited amounts of entrained sludge and require treatment at the SWPF. The saltcake in the tanks is dissolved by adding inhibited water. The resultant salt solution is treated at the SWPF.

Waste stored in the tanks can be characterized as either “salt” or

“sludge” both containing highly radioactive residues. The sludge waste, which is insoluble and settles to the bottom of a waste tank, generally contains insoluble radioactive elements in the form of hydrated metal oxides.

Since 1996, SRS has been removing the sludge waste from tanks, pre-treating and delivering it to the Defense Waste Processing Facility (DWPF) for final treatment. The DWPF was built to vitrify concentrated high-activity tank waste into a stable form and store it for eventual permanent disposal. The Saltstone Production Facility (SPF) was constructed to immobilize and dispose of low activity decontaminated salt waste. To effectively utilize these existing facilities for liquid radioactive waste disposition, a processing capability was needed for separating and concentrating the high-activity constituents from the salt waste solutions resulting from tank closure operations. Construction of the SWPF was completed in June 2016.



An aerial view of the Salt Waste Processing Facility at the Savannah River Site.



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**SRS**<sup>™</sup>  
SAVANNAH RIVER SITE

The SWPF separates and concentrates the highly radioactive waste—mostly cesium, strontium, actinides, and waste slurry—from the less radioactive salt solution. The process begins by transferring the waste from H Tank Farm to SWPF where it undergoes a two-step cleanup process. The first step removes strontium and actinides (uranium, plutonium, etc.) from the waste. The second step, known as Caustic Side Solvent Extraction (CSSX), is designed for the removal of radioactive cesium.

After the separation process is completed, the concentrated high-activity waste is sent to the nearby DWPF. At DWPF, the waste is combined with sludge waste and immobilized in glass and stored in stainless steel canisters on site until a federal repository is established.

The decontaminated salt solution is mixed with cement-like grout at the nearby SPF for disposal on site. The grout is pumped from the SPF into Saltstone Disposal Units (SDU). There, the saltstone grout solidifies into a monolithic, non-hazardous, solid low-level waste form.

The first batch of radioactive waste, approximately 4,000 gallons, was transferred to SWPF on Oct. 5, 2020 beginning “hot” commissioning of the facility. SWPF successfully completed the hot commissioning testing phase of operations in January 2021, having validated radiation shielding, environmental emissions, and product waste acceptance requirements while processing over 320,000 gallons of radioactive liquid waste. SWPF then entered full operations and processed just over 2,000,000 gallons of salt

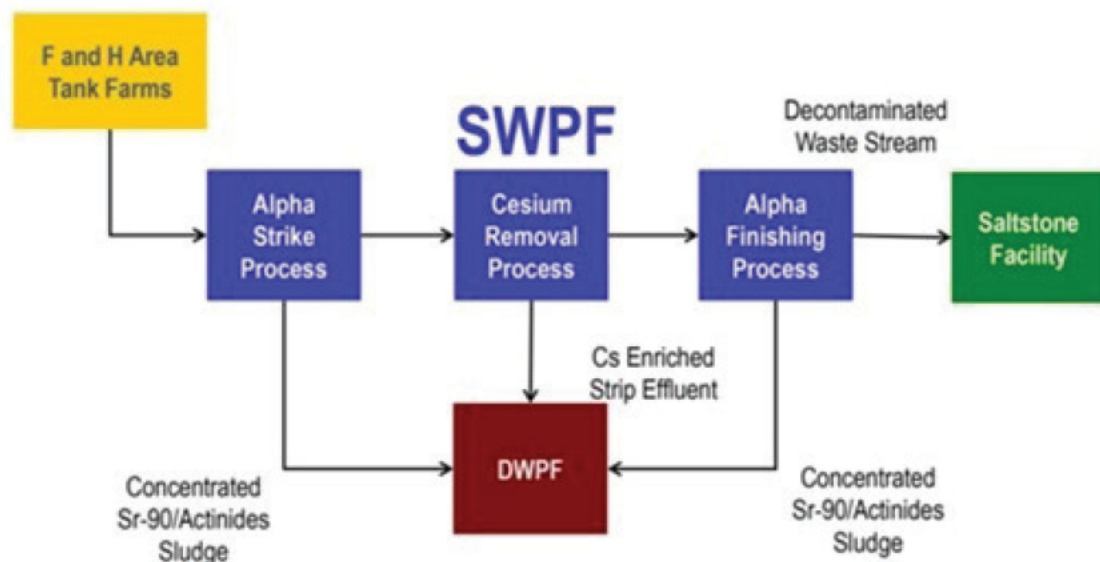


Next Generation Solvent in SWPF. The SWPF is expected to process up to 9 million gallons of waste per year by FY 2024 following the implementation of the Next-Generation Solvent.

waste during its first year of operations. In its second year of operations SWPF is expected to process up to 4,000,000 gallons of salt waste.

The SWPF is expected to process up to 9 million gallons of waste per year by FY 2024 following the implementation of the Next-Generation Solvent. By 2031, it is expected that nearly all of the salt waste inventory will be processed, and F-Tank Farm will be nearly empty.

## SWPF Process Overview



A diagram of the Salt Waste Processing Facility process.



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