



## FACT SHEET

# Salt Processing

*The Savannah River Site's (SRS) radioactive liquid waste operations involves the management of space in the remaining 43 underground waste tanks, including the removal of waste materials. Once water is removed from the waste tanks, two materials remain: salt and sludge waste.*

*Removing salt waste, which fills approximately 94 percent of the tank space in the SRS tank farms, is a major step toward emptying the Site's waste tanks that currently contain approximately 35 million gallons of waste. Additionally, salt waste must be dispositioned to ensure sufficient tank space to prepare sludge for vitrification.*

### Salt Processing Facilities

Several processes are being used at SRS to treat and disposition salt waste. An interim salt waste processing program has been developed that integrates, and continues to optimize, a set of salt-decontamination facilities designed to eliminate nearly all of the radioactive isotopes at a rate of approximately one million gallons of salt solution per year. Once operational, the Salt Waste Processing Facility will replace the interim salt waste processing facilities and significantly accelerate salt processing. In addition, a demonstration of innovative technology to assist in salt processing was recently deployed at SRS, Tank Closure Cesium Removal (TCCR).

The goal is to immobilize all of the liquid waste into one of two final forms for safe, long-term storage: borosilicate glass stored in stainless steel canisters, which will contain more than 99 percent of the radioactivity, or, cement-like grout (saltstone) stored in Saltstone Disposal Units (SDU), for disposal of low-activity salt waste.



## **Interim Salt Processing: Actinide Removal Process/ Modular Caustic Side Solvent Extraction Unit**

The Actinide Removal Process (ARP) and Modular Caustic Side Solvent Extraction Unit (MCU) work together as an integrated system to remove nearly all of the radioactive isotopes from salt waste solutions prior to its transfer to the Saltstone Production Facility.

As needed, ARP removes radioactive contaminants, such as plutonium and strontium, by adding monosodium titanate (MST) to radioactive salt solutions stored at SRS and then filtering out the MST that has adsorbed the radioactive contaminants.

The radionuclide-laden MST particles are transferred to the Site's Defense Waste Processing Facility (DWPF), where it is mixed with molten glass and poured into 10-foot-tall stainless steel canisters. The canisters are then welded shut and temporarily stored on-site awaiting final disposition at a federal repository. The remaining filtered salt solution is then sent to the MCU for further processing.

Using principles involving centrifugal force and a special engineered solvent, MCU equipment takes the filtered high-activity salt solution from ARP and divides it into two waste streams. The cesium is removed and sent to DWPF. The remaining decontaminated salt solution is transferred to the Saltstone Production Facility to be mixed with dry materials to form a cement-like grout for safe, permanent on-site disposal as saltstone in Saltstone Disposal Units.

## **Tank Closure Cesium Removal**

TCCR is a demonstration of innovative technology to assist in the acceleration of tank closure at SRS and is a supplemental at-tank process that is removing cesium. The new technology uses an ion exchange process within a self-shielded, self-contained column. Liquid salt waste from Tank 10 passes through the modules, including a pre-filter and multiple ion exchange columns. The waste stream is treated with an engineered resin inside the ion exchange column to remove the cesium. The cesium-rich resin will then be sent to an interim on-site safe storage area and maintained for future disposal. The decontaminated discharge is sent to the Saltstone Production Facility for on-site disposal.

