

Facts

from the
Savannah River Site

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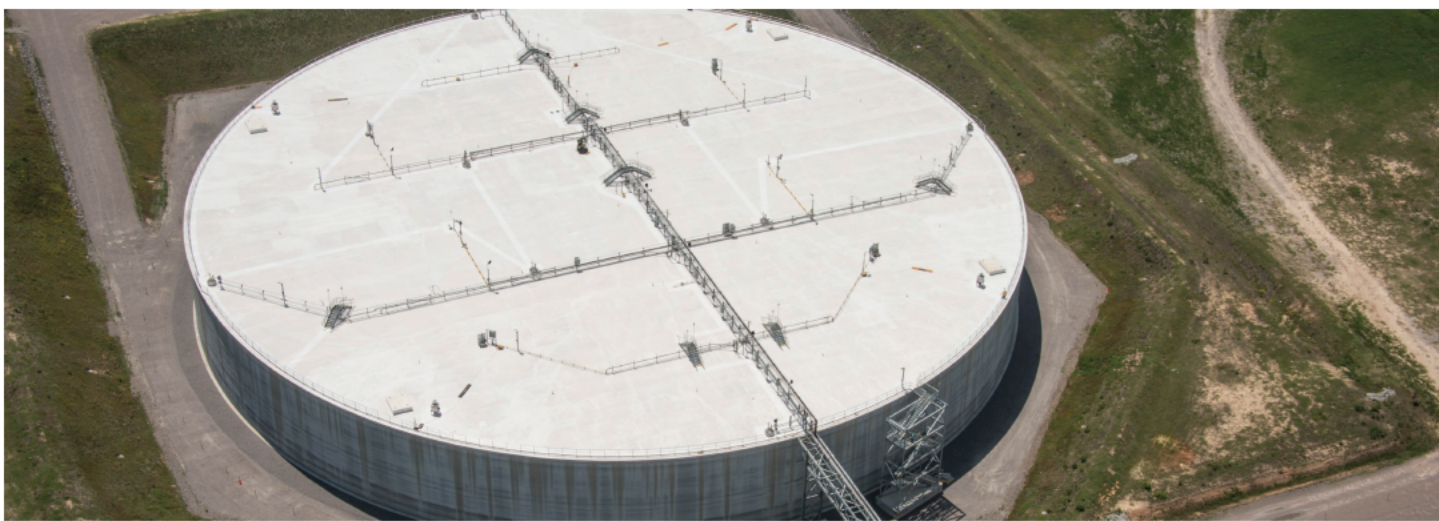
Saltstone Disposal Units

The U.S. Department of Energy's Savannah River Site (SRS) has 51 underground carbon-steel waste storage tanks, located in its two tank farms. These tanks were built to hold radioactive liquid waste from Cold War-era nuclear weapons production. Approximately 35 million gallons of radioactive liquid waste remains in 43 waste operational tanks. Eight of the tanks have been operationally closed. Operational closure includes emptying the tank and processing its contents, isolating the tank from other facilities, cleaning its interior and annulus, and filling with grout to permanently remove the tank from service.

Tank waste takes two forms: sludge and salt waste. Sludge at the bottom of the waste tanks is processed through the Defense Waste Processing Facility (DWPF), where the waste is converted into a solid glass form suitable for long-term storage and disposal in a process known as "vitrification." The Salt Waste Processing Facility (SWPF) will process most of the salt waste in the tanks. The facility will forward the high-activity radionuclides to DWPF for vitrification, while the decontaminated salt solution (DSS) will be sent to the Saltstone Production Facility (SPF) to be turned into grout for permanent on-site disposal.

The SPF contains the tanks and equipment necessary to receive the DSS and process it into saltstone grout by mixing the liquid feed with cementitious materials (cement, fly ash, and slag). The grout is pumped from the SPF into the Saltstone Disposal Units (SDU), where the saltstone grout solidifies into a monolithic, non-hazardous, solid low-level waste form.

SDUs are large concrete vaults used for permanent disposal of the DSS. Generally, there are two types of SDUs that have been utilized at SRS. The early vaults were rectangular in shape. Construction of those first two vaults (Vaults 1 and 4) was completed between February 1986 and July 1988. No more waste disposal is planned for these SDUs. Subsequent SDUs were cylindrical and based on a design used commercially for storage of water and other liquids. The early cylindrical SDUs held approximately three million gallons of saltstone. SDU 2 construction completed June 2012 and began filling in September 2012 and completed filling in July 2014. SDU 3 and SDU 5 were construction-complete in September 2013. SDU 5 completed filling in February 2017. SDU 3 began filling in February 2017.



The mega-volume units are designed for the larger decontaminated salt solution stream that will be produced by the site's Salt Waste Processing Facility.



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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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In 2012 DOE approved the design for mega-volume units that are 10 times larger than the previous SDUs. The mega-volume units are 375 feet in diameter, 43 feet high, and can hold approximately 33 million gallons of saltstone. They are designed for the larger quantities of DSS that will be produced by the site's SWPF. SDU 6, SRS's first mega-volume SDU, was completed in May 2017, and it began receiving low-activity waste grout in August 2018. The second mega-volume SDU, SDU 7, is currently being constructed, and work has begun on SDUs 8 and 9. SDUs 10 through 12 also have been approved. The larger SDU design will result in substantial cost savings over the life of the project because of economies of scale, requiring less infrastructure and materials to design and build.

Mega-Volume SDUs by the Numbers:

- More than 13,000 cubic yards of concrete was used in the construction of SDU 6's exterior shell, which includes a one-foot-thick floor. For SDU 7, more than 18,000 cubic yards
- was used in the construction of its exterior shell, including its two-foot-thick floor.
- The walls of SDU 6 are wrapped in 289 miles of pre-tensioned wire strand. An additional 57 miles of cable, for a total of 346 miles, was used to wrap the walls of SDU 7. The tanks walls were designed to expand outward as the tanks are filled, and the wire strand ensures the structural integrity of the tank wall is maintained while waste is being added.
- The insides of both tanks are lined with over 7,000 individual pieces of three-millimeter-thick rubber that are epoxy-bonded to the tank walls and floors. Mega-volume SDUs are among the largest rubber-lined tanks in the world.
- A total of seven mega-volume units are needed to fulfill the needs of the liquid waste mission. SRS would have needed 80 of the smaller SDUs.



Saltstone Disposal Units are permanent disposal units at the Savannah River Site. The smaller SDUs can be seen in the lower left portion of the photo, while the larger, mega-volume SDUs are to the right.



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