



2020

SAVANNAH RIVER SITE Environmental Report

SUMMARY

SAVANNAH RIVER SITE

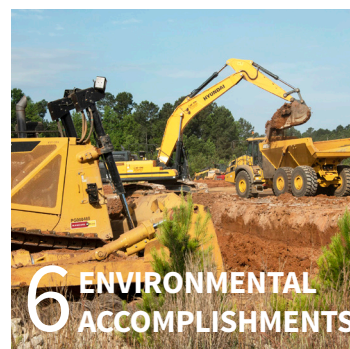
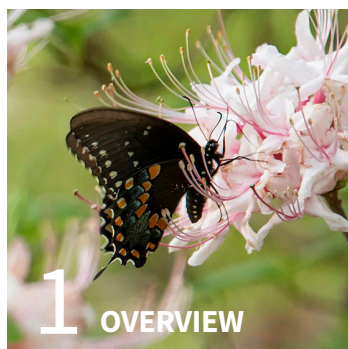
2020 Environmental Report Summary

This report highlights the Savannah River Site's activities, environmental performance, and engagement with the local communities. Many articles in this Summary are based on the information presented in the 2020 *Environmental Report* and touch on the following:

- Significant environmental accomplishments that support Site missions
- Compliance with environmental laws and regulations
- Dose to the public from onsite activities
- Monitoring that supports dose calculations and compliance requirements
- Community involvement

When applicable, a text box at the bottom of the page identifies the related chapters and sections in the 2020 *Environmental Report* where readers may find more detailed information, along with supporting data, maps, and figures.

CONTENTS



The photographs in this report were taken before the COVID-19 pandemic and in the months of 2020 when the virus was prevalent in the United States. Throughout this document, you will see Savannah River Site workers and visitors distancing themselves from others, wearing masks, or doing both to protect against the spread of COVID-19. When a photograph shows masking and distancing precautions taking place, the subjects were following Site guidelines from the Centers for Disease Control and Prevention, the South Carolina Department of Health and Environmental Control, the Georgia Department of Public Health, and the U.S. Department of Energy. If a photograph shows the subjects interacting within 6 feet of one another or not wearing a mask, they are following the appropriate safety protocol for the COVID-19 pandemic at the time the photograph was taken.



OVERVIEW



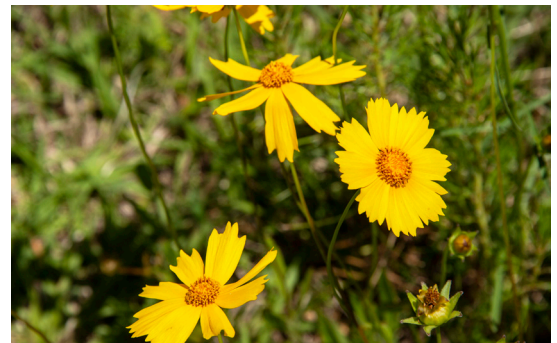
The Savannah River Site is a 310-square-mile U.S. Department of Energy complex along the Savannah River in the sandhills area of three western South Carolina counties. It is 12 miles south of Aiken, South Carolina and 15 miles southeast of Augusta, Georgia. Population within a 50-mile radius of the Site center in Aiken, Allendale, and Barnwell counties in South Carolina and in Richmond, Burke, and Screven counties in Georgia, is 803,370. The largest population concentration is in the Augusta, Georgia metropolitan area.

The Atomic Energy Commission, the precursor for the Department of Energy, selected this area in 1950 for E. I. du Pont de Nemours Company to create materials for nuclear weapons for the nation's defense. In 1972, the Atomic Energy Commission designated the Site as the first National Environmental Research Park, providing it with opportunities to study environmental impacts of energy and defense-related technologies.

The Savannah River Site supports diverse natural habitats, including pine and hardwood forests, riverine environments, 48,973 acres of wetlands, along with hundreds of species of plants and animals.

Today, the Site's mission is to protect public health and the environment, while also supporting the nation's deterrent program. The Savannah River Site is committed to environmental cleanup, nuclear weapons stockpile stewardship, and disposing of nuclear materials to support the nation's nonproliferation policy. Together, these actions are transforming the Site for future use.

The Department of Energy Office of Environmental Management and the National Nuclear Security Administration oversee the Site and its resources.





HISTORY



Wetlands make up 25% of the total Savannah River Site area, or 48,973 acres (top photo). Photos above, ecology pioneers Dr. Eugene Odum and Dr. Ruth Patrick.

70 Years of Environmental Monitoring

In the 70 years since the Atomic Energy Commission, the Department of Energy's predecessor, built the Savannah River Site to supply weapons materials for the nation's defense, the technology and methods scientists use to measure the effect of missions on the environment have advanced, adapting to conditions occurring in nature and heeding to the requirements of regulators.

In 1951, just one year into construction and operations at the former weapons materials complex in South Carolina, and even before federal and state regulators required it, the Savannah River Site began its environmental monitoring program. This initiative gave way to the start of the University of Georgia's Savannah River Ecology Laboratory and its mission to independently evaluate the impact of Savannah River Site's operations on the environment.

Dr. Eugene Odum, a University of Georgia professor known as the "father of modern ecology," innovated the concept of the ecosystem, the holistic understanding of the environment as a system of interlocking biotic communities. Through the Savannah River Ecology Laboratory, he investigated how radioactive elements traveled through ecosystems and altered them.

While Dr. Odum focused on terrestrial ecology at the laboratory, E.I. du Pont de Nemours, the Atomic Energy Commission's contractor, hired Dr. Ruth Patrick, a leader in algae and stream ecology to document environmental health of the Savannah River prior to construction. Dr. Patrick's study was the foundation for long-term ecological monitoring in place at the Savannah River Site today.

Drs. Patrick and Odum, both environmental pioneers, initiated early research that has become a baseline for the studies the Savannah River Site has conducted since the 1950s and will continue to serve as a point of reference today and into the future.

In 1972, the entire Site became the nation's first National Environmental Research Park, a designation that provides a combination of pristine and impacted areas in which to conduct research. Such information provides the means to understand the impact of humans on the environment while providing resources for training and education.

Monitoring over the Years

As early as 1953, the Savannah River Site attached air monitors to stacks and pipelines; put air monitoring stations at main facilities; and established different levels of monitoring intensity and frequency around process areas, the Site boundary, and locations as far away as 25 miles from the Site.

At that time, the Site sampled surface water and sediment in the onsite streams and at multiple locations in the Savannah River. The Site collected food crops from local farms, as well as water samples from open wells from homesteads predating Site construction. As the Savannah River Site advanced air monitoring from beyond the local community to a more regional approach, stations were set up at distances up to 100 miles from the Site.

Monitoring Program at 70 Years

Changes to the Site mission over the last 70 years have also evolved the environmental monitoring program. As emphasis moved from weapons production to safely storing and disposing of waste, equipment for monitoring, sampling, and analysis adapted, allowing precise measurement of contaminants at the low levels seen in the environment. This supports the Site's ongoing commitment to protect public health and the environment while performing its missions and complying with federal regulations, state permits, and Department of Energy Orders.

Today at the Savannah River Site, environmental monitoring involves 1) point-source discharges, known as effluent monitoring, and 2) sampling beyond the discharge points and from the surrounding environment, which is environmental surveillance. To do this, the Site collects thousands of environmental samples yearly at regular intervals, ranging from weekly to annually, for the following programs: air, drinking water, fish, food products, groundwater, sediment, soil, surface water, stream and river water quality, vegetation, and wildlife.

The Site analyzes samples for radionuclides, metals, and other chemicals that could be present in the environment because of Site activities, although many of these analytes occur naturally or from unrelated human activities. Early studies provide the invaluable baseline with which the Site compares current trends. Data collected are consistent with previous years and indicate that releases (radiological and nonradiological) by Site operations have a minimal effect on public health and the environment.



Food sampling (top photo) and environmental surveillance (middle photo) have been important parts of the monitoring program at the Site since the 1950s. The Site has recently added portable air samplers (bottom photo) to allow sampling in the expected path a plume is traveling.

RADIOLOGICAL MONITORING and DOSE

What is Radiation Dose?

Radiation dose to a person is the amount of energy the human body absorbs from a radioactive source located either inside or outside of the body. Radioactive sources typically transfer energy in the form of rays (such as gamma or X-rays) or high-energy particles (such as alpha or beta particles).

Humans, plants, and animals can receive radiation doses from both natural and man-made sources. Radiation can come from as far away as outer space and from as near as the ground on which you are standing. Because it is naturally all around us, we cannot eliminate radiation from our environment.

Radiation dose is typically reported in a unit of measure called a “millirem” (mrem). The average dose from naturally occurring radioactive minerals in the ground and water, and cosmic radiation from outer space is 311 mrem. The average annual dose for U.S. residents from both natural and man-made sources is 625 mrem. Man-made sources of background radiation include the following:

- Medical procedures (300 mrem)
- Consumer products (13 mrem)
- Industrial and occupational exposures (1 mrem)

The Department of Energy has established dose limits to the public so that Site operations will not contribute significantly to this average annual background exposure.

DOE Order 458.1, Radiation Protection of the Public and the Environment, establishes 100 mrem/year as the annual dose limit to a member of the public that can come from Site operations.

Exposure to radiation potentially occurs by:

- Inhaling through the air
- Ingesting through food and water
- Absorbing through the skin
- Experiencing direct (external) exposure to radionuclides in soil, air, and water

2020 Potential Radiation Dose

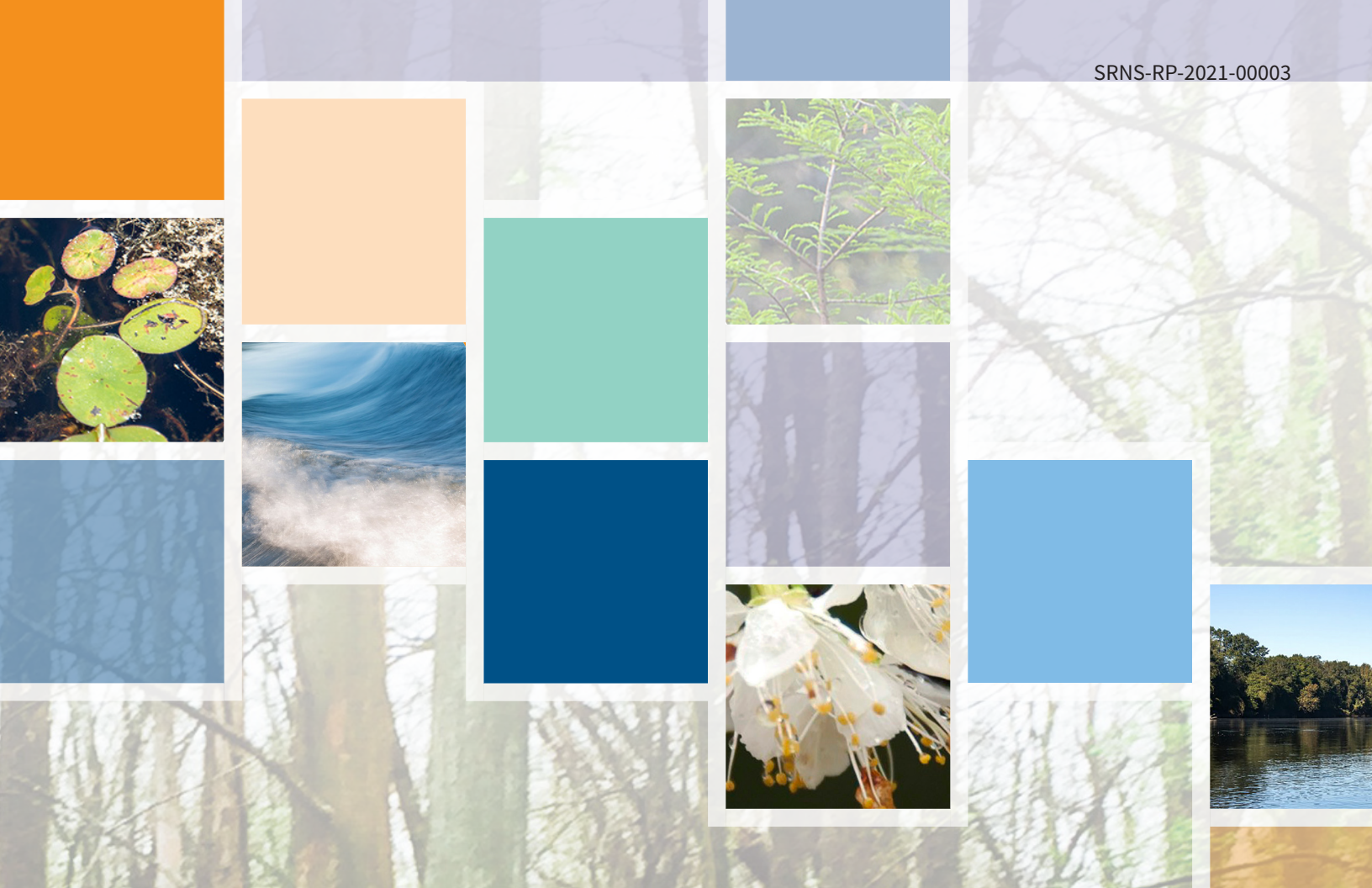
In 2020, the Savannah River Site did not significantly increase potential radiation exposure to the public.

The potential doses from Site radioactive discharges to air and water were below all regulatory standards for the public and the environment. The *Environmental Report 2020* in Chapter 6, Radiological Dose Assessment, discusses how the Site calculates the potential public doses and shows compliance with DOE Order 458.1.

The combined dose from air and water pathways—

called the “all pathway” dose—was 0.36 mrem in 2020, which is well below the DOE public dose limit of 100 mrem/yr. Of this 0.36 mrem/yr dose, 0.35 mrem was from liquid releases, and 0.012 was from releases to the air.

The Department of Energy established the dose limit to protect the public and environment from the potential effects of radiation released during Site operations. The Savannah River Site continues to remain far below the 100 mrem/year public dose limit.



■ Assigning Dose to the Representative Person

The representative person is not someone you've met or even have much in common with, but this individual has a great influence on protecting your health, your quality of life, and safeguarding the environment you live in. This person represents **YOU**, but in a very unlikely scenario.

This unnamed, physically indistinguishable person exists only in calculations and dose models as a hypothetical human who is between you and the radiation originating from Savannah River Site projects and missions. The premise is if the dose the representative person receives is at or below the Department of Energy's dose limit prescribed as safe for the public, then you, a resident who does not seek out exposure pathways, would be at an even safer level.

The representative person's exposure is at the 95th percentile of national and regional data, meaning that this hypothetical person is participating in the exposure scenarios to an extent greater than 95% of the population.

■ How is the Representative Person's Exposure Significant?

In each scenario below, which describe liquid and air pathway exposures based on location and duration, the representative person is in a position that maximizes the amount of potential radiation that a human could be exposed to.

- Lives near the Site boundary all day, every day
- Consumes milk, meat, and vegetables grown or raised at the Site boundary
- Drinks water and eats fish from the Savannah River
- Participates in recreational activities on the river or spends time near the river every day



ENVIRONMENTAL ACCOMPLISHMENTS

D-Area Coal Storage Yard

In just six months, the Savannah River Site restored a sprawling 60-year-old coal storage yard to its pre-mission state, creating a cleaner environment and preventing contaminants from migrating into the ground water and surface water.

The 12-acre D-Area Coal Storage Yard housed the coal needed to run the D-Area Powerhouse at the Site, which provided steam and electricity to power missions. The Site shut down the D-Area Powerhouse in 2012, when all powerhouse production operations permanently ceased. The same year, the Savannah River Site began operating the Biomass Cogeneration Facility to replace the Site's 1950s-era coal powerhouse and oil-fired boilers. The biomass fueled facility relies on the sustainable and innovative approach of burning forest debris, agricultural waste, and scrap lumber to generate steam and power.

Over the decades, the iron sulfide in the coal in the storage yard reacted with rainwater and atmosphere to create sulfuric acid. The acidity leached into the soil and drew out heavy metals. Although the heavy metals were primarily within the first few feet of soil, they could have slowly migrated into the groundwater, where they were at risk of reaching the Savannah River.

During the storage yard's cleanup and closure, Site construction meticulously worked on only one acre at a time—with an excavator, dump trucks, road scraper, and a large industrial mixer—controlling erosion and ensuring that sediment did not enter creeks and streams nearby.



The D-Area Coal Storage Yard cleanup site (top photo) during the project. An aerial view (bottom photo) of the site once work was complete.

To counter the acidic condition of the soil, Site crews mixed in 1,000 tons of fine-grade limestone to a depth of four feet. The soil started with a pH of around 3.0 to 3.2, about the same as a cola-based soft drink, and returned to a normal level of about 5.5 after the limestone treatment. Taking care of the acidic condition of the soil upstream protects threats to human health and the environment.

As the project progressed to closure, the coal yard surface composition slowly changed from red clay to a protective gravel cap.

The innovative cleanup approach expedited the project timeline and significantly reduced costs associated with traditional cleanup methods for projects of this size and scale. In July 2020, the Department of Energy presented the Savannah River Site with the 2020 Project Management Excellence Award for remediating two coal ash basins and a coal pile basin.

TANK CLOSURE

- The Tank Closure Cesium Removal system treated approximately 89,430 gallons of salt solution during 2020. It began operating in 2019.
- The Defense Waste Processing Facility filled 16 canisters with 61,842 pounds of glass waste mixture, immobilizing 273,677 curies of high-level radioactive waste in 2020.
- Construction of SDU-8 and SDU-9, two mega vaults for saltstone disposal, started in 2020. These two units are being built in tandem, optimizing resources.

ENVIRONMENTAL MANAGEMENT SYSTEM

- Received the Department of Energy 2020 Project Management Excellence Award for remediating two coal ash basins and a coal pile basin.
- Recycled 48% (278 metric tons) of nonhazardous solid waste.
- Continued to reduce greenhouse gas emissions, exceeding federal goals.
- Continued to exceed its fleet management goals. More than 87% of the current fleet of light-duty vehicles are hybrid, electric, or vehicles that use E-85 (85% ethanol, 15% unleaded gasoline) fuel.

WASTE SITE REMEDIATION and CLOSURE

- Completed the cleanup of one waste unit during the 2020 fiscal year, and work continued on eight additional units during this time. Of the Site's total 515 waste units, 411 had been completed by December 2020.

RADIOACTIVE WASTE MANAGEMENT

- Sent 10 transuranic waste shipments to the Waste Isolation Pilot Plant for deep geologic disposal.
- Continued to operate the E-Area Low-Level Waste Facility and the Saltstone Disposal Facility in a safe and protective manner.

ENVIRONMENTAL COMPLIANCE

- Conducted 731 National Environmental Policy Act reviews to identify potential environmental impacts from proposed federal activities. The Site identified 651 of these as categorical exclusions that did not require action.
- Managed more than 530 operating and construction permits. South Carolina Department of Health and Environmental Control issued one Notice of Violation. The Site resolved all matters the notice identified.
- Air and water discharges containing radionuclides were well below the DOE public dose limit of 100 mrem per year.
- All 17 of the Underground Storage Tanks were in compliance. F Canyon completed closure of two of them, and five that support Emergency Generators for Defense Waste Processing Facility, H Canyon, and Utilities and Operating Services completed necessary upgrades and testing.



Saltstone Disposal Units 8 and 9, under construction, will be the newest mega-tanks to permanently store saltstone at the Savannah River Site.

Saltstone Disposal Units

An integral part of the Savannah River Site liquid waste program advanced into the construction phase in 2020 with the unprecedented approach of building two mega-volume storage tanks (mega-tanks) in tandem.

This time- and cost-saving construction plan for the Saltstone Disposal Units, known as SDUs, will improve liquid waste storage at the Site and ultimately ensure the safety of the community and the environment. The Savannah River Site will build Units 8 and 9 in conjunction with each other and complete construction phases consecutively. This approach optimizes manpower and other resources used on the two adjacent structures, cutting costs for the two projects.

SDUs are above-ground disposal units that will permanently store decontaminated salt solution that has been housed in aging underground storage tanks before treatment. The liquid radioactive waste is a product of Cold War nuclear material operations at the Site.

SDU-8 and SDU-9, which are projected to be operating in 2023, will be the third and fourth mega-tanks that the Savannah River Site has built. SDU-6, the first mega-tank, went into service in 2017. SDU-7 is to be completed in 2021.

The four cylindrical mega-tanks are 43 feet tall and 375 feet wide, and each holds 32.8 million gallons of salt solution that the Salt Waste Processing Facility has decontaminated. After the Site removes radioactive isotopes, it mixes it with dry materials at the Saltstone Production Facility to form grout and then pumps the waste it into the SDU to harden into saltstone. The Saltstone Facilities processed and disposed of approximately 638,759 gallons of waste during 2020.

The Site is building the SDUs to support the increased volume of decontaminated salt solution from the Salt Waste Processing Facility, which began processing the legacy waste in October 2020. With Salt Waste Processing Facility operational, it is expected that nearly all of the salt waste inventory at the Site will be processed by 2030.



ENVIRONMENTAL ACCOMPLISHMENTS

Cold War-Era Ford Building Demolished

A Savannah River Site crew demolished a large metal Cold War-era building that housed mechanical systems the Ford Motor Company made for essential reactor operations.

The teardown of the structure, known by employees as the Ford Building, eliminated the need for surveillance and maintenance of obsolete structures and prevented a potential release of hazardous substances to the environment.

Decades ago, employees at the Ford Building worked daily on hundreds of control rod assemblies, which were used to ensure a stable nuclear criticality within reactor vessels. The Ford Building formerly contained mechanical systems that remotely raised and lowered control rods within the Site's nuclear reactors. A system at the facility could insert or withdraw a control rod at a slow, steady rate to fine tune reactor operations. In the event of an emergency, the system allowed neutron-absorbing rods to drop, using gravity in the reactor core to slow or stop the reactor.

Later, the Site reconfigured the Ford Building to function as a repair facility for nuclear reactor heat exchangers. These devices removed heat from heavy water used to control the temperature within a reactor vessel by transferring the heat to water circulating inside the exchanger.

Workers have also sealed the Ford Building's original concrete flooring with six inches of new concrete.



The Ford Building (top photo) formerly housed the mechanical systems that remotely raised and lowered control rods within the Site's Reactors. The project team (bottom photo) in front of the partially demolished building.

Savannah River Site employees (facing page, top photo) plan the safe removal and dismantlement of a now-unneeded high-vacuum soil vapor extraction unit. Site crews (facing page, bottom photo) work on the F-Area Process Sewer Line.



M-Area Process Sewer Line

The Savannah River Site successfully ended a 12-year cleanup campaign in 2020 when it stopped operating a soil vapor extraction system that removed 5,000 pounds of solvents from soils within the M-Area Inactive Process Sewer Line Operable Unit.

The elaborate extraction system required large electric pumps, support facilities, and monitoring equipment to operate. Eliminating the equipment will save approximately a quarter of a million dollars every year in operation, maintenance, and reporting costs.

M-Area facilities operated from 1952 to 1995. Beginning in the 1950s, workers at several buildings in the Savannah River Site's

M Area disposed of used solvents in an underground process pipeline leading to a storage basin. The Site used the solvents to degrease nuclear reactor fuel and other manufactured metal components. Over time, the pipes degraded and began leaking at the point where they joined four manhole access points.

Remediation of the M-Area Inactive Process Sewer Line Operable Unit was complete following a review of recent comprehensive soil sampling results under an agreement with the South Carolina Department of Health and Environmental Control. The agreement called for soil samples to help evaluate the effectiveness of the remedial action, which used the high-vacuum soil vapor extraction unit to treat the operable unit, ultimately preventing chemicals (tetrachloroethylene and trichloroethylene) from leaching into the groundwater.

Analytical results from a soil sampling program performed in 2019 indicated that concentrations of the chemicals had declined to levels much lower than had been expected and far below regulatory limits. The Savannah River Site submitted the soil characterization results to the South Carolina Department of Health and Environmental Control and the Environmental Protection Agency. Both agencies agreed that the Site met the remedial goal and, subsequently, the Site discontinued operating the soil vapor extraction system.

Treble Removal at Inactive Sewer Line

The Savannah River Site in 2020 demolished contaminated structures called "Treblers," formerly used to sample and measure the flow of hazardous wastewater. The project is important to the overall success of the Site's comprehensive remediation plan in that the two primary access points to the contaminated sewer line are now closed safely and permanently.

The Site built Treble units, each about the size of a walk-in closet, over 8- to 12-foot-deep concrete pits to allow sampling of the F Area Process Sewer Line. The sewer line formerly carried contaminated process waste from the F Canyon to the now-closed F-Area Seepage Basins.

Sampling of the F Canyon wastewater at the Treblers began in the 1950s but stopped in 1988 when the Site took the F-Area Process Sewer Line out of service. F Canyon was one of the two primary separations facilities onsite that could chemically recover and purify nuclear materials. The F-Area separation facilities have been deactivated and await determination of final disposition.

As part of the Treble units' closure, the Site placed radiologically contaminated equipment and noncontaminated process sample equipment—such as piping, tanks, and pumps—into each concrete pit to permanently encapsulate it with a cement-like grout. The Site used 40 cubic yards of the cementitious grout to fill the two pits and poured 16 cubic yards



of concrete on top of the grouted structures to complete the closure.

Although not a large-scale project, demolishing the Treblers marked the partial closure of the F-Area Inactive Process Sewer Line; final closure will occur as part of the F-Area Operable Unit. The South Carolina Department of Health and Environmental Control approved and helped coordinate the remediation plan for this project.



SUSTAINABILITY

Reclaiming Silver from Silver Nitrate

Before memory cards and Photoshop there was Kodak film and chemical developers.

For 70 years, photographs have documented Savannah River Site construction, initiatives, projects, employees, and facilities. When the Site moved into the digital age, pictures became digital “captures,” providing an immediate, cost-effective, and flexible alternative to film.

The transition from film to digital technology led the Site to also broaden its focus from what was in front of the lens to what remained behind as a byproduct of film and chemical developing processes.

During chemical processing, silver nitrate reacts with sodium chloride to make silver chloride, which gives photographic film and paper their light sensitivity properties that produce an image. The wastewater this process generated at the Site passed through ion-exchange equipment to remove the silver before it was discharged into an industrial wastewater tank that the South

A Savannah River National Laboratory worker (top photo) examines a camera that he will use to inspect the interior of the tank for remaining sludge. A tote (bottom photo) containing dark, silver-bearing sludge from the Trade Waste Tank awaits shipment to the DOE Repository.

Carolina Department of Health and Environmental Control regulated. It was permitted in 1985 to discharge to the A-Area Wastewater Treatment Plant. However, some of the silver still made it into the tank and accumulated significantly over the years in the tank sludge. The high concentrations of silver required that the sludge be disposed of as hazardous waste. The Site was able to avoid the cost associated with hazardous waste disposal by reclaiming the silver.

This approach was creative, economical, and sustainable. In June 2020, the Site removed the silver-bearing sludge, following safety protocols and adhering to all state environmental





Vacuum equipment (top photo) was used to remove water from the tank, exposing a layer of sludge containing silver. A worker (bottom photo) lowers the camera to inspect the inside of the tank.

regulations. Site workers emptied the 25-foot-long and 10-foot-wide carbon steel tank, cleaned it, and lowered a camera into it to make sure that no sludge remained and verify the integrity of the tank floor and walls. Once cleared, the tank was filled with a cement-like grout in an *in-situ* remediation action that renders a vessel safe and closed for the long-term.

The Site sent the silver-bearing sludge to the DOE Business Center for Precious Metals Sales and Recovery to reclaim the silver, with proceeds going to the U.S. Treasury. Precious metals reclamation recycles and recovers elements such as gold, silver, platinum, and palladium from hazardous waste. As a result, the process yielded 38.461 Troy ounces of silver and 0.49 Troy ounces of palladium. The reclaimed value of the metals was \$2,400.

The sustainable practice of recycling the silver in the sludge not only generated revenue for the U.S. Treasury, but also allowed the Site to save \$50,000 associated with managing and disposing of the sludge as hazardous waste.

Recycling to Benefit the Site and Region

The Savannah River Site is saving nearly \$2 million by donating rather than decommissioning and demolishing six metal buildings.

The buildings date to the early 1990s and stored materials for the now-closed coal-fired powerhouse, which produced electricity for the Site. They are no longer needed to meet Savannah River Site or Department of Energy missions.

The nonprofit Savannah River Site Community Reuse Organization arranged for their final disposition with proceeds going to support economic and workforce development activities and initiatives throughout the region. Area businesses can reassemble the buildings for much less than buying new ones, freeing funds for machinery, tools, or to hire employees.

In the Site's 2020 fiscal year, it dispositioned more than \$7.6 million in usable assets for reuse and recovery. The transfer of surplus items to the Savannah River Site Community Reuse Organization benefits groups in Richmond and Columbia counties in Georgia, and Aiken, Allendale, and Barnwell counties in South Carolina.



The Site donated unused metal buildings, saving disposition costs while benefiting the community.



EDUCATION OUTREACH

Virtual Field Trips

When challenged with how to safely allow students to visualize the ecosystems unique to the Savannah River Site and the region during the COVID-19 pandemic, the Site decided the next best thing to being there in person was to experience it virtually.

The area's school children, already familiar with distance learning due to closed and hybrid classrooms, embarked on virtual field trips in 2020, designed to educate elementary school to high school age students about the flora and fauna and biota that make the Site home.

The Site developed one such lesson, "Wet Wonders," to give students the opportunity to study biotic factors that determine the health of a pond by capturing and examining macroinvertebrates. Water samples containing actual aquatic creatures augment this virtual lesson, making the experience comparable to an in-person visit to one of the Site's ponds.

The immersive virtual information and aquatic samples allow the Site to reach even more students than it can with actual visits to the Site.

Other field trip lessons help participants assist endangered species, such as the red-cockaded woodpecker. Students can also explore the workings of a mass spectrometer in a Site laboratory. This highly sensitive piece of equipment allows laboratory personnel to separate individual components of a substance, resulting in identifying each component and the amount present in the substance being tested.



Beth Eberland and Kimberly Fickling (top photo), from the Ruth Patrick Science Center at the University of South Carolina Aiken, preparing for field work during the filming of a virtual field trip. U.S. Forest Service's Raymond Geroso (bottom photo) holds an artificial cavity that red-cockaded woodpeckers will use for nesting and roosting.



Beth Eberland, from the Ruth Patrick Science Center (left), adjusts a microscope during the filming of a virtual field trip. Lessons involved water samples (above, right) containing aquatic creatures and maintaining the red-cockaded woodpecker habitat (below).

Red-cockaded Woodpecker Habitat

The U.S. Forest Service-Savannah River actively manages more than 65,000 acres in the red-cockaded woodpecker habitat management areas by using prescribed fire or by mechanical or chemical treatments to control vegetation.

These methods create and improve habitat by restoring the natural fire regime, improving native plant diversity in the understory, and enhancing the native longleaf pine and wiregrass communities.

Additionally, the Forest Service inserts artificial cavities into living pine trees to the available cavities for roosting and nesting. From 1985 through 2020, active red-cockaded woodpecker clusters increased from 3 to 145 due to successful habitat restoration. As of 2020, the Forest Service managed 175 cluster sites for the red-cockaded woodpecker, with an average expected population growth of 5% each year.





ENGAGING the PUBLIC

Tours of the Savannah River Site

The Savannah River Site has long-standing programs to provide the public and stakeholders a look into its 70-year history as both a Cold War production site of nuclear materials and as a comprehensive environmental and ecological research habitat.

The 310-square-mile Site is a key Department of Energy industrial complex responsible for stewardship of the environment, the enduring nuclear weapons stockpile, and nuclear materials. Along with the missions related to processing and storing nuclear materials to support the national defense and U.S. nuclear nonproliferation, the Site also develops and deploys technologies to improve the environment and treat nuclear and hazardous wastes left from the Cold War.

The public tour program brings to life the Savannah River Site's rich history and contributions it has played in national security and nuclear energy research, as well as insight into the substantial progress it has made addressing the environmental legacy of these activities.

The Site placed tours of the 310-square-mile nuclear facility on hold in 2020 due to ongoing precautions and safety and health protocols brought about by the COVID-19 pandemic. It did continue with mission-related tours for stakeholders, regulators, and others with an interest in a specific program, project, or area of the Savannah River Site.

Visit the Site's Tour Program page for the status of public tours and, when available, information on how to register.



Top photo, foreground (left to right), Savannah River National Laboratory Director Vahid Majidi, former DOE Under Secretary for Science Paul Dabbar, and DOE-Savannah River Manager Michael Budney on a tour of the laboratory. Bottom photo, the tour embarks from the Aiken County Applied Research Center.

Facing page, S.C. Senate Resolution designating Savannah River Site Day in South Carolina on November 28, 2020. Top row (left to right), S.C. Rep. Bill Taylor, DOE-Savannah River Deputy Manager Thomas Johnson; bottom row (left to right) National Nuclear Security Administration Deputy Manager of the Savannah River Field Office Jeffrey Allison, DOE-Savannah River Manager Michael Budney, and S.C. Sen. Tom Young.

Environmental Justice

Mandated by the Department of Energy's Office of Legacy Management, the Environmental Justice program at the Savannah River Site ensures no group of people bears a disproportionate share of negative environmental consequences from Site operations by developing, implementing, and enforcing environmental laws, regulations, and policies.

Funded by the Department of Energy, the Environmental Justice program encourages groups to express concerns that influence the decision-making process associated with setting standards, permitting facilities, awarding grants, and issuing licenses and regulations.

The Savannah River Site uses various methods to enhance engagement from the target communities. One such program is the annual Teaching Radiation, Energy, and Technology (TREAT) workshop, which gives local teachers and community leaders the opportunity to learn more about radiation, energy,

and technology from Department of Energy experts. This extra level of lecture and hands-on training allows educators to more thoroughly and creatively pass on the information to their students in the classroom. The Site held the 2020 workshop at the University of South Carolina Aiken in August and explored topics such as the Site's Environmental Monitoring and Air Surveillance Program.

Other Environmental Justice programs at the Site include community outreach meetings that focus on job training, grants, environmental monitoring, and emergency response. The Site also offers hands-on training in the form of student internships focusing on environmental contaminant analysis research projects.

The Savannah River Site is committed to the principles of Environmental Justice and ensuring that all programs, policies, and activities support these principles, thereby facilitating meaningful involvement by affected communities and stakeholders.

Stakeholder Engagement

Savannah River Site management has built long-term support at all tiers of community and government and is committed to keeping the public informed about Site projects. From individuals, schools, and municipalities, to a broader reach encompassing state and national officials, the Site has ensured that it has a framework from which communication and information exchange purposely between itself and those with a vested interest in Site missions.

The foundation of the stakeholder program is the belief that the public has the right to know what the U.S. Department of Energy is doing in the community and to have input in the decision-making process. Stakeholder engagement offers those who will be affected by the outcome of Site work a chance to voice their opinions, and it ensures that the Department of Energy has a shared vision with the public.

The Site involves stakeholders through a variety of activities that solicit input from the public, including the following:

- Assisting stakeholder groups with analyzing environmental management plans
- Increasing public awareness of the impact of contaminant releases or potential releases during cleanup
- Allowing community groups to propose alternative plans that may achieve better results
- Explaining how the Site establishes priorities to promote cleanup and safety
- Involving elected officials in Site tours and discussions about technologies, project milestones, and new and ongoing missions



The Savannah River Site works closely with the U.S. Environmental Protection Agency Region 4 and the South Carolina Department of Health and Environmental Control to reduce risk and accelerate environmental cleanup at the Site. Through the federal Resource Conservation and Recovery Act, which tracks and manages hazardous wastes from generation to disposal, and the Comprehensive Environmental Response, Compensation, and Liability Act, which addresses the protection and cleanup of the environment from known releases of hazardous substances, the Savannah River Site relies heavily on communication to streamline essential documentation.

One organization that is a valuable conduit between the Savannah River Site and the public is the Citizens Advisory Board, commonly called the CAB. The advisory board is an appointed group of citizens that makes recommendations to the Department of Energy regarding Site cleanup.



Members of the Citizens Advisory Board assemble at a meeting venue.

Citizens Advisory Board

For more than 25 years, the Savannah River Site Citizens Advisory Board, called the CAB, has been the eyes and ears of the local community, providing insight into Department of Energy programs, policies, and projects. The board also provides a voice for the community to reach the Site and its regulators, sharing public thought and opinion.

The board's members, from 10 Georgia and South Carolina counties, reflect diverse viewpoints in the affected community and region surrounding the Savannah River Site. They are people whom Site clean-up activities directly affect. A chair and vice chair, who represent the CAB at Environmental Management Site-Specific Advisory Board meetings and to the public, head the organization. The remaining board members belong to the following four issues-based committees:

- Facilities Disposition & Site Remediation Committee
- Nuclear Materials Committee
- Strategic & Legacy Management Committee
- Waste Management Committee

The various committees within the CAB meet bimonthly to discuss topics such as environmental clean-up on the Site, budget management, materials handling, historic preservation, and plans for future uses of the Site.

The Department of Energy started the CAB in 1994 to serve as a local recommendation-giving entity. Since its inception, the members have issued 369 recommendations. Generally, the CAB

issues advice on environmental restoration, waste management, and other related topics of interest.

The CAB schedules six public meetings a year, at rotating locations throughout the region extending from east central Georgia to the South Carolina Lowcountry to enable a wide range of attendees and viewpoints. Agency liaisons from the Department of Energy, the U.S. Environmental Protection Agency Region 4, and the South Carolina Department of Health and Environmental Control participate in CAB meetings. The board streams meetings live over the internet for those who can't attend, and a video archive of past meetings and newsletters exist on the CAB website for reference. The CAB did not have any in-person meetings or go on any Site tours due to the COVID-19 pandemic and travel restrictions. In keeping with the commitment to provide meaningful involvement in the decision-making process, virtual meetings took the place of in-person meetings in 2020.

The CAB is also dedicated to outreach to the community through Site tours (Public tours were also canceled in 2020); an online CAB university, which offers background on general Site missions and quizzes to test knowledge takeaway; and a line-up of speakers that civic groups can engage for events and meetings.

26 Years at the Savannah River Site

369 Recommendations

10 Counties Represented



SAVANNAH RIVER SITE

Department of Energy-Environmental Management

To Learn More About the Focus on Environmental Safety:
Visit the SRS website: www.srs.gov/general/srs-home.html

View or download the *Savannah River Site 2020 Environmental Report*: www.srs.gov/general/pubs/ERsum/

For More Information about
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Or, go to the *SRS Environmental Report* webpage at
www.srs.gov/general/pubs/ERsum/er20/index.html
and under the *2020 Environmental Report*, complete the
electronic customer satisfaction survey.

The cover of the *2020 SRS Environmental Report* features photographs by two Site employees.
The photo of the Savannah River was a 2020 entry to the Snap SRS photography contest, open to Site employees.

Front and Back Cover, top photograph:

Savannah River-Silver Bluff Audubon, taken by Philip Monaco, Savannah River Remediation

Front and Back Cover, bottom photograph:

Coreopsis, taken by Steve Ashe, SRS Photographer



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