

# Savannah River National Laboratory

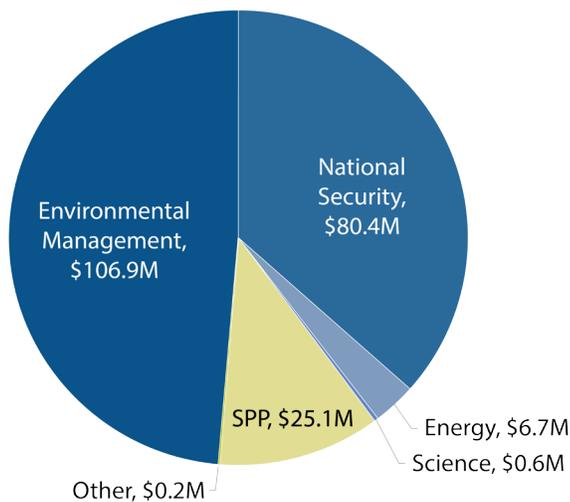
## At a Glance



Savannah River National Laboratory (SRNL) is a multi-program national laboratory that puts science to work to provide practical, cost-effective solutions for our nation's environmental cleanup, nuclear security and clean energy challenges. SRNL is the national laboratory for DOE's Environmental Management program. In this capacity, SRNL applies its expertise and applied technology capabilities to assist sites across the DOE complex in meeting cleanup requirements.

SRNL's unique facilities include laboratories for the safe study and handling of radioactive materials, a field demonstration site for testing and evaluating environmental cleanup technologies, laboratories for ultra-sensitive measurement and analysis of radioactive materials, and the world's only radiological crime investigation laboratory. Underpinning the laboratory is a world-class culture of safety and security that enables SRNL to tackle some of the nation's most difficult challenges in environmental stewardship, nuclear security and clean energy, as well as to provide nuclear chemical manufacturing leadership for DOE.

### FY 2016 Funding by Source



Lab operating costs: **\$219.8M**  
DOE-EM/NNSA costs: **\$187.1M**  
SPP costs (non-DOE/non-DHS): **\$25.1M**  
SPP as % total lab operating costs: **11.4%**  
DHS costs: **\$7.7M**

### Facts

**Location:** Aiken, South Carolina  
**Type:** Environmental Management-Multiprogram  
**Year Founded:** 1951  
**Director:** Dr. Terry A. Michalske  
**Contractor:** Savannah River Nuclear Solutions LLC  
**Responsible Site Office:** DOE-Savannah River

### Physical Assets

**39** acres and **58** buildings  
**817,010** GSF in buildings  
Replacement plant value: **\$1.6B**  
**15,318** GSF in **10** excess facilities  
**63,285** GSF in leased facilities

### Human Capital

**972** full-time equivalent employees (FTEs)  
**12** postdoctoral researchers  
**60** undergraduate students (summer 2017 projection)  
**2** visiting scientists (average)

### Core Capabilities

- Environmental Remediation and Risk Reduction
- Tritium Processing, Storage and Transfer Systems
- Nuclear Materials Processing and Disposition
- Nuclear Materials Detection, Characterization and Assessment

### Mission Unique Facilities

- Shielded Cells Facility
- Ultra-Low-Level Underground Counting Facility
- Outfall Constructed Wetland Cell Facility
- Radiological Testbed Facilities
- FBI Radiological Evidence Examination Facility
- Atmospheric Technology Center



# Savannah River National Laboratory Accomplishments



## Mission Highlight

### Immobilization of High Level Waste through Smart Manufacturing



SRNL has optimized the high-level waste vitrification process by employing a “materials-by-design” approach coupled with focused laboratory experiments, as shown at left. Tailoring the glass-forming chemicals (frit) to the composition of each waste batch has significantly reduced the canister fill time (melt rate) and increased the waste loading—the ratio of waste to glass—by 40%. Fewer canisters are filled more quickly and contain more waste, ultimately shaving five years off the life of the defense waste processing mission and reducing the cost by \$1.5B.

## Technology to Market Highlight

### SRNL Innovation Used to Harvest Medical Isotopes



SRNL’s Thermal Cycling Adsorption Process (TCAP) is the world’s best hydrogen isotope separation process. With flexible modularization and process intensification, the hydrogen isotope separation process has evolved from a 23-ft tall distillation column to a two-square-foot mini-TCAP. This doubles the throughput with 1/10 the footprint, saving hundreds of millions of dollars in tritium separation costs alone. SRNL has licensed this technology to SHINE Medical Technologies, Inc. With their patented application of SRNL’s TCAP technology, SHINE anticipates production of enough Mo-99 every year to serve more than two-thirds of the U.S. patient population, ensuring a stable supply of radioisotopes for a wide variety of nuclear-medical diagnostic procedures. Another TCAP technology, the micro-TCAP (at left) is being used in the OMEGA laser at the DOE Laboratory for Laser Energetics.

## Mission and Partnership Highlight

### Putting Science to Work Securing our Nation’s Electric Grid



The electrical transmission infrastructure in the United States needs to be updated to improve efficiency, reliability and security. Central to that update is the development and certification of new technologies that can be added into the existing electrical grid to meet this challenge. SRNL and Clemson University have joined forces in the creation of an electrical grid simulator (at left) for testing multi-megawatt power systems. The system is capable of testing, certifying, and simulating the full-scale effects of new technology under stressed or hypothetical operating conditions. The 20 MW grid simulator is the highest power experimental utility-scale facility in the world. The Grid Simulator will be an invaluable tool in developing cyber security approaches for ensuring the sanctity of power systems.