The Savannah River Site (SRS) has extensive experience in safely receiving and storing a wide variety of spent nuclear fuel (SNF) assemblies from both domestic and foreign research reactors. Since 1964, SRS has received more than 2,300 casks containing over 46,000 SNF assemblies.

Since 1996, the L Area Complex (LAC) has received about 10,500 SNF assemblies in 516 casks from off-site sources. Fuel types include high and low enriched uranium spent fuel. The LAC has received and handled about 10 different SNF transportation casks weighing up to 65,000 pounds. The LAC also made about 371 on-site spent fuel casks transfers during this time.

Underwater storage facilities, called disassembly basins, were located in all five SRS production reactor areas. These facilities were designed to store SNF and target assemblies discharged from the reactor cores. This storage allowed the nuclear material to cool after being irradiated in the reactors. The basins were also used to prepare the nuclear materials for transport to F and H Area processing facilities.

In 1996, L Basin equipment was reconfigured to safely handle and store SNF from off-site (foreign and domestic) research reactors. In February 1997, the first off-site fuel was received and stored in L Basin. To avoid the cost of operating multiple facilities, SRS decided in 1998 to consolidate all of SRS's stored spent fuel into the much larger, recently refurbished L Basin. By 2003, L Basin was SRS's only fuel receipt and storage facility. L Basin currently stores 27.5 metric tons of heavy metal in spent fuel.

L Basin has concrete walls two and a half to seven feet thick and holds approximately 3.5 million gallons of water with pool depths of 17 to 50 feet. All spent fuel assemblies have low enough radioactivity, or are “cool” enough, to be safely stored without an active basin water cooling system. The basin water provides shielding to protect workers from radiation.