Fact Sheets

SRS

F-Area Retention Basin (281-3F)

Background

The F-Area Retention Basin 281-3F is located just outside the southern fence in F-Area Separations. This open, unlined basin was used from 1955 to 1973 providing temporary emergency storage for potentially contaminated cooling water from the F-Area Separations Canyon and for storm sewer drainage from the F-Area Tank Farm. Basin water that did not meet stream release standards was treated by a deionization process prior to release to surface streams. The exact quantities of radioactive water discharged to the basin are unknown.

The 1,250 foot long pipeline leading into the basin originates within F Area and is constructed of 24- and 36-inch diameter reinforced concrete. The outlet pipeline, which is 100-feet long, is similarly constructed and discharges into a nearby tributary of Fourmile Branch.

Historical accounts indicate that at least once during operations, water levels in the basin exceeded the berm elevation and overflowed into the unnamed stream. In late 1978 and early 1979, the Savannah River Site (SRS) removed two feet of bottom sediment from the F-Area Retention Basin. A total of 1,267 cubic yards of contaminated soil was deposited in the SRS Burial Ground Complex. The basin was then backfilled with clean soil and seeded with grass. The site is currently marked with signs identifying the location of the filled basin.

Environmental Concerns

The nature and extent of contamination at this F-Area Retention Basin was determined during a two-phased investigation that included soil, sediment, and groundwater sampling and analysis. In January 1994, soil samples were collected from near the inlet pipeline, the former basin bottom, and the overflow area between the basin and the stream as part of a Phase I Remedial Investigation (RI). During this investigation several radionuclides, metals, and organic constituents were detected in and around the basin; however, the metal and organic constituents were detected at relatively low levels.

In May 1994, a remotely operated vehicle was used to assess the integrity of the inlet pipeline. The vehicle, equipped with a video camera and two radiation detectors, was able to identify potential weak points along the pipeline which were then evaluated during the Phase II RI Characterization. In 1995 and 1996, the Phase II RI Characterization was conducted which included soil and groundwater samples from the basin and surrounding pipeline as well as sediment samples from inside the pipeline manholes. The Phase I Baseline Risk Assessment (BRA) identified metals (arsenic and thallium) and several radionuclides, including cesium-137, iodine-129,

and strontium-90, as risk drivers for soils in the basin and pipeline. The determination was made that the basin did not contribute to groundwater contamination.

Environmental Actions and Plans

In March 1999, SRS initiated remedial action activities were initiated in accordance with the approved Record of Decision (ROD). The scope of the action included in-situ solidification/stabilization of the basin and specified pipeline soils, grouting of abandoned pipelines, and the establishment of institutional controls.

The contaminated basin soil and pipeline soils were in-situ stabilized with a cement-based grout and then capped with a low-permeability soil cover placement over the basin. The abandoned pipelines and manholes were grouted in place. SRS established institutional controls through deed notifications, and future land use is restricted to industrial purposes only.

The remedial activities were completed in February 2001. A Post Construction Report was submitted to the U.S. Environmental Protection Agency and South Carolina Department of Health and Environmental Control and was later approved by both regulatory agencies. The report documents the completion of the remedial activities and describes the ongoing well monitoring and post-closure maintenance.