



# **Superfund Record of Decision:**

**Savannah River (USDOE)  
(Operable Unit 6), SC**



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			<b>14.</b>	
<b>15. Supplementary Notes</b>  PB94-964020				
<b>16. Abstract (Limit: 200 words)</b>  <p>The USDOE Savannah River (Operable Unit 6) site is part of the 300-square mile Savannah River Site facility located in Aiken, Barnwell, and Allendale Counties, South Carolina. Land use in the area is predominantly agricultural, with no residential uses. The Savannah River Site (SRS), co-operated by the Westinghouse Savannah River Company, is a secured, national defense-related facility that produces tritium, plutonium, and other special nuclear materials. The site also provides nuclear materials for the space program, and conducts medical, industrial, and research efforts. From 1955 to 1988, the central area of the site, known as the F-Area, was used as a Hazardous Waste Management Facility (HWMF). The F-Area HWMF consists of three unlined, earthen surface impoundments located near the center of SRS. During site operations, the facility received waste effluents from F-Area chemical separation facilities processes, including a nitric acid recovery unit, waste storage system evaporator overheads, and general purpose evaporator overheads. The three basins had a combined maximum operating capacity of 20.5 million gallons of wastewater. Significant amounts of nitrate and caustic were received from wastewater discharge into the F-Area basins, and these radioactive releases to the three basins were greater than 99% tritium. Several studies showed that 90% of the radionuclides, cations, and anions were concentrated</p> <p>(See Attached Page)</p>				
<b>17. Document Analysis</b>				
<p><b>a. Descriptors</b> Record of Decision - USDOE Savannah River (Operable Unit 6), SC Fourth Remedial Action Contaminated Medium: None Key Contaminants: None</p> <p><b>b. Identifiers/Open-Ended Terms</b></p> <p><b>c. COSATI Field/Group</b></p>				
<b>18. Availability Statement</b>		<b>19. Security Class (This Report)</b> None		<b>21. No. of Pages</b> 22
		<b>20. Security Class (This Page)</b> None		<b>22. Price</b>

Abstract (Continued)

within the top 1 foot of basin soil. In 1988, a RCRA closure plan for the site was developed. The closure of the F-Area HWMF began in 1989, and was completed in early 1991. Closure activities included removing standing water remaining in the basins; stabilizing the basin sludge with a layer of granite, limestone, and blast furnace slag; constructing a low permeability multi-layer cap over the basins; and restoring the area. The site closure prevents physical exposure to contaminants and mitigates further migration of contaminants from the F-Area HWMF to ground water through rainwater percolation. The F-Area HWMF is being routinely inspected for a minimum of 30 years, and institutional controls, including deed restrictions, have been implemented. This ROD addresses contaminated soil and sludge in the F-Area, as OU6. Future RODs will address the remaining ground water beneath the site. EPA investigations indicate that the previous RCRA closure of the site sufficiently has reduced the threat to human health and the environment; therefore, there are no contaminants of concern affecting this site. Future RODs will address the remaining OUs found at the site.

The selected remedial action for this site is no further action, with ground water monitoring. EPA has determined that the previous RCRA closure of the site has prevented the risk of physical exposure to site contaminants, reduced further migration of site contaminants to ground water, and that the site poses no threat to human health and the environment. However, as a condition of the RCRA Hazardous Waste Permit, post closure ground water monitoring is required to verify that no unacceptable exposures to potential hazards posed by conditions at OU6 occur in the future. There are no present worth or O&M costs associated with this no action remedy.

PERFORMANCE STANDARDS OR GOALS:

Not applicable.

4) The F-Area HWMF is being routinely inspected for a minimum of 30 years to verify the integrity of the cover system, fences, signs, etc. Any necessary repairs to the cap will be made as part of the maintenance program.

5) Access to the F-Area HWMF is restricted to authorized personnel with appropriate training on applicable requirements. The survey plat and records associated with deed restricted use of the F-Area HWMF have been filed with Aiken County, SC.

#### ***Declaration Statement***

Previous action taken at the F-Area HWMF was under a RCRA Closure Plan approved by the state of South Carolina and was protective of human health and the environment. Therefore, no further remedial action is necessary under CERCLA. To ensure continued protection of human health and the environment, this remedial action will be reviewed every 5 years, consistent with the requirements of the NCP.

September 7, 1993  
Date

*James M. Roberson*  
James M. Roberson  
Acting Assistant Manager for Environmental  
Restoration and Solid Waste  
U S Department of Energy

September 10, 1993  
Date

*Patrick M. Tobin*  
Patrick M. Tobin  
Acting Regional Administrator,  
U S Environmental Protection Agency  
Region IV

# **SUMMARY OF FINAL ACTION REMEDIAL ALTERNATIVE SELECTION**

**FOR**

**F-Area Hazardous Waste Management Facility (U)**

**Prepared by  
WESTINGHOUSE SAVANNAH RIVER COMPANY  
SAVANNAH RIVER SITE  
AIKEN, SC 29802**

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**PREPARED FOR THE US DEPARTMENT OF ENERGY UNDER  
CONTRACT DE-AC09-89SR18035**

**DECISION SUMMARY  
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## **I. Site and Operable Unit Names, Locations, and Descriptions**

The Savannah River Site (SRS) occupies approximately 300 square miles (483 km) adjacent to the Savannah River, principally in Aiken and Barnwell Counties of South Carolina (Figure 1). SRS is a secured facility with no permanent residents. The site is approximately 25 miles (40 km) southeast of Augusta, Georgia, and 20 miles (32 km) south of Aiken, South Carolina. The average population density in the counties surrounding SRS ranges from 23-560 people per square mile (60-1452 per square km) with the largest concentration in the Augusta, Georgia, metropolitan area. Based on 1980 census data, the population within a 50-mile (80 km) radius of SRS is approximately 555,100.

SRS is owned by the United States Department of Energy (DOE). Westinghouse Savannah River Company (WSRC) is the manager and operating contractor for DOE. SRS produces tritium, plutonium, and other special nuclear materials for national defense. The site also provides nuclear materials for the space program, and conducts medical, industrial, and research efforts. The F-Area HWMF is a source specific operable unit within the F-Area Fundamental Study Area. The F-Area HWMF consists of three unlined, earthen surface impoundments located in the center of SRS, west of Road C and opposite road E approximately 5 miles (8 km) from the nearest site boundary (Figure 2).

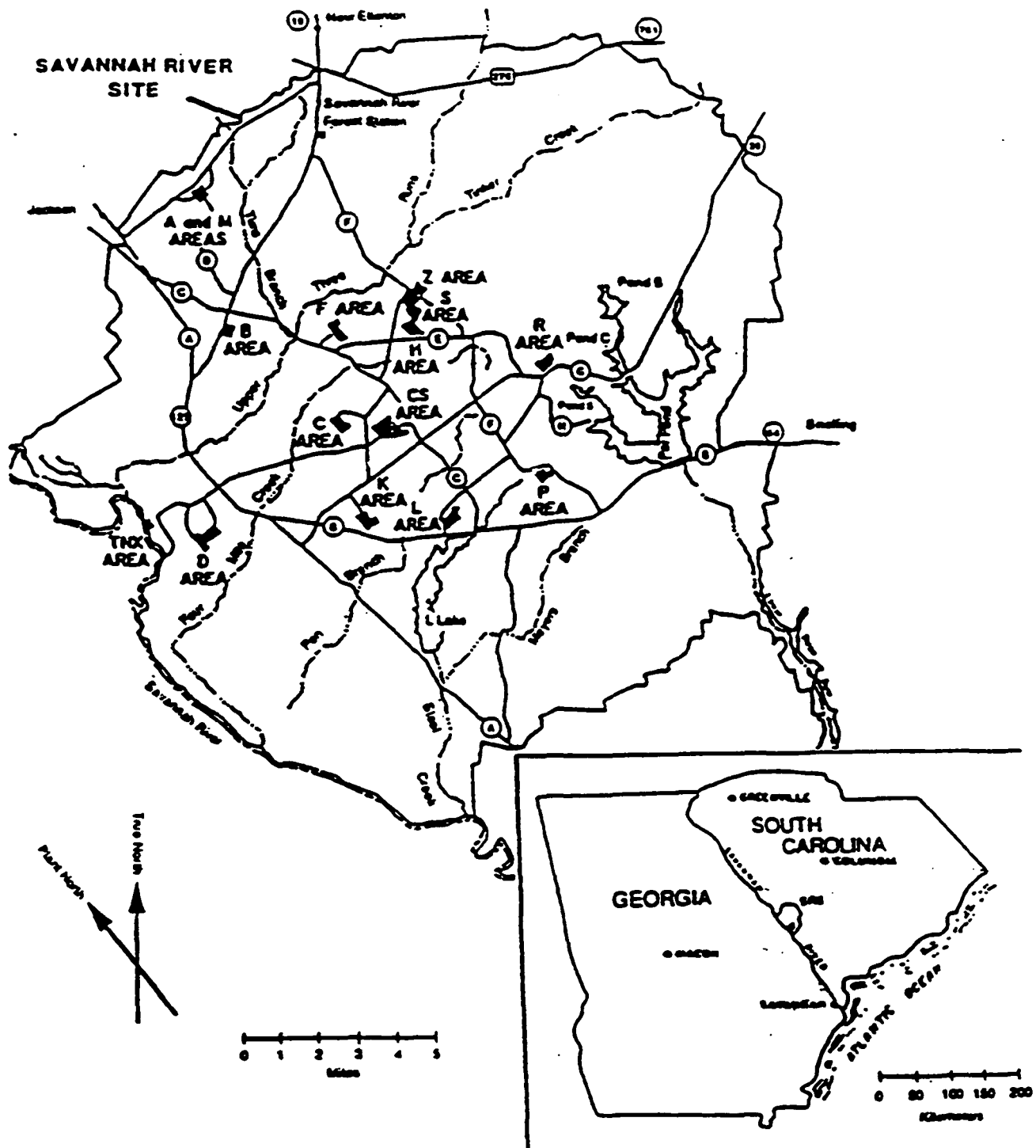


Figure 1 Location of the Savannah River Site (SRS)  
(Source: Modified from the Savannah River Environmental Report, 1990)



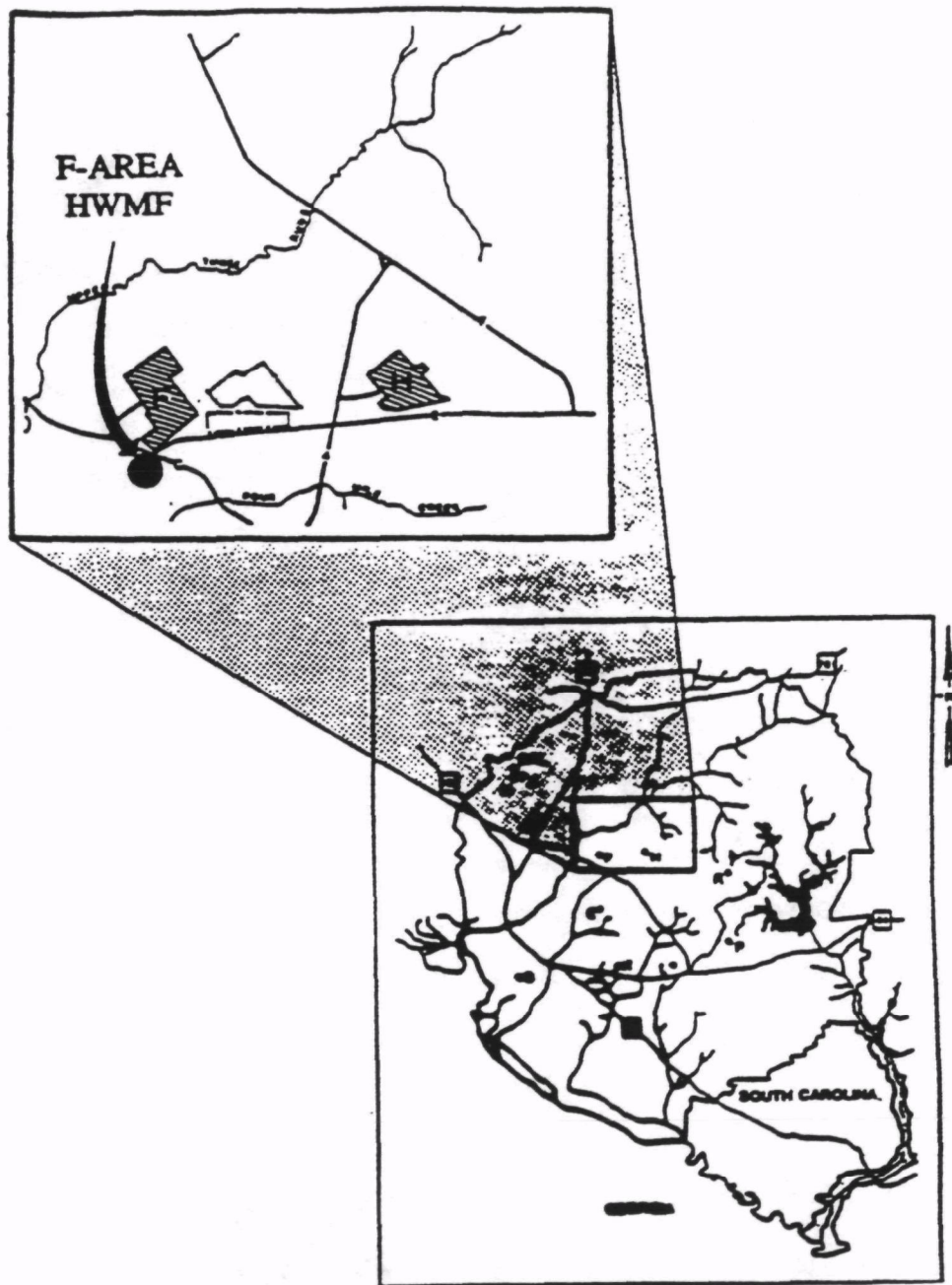


Figure 2 F-Area HWMF  
(Source: Modified from the EID for F-Area Seepage Basins, 1987)

## **II. Operable Unit History and Compliance History**

### ***Operable Unit History***

The F-Area HWMF (basins F-1, F-2, and F-3) operated from 1955 until November 7, 1988. During that time, the facility received waste effluents from F-Area chemical separation facilities processes such as the nitric acid recovery unit, waste storage system evaporator overheads, and general purpose evaporator overheads. The maximum operating dimensions and volumetric capacities of the F-Area HWMF basins were as follows:

F-1: 90 ft x 280 ft x 10.7 ft, 1.6 million gallons

F-2: 90 ft x 530 ft x 10.7 ft, 3.1 million gallons

F-3: 310 ft x 720 ft x 11.2 ft, 15.8 million gallons

The three basins had a combined maximum operating capacity of 20.5 million gallons of wastewater.

These basins were closed by dewatering, physically and chemically stabilizing the remaining sludges and placing a protective multi-layer cover system (Figure 3) over them to reduce rainwater contact with basin bottoms.

### ***Compliance History***

RCRA preventive actions at the F-Area HWMF were conducted pursuant to the requirements of the Resource Conservation and Recovery Act (RCRA) per Settlement Agreement 87-27-SW. In 1988, a RCRA Closure Plan was submitted to the South Carolina Department of Health and Environmental Control (SCDHEC). The closure plan underwent several revisions prior to

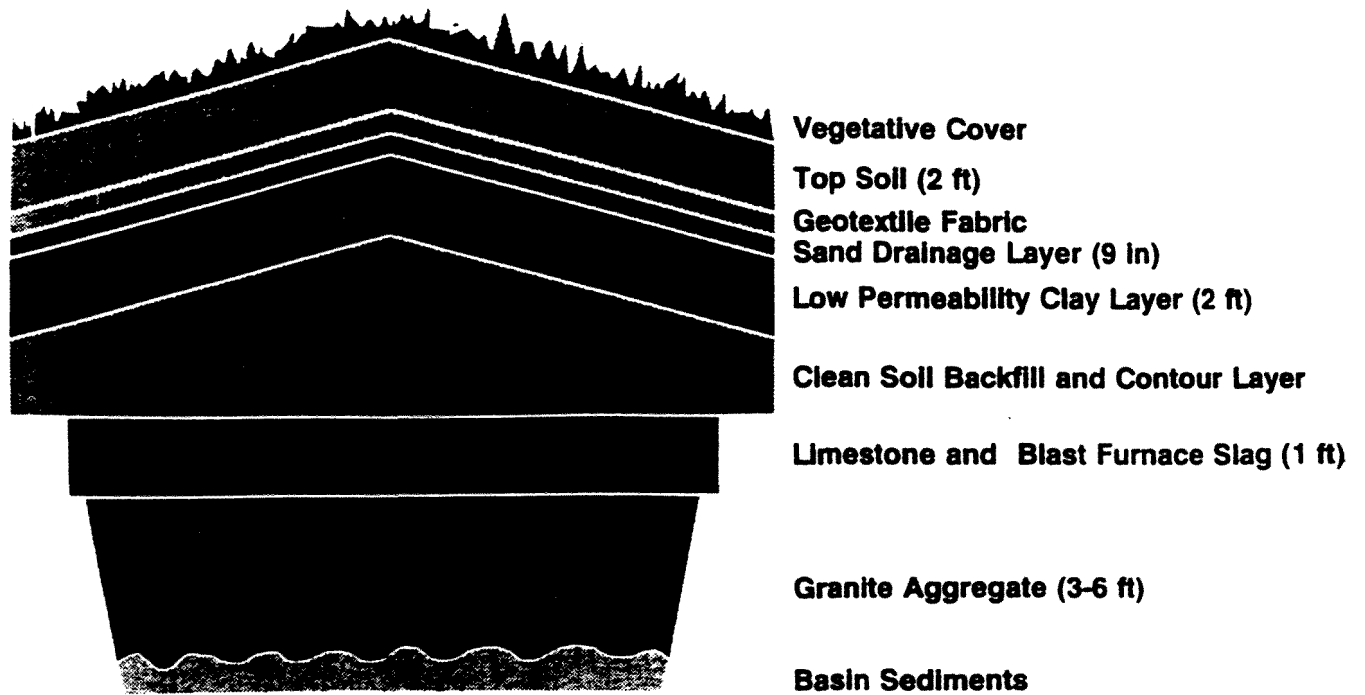


Figure 3 F-Area HWMF Cap Cross Section

approval by SCDHEC in 1989. Closure of the F-Area HWMF was begun in 1989 and completed in January 1991. The F-Area HWMF was certified closed in February 1991. In April 1991, the closure certification was accepted by SCDHEC as being in compliance with RCRA requirements. A RCRA Part B Permit Application for Post-Closure Care was submitted in December 1990 and a Hazardous Waste Permit was effective November 1992.

Closure activities specifically included removal of standing water remaining in the basin; stabilization of the basin sludge with a layer of granite, limestone and blast furnace slag; construction of a low permeability cap over the basin; and restoration of the area.

RCRA preventive activities at the F-Area HWMF became subject to CERCLA when the entire SRS facility was placed on the National Priorities List (NPL) in December 1989. The F-Area HWMF is a source-specific operable unit within the F-Area Fundamental Study Area.

### **III. Highlights of Community Participation**

The public comment period ran from 18 June 93 - 2 August 93. SCDHEC submitted comments on the Proposed Plans which have been incorporated into this ROD, where appropriate.

#### **IV. Scope and Role of Operable Unit within the Site Strategy**

The selected remedy involved the placement of all contaminated materials under a low permeability cap. The remedy prevents physical exposure to contaminants and mitigates further migration of contaminants from the F-Area HWMF to groundwater by minimizing a liquid medium pathway (rainwater percolation) for transport.

#### **V. Summary of Operable Unit Characteristics**

Waste effluents from F-Area chemical separation facilities processes such as the nitric acid recovery unit, waste storage system evaporator overheads, and general purpose evaporator overheads were discharged to the F-Area HWMF. Significant amounts of nitrate and caustic were received. Radioactive releases to these basins were greater than 99% tritium. Several studies were conducted to characterize the subsoils. A 1984 soil coring study showed that approximately 90% of the radionuclides, cations, and anions were concentrated within the top 1 foot of basin soil. The constituents of concern at the F-Area HWMF are barium, cadmium, chromium, lead, mercury, tritium, copper, cyanide, nickel, tetrachloroethylene, trichlorofluoromethane, zinc, gross alpha, gross beta, nitrate, radium-226, radium-228, tritium, americium-241, cesium-137, curium-234/244, curium-246, cobalt-60, strontium-90, technetium-99, uranium-233/234, uranium-238.

## **VI. Summary of Operable Unit Risks**

Due to the previous F-Area HWMF RCRA preventive action, No Further Action under CERCLA is necessary for this source control operable unit. The RCRA preventive action is protective to human health and the environment and satisfies CERCLA requirements.

Contaminated sediments of the F-Area HWMF were stabilized in the basin during closure. The basin then was covered with a low permeability soil cap. Therefore, exposure through surface soil and sediment pathways is minimized because of this RCRA cap.

Preventive alternatives were developed for the F-Area HWMF based on effective technologies available at the time the RCRA Closure Plan was prepared. The RCRA Closure Plan was initially submitted to SCDHEC in early 1989 and was approved, following several revisions, in June 1989.

Options regarding the F-Area HWMF evaluated at that time included:

### **Alternative 1**

No Action

### **Alternative 2**

No Waste Removal, Waste Consolidation, ~~Treatment~~, and Closure

### **Alternative 3**

Waste Removal and Closure

Alternative 2 was selected within the RCRA closure process in 1988 as the most technically effective of the three alternatives for protection of human health and the environment. Closure of the F-Area HWMF was begun in 1989 and completed in 1991. The closure was certified in February 1991 and accepted by SCDHEC as being in compliance with RCRA and state requirements. The closure is considered a final action under CERCLA.

## **VII. Explanation of Significant Changes**

There were no significant changes.

## Appendix A

### References for Development of ROD Format

- Weeks, Victor, 1993. "Regarding Records of Decision, F-Area and H-Area, Savannah River Site, Aiken, South Carolina", Letter to Goidell (DOE), Savannah River Site, Aiken, SC, April 14, 1993.
- EPA, 1991. "Guide to Developing Superfund No Action, Interim Action, and Contingency Remedy RODs," OSWER Publication 9355.3-02FS-3, U.S. Environmental Protection Agency, Washington, D.C., April 1991.
- WSRC, 1992. "Draft RCRA Facility Investigation/Remedial Investigation Program Plan," WSRC-RP-89-994, Rev. 1, Chapter 15, Westinghouse Savannah River Company, Aiken, South Carolina, May 1992.



## **Appendix B**

### **Responsiveness Summary**

SCDHEC submitted comments. DOE concurs with these comments and they have been incorporated into this ROD, where appropriate. These comments are available for review in the Administrative Record File.