WSRC-RP-91-596-1

# SAVANNAH RIVER SITE'S SITE SPECIFIC PLAN

## ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT FISCAL YEAR 1992

August 1991

## Executive Summary

Westinghouse Savannah River Company
Savannah River Site
Aiken, SC 29808

SAFETY • RESPONSIBILITY • SECURITY
SRS
SAVANNAH RIVER SITE

PREPARED FOR THE U.S. DEPARTMENT OF ENERGY UNDER CONTRACT NO. DE-AC09-89SR18035

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# SUMMARY

## Introduction

The Savannah River Site's *Site Specific Plan* (SSP) is produced annually to define sitewide environmental restoration and waste management activities identified by the Department of Energy (DOE) *Environmental Restoration and Waste Management Five-Year Plan* (FYP).

The FYP describes the environmental restoration and waste management (ER/WM) planning process, communicates ER/WM's philosophy and overall strategy for achieving its compliance and cleanup goals, summarizes multi-year program plans and assesses progress made during the previous year. The FYP goal is to ensure that risks to human health and safety and to the environment posed by the Department's past, present, and future operations are either eliminated or reduced to safer levels by the year 2019.

The SSP applies the overall strategic goals and commitments of the FYP, incorporating site-specific and local public considerations. It will address accomplishments since the FY 1990 plan, document planned activities focused on the upcoming fiscal year (FY 1992) and discuss milestones and objectives based on restricted and nonrestricted budget conditions for FY 1993-1997.

The SSP is the primary means of demonstrating the relationship of local cleanup and compliance activities to broad environmental goals set forth in the FYP. The SSP provides an important channel for conveying information to regulators, the public, special interest groups, and other DOE organizations.

This summary will briefly review the site's facilities and missions, current and future program objectives, major accomplishments, funding levels, and major milestones for the five-year period.

## Description of Facilities and Missions

The Savannah River Site (SRS) is a key installation for nuclear materials production and research for the DOE. This unique industrial complex covers 198,334 acres, or 325 square miles, encompassing parts of three counties, Aiken, Barnwell, and Allendale, in western South Carolina bordering the Savannah River. The SRS comprises 18 production, production support, service, research and development, and waste management areas. The primary areas of SRS are production facilities. They include a fuel and target fabrication facility, five nuclear reactors, two chemical separations plants, a tritium processing facility, a defense waste processing facility, a heavy water rework plant, a uranium fuel processing facility, and the Savannah River Laboratory (SRL).

Processing useful nuclear materials produces byproducts, which include radioactive waste, hazardous waste, and a combination of the two, mixed waste. Because some of these wastes remain radioactive or hazardous for many years, they must be treated, stored, and disposed of safely. Improved technical know-how and a reordering of DOE's and the nation's priorities have resulted in programs and facilities designed to provide greater

protection to human health and the environment. However, past practices resulted in contamination to soil and groundwater.

Specific areas of concern regarding contamination are hazardous waste management units, which consist primarily of seepage basins and rubble pits; sites contaminated by unplanned releases of hazardous liquids; existence of trichloroethylene in groundwater near the Savannah River; and effluent discharges to the Savannah River Swamp.

A top priority of the SRS is compliance with all applicable federal and South Carolina environmental regulations and U. S. DOE Orders. The Environmental Protection Agency (EPA) monitors all federal regulations. Chief among site compliance activities are the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). The South Carolina Department of Health and Environmental Control (SCDHEC) monitors all state regulations and oversees some federal regulations.

The Federal Facility Agreement (FFA), a three-party agreement between the EPA, SCDHEC and DOE, is currently in draft form and is due to be released upon approval by DOE-HQ for public comment. The purpose of the FFA is to: 1) ensure that environmental impacts of past and present activities are investigated, and appropriate action is taken to protect public health, welfare, and the environment; 2) establish a basis for determining that DOE has completed remedial actions in accordance with environmental laws; and 3) ensure that the public is informed and involved in the process.

## Primary Program Objectives and Accomplishments

The primary programs addressed in the SSP are Corrective Activities, Waste Management, Environmental Restoration, and Technology Development.

### *Corrective Activities Program*

Corrective activities are those activities needed to bring active and standby facilities, currently out of compliance with applicable local, state, and federal requirements, and internal DOE requirements into compliance. Corrective activities are grouped into three categories: air, water, and solid waste.

The only major corrective activity underway at SRS involves construction of a mechanical draft cooling tower for thermal mitigation of K-Reactor effluent. Because Corrective Activities must be completed in a timely and effective manner, they are generally accomplished using existing technologies.

One major activity accomplishment was the elimination of a power house wastewater effluent discharge point. The wastewater is now collected in a tank and transported to an ash basin for disposal.

### *Environmental Restoration (ER) Program*

The ER Department is responsible for all aspects of assessment and cleanup of facilities and sites that are no longer a part of active operations but are contaminated with various

quantities of transuranic, low-level, hazardous, or mixed waste materials. ER is also responsible for inactive waste sites which are nonhazardous and nonradioactive. The WSRC-ER Department was formed at the SRS in 1991 to consolidate all ER activities. It consists of two distinct activities: Remedial Actions and Decontamination and Decommissioning (D&D). The Department's goal is to ensure that risks to human health and safety and to the environment posed by DOE's past, present, and future operations are either eliminated or reduced to prescribed, safe levels.

Remedial Action includes site identification, assessment and inspection; characterization, analysis of alternatives and remedy selection; cleanup and closure; and compliance monitoring. Although remedial actions may deal with surface water contamination or with tanks, buildings, or structures, most remedial action activities are now directed toward cleanup of contaminated soil and groundwater.

D&D is the safe caretaking of inactive nuclear facilities until they are decontaminated, followed by entombment, dismantling and removal, or conversion to another use. D&D tasks include surveillance and maintenance, assessment and characterization, environmental review, engineering, operations, and closeout.

ER activities are regulated by RCRA, CERCLA, DOE Orders 5400.3 and 5400.4, and a variety of state requirements.

ER has undertaken an active program and realized many accomplishments. One hundred and seventeen waste sites at SRS have been evaluated and scheduled for detailed investigation and characterization. Another 302 sites have been identified for preliminary evaluation that could lead to more detailed studies.

The M-Area Settling Basin, contaminated with solvents and metals from past operations, has been closed. Three of the seven F- and H-Area seepage basins were closed, and the four remaining basins will be closed later this year. The Mixed Waste Management Facility, contaminated with low-level radioactive and hazardous wastes, was closed in 1990. These RCRA closures were completed in accordance with SCDHEC regulations, a first for the site.

Other major closures underway and anticipated for completion during the upcoming year are the Metallurgical Laboratory Basin, used for disposal of wastewater containing metals and organic solvent, and the 105-C Process Tank wastewater and sludge.

## *Waste Management Program*

The primary purpose of the Waste Management Department is to manage, account for, and dispose of all types of DOE waste in a safe and environmentally sound manner. A fundamental goal of Waste Management Operations is to achieve real reductions in the volume and toxicity of the waste. The waste categories at SRS are radioactive, hazardous, mixed, and sanitary.

The Waste Management Program at SRS is extensive and comprehensive, covering all facets of site operations. One hundred thirty-seven waste management operations and research and development activities were identified for the past fiscal year and account for 87 percent of the budget identified in the SSP.

The SRS waste management objectives are to comply with applicable federal and state regulations, DOE Orders, and WSRC policies, to minimize effects on the environment, minimize the generation of waste, and to the extent possible, contain waste handling, treatment, storage, and disposal within the site. The SSP presents the strategy to carry out these objectives.

Accomplishments occurred in many areas of waste management operations during the past year. Several test program milestones in the Defense Waste Processing Facility were successfully completed. The power facility ash scrubber water system was redesigned to effectively eliminate high levels of arsenic. A new process was implemented to treat the separated supernate layer in the Interim Treatment/Storage Facility Tanks that will reduce the volume of material requiring treatment, stabilization, and subsequent storage. A formal Waste Minimization Program achieved excellent results in several waste operation areas.

SRL's research and development activities center on support for site waste management, production operations, solution of production technical problems, and enhancement of existing production processes. The emphasis is on development and demonstration of technology for waste management operations. Primary efforts are currently being undertaken in the areas of high-level waste decontamination, high-level waste transfer, low-level liquid treatment, waste incineration technology, plutonium recovery, transuranic waste support, high-level waste tank farm support, SRL model waste, salt disposal, new low-level waste disposal systems, waste disposal technology, waste site closure support, decontamination technology, waste solidification, and waste minimization.

## *Technology Development Program*

The Office of Technology Development (OTD) was formed by DOE to establish and maintain an aggressive program for applied research and development, to resolve major technical issues and rapidly advance, beyond current technologies, for environmental restoration and waste operations. Within the OTD, the Research and Development Program provides the technology base necessary to determine the technical, economic, and regulatory justification to transfer technologies to other divisions.

A variety of accomplishments have been realized in the technology development area. Developed by researchers in SRL, a new drilling technique, utilizing horizontal wells, is being used to clean up contaminated groundwater and to prevent contamination from spreading. This pilot well system was installed at the site's M Area where the groundwater has been contaminated. Other major activities include waste retrieval and processing, administrative support, and planning, including robotics and educational outreach activities.

Significant progress has been made in the area of technology development. Evaluation of several site operations programs is complete. Characterization and development of other programs are underway.

## Cost

Waste Management and Environmental Restoration projected costs will total over $612 million in FY 1991 and over $558 million in FY 1992, based on the President's budget. The following table shows defense and nondefense costs over the planning period. The FYP starts with FY 1991 execution and establishes the FY 1992 amended President's budget and forecasts budget projections from FY 1993 through FY 1997 using Preliminary Unvalidated Case (PUC) and Validated Target Level (VTL) scenarios.

### *Preliminary Unvalidated Case*

PUC represents a preliminary estimate of funding: to ensure protection of the public and worker health and safety, to carry out the agreements entered into by DOE, to ensure compliance with applicable environmental requirements, and to implement other desired improvements.

### *Validated Target Level*

VTL provides a ten percent annual increase for the defense-related Environmental Monitoring (EM) Program. This growth rate far exceeds that of any other defense-funded program within DOE. The program grows at ten percent per year even in the context of declining statutory caps for the overall defense category which were insisted upon by Congress.

Under this case, consistent with the EM prioritization philosophy, priority 1 activities would be funded at the largest percentage of the PUC. Priority 4 activities would receive the lowest percentage of the field-office requested funding.

Neither the PUC nor the VTL necessarily reflects the actual amount of money that will be allocated to the EM Program between FY 1993 and FY 1997. Actual funding will depend upon further priority setting in the context of the annual budget and appropriations process.

Funding Summary (Thousands of Dollars)

| | | FY 1991 | FY 1992 |
|---|---|---|---|
| **Corrective Activities** | | | |
| Defense | | 47,600 | |
| **Environmental Restoration** | | | |
| Assessment | | | |
| Defense | | 19,850 | 19,714 |
| Nondefense | | | 250 |
| | Subtotal | 19,850 | 20,044 |
| Cleanup | | | |
| Defense | | 27,650 | 35,216 |
| Nondefense | | | |
| | Subtotal | 27,650 | 35,216 |
| | Total | 47,500 | 55,260 |
| **Waste Operations** | | | |
| Defense | | 508,536 | 491,325 |
| Nondefense | | | |
| | Total | 508,536 | 491,325 |
| **Technology Development** | | 9,215 | 12,190 |
| | Grand total | 612,851 | 558,775 |

## Milestones

The following major milestones were identified in the PUC as presented in the FYP Activity Data Sheets. These milestones may change depending on final program guidance from DOE-HQ.

### Environmental Restoration

FY 1992 milestones include:

- Completion of railroad crosstie disposal
- Closure of acid/caustic basins
- Submittal of 11 work plans to EPA
- Start of D&D Studies
- Continuation of groundwater remediation efforts of A/M Areas, Sanitary Landfill, MW/MF, F/H Areas, and TNX

Major milestones to be established for FY 1993-1997 include:

- Closure of SRL seepage basins and the new TNX seepage basin
- Closure of 22 solvent tanks and 4 underground fuel storage tanks
- Closure of the Sanitary Landfill

### Waste Management

FY 1992 milestones include:

- Recovery of 2.5-million gallons of space in F- and H-Area Evaporators
- Achievement of 95 percent certification of newly generated drummed TRU waste
- Startup of hazardous waste/mixed waste (HW/MW) Vault Construction
- Begin In-Tank Precipitation

Major milestones for FY 1993-1997 include:

- Startup of Consolidated Incinerator Facility (CIF)
- Startup of HW/MW Vault Construction

## Corrective Activities

Major milestone for FY 1993 includes:

- Completion of K-Reactor Cooling Tower

## Defense Waste Processing Facility (DWPF)

Major milestones for FY 1993-1995 include:

- Hot Startup of DWPF
- Startup of Y-Area Radioactive Operations

## Technology Development Division

Major milestones for FY 1992 include:

- Hazardous and Mixed Waste Treatment Technology Development
- Savannah River Laboratory TRU Waste Treatment
- Aqueous Detritiation Technology Development
- TCE Biodegradation Demonstration Technology Development
- Integrated Demonstration for Cleanup of Organics in Soils and at Non-Arid Sites; Phase 2 Bioremediation Tasks
- Savannah River Site Integrated Demonstration; Directional Drilling and Characterization
- Integrated Demonstration for Cleanup of Organics in Soils and at Non-Arid Sites; Offgas Treatment

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