Chapter 1

Environmental Compliance

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Contributing authors' names appear on page 24.

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THE goal of the Savannah River Site (SRS)—and that of the U.S. Department of Energy (DOE)—is positive environmental stewardship and full regulatory compliance, with zero violations. The site's employees maintained progress toward achievement of this goal in 2001, as demonstrated by examples in this chapter.

The site's compliance efforts were near-perfect again in 2001. No notices of violation (NOVs) were issued in 2001 under the Resource Conservation and Recovery Act (RCRA), the Safe Drinking Water Act (SDWA), or the Clean Water Act (CWA). Two NOVs were issued to SRS during 2001—one, associated with permit requirement compliance, was issued under the Clean Air Act (CAA); the other, related to an oil release, was issued under the South Carolina Pollution Control Act. Under the CWA, the site's National Pollutant Discharge Elimination System (NPDES) compliance rate was 99.6 percent. Also, 274 National Environmental Policy Act (NEPA) reviews of newly proposed actions were conducted and formally documented in 2001, and only one of the year's 799 Site Item Reportability and Issues Management (SIRIM) program-reportable events was categorized as environmental; it was classified as an off-normal event.

Some key regulations with which SRS must comply—and its compliance status on each—are noted in the chart on the next page.

Compliance Activities

Compliance with environmental regulations and with DOE orders related to environmental protection is a critical part of the operations at SRS. Assurance that onsite processes do not impact the environment adversely is a top priority, and management of the environmental programs at SRS is a major activity. All site compliance activities are overseen by one or more regulatory bodies, including the U.S. Environmental Protection Agency (EPA) and the South Carolina Department of Health and Environmental Control (SCDHEC). Significant effort and funding have been dedicated to ensuring that site facilities and operations comply with all requirements.

Resource Conservation and Recovery Act

RCRA was passed in 1976 to address the problem of solid and hazardous waste management. The law requires that EPA regulate the management of solid and hazardous wastes, such as spent solvents, batteries, and many other discarded substances deemed potentially harmful to human health and the environment. Amendments to RCRA regulate nonhazardous solid waste and some underground storage tanks.

RCRA also is responsible for managing inactive land-based facilities that were operating in 1982 and nonland-based facilities that were operating in 1980. RCRA requires that these inactive facilities be closed. If they cannot be clean-closed, RCRA issues permits for postclosure care and possible corrective actions. These facilities also are subject to Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requirements; however, through the SRS Federal Facility Agreement (FFA) with EPA and SCDHEC, it was agreed that if the facilities met the RCRA closure and postclosure requirements, they would not be subject to any additional CERCLA requirements.

Under RCRA, hazardous waste generators are responsible for managing every aspect of the generation, treatment, storage, and disposal of the waste; this is referred to as "cradle-to-grave" management. Hazardous waste generators, including SRS, must follow specific requirements for handling these wastes. For many waste management activities, RCRA requires permits for owners and operators of operating facilities.

Some of the Key Regulations SRS Must Follow

Legislation	What it Requires/*SRS Compliance Status*
RCRA Resource Conservation and Recovery Act (1976)	♦ The management of hazardous and nonhazardous wastes and of underground storage tanks containing hazardous substances and petroleum products – *In compliance*
FFCAct Federal Facility Compliance Act (1992)	♦ The development by DOE of schedules for mixed waste treatment to avoid waiver of sovereign immunity and to meet LDR requirements – *In compliance*
CERCLA; SARA Comprehensive Environmental Response, Compensation, and Liability Act (1980); Superfund Amendments and Reauthorization Act (1986)	♦ The establishment of liability, compensation, cleanup, and emergency response for hazardous substances released to the environment – *SRS placed on National Priority List in December 1989*
CERCLA/TITLE III (EPCRA) Emergency Planning and Community Right-to-Know Act (1986)	♦ The reporting of hazardous substances used on site (and their releases) to EPA, state, and local planning units – *In compliance*
NEPA National Environmental Policy Act (1969)	♦ The evaluation of the potential environmental impact of federal activities and alternatives; in 2001, WSRC conducted 274 reviews of newly proposed actions – *In compliance*
SDWA Safe Drinking Water Act (1974)	♦ The protection of public drinking water systems; enacted in 1974, amended in 1980, 1986 – *In compliance*
CWA; NPDES Clean Water Act (1977); National Pollutant Discharge Elimination System	♦ The regulation of liquid discharges at outfalls (e.g., drains or pipes) that carry effluents to streams – *In compliance*
CAA; NESHAP Clean Air Act (1970); National Emission Standards for Hazardous Air Pollutants	♦ The establishment of air quality standards for hazardous air emissions, such as radionuclides and benzene – *In compliance*
TSCA Toxic Substances Control Act (1976)	♦ The regulation of use and disposal of PCBs – *Nation has inadequate disposal capacity for radioactive PCBs generated and currently stored at SRS*

EPA is responsible for all hazardous waste regulations. However, EPA can delegate this authority to a state when the state passes laws and regulations that meet or exceed the EPA hazardous waste regulations. The state plan then must be approved by EPA. The agency has approved South Carolina's plan and delegated RCRA authority to SCDHEC. Similarly, the Federal Facility Compliance Act (FFCAct) gives the state authority to enforce land disposal restrictions (LDRs) for mixed wastes, which contain both hazardous and radioactive wastes. Also, SCDHEC has been authorized by the FFCAct to play the key role in the implementation of the FFCAct statute and was the lead regulatory agency for implementation of the SRS Site Treatment Plan (STP), which addresses storage and treatment of mixed waste. More information on waste

management at SRS can be found in chapter 2, "Environmental Management."

SRS received no RCRA-related NOVs during 2001.

Land Disposal Restrictions

The 1984 RCRA amendments established LDRs to minimize the threat of hazardous constituents migrating to groundwater sources. Hazardous wastes were banned from land disposal unless certain treatment requirements were met. LDRs do not allow storage of hazardous wastes except for the purpose of accumulating such quantities as are necessary to facilitate proper recovery, treatment, or disposal.

The same restrictions apply to mixed wastes. Because SRS did not have the capacity to treat all mixed wastes according to the applicable LDR standards, an LDR Federal Facility Compliance Agreement (FFCA) was signed in March 1991 between DOE's Savannah River Operations Office (DOE–SR) and EPA Region IV (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee). The FFCA was an independent compliance instrument initiated by SRS and was not part of the FFCAct statute described below. The goal of the FFCA was to address SRS mixed waste compliance with LDRs. The FFCA was terminated September 29, 1995—by mutual consent of SRS and EPA—when the STP consent order became effective.

Treatability variances are an option available to waste generation facilities if alternate treatment methods are appropriate for specific waste streams. SRS has identified certain mixed waste streams that are potential candidates for a treatability variance. The STP references four treatability variances for mixed wastes with special problems that prevent treatment according to LDR standards. Two of the variances, completed and sent to EPA headquarters in September 1997, were for tritiated water with mercury and for silver saddles (silver nitrate-coated ceramic devices designed to take up iodine gas). A third variance, for plastic/lead/cadmium Raschig rings (packing material spacers used for criticality control), was submitted September 7, 1999. These three are pending approval. With respect to the fourth variance, an interpretation was received from EPA in August 2001 regarding the treatment of radioactively contaminated lead-acid batteries. EPA considers these batteries to be radioactive lead solids; therefore, if appropriate standard treatment methods (i.e., macroencapsulation) were employed, the recovery of lead would not be necessary and SRS would not need a treatability variance for this waste.

Federal Facility Compliance Act

The FFCAct was signed into law in October 1992 as an amendment to the Solid Waste Disposal Act to add provisions concerning the application of certain requirements and sanctions to federal facilities. For mixed waste, the FFCAct provided a 3-year extension (until October 1995) of the LDR compliance date so that DOE sites could investigate mixed waste volumes in storage, evaluate treatment capacities, and develop STPs with schedules for mixed waste treatment for approval by their state or federal regulatory agencies.

Westinghouse Savannah River Company (WSRC) submitted a mixed waste inventory report January 13, 1993, and DOE Headquarters (DOE–HQ) issued a complexwide report—*U.S. Department of Energy Interim Mixed Waste Inventory Report: Waste Streams, Treatment Capacities, and Technologies*—April 21, 1993, to state governors and to regulatory agencies in states that host DOE sites. This was followed by a comment period for the regulators and states. DOE–HQ provided an update to the mixed waste inventory report in April 1994.

On March 30, 1995, DOE–SR submitted an STP that addressed the development of capacities and technologies for treating SRS mixed wastes in accordance with LDRs, as required by the FFCAct. This plan was approved with modifications, and the STP consent order was executed September 29, 1995.

As required by the STP consent order, SRS issued an annual update to the STP by April 30, 2001. The update identified changes in the mixed waste treatment status, including the addition of new mixed waste streams. STP updates will continue to be produced annually unless the consent order is modified.

Underground Storage Tanks

The 19 underground storage tanks at SRS that house petroleum products—such as gasoline and diesel fuel—and hazardous substances, as defined by CERCLA, are regulated under Subtitle I of RCRA.

These tanks require a compliance certificate annually from SCDHEC to continue operations. SCDHEC conducts an annual compliance inspection and records audit prior to issuing the compliance certificate. The inspection/audit for 2002 will be conducted by SCDHEC early in the year.

The site closed and removed one underground storage tank in 2001.

High-Level Radioactive Waste Tank Closure

The primary regulatory goal of SRS's waste tank closure process at the F-Area and H-Area high-level tank farms is to close the tank systems in a way that protects public health and the environment in accordance with South Carolina Regulation 61–82, "Proper Closeout of Wastewater Treatment Facilities." This must be accomplished in compliance with the requirements of RCRA and CERCLA, under which the high-level waste tank "farms" will be remediated. A general tank closure plan presents the environmental regulatory standards and guidelines pertinent to closure of the waste tanks and describes the process for evaluating and selecting the closure configuration (the residual source term and method of stabilizing the tanks systems' residual waste material). The plan also describes the integration of high-level waste tank system closure with existing commitments to remove waste from the tanks before closure and to ultimately remediate the entire area (including soils and groundwater) surrounding the tank farms.

Tank 20F, a 1.3-million-gallon, single-shelled, carbon steel vessel, and tank 17F, with the same construction and capacity, were closed in 1997. Prior to the initiation of closure activities, all but approximately 1,000 gallons of waste in tank 20F and 2,400 gallons in tank 17F were removed and further processed.

The assessment of soils and groundwater around the waste tanks is being deferred until complete closure of a geographical grouping of tank systems and their associated support services. Currently, the tank 17F and tank 20F systems cannot be isolated practically from other operational systems (tanks 18F and 19F and the 1F evaporator) for the purpose of assessing potential remedial actions.

The FFA requires closure of tank 19F in 2003 and tank 18F in 2004. The removal of waste from tank 19F was completed in November 2001. The waste residual characterization will be completed in 2002. A tank 19F closure module subsequently will be prepared and submitted to SCDHEC for approval prior to the initiation of closure activities. The general plan for high-level waste tank system closure was revised and submitted in March 2000 to DOE–HQ, EPA, and SCDHEC for approval, as required by DOE Order 435.1 ("Radioactive Waste Management"). EPA and SCDHEC approved the plan in September 2000.

DOE determined in October 1998 that SRS should perform a tank closure environmental impact statement (EIS) before conducting any further closure activities. A record of decision (ROD) on this action, originally scheduled for December 1999, was expected during 2001 but was delayed because of changes required as a result of the terrorist attacks on September 11.

RCRA 3004(u) Program

The hazardous waste permit issued to SRS in September 1987 (and renewed in October 1995) requires that the site institute a program for investigating and, if necessary, performing corrective actions at solid waste management units under RCRA 3004(u). The RCRA 3004(u) requirements have been integrated with CERCLA requirements in the FFA. The integration of RCRA and CERCLA regulatory requirements is expected to provide a more cost-effective and focused investigation and remediation process. The RCRA/CERCLA program status is detailed under the CERCLA section of this chapter.

Waste Minimization Program

The SRS Waste Minimization Program is part of a broad, ongoing effort to prevent pollution and minimize waste on site. The program is designed to meet the requirements of RCRA, of DOE orders, and of applicable executive orders.

Comprehensive Environmental Response, Compensation, and Liability Act

SRS was placed on the National Priority List in December 1989, under the legislative authority of CERCLA (Public Law 96–510), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA, Public Law 99–499). CERCLA assigns liability and provides for compensation, cleanup, and emergency response for hazardous substances released to the environment.

In accordance with Section 120 of CERCLA, DOE, EPA Region IV, and SCDHEC entered into the FFA, which became effective August 16, 1993. Declaration of the effective date resulted in the FFA being an enforceable agreement. The FFA sets the milestones for the investigation and remediation of waste management units at SRS and for the integration of CERCLA and RCRA 3004(u) requirements.

The FFA also identifies about 300 site evaluation units for which investigations are required. These are suspect areas that are screened to determine if additional investigation and possible remediation are warranted. Site evaluation reports on 16 areas were submitted to EPA Region IV and SCDHEC in 2001.

Releases or potential releases from RCRA/CERCLA waste management units are evaluated under the FFA.

Work plans detailing the proposed investigations for the RCRA/CERCLA units must be approved by both EPA Region IV and SCDHEC prior to implementation.

Remediation under CERCLA imposes requirements in addition to existing RCRA requirements. CERCLA requires remedial decisions to be based on the results of a baseline risk assessment, which examines present and future risk to human health and the environment from the waste unit, using conservative, EPA Region IV-approved exposure scenarios.

CERCLA also requires public participation in the selection of remediation alternatives. A significant step in this process is the development of a Proposed Plan, which highlights key aspects of the remedial investigation and feasibility study. The plan also provides a brief analysis of remedial alternatives that were considered, identifies the preferred alternatives, and tells the public how it can participate in the remedy selection process. After consideration of public comments and further analysis, decisions are made and documented in a ROD, which presents the selected remedy and provides the rationale for that selection. Also included in this process is the establishment of an administrative record file that documents the remediation alternatives and provides for public review of them.

Details of the site's environmental program are provided in the *Federal Facility Agreement Annual Progress Report for Fiscal Year 2001*, WSRC–RP–2001–4166.Preparation of this report is required under terms of the FFA.

SRS's 2001 environmental restoration activities were highlighted by

- the issuance of signed RODs on (1) the A-Area Burning/Rubble Pits (731–A and –1A) and A-Area Rubble Pit (731–2A) Interim Action, (2) Old Radioactive Waste Burial Ground Solvent Tanks Interim Action, and (3) Miscellaneous Chemical Basin/Metals Burning Pit Interim Action
- the initiation of RCRA Facility Investigation/Remedial Investigation characterizations on A-Area Burning/Rubble Pits (731–A, –1A) and Rubble Pit (731–2A), (2) D-Area Expanded Operable Unit (488–D, 489–D, and 484–10D), (3) Heavy Equipment Wash Basin and Central Shops Burning/Rubble Pit (631–5G), (4) Formulae Branch Integrator Operable Unit, (5) Savannah River Floodplain Swamp Integrator Operable Unit, and (6) H-Area Groundwater Operable Unit
- the initiation of remedial actions at (1) the P-Area Bingham Pump Outage Pits, (2) the L-Area Bingham Pump Outage Pits, and (3) the C-Area Reactor Seepage Basins
- the continuation of remedial actions initiated prior to fiscal year 2001 on (1) the A-Area Burning/Rubble Pits and Rubble Pit, (2) the CMP Pits Interim Action, (3) the K-Area Reactor Seepage Basin, (4) the Miscellaneous Chemical Basin/Metals Burning Pit, (3) the C-Area Burning/Rubble Pit (131–C) Interim Action, (4) the Old F-Area Seepage Basin (904–49G), and (5) the TNX Groundwater Operable Unit (082–G) Interim Action
- the completion of remedial actions at (1) the SRL Seepage Basins, (2) the F-Area Retention Basin, and (3) the L-Area Oil/Chemical Basin

Table 1–7 ("SRS 2001 Environmental Restoration Activities"), beginning on page 22, includes a more complete presentation of the site environmental restoration program's environmental restoration activities. A listing of all operable units at SRS can be found in appendix C ("RCRA/CERCLA Units List") and appendix G ("Site Evaluation List") of the FFA.

Emergency Planning and Community Right-to-Know Act

Two related federal acts were passed within a period of 4 years to help protect the public and the environment. The Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986 was established as a freestanding provision of SARA. EPCRA requires facilities to notify state and local emergency planning entities about their hazardous chemical inventories and to report releases of hazardous chemicals. The Pollution Prevention Act of 1990 expanded the Toxic Chemical Release Inventory report to include source reduction and recycling activities.

Tier II Inventory Report

Under Section 312 of EPCRA, SRS completes an annual Tier II Inventory Report for all hazardous chemicals present at the site in excess of specified quantities during the calendar year. Hazardous chemical storage information is submitted to state and local authorities by March 1 for the previous calendar year.

Toxic Chemical Release Inventory Report

Under Section 313 of EPCRA, SRS must file an annual Toxic Chemical Release Inventory report by July 1 for the previous year. SRS calculates chemical releases to the environment for each regulated chemical that exceeds its established threshold and

reports the release values to EPA on Form R of the report. The release values include chemical releases to air, water, land, underground injection, and offsite transfers. EPA treats offsite transfers as releases to the environment for reporting purposes. The transfers actually are shipments of waste to EPA-approved facilities for further treatment, storage, disposal, or recycling.

Form R for 2000 was submitted to EPA in June 2001. Eight chemicals, with releases totaling 248,332 pounds, exceeded the "manufactured," "processed," or "otherwise used" threshold and were reported to EPA for 2000. This compares with twelve chemicals (281,056 pounds of releases) exceeding the threshold for 1999 and 10 chemicals (160,580 pounds of releases) for 1998. In 1997, in response to EPA guidance, the site modified its calculation protocol for the estimation of metal emissions from coal-fired units. Coal combustion represented more than 90 percent of the total 2000 release inventory. Releases from waste immobilization activities at the Defense Waste Processing Facility (DWPF) and reprocessing operations at the canyon facilities represented less than 3 percent of the total releases for 2000.

A breakdown of the comparison of toxic chemical releases from 1998 through 2000 is presented in table 1–1. Site operations, which determine these releases, are expected to remain relatively steady until new missions are funded.

Nitrate, chromium, and zinc compounds were the largest contributors to the total reportable releases in 2000. Nitrates released via NPDES outfalls and metals-to-land disposal represented the two major receiving media. Wackenhut changed training ammunition in 1998 to environmentally friendly "green bullets" (lower lead content), which reduced the volume of lead discharged to land. Hexane, toluene, and xylene disappeared in 2000 because of a change in gasoline formulation used on site.

Executive Order 12856

Executive Order 12856 requires that all federal facilities comply with right-to-know laws and pollution prevention requirements. The order requires that federal facilities meet EPCRA reporting requirements and develop voluntary goals to reduce releases of toxic chemicals 50 percent on a DOE complexwide basis by the end of 1999—a goal accomplished by the complex. SRS complies with the applicable reporting requirements for EPCRA, as indicated in table 1–2, and the site incorporates the toxic chemicals on the Toxic Chemical Release Inventory report into its pollution prevention efforts.

National Environmental Policy Act

NEPA establishes policies and goals for the protection, maintenance, and enhancement of the human environment in the United States. NEPA's purpose is to provide the federal government with a process for implementing these goals. The act requires consideration of environmental factors during the planning process for all major federal activities that could significantly affect the quality of the environment. In practice, NEPA provides a means to evaluate the potential environmental impact of such proposed activities and to examine alternatives to those actions.

Although implemented at SRS by the Energy Research and Development Administration during the 1970s, a formal maintenance and operations NEPA compliance group was not established on site until 1982. The ongoing mission of this group is to make recommendations regarding the level of NEPA review of site-proposed action and to prepare draft documentation supporting DOE–SR compliance with NEPA at SRS.

In 2001, 274 reviews of newly proposed actions were conducted at SRS and formally documented through categorical exclusions (CXs), notifications of previous NEPA coverage, environmental assessments (EAs), NEPA values impact assessments (VIAs), engineering evaluations/cost analyses (EE/CAs), or EISs.

WSRC also provided technical support to DOE–SR for the preparation of supplemental environmental impact statements (SEISs) and programmatic environmental impact statements (PEISs).

The types and numbers of NEPA activities conducted at SRS during 2001 are presented in table 1–3. Among the specific activities were the following:

- The final EA and FONSI on the proposed offsite transportation of certain low-level radioactive waste (LLW) and mixed (i.e., hazardous and radioactive) low-level radioactive waste (MLLW) from SRS were issued February 15. This EA evaluated the potential for significant impacts associated with the proposed shipment of five LLW or MLLW forms to offsite facilities for treatment and/or final disposal. The purpose of the proposed action is to provide DOE with a viable near-term treatment and disposal option for these waste forms. DOE needed to take action in a cost-effective and timely manner because onsite treatment and disposal capabilities for these waste forms does not exist at this time and/or it would be more beneficial to DOE to dispose of the waste at another location. In

Table 1–1 Releases and Offsite Transfers of Toxic Chemicals (in Pounds) by SRS During 1998, 1999, and 2000 Reporting Years (Reported Under EPCRA Section 313)

1998

Chemical	Air Emissions	Water Discharges	Land Disposal	Offsite Transfers	Total Releases
Chromium compounds	168	3	2,203	236	2,610
Formic acid	7,400	0	0	0	7,400
HCFC 22	14,160	0	0	0	14,160
Lead	5	47	6,601	308	6,961
Lithium carbonate	16	0	0	0	16
Methyl tert-butyl ether	1	0	0	0	1
Nitrate compounds	26	19,721	95,000	9	114,756
Nitric acid	3,530	0	0	11	3,541
Sodium nitrite	2	0	8,000	0	8,002
Zinc compounds	577	621	1,933	2	3,133
Totals	**25,885**	**20,392**	**113,737**	**566**	**160,580**

1999

Chemical	Air Emissions	Water Discharges	Land Disposal	Offsite Transfers	Total Releases
Chromium compounds	1,001	10	31,100	27	32,138
Formic acid	6,832	0	12	0	6,844
n-Hexane	430	0	0	10	440
Lead	6	35	4,800	1,500	6,341
Lithium carbonate	7	0	0	0	7
Naphthalene	57	0	0	3	60
Nitrate compounds	201	28,165	0	86	28,452
Nitric acid	3,500	0	0	273	3,773
Sodium nitrite	7	0	3	8	18
Toluene	1,030	0	5	69	1,104
Xylene	350	0	0	400	750
Zinc compounds	4,046	4,034	193,000	49	201,129
Totals	**17,467**	**32,244**	**228,920**	**2,425**	**281,056**

2000

Chemical	Air Emissions	Water Discharges	Land Disposal	Offsite Transfers	Total Releases
Chromium compounds	835	14	27,801	0	28,650
Formic acid	2,201	0	0	0	2,201
Lead	10	16	4,900	762	5,688
Mercury compounds	829	1	0	3	833
Nitrate compounds	712	34,830	0	801	36,343
Nitric acid	5,420	0	0	60	5,480
Sodium nitrite	0	0	1	49	50
Zinc compounds	14,024	2,367	150,055	8	166,454
Totals	**24,031**	**37,228**	**182,757**	**1,683**	**245,699**

Table 1–2 2001 SRS Reporting Compliance with Executive Order 12856

EPCRA Citation	Activity Regulated	Reported per Applicable Requirement
302–303	Planning Notification	Not Required[a]
304	Extremely Hazardous Substances Release Notification	Not Required[a]
311–312	Material Safety Data Sheet/ Chemical Inventory	Yes
313	Toxic Release Inventory Reporting	Yes

a Not required to report under provisions of "Executive Order 12856 and SARA Title III Reporting Requirements"

addition, the estimated volume of these wastes likely would exceed regulatory limits for post-generation storage. This situation would not be consistent with the agreements between DOE and the State of South Carolina concerning MLLW management under the site STP that was developed pursuant to the FFCAct. Violating these agreements could result in fines and penalties for DOE, as well as suspension of the site's RCRA permit.

Table 1–3 Types/Quantity of NEPA Activities at SRS During 2001

Type of NEPA Documentation	Number
Categorical Exclusion	251
Tiered to Previous NEPA Documentation	20
Environmental Assessment	4
Programmatic Environmental Assessment	2
Engineering Evaluation/Cost Analysis	1
Values Impact Assessment	1
Environmental Impact Statement	4
Supplemental Environmental Impact Statement	1
Programmatic Environmental Impact Statement	1
Total	285[a]

a Eleven of the 285 NEPA activities were carryovers from 2000, leaving 274 newly proposed actions in 2001.

- DOE issued the fifth ROD related to the final PEIS on DOE Waste Management July 25. The first ROD dealt with decisions for the management of transuranic waste, while the second was concerned with the disposal of nonradioactive hazardous waste. The third ROD dealt with decisions for the storage of high-level radioactive waste, and the fourth dealt with the management of low-level and mixed radioactive waste types within the DOE complex. The fifth ROD revised DOE's decision for transuranic waste, electing to transfer approximately 300 cubic meters of contact-handled transuranic waste from the Mound Plant in Ohio to SRS for storage, characterization, and repackaging prior to sending it to the Waste Isolation Pilot Plant in New Mexico for disposal. The contact-handled transuranic waste will be shipped to SRS in specially designed rail cars under an exemption granted by the U.S. Department of Transportation.

- The ROD for the SRS Salt Processing Alternatives final SEIS was issued October 17. The SEIS considered alternatives for separating the high-activity fraction from the low-activity fraction of the high-level radioactive salt wastes now stored in underground tanks at SRS. Based on the analysis in the SEIS and the results of laboratory scale research and development and independent reviews, DOE determined that any of the alternatives evaluated could be implemented with only small and acceptable environmental impacts. This ROD covers DOE's decision to implement the alternative for caustic side solvent extraction for separation of radioactive cesium from the SRS salt wastes.

Table 1–4 SRS Project NEPA Documentation Activities During 2001

Project Name	Level of NEPA Documentation
DOE Waste Management	PEIS
Disposition of Scrap Metals	PEIS
Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada	EIS
High-Level Waste Salt Disposition Alternatives at SRS	EIS
SRS High-Level Waste Tank Closure	EIS
Removal, Transportation, and Storage of Radioisotopic Thermoelectric Generators from Burnt Mountain, Alaska	PEA
Storage, Transportation, and Disposition of Potentially Reusable Uranium Materials	PEA
Alternative Approach for the DWPF Glass Waste Canister Storage Facility at SRS	EA
Construction and Operation of the Low Enriched Uranium Loading Station and Modification to the Existing Highly Enriched Uranium Blending Facilities at SRS	EA
Offsite Transportation of Certain Low-Level and Mixed Radioactive Waste from SRS for Treatment and Disposal at Commercial Facilities	EA
Natural Resources Management Activities at SRS	EA
Closure of the R-Reactor Disassembly Basin at SRS	EE/CA
Remediation of TNX-Area Operable Unit at SRS	VIA

Key: *PEIS — Programmatic Environmental Impact Statement*
EIS — Environmental Impact Statement
PEA — Programmatic Environmental Assessment
EA — Environmental Assessment
EE/CA — Engineering Evaluation/Cost Analysis
VIA — Values Impact Statement

Table 1–4 contains a complete list of NEPA documentation activities conducted at SRS during 2001.

Five new department NEPA coordinators completed the SRS certification program during 2001. The total number of certified department NEPA coordinators supporting various contractor organizations on site remained at 37 because of the transfer of five coordinators to other assignments.

The SRS NEPA Program continues to improve the sitewide computerized NEPA database/tracking system, which was developed for reporting and analysis purposes. An SRS NEPA home page was available to offsite computer users by means of the Internet. The home page contained (1) electronic copies of SRS EAs and EISs, (2) monthly NEPA reports, and (3) hot links to other NEPA web sites. However, public access to this home page has been suspended in the wake of the events of September 11.

Safe Drinking Water Act

The federal SDWA—enacted in 1974 to protect public drinking water supplies—was amended in 1980, 1986, and 1996. SRS drinking water is supplied by 18 separate systems, all of which utilize groundwater sources. The A-Area, D-Area, and K-Area systems are actively regulated by SCDHEC and are classified as nontransient/noncommunity systems because each serves more than 25 people. The remaining 15 site water systems, each of which serves fewer than 25 people, receive a lesser degree of regulatory oversight.

Samples are collected and analyzed periodically by SRS and SCDHEC to ensure that site domestic water systems meet SCDHEC and EPA bacteriological and

chemical drinking water quality standards. All samples collected in 2001 met these standards.

Lead and copper analyses are required periodically for the three large systems. During 2001, lead and copper compliance sampling was performed for the A-Area consolidated system. Results were substantially below the SCDHEC action levels of 15 parts per billion for lead and 1,300 parts per billion for copper. Under the SCDHEC-approved, ultrareduced monitoring plan, lead and copper sampling will not be required for A-Area consolidated system again until 2004. The D-Area and K-Area water systems were sampled for lead and copper in 2000. They also were below the SCDHEC limits, and they will not require compliance sampling again until 2003.

The B-Area Bottled Water Facility, which was approved for operation 1998, is listed as a public water system by SCDHEC. Results from quarterly bacteriological analyses and annual complete chemical analyses performed in 2001 met SCDHEC and FDA water quality standards. The bottled water facility is not subject to the lead and copper requirements.

SCDHEC conducted its biannual survey of the A-Area, D-Area, and K-Area domestic water systems in March 2001. Survey results indicated a "satisfactory" rating.

No NOVs were issued to SRS in 2001 under the SDWA.

Clean Water Act

National Pollutant Discharge Elimination System

The CWA of 1972 created the NPDES program, which is administered by SCDHEC under EPA authority. The program is designed to protect surface waters by limiting releases of nonradiological effluents into streams, reservoirs, and wetlands. Radiological effluents are limited under DOE orders. Discharge limits are set for each facility to ensure that SRS operations do not adversely impact water quality.

SRS had three NPDES permits in 2001, as follows:

- *One permit for industrial wastewater discharge (SC0000175)*
- *Two general permits for stormwater discharge (SCR000000 for industrial and SCR100000 for construction)*

More information about the NPDES permits can be found in chapter 6, "Nonradiological Effluent Monitoring."

All results of monitoring for compliance with the industrial wastewater discharge permit and the general permit for utility water discharge were reported to SCDHEC in the monthly Discharge Monitoring Reports, as required by the permits.

The annual 2-week audit of SRS wastewater facilities and NPDES outfalls, normally conducted by SCDHEC in October, was postponed until 2002 in the wake of the events of September 11. The audit will be conducted in early 2002.

All monitoring for compliance with the industrial stormwater discharge permit was evaluated and recorded in the pollution prevention plan for each outfall, as required by that permit. The individual outfall pollution prevention plans were combined to form a site pollution prevention plan, which was developed and implemented in 1993 and updated in 1996 for identified stormwater outfalls. Effective in 1998, individual outfall pollution prevention plans are kept at specific operations facilities, where they can be updated as needed. They are submitted to the Environmental Protection Department (EPD) annually. Each plan identifies facility areas where "best management practices" and/or "best available technology" should be implemented to prevent or mitigate the release of pollutants with stormwater runoff.

The pollution prevention plan was revised in November 2001. A new category of outfalls ("Administrative") was created to capture stormwater outfalls not exposed to pollutants. The revised plan ensures that all outfalls are evaluated annually.

The outfalls covered by the modified industrial stormwater permit (SCR000000) were reevaluated in 1998. This resulted in the development of a new sampling plan, which was implemented in 1999 and underwent only minor modifications in 2000 and no changes in 2001.

All construction activity that would result in a land disturbance of 5 or more acres must be permitted. The nine land areas associated with industrial activity from construction were permitted as required in 2001 under permit SCR100000. The pollution prevention plan for this permit also requires a sediment reduction and erosion control plan.

Under the Code of Federal Regulations (CFR) Oil Pollution Prevention regulation (40 CFR 112), SRS must report petroleum product discharges of 1,000 gallons or more into or upon the navigable waters of

the United States, or petroleum product discharges in harmful quantities that result in oil sheens. No such incidents occurred at the site during 2001.

SRS has an agreement with SCDHEC to report petroleum product discharges of 25 gallons or more to the environment. One such incident in this category occurred at the site during 2001 and was reported appropriately.

Notices of Violation (NPDES)

SRS's 2001 compliance rate for NPDES under the CWA was 99.6 percent. No NOVs were issued to the site under NPDES in 2001 by SCDHEC or EPA. However, an NOV was issued (by SCDHEC) to the site under the South Carolina Pollution Control Act for an oil release at a NPDES-permitted stormwater outfall.

In a 1998 NOV, SCDHEC had cited 13 violations involving flow, total suspended solids, fecal coliform, copper, and toxicity that occurred from January through July of that year. Corrective actions were implemented in all the cases, but because no resolution could be reached on SRS's toxicity problems, SCDHEC turned over the enforcement action to EPA, which issued an NOV to the site August 3, 1999. The NOV, which detailed exceedances (including toxicity) and missing samples from 1996 through 1999, was discussed during an August 25, 1999, meeting (involving SRS, EPA, and SCDHEC) at which site representatives offered explanations for each point cited. EPA still had not determined a course of action by the end of 2001.

A toxicity problem at outfall A-11 resurfaced in October 1999, and a toxicity identification evaluation was implemented at that time. The evaluation was still under way at the end of 2001. Results of 2001 toxicity tests at SRS NPDES outfalls are presented in *SRS Environmental Data for 2001*, and additional discussion of the site's toxicity problems appears in chapter 6.

SCDHEC issued SRS a consent order October 11, 1999, addressing compliance with the site's NPDES permit at outfall A–01. The consent order gave SRS until October 2001 to comply with lead, copper, chlorine, and toxicity parameters at this outfall and until April 2002 to comply with the mercury parameter. During 2000, a wetland treatment system was designed and built to address these problems. The system, which began operating in November 2000, was fine-tuned between January and October 2001 to ensure compliance with permit limits. The outfall was in compliance with permit metal and total residual chlorine limits during the last 3 months of 2001.

SRS had 24 exceedances of permit parameters in 2001. A list of these—including outfall locations, probable causes, and corrective actions—can be found in chapter 6 (table 6–5).

Dredge and Fill; Rivers and Harbors

The CWA, Section 404, "Dredge and Fill Permitting," as amended, and the Rivers and Harbors Act, Sections 9 and 10, "Construction Over and Obstruction of Navigable Waters of the United States," protect U.S. waters from dredging and filling and construction activities by the permitting of such projects. Dredge and fill operations in U.S. waters are defined, permitted, and controlled through implementation of federal regulations in 33 CFR (U.S. Army Corps of Engineers) and 40 CFR (EPA).

In 2001, SRS conducted activities under five nationwide permits (NWPs) as part of the NWP program (general permits under Section 404), but under no individual Section 404 permits. The activities were as follows:

- Dam construction on an unnamed tributary to Four Mile Creek (also known as Fourmile Branch) for the Mixed Waste Management Facility Groundwater Interim Measures project was conducted under NWP 38, "Hazardous Waste Cleanup."
- A preconstruction notification under NWP 13, "Bank Stabilization," was submitted to the U.S. Army Corps of Engineers to allow stabilization of the SRS boat dock on the Savannah River. The project has been approved by the Corps but has not been started.
- A preconstruction notification under NWP 27, "Wetland Restoration," was submitted to the Corps to permit the plugging of ditches in 16 SRS Carolina bays under the SRS Carolina Bay Restoration Project.
- Repairs of the dam at the New Fire Pond near Road F were conducted under NWP 3, "Maintenance."
- Existing Sampling platforms on Upper Three Runs at Road C and Highway 125 were placed under NWP 5, "Scientific Measuring Devices."

Construction in Navigable Waters

SCDHEC Regulation 19–450, "Permit for Construction in Navigable Waters," protects the state's navigable waters through the permitting of any dredging, filling, construction, or alteration activity in, on, or over state navigable waters, in or on the

beds of state navigable waters, or in or on land or waters subject to a public navigational servitude. The only state navigable waters at SRS are Upper Three Runs Creek (through the entire site) and Lower Three Runs Creek (upstream to the base of the PAR Pond Dam).

SRS applied to SCDHEC for an after-the-fact "Construction in Navigable Waters" permit in October 2001 for two existing sampling platforms in Upper Three Runs at Road C and Highway 125.

Federal Insecticide, Fungicide, and Rodenticide Act

The Federal Insecticide, Fungicide, and Rodenticide Act restricts the application of restricted pesticides through a state-administered certification program. SRS complies with these requirements through procedural guidelines, and the site's pesticide procedure provides guidelines for pesticide use and requires that applicators of restricted-use pesticides be state certified. A pesticide-use task group evaluates planned pesticide programs to ensure that they are acceptable and that appropriate pesticides are used, so that impacts on the environment are minimal. The task group also

- maintains records of pest control activities
- assists in disseminating pesticide-use information to site contractors

SRS pesticide programs typically include such activities as the maintenance of roadways, gravel areas, and fence lines through the use of herbicides.

Clean Air Act

Regulation, Delegation, and Permits

The CAA provides the basis for protecting and maintaining air quality. Some types of SRS air emissions, such as radioactive sources and ozone-depleting substances (ODSs), are regulated by EPA, but most are regulated by SCDHEC, which must ensure that its air pollution regulations are at least as stringent as the CAA's. This is accomplished through SCDHEC Regulation 61–62, "Air Pollution Control Regulations and Standards."

Under the CAA, and as defined in federal regulations, SRS is classified as a "major source" and, as such, is assigned one permit number (0080–0041) by SCDHEC. In this permit, each emission source is identified by the area designation, by a point identification number, and by a source description. SRS holds operating and construction permits or exemptions from SCDHEC's Bureau of Air Quality, which regulates nonradioactive toxic and criteria pollutant emissions from approximately 172 point sources, several of which have specific emission limits.

As of May 1994, SCDHEC had completed renewal of all SRS operating permits, which are valid for 5 years. Because of ongoing work on the Title V permit, SCDHEC granted extensions of the operating permits in 1998 and 1999 and of the construction permits in 2000. The extensions will be valid until the new Title V permit is issued. Of the 172 point sources, 133 operated in some capacity during 2001. The remaining 39 either were under construction or were being maintained in a "cold standby" status.

During 2001, SCDHEC conducted compliance inspections of 102 permitted sources at SRS, reviewing 141 permitted parameters. The inspections included

- biennial stack tests
- annual compliance inspections

As a result of the annual compliance inspections, the site achieved a compliance rate of 99 percent—and received one NOV—under the CAA in 2001.

National Emission Standards for Hazardous Air Pollutants

The National Emission Standards for Hazardous Air Pollutants (NESHAP) is a CAA-implementing regulation that sets air quality standards for air emissions containing hazardous air pollutants, such as radionuclides, benzene, and asbestos. The NESHAP regulations found in 40 CFR 61 are divided into subparts based on specific hazardous pollutant categories, such as Subpart H for radionuclides and Subpart M for asbestos. The Clean Air Act Amendments (CAAA) of 1990 revised the original list of hazardous air pollutants. The revised list of 189 air pollutants includes all radionuclides as a single item. Regulation of these pollutants has been delegated to SCDHEC; however, EPA Region IV continues to partially regulate radionuclides.

SRS, like most South Carolina industrial complexes, uses a number of chemicals identified by SCDHEC as toxic air pollutants and by EPA as hazardous air pollutants. These include many common consumer products—e.g., off-the-shelf bug sprays, correction fluids, paints, sealers, janitorial cleaning supplies, gasoline for vehicles—as well as a number of typical industrial chemicals, such as degreasers, solvents, metals, batteries, and diesel fuel. But SRS has at least one category, radionuclides, not found in typical industrial settings. During the course of normal operations, some radionuclides are released to the air.

NESHAP Radionuclide Program Subpart H of NESHAP was issued December 15, 1989, after which an evaluation of all air emission sources was performed to determine compliance status. DOE–SR and EPA Region IV signed an FFCA October 31, 1991, providing a schedule to bring SRS's emissions monitoring into compliance with regulatory requirements. An amendment to the FFCA, signed August 16, 1993, provided an extension to the original FFCA through February 10, 1995, to accomplish additional monitoring equipment upgrades. The upgrades were completed on time, and the FFCA was officially closed—and the site declared compliant—by EPA Region IV May 10, 1995. The SRS NESHAP radionuclide program continues to change to incorporate sampling, monitoring, and dose assessment practices that meet or exceed the requirements of 40 CFR 61, Subpart H.

During 2001, the maximally exposed individual effective dose equivalent, calculated using the NESHAP-required CAP88 computer code, was estimated to be 0.05 mrem (0.0005 mSv), which is 0.5 percent of the 10-mrem-per-year (0.10-mSv-per-year) EPA standard (chapter 5, "Potential Radiation Doses").

NESHAP Nonradionuclide Program SRS uses many chemicals identified as toxic or hazardous air pollutants, but most of these chemicals are not regulated under the CAA or under federal NESHAP regulations. Except for asbestos, SRS facilities and operations do not fall into any of the "categories" listed in the subparts. Under Title III of the federal CAAA of 1990, EPA in December 1993 issued a final list of hazardous air pollutant-emitting source categories potentially subject to maximum achievable control technology standards. These standards were being developed and issued over a 10-year period that ended in November 2000; however, because of the number and complexity of the new standards to be developed, EPA was not able to meet the original schedule, which was arranged according to

- the effects of each pollutant
- the industry group source category
- the abatement technology available

EPA is not issuing another schedule, but rather is assigning revised due dates for the remaining new regulations in what is referred to as a "unified agenda."

In an attempt to regulate hazardous or toxic air pollutants in South Carolina, SCDHEC established Air Pollution Control Regulation 61–62.5, Standard No. 8, "Toxic Air Pollutants," in June 1991. To demonstrate compliance with this standard, SRS completed and submitted an air emissions inventory and air dispersion modeling data for all site sources in 1993. The submitted data demonstrated compliance by computer modeling the accumulated ambient concentration of individual toxic air pollutants at the boundary line and comparing them to the Standard No. 8 maximum allowable concentrations. To ensure continued compliance with Standard No. 8, new sources of toxic air pollutants must be permitted. This requires submittal of appropriate air permit applications and air dispersion modeling. Sources with emissions below a threshold of 1,000 pounds per month of any single toxic air pollutant may be exempted from permitting requirements. During 2001, 10 sources of toxic air pollutants either were issued a construction permit or exempted from permitting requirements.

NESHAP Asbestos Abatement Program Asbestos is a naturally occurring mineral. Because of its availability, low cost, and unique properties, the U.S. construction industry used asbestos extensively from after World War II through the mid 1970s. The construction of SRS began in the early 1950s, and asbestos-containing material can be found throughout the site. The danger from exposure to airborne asbestos fibers was virtually unknown during the early years at the site. Today, however, it is well established that unprotected exposure to airborne asbestos fibers can lead to asbestosis, lung cancer, mesothelioma, and other diseases.

SRS began an asbestos abatement program in 1988 and continues to manage asbestos-containing material by "best management practices." Site compliance in asbestos abatement, as well as demolitions, falls under South Carolina and federal regulations, including SCDHEC Regulation R.61–86.1 ("Standards of Performance for Asbestos Projects") and 40 CFR 61, Subpart M ("National Emission Standards for Asbestos").

Asbestos-containing material is managed at SRS through the following control options:

- an operations and maintenance program
- enclosure
- encapsulation
- repair
- removal

Many site demolition, renovation, and maintenance projects require the removal of asbestos-containing material. During 2001, SRS personnel removed and disposed of an estimated 835 square feet and 1,570 linear feet of regulated asbestos-containing material.

In addition, contractors removed and disposed of an estimated two square feet and 220 linear feet of regulated asbestos-containing material. Only qualified, asbestos-trained personnel are permitted to handle the material, and they must follow Occupational Safety and Health Administration standards and practices for its removal and disposal.

Radiological asbestos waste, removed by SRS personnel and contractors who are not permanent SRS employees, was disposed of at the SRS low-level burial ground, which is approved by SCDHEC as a disposal site. Nonradiological asbestos waste removed by SRS personnel was disposed of at the Three Rivers Landfill, located on site. Nonradiological asbestos waste removed by contractors was disposed of at SCDHEC-approved offsite landfills.

Other CAA Requirements

Only a few of the major sections of the CAA and its 1990 amendments and regulations have had—or are expected to have—a significant impact on SRS sources and facilities. These include Title V, "Permits," and Title VI, "Stratospheric Ozone Protection." The other regulations impacting SRS facilities are implemented primarily in SCDHEC Regulation 61–62 and in existing operating or construction permits.

Title V Operating Permit Program As previously indicated**,** the CAAA of 1990 also include, under Title V, a major new permitting section expected to have a significant impact on the site through increased reporting and recordkeeping requirements. The primary purpose of this permitting program is to establish federally enforceable operating permits for major sources of air emissions. The implementation plan for this program was submitted to EPA in 1993 by the State of South Carolina and subsequently approved by EPA in June 1995. SRS then submitted an extensive application package for site air emission sources by the March 15, 1996, deadline set forth in the implementation plan, Regulation 62.70, "Title V Operating Permit Program."

SRS and SCDHEC have been developing the Title V (Regulation 62.70) operating air permit since 1996. In September 1998, SRS received a draft Part 70 permit from SCDHEC and subsequently submitted comments back to SCDHEC on October 1 of that year. However, the permitting process has been on hold for the past 3 years because of the departure of SCDHEC's permit engineer for SRS and because of higher priority permitting needs in the state during 2000 and most of 2001. SCDHEC resumed the permit preparation process in July 2001 and provided the site with another complete preliminary draft air permit in November for review and comment. Comments were transmitted December 5 to SCDHEC, which on December 21 opened the SRS Draft Part 70 Air Permit (No. 0080–0041) for public comment. The public comment period will close January 21, 2002.

Ozone-Depleting Substances Title VI of the CAAA of 1990 addresses stratospheric ozone protection. This law requires that EPA establish a number of regulations to phase out the production and consumption of ODSs. The substances commonly are used as refrigerants in air conditioning and cooling systems; as degreasers and cleaners; as spray-can propellants; as fire suppressants (Halon); as laboratory extractions; and in many other common consumer products.

Several sections of Title VI of the CAAA of 1990, along with recently established EPA regulations found in 40 CFR 82, apply to the site. The ODSs are regulated in three general categories, as follows:

- *Class I substances* – chlorofluorocarbons (CFCs), Halons, carbon tetrachloride, methyl chloroform, methyl bromide, and hydrobromofluorocarbons (HBFCs)
- *Class II substances* – hydrochlorofluorocarbons (HCFCs)
- *Substitute substances*

The "Savannah River Site Refrigerant Management Plan," completed and issued in September 1994, provides guidance to assist SRS and DOE in the phaseout of CFC refrigerants and equipment.

The site has

- purchased certified recycling equipment
- trained and certified technicians where required
- implemented required recordkeeping and leak-tracking for large cooling systems
- implemented proper labeling and other recordkeeping requirements
- permanently shut down and evacuated six chillers that utilized CFC refrigerants
- replaced 30 of 35 chillers that utilized CFC refrigerants with equipment containing non-CFC refrigerants
- transferred excess CFC–11 (or R–11) refrigerant to the Defense Logistics Agency facility in Richmond, Virginia.

SRS has reduced CFC refrigerant usage more than 99 percent, based on 1993 data. The site used 480

pounds of CFC refrigerants in 2000 and reduced that amount to 450 pounds in 2001.

The SRS CAAA of 1990 Title V operating air permit application includes ODS emission sources. All large (greater than or equal to 50-pound charge) heating, ventilation, and air conditioning/chiller systems for which there are recordkeeping requirements are included as fugitive emission sources.

SRS is phasing out its use of Halon as a result of the DOE 1999 Pollution Prevention and Energy Efficient Leadership Goal to eliminate use of Class I ODSs by 2010 "to the extent economically practicable." A Halon 1301 alternative study was completed by the site's fire protection and systems engineering groups in 2000 to (1) recommend alternative fire suppression agents to replace Halon 1301 and (2) provide a method for assigning modification priorities to site fire protection systems that use Halon 1301.

Additionally, a Halon 1301 phaseout plan and schedule is being developed by Fire Protection Engineering to help meet DOE's goal. The plan includes an SRS Halon 1301 fire suppression system inventory that identifies systems in operation, systems abandoned in place, and systems that have been dismantled and taken to the DOE complex's Halon repository, located at SRS. At the end of 2001, there were 110 operating systems and 84 systems abandoned in place.

Halon 1301 total inventory on site has increased—from 75,089 pounds in 1995 to 93,941 pounds in 2001. At the end of 2001, the site had an inventory of 55,193 pounds of stored Halon 1301, including 3,191 pounds received from other DOE sites during 2001. In addition, 23,061 pounds are contained in the 110 operating systems, and 15,687 pounds of Halon 1301 are contained in the 84 systems that have been abandoned in place.

As part of the national program to phase out their use, portable Halon 1211 fire extinguishers have been replaced at SRS as they reached the end of their useful lives. During 2001, all the Halon 1211 units remaining on site were shipped to the Defense Logistics Agency facility in Richmond. SRS no longer has a Halon 1211 inventory.

As is the case with refrigerants, all personnel working with the site's nine Halon 1301 fire suppression systems and its Halon 1301 recycling and recharging operations have been trained in Halon emissions reduction. Training is based on vendor information for specific systems and on National Fire Protection Association-recommended practices required by Halon emissions reduction regulations.

Air Emissions Inventory

SCDHEC Regulation 61–62.1, Section III ("Emissions Inventory"), requires compilation of an air emissions inventory for the purpose of locating all sources of air pollution and defining and characterizing the various types and amounts of pollutants. To demonstrate compliance, SRS personnel conducted the 1993 comprehensive air emissions inventory, compiling source information from as far back as 1985. Guidelines and procedures were written to

- ensure that all radiological and nonradiological sources had been accounted for
- ensure documentation of all vents and stacks for each building
- better characterize emission points from site processes
- calculate emissions based on design capacity, maximum potential emissions, and actual emissions for a selected period of time
- provide consistency in recording appropriate data

The inventory identified approximately 5,300 radiological and nonradiological air emission sources. Source operating data and calculated emissions from 1990 were used to establish the SRS baseline emissions and to provide data for air dispersion modeling. This modeling was required to demonstrate sitewide compliance with Regulation 61–62.5, Standard No. 2, "Ambient Air Quality Standards," and Standard No. 8.

Regulation 61–62.1, Section III, requires that inventory data be updated and *recorded* annually but only *reported* every even calendar year. The emissions inventory is updated each year in accordance with SRS procedures and guidelines. Calendar year 2000 operating data for *permitted and other significant* sources were *reported* to SCDHEC in 2001. Because data collection for all SRS sources begins in January and requires up to 6 months to complete, this report provides emissions data for calendar year 2000 (table 6–4 of this document for criteria pollutants and table 45, *SRS Environmental Data for 2000*, WSRC–TR–2000–00329, for toxic/hazardous air pollutants). Compilation of 2001 data will be completed in 2002 and reported in the *SRS Environmental Report for 2002*.

Toxic Substances Control Act

The Toxic Substances Control Act (TSCA) gives EPA comprehensive authority to identify and control chemical substances manufactured, imported, processed, used, or distributed in commerce in the

United States. Reporting and recordkeeping are mandated for new chemicals and for any chemical that may present a substantial risk of injury to human health or the environment. EPD and Industrial Hygiene personnel coordinate reporting and recordkeeping requirements under TSCA.

Polychlorinated biphenyls (PCBs) have been used in various SRS processes. The use, storage, and disposal of these organic chemicals are specifically regulated under 40 CFR 761, which is administered by EPA. SRS has a well-structured PCB program that complies with this TSCA regulation, with DOE orders, and with WSRC policies.

The site's 2000 PCB document log was completed prior to the July 1, 2001, deadline in full compliance with 40 CFR 761. Also, SRS's report on 2000 PCB disposal activities (ESH–FSS–2001–00089) was prepared and submitted to EPA Region 4 prior to the July 15, 2001, deadline. The disposal of nonradioactive PCBs routinely generated at SRS is conducted at EPA-approved facilities within the regulatory time frame. For many forms of radioactive PCB wastes, disposal capacity is not yet available, and the wastes must remain in long-term storage. Such wastes are held in TSCA-compliant storage facilities in accordance with 40 CFR 761. Site plans call for the disposal of incinerable radioactive PCB wastes at the TSCA incinerator in Oak Ridge, Tennessee, as the State of Tennessee approves the disposal plans. The first shipment of such wastes to the Oak Ridge incinerator occurred in September 2001.

In August 1993, PCBs were confirmed to be present as a component of dense nonaqueous phase liquids in samples from two groundwater monitoring wells around the M-Area hazardous waste management facility. Regulators were notified, and a modification to the RCRA Part B Permit Application to address the discovery of PCBs was submitted to SCDHEC in December 1993. Any waste generated was handled according to the appropriate TSCA and RCRA requirements. Environmental Restoration Division and Savannah River Technology Center (SRTC) personnel continue to study ways to remediate the dense nonaqueous phase liquids.

In 1996 and subsequent years, site personnel discovered PCBs in certain painted surfaces and in other solid forms within several facilities constructed prior to TSCA. As such discoveries were made, SRS worked with EPA—as necessary—on related TSCA compliance issues. Current TSCA regulations prohibit the use and distribution in commerce of these forms of PCBs above specified concentrations. In December 1999, however, EPA issued a proposed rule to authorize the continued use of these forms of PCBs. A final rule is expected in 2002.

Endangered Species Act

The Endangered Species Act of 1973, as amended, provides for the designation and protection of wildlife, fish, and plants in danger of becoming extinct. The act also protects and conserves the ecosystems on which such species depend.

Several threatened and endangered species exist at SRS. The site conducts research on the wood stork, the red-cockaded woodpecker, the bald eagle, the shortnose sturgeon, and the smooth purple coneflower. Programs designed to enhance the habitat of such species are in place.

No biological assessments and/or biological evaluations were prepared for NEPA documents for new projects at SRS in 2001. However, to ensure the protection of threatened and endangered species, biological assessments and biological evaluations—which are required under NEPA—were conducted by the U.S. Department of Agriculture Forest Service–Savannah River (USFS–SR) to evaluate potential impacts of forestry related activities.

None of these activities was found to have had any significant potential impact on threatened and endangered species.

The biological assessment for the river water system shutdown EIS concluded in 1996 that the proposed action could affect the bald eagle, the alligator, and the wood stork. Consultations conducted between SRS and the U.S. Fish and Wildlife Service required the site to perform studies on the bald eagle. The studies were completed in 1999, and a report of the findings is expected to be issued in 2002. The results of this report will determine if a mitigation plan should be implemented.

National Historic Preservation Act

The National Historic Preservation Act (NHPA) of 1966, Section 106, governs the protection and preservation of archaeological and historical resources. SRS ensures that it is in compliance with this act through the site-use process. All sites being considered for activities such as construction are evaluated by the University of South Carolina's Savannah River Archaeological Research Program (SRARP) group to ensure that archaeological or historic sites are not impacted. Reviews of timber compartment prescriptions include surveying for archaeological concerns and documenting areas of

importance with regard to historic and prehistoric significance.

SRARP personnel reviewed 76 site-use packages and surveyed 2,078 acres in support of SRS project activities during 2001. Most of the site-use packages were found to have no activities of significant impact in terms of the NHPA, but 12 of them resulted in surveys being conducted because of the potential for land alteration in 2001. SRARP personnel also surveyed 2,849 acres during 2001 in support of onsite forestry activities.

The surveys of all 4,927 of these acres resulted in the investigations of 92 new archaeological sites and in revisits to 46 previously recorded sites for cultural resources management.

In support of the Mixed Oxide Fuel Facility project, preliminary test excavations were conducted in December 2001 to determine locations for large-scale excavation of the project site. Large-scale excavation will be conducted in early 2002.

Floodplains and Wetlands

Under DOE General Provisions, 10 CFR, Part 1022 ("Compliance with Floodplains/Wetlands Environmental Review Requirements"), establishes policies and procedures for implementing DOE's responsibilities in terms of compliance with Executive Orders 11988 ("Floodplain Management") and 11990 ("Protection of Wetlands"). Part 1022 includes DOE policies regarding the consideration of floodplains/wetlands factors in planning and decision making. It also includes DOE procedures for identifying proposed actions involving floodplains/wetlands, providing early public reviews of such proposed actions, preparing floodplains/wetlands assessments, and issuing statements of findings for actions in floodplains.

Executive Orders 11988, "Floodplain Management," and 11990, "Protection of Wetlands"

Executive Order 11988, "Floodplain Management," was established to avoid long- and short-term impacts associated with the occupancy and modification of floodplains. The evaluation of impacts to SRS floodplains is ensured through the NEPA Evaluation Checklist and the site-use system. Site-use applications are reviewed for potential impacts by WSRC, DOE–SR, the USFS–SR, and the Savannah River Ecology Laboratory (SREL), as well as by professionals from other organizations.

Executive Order 11990, "Protection of Wetlands," was established to mitigate adverse impacts to wetlands caused by the destruction and modification of wetlands and to avoid new construction in wetlands wherever possible. Avoidance of impact to SRS wetlands is ensured through the site-use process, various departmental procedures and checklists, and project reviews by the SRS Wetlands Task Group. Many groups and individuals—including scientists at SRTC, SREL, and EPD—review site-use applications to ensure that proposed projects do not impact wetlands.

No floodplain or wetland assessments were conducted at SRS during 2001.

Environmental Release Response and Reporting

Response to Unplanned Releases

Environmental Monitoring Section (EMS) personnel respond to unplanned environmental releases—both radiological and nonradiological—upon request by area operations personnel.

No unplanned environmental releases that occurred at SRS in 2001 required the sampling and analysis services of EMS. If the services of EMS personnel are requested, the samples collected are given priority in preparation and, if radiological in nature, priority in the counting room. Data are validated, and a determination is made as to whether there has been an actual release. If there has been, then consequences to the public and the environment are determined.

Occurrences Reported to Regulatory Agencies

"Federally permitted" releases comply with legally enforceable licenses, permits, regulations, or orders. Under the Atomic Energy Act, for example, releases of SRS radionuclides are federally permitted as long as public dose standards in DOE orders are not exceeded.

If a nonpermitted release to the environment of a reportable quantity (RQ) or more of a hazardous substance (including radionuclides) occurs, CERCLA requires notification of the National Response Center. Also, the CWA requires that the National Response Center be notified if an oil spill causes a "sheen" on navigable waters, such as rivers, lakes, or streams. Oil spill reporting was reinforced with liability provisions in CERCLA's National Contingency Plan.

Other CERCLA provisions allow exemptions from reporting a release of an RQ or more of a hazardous

substance if the release is federally permitted or covered by a continuous-release notification. A continuous-release notification provides an exemption from reporting each release of a specific hazardous substance greater than an RQ. The site submitted two continuous-release notifications in 1992—for ethylene glycol and for asbestos, each of which had a statutory RQ of 1 pound. SRS withdrew the request for continuous-release notification status for ethylene glycol in 1995, when EPA made an adjustment to that RQ. The asbestos continuous-release notification request was retracted during 1999 with the completion of deactivation and decommissioning activities at the D-Area Heavy Water Facility.

SRS had no CERCLA-reportable releases in 2001. This performance compares with no such releases reported during 2000, one during 1999, one during 1998, and three during 1997.

Seven notifications—not required by CERCLA—were made by the site to regulatory agencies during 2001. One of these was a "courtesy notification" made to inform SCDHEC of equipment malfunctions. Four were the result of an agreement to notify SCDHEC about sewage and petroleum product releases. The agreement requires reporting of sewage releases "equal to or greater than 100 gallons" and of petroleum product releases "equal to or greater than 25 gallons" unless the releases come in contact with "waters of the state." In these cases, releases in any amount are to be reported—whether for sewage or for petroleum products. Of the remaining two notifications, one involved an opacity issue that was later resolved and the other concerned the discovery of a white powder ultimately determined to be harmless.

EPCRA (40 CFR 355.40) requires that reportable releases of extremely hazardous substances or CERCLA hazardous substances be reported to any local emergency planning committees and state emergency response commissions likely to be affected by the release. No EPCRA-reportable releases occurred in 2001.

It is SRS policy to notify SCDHEC and the Georgia Department of Natural Resources (GDNR) of any occurrence that may interest state regulatory agencies. Although not required by law, these courtesy notifications enhance environmental protection objectives. In 1997, SRS expanded the plan for the courtesy notifications in response to a request by local governments. The expanded notification plan includes such occurrences as shelter alarms and stack monitoring alarms, even though they may be false alarms.

Site Item Reportability and Issues Management Program

The Site Item Reportability and Issues Management (SIRIM) program, mandated by DOE Order 232.1A (which superceded DOE Order 232.1), "Occurrence Reporting and Processing of Operations Information," is designed to ". . . establish a system for reporting of operations information related to DOE-owned or operated facilities and processing of that information to provide for appropriate corrective action. . . ." It is the intent of the order that DOE be ". . . kept fully and currently informed of all events which could: (1) affect the health and safety of the public; (2) seriously impact the intended purpose of DOE facilities; (3) have a noticeable adverse effect on the environment; or (4) endanger the health and safety of workers."

The SIRIM program at SRS is designed to meet the requirements of DOE Order 232.1A by ensuring that

- all occurrences specified are identified in a timely manner, categorized, and reported
- proper corrective actions are taken in a timely manner
- all reportable occurrences are reviewed to assess significance and root causes
- occurrence reports to DOE operations are disseminated to prevent the recurrence of similar events

All SIRIM events are classified in one of the following categories: (1) facility condition; (2) environmental; (3) personnel safety; (4) personnel radiation protection; (5) safeguards and security; (6) transportation; (7) value-based reporting; (8) facility status; (9) nuclear explosive safety (not applicable at SRS); or (10) cross-group items. The impact—or the anticipated impact—of each event is categorized as follows (based on criteria in site procedures):

- *Emergency* – the most serious event; requires increased alert status for onsite and, in specific cases, offsite authorities
- *Unusual occurrence* – a nonemergency event that has significant impact or potential for impact on safety, environment, health, security, or operations
- *Off-normal occurrence* – an abnormal or unplanned event or condition that deviates from established standards or specifications

Table 1–5
Environmentally Related Unusual Occurrence Reported Through SIRIM in 2001

Discovery Date	Occurrence	Report No. (SR–WSRC–)	Cause/Explanation[a]
Dec. 8	500 gallons of sludge water released to the ground; no environmental release in excess of reportable quantities	REACL–2001–0013	Solenoid valve failure

a SRS takes followup corrective actions to minimize impact on the environment.

Of the 799 SIRIM-reportable events in 2001, only one was categorized as environmental; it was classified as an off-normal occurrence (table 1–5).

Assessments/Inspections

The SRS environmental program is overseen by a number of organizations, both outside and within the DOE complex. In 2001, the WSRC environmental appraisal program consisted of self and independent assessments. The program employs total-quality management concepts that support the site's four imperatives of safety, disciplined operations, continuous improvement, and cost effectiveness. It also ensures recognition of noteworthy practices, identification of performance deficiencies, and initiation and tracking of associated corrective actions until they are satisfactorily completed. The primary objectives of the WSRC assessment program are to ensure compliance with regulatory requirements and to foster continuous improvement. The program is an integral part of the site's Integrated Safety Management System and supports the SRS Environmental Management System, which continues to be certified to the standards of International Organization for Standardization (ISO) 14001. (ISO 14000 is a family of voluntary environmental management standards and guidelines.)

WSRC conducted seven environmental program-level assessments in 2001. Areas assessed included

- land disturbance field verification
- Operation and Maintenance (O&M) administrative compliance
- secondary containment adequacy
- proper chemical storage
- Ozone Depleting Substance (ODS) accounting
- NEPA education/field compliance
- pesticide administrative compliance

During 2001, personnel from DOE–SR's Environmental Quality and Management Division again performed direct oversight and evaluation of WSRC's self-assessment program to help ensure that the program continues to meet the needs and expectations of DOE Order 5482.1B, "Environment, Safety, and Health Appraisal Program"; Savannah River Implementation Procedure (SRIP) 200, chapter 223.4, "SR Technical Assessment Program"; and SRIP 450.1, "SR Environmental Protection Program." Completed assessments have met with positive results; routine assessments have promoted improvement and helped ensure the adequacy of environmental programs and operations at SRS.

SCDHEC, EPA, and DOE–HQ also provide external inspections of the SRS environmental program for regulatory compliance. Agency representatives performed five comprehensive compliance inspections in 2001, as follows:

- *Inspection of Environmental Monitoring and Surveillance Programs by DOE's Office of Independent Environmental, Safety, and Health Oversight (EH–2)* – An inspection by EH–2 personnel in January identified positive attributes in the environmental surveillance and monitoring programs at SRS. With few exceptions, the program was characterized as well-designed, comprehensive, and effectively implemented. Sound and well-documented technical justifications were identified for most of the activities supporting the radiological environmental monitoring and surveillance program. The radiological air program was found to be effective, proactively ensuring implementation of regulatory requirements. The auditors also noted that SRS had made significant achievements in monitoring groundwater contamination. The EH–2 inspection identified areas where program improvements were considered appropriate. Three "issues" were identified that required changes to achieve full compliance with DOE Orders 5400.1 ("General Environmental

Protection Program") and 5400.5 ("Radiation Protection of the Public and the Environment") and their associated technical guidance. Also, seven "observations" recommended changes for consistency with best management operating practices. One issue and one observation subsequently were reevaluated and judged not to be deficiencies requiring corrective actions. A corrective action plan was developed to address all the remaining issues and observations. Corrective measures have been implemented to add several select analyses to the annual environmental surveillance program, to improve facility-specific effluent air program protocols, and to strengthen and formalize SRS groundwater monitoring program documents, data evaluation, and reporting practices.

- *Annual Air Compliance Inspection* – SCDHEC's Bureau of Air Quality conducted an inspection of SRS in March. Results indicated that the site generally was in compliance with air pollution regulations and/or the requirements of the Bureau of Air Quality permit. However, the site was found to have failed to follow a requirement contained in the site air permit in that a differential pressure gauge associated with the A-Area baghouse had not been operated and maintained properly. Immediate actions were taken by the responsible organizations to correct and prevent recurrence of this issue.

- *Domestic Water System Sanitary Survey* – SCDHEC conducted a sanitary survey of domestic water systems at SRS in March. Three areas of the site program implementation were identified as "needs improvement": (1) the railroad yard system storage tank required installation of an isolation valve; (2) the L-Area Fire Station system storage tank's exterior was determined to be rusted and in need of maintenance; and (3) operational inconsistencies were found with the flow-testing of fire hydrants associated with the A-Area water system. Immediate actions were taken by the responsible organizations to correct and prevent recurrence of these issues.

- *RCRA Compliance Evaluation Inspection* – SCDHEC personnel inspected SRS in June for compliance with South Carolina Hazardous Waste Management Regulations (SCHWMR), as amended. No deficiencies were noted during the inspection. Suggestions were offered regarding various items such as secondary containment for all satellite containers holding liquids. The inspector stated that SRS has an excellent Hazardous Waste Management System in place. The formal report had not been received at the end of 2001.

- *Annual Underground Storage Tank Inspection* – SCDHEC personnel performed their annual inspection of the site's underground storage tanks in October. Results indicated that each of the tanks was fully compliant with regulatory requirements.

Environmental Permits

SRS had 621 construction and operating permits in 2001 that specified operating levels for each permitted source. This compares with 655 such permits in 2000, 684 in 1999, 697 in 1998, and 675 in 1997. Table 1–6 summarizes the permits held by the site during the past 5 years. These numbers reflect only permits obtained by WSRC for itself and for other SRS contractors that requested assistance in obtaining permits. It also should be noted that these numbers include some permits that were voided or closed some time during the calendar year (2001).

Environmental Training

The site's environmental training program identifies training activities to teach job-specific skills that protect the employee and the environment while satisfying regulatory training requirements. Regularly scheduled classes in this program at SRS include the Environmental Laws and Regulation Overview, Environmental Compliance Authority Modules, and Department NEPA Coordinator courses. Special training sessions held in 2001 included the McCoy RCRA Seminar and the Applied CAA course, both offered by DOE's former National Environmental Training Organization.

Facility Decommissioning

With the rapidly declining need for a large nuclear weapons stockpile, many SRS facilities no longer are needed to produce or process nuclear materials. They have become surplus and must be dispositioned safely and economically. Many of them are large and complex and contain materials that, if improperly handled or stored, could be hazardous. SRS faces a major task in the cleanup, reuse, safe storage, and demolition of these facilities. The Facilities Decommissioning Division (later renamed the Facilities Disposition Division) was established in 1996 to meet this challenge. The site's 2001 deactivation and decommissioning activities are discussed in chapter 2.

Table 1–6
SRS Construction and Operating Permits, 1997–2001

Type of Permit	Number of Permits				
	1997	**1998**	**1999**	**2000**	**2001**
Air	198	202	200	199	172
U.S. Army Corps of Engineers 404	1	1	0	0	0
Army Corps of Engineers Nationwide Permit	6	6	4	1	5
Domestic Water	186	194	203	203	203
Industrial Wastewater	84	83	86	77	70
NPDES–Discharge	1	1	1	1	1
NPDES–General Utility	1	1	1	1	0
NPDES–No Discharge	1	1	1	1	1
NPDES–Stormwater	2	2	2	2	2
RCRA	1	1	1	1	1
Sanitary Wastewater	137	139	141	133	133
SCDHEC 401	2	2	1	1	1
SCDHEC Navigable Waters	4	4	0	0	1
Solid Waste	5	5	5	5	4
Underground Injection Control	17	31	18	23	20
Underground Storage Tanks	29	24	20	7[a]	7
Totals	675	697	684	655	621

a This number was revised to reflect the actual number of permits that included requirements for 20 underground storage tanks.

Table 1–7 SRS 2001 Environmental Restoration Activities

Operable Unit	Activity Description
Fourmile Branch Watershed	
Burial Ground Complex Groundwater (also in Upper Three Runs Watershed)	Continued characterization
C-Area Burning/Rubble Pit	Continued interim remedial action
C-Area Reactor Seepage Basins	Continued remedial action
Central Shops Sludge Lagoon	Finalized remedy selection
F-Area Retention Basin (281–3F)	Completed remedial action
F-Area Seepage Basin Groundwater	Continued remediation system operation
Ford Building Seepage Basin	Issued ROD
H-Area Retention Basin (281–3H)	Issued remedy selection
H-Area Seepage Basin Groundwater	Continued remediation system operation
H-Area Groundwater	Continued characterization
Heavy Equipment Wash Basin and Central Shops Burning/Rubble Pit (631–5G)	Issued ROD
Old Radioactive Waste Burial Ground, including Solvent Tanks	Issued ROD
Lower Three Runs Watershed	
R-Area Reactor Seepage Basins	Initiated remedy selection
R-Area Acid/Caustic Basin	Initiated remedy selection
R-Area Bingham Pump Outage Pits	Initiated remedy selection
Pen Branch Watershed	
CMP Pits	Continued interim remedial action
K-Area Burning/Rubble Pit and Rubble Pile	Continued remedial action
K-Area Reactor Seepage Basin	Issued source unit remedy explanation of significant differences (plug-in ROD)
L-Area Burning/Rubble Pit, Rubble Pile, and Gas Cylinder Disposal Facility	Finalized remedy selection
Savannah River and Floodplain Swamp Watershed	
D-Area Expanded Operable Unit (Ash Basin, Coal Pile Run–off Basin, Waste Oil Facility, and Upgradient Sources)	Continued characterization
D-Area Oil Seepage Basin	Continued remedial action
Road A Chemical Basin	Finalized characterization
Savannah River and Floodplain Swamp IOU	Continued Phase I IOU characterization

Table 1–7 SRS 2001 Environmental Restoration Activities

Operable Unit	Activity Description
Savannah River and Floodplain Swamp Watershed (cont.)	
TNX Operable Unit	Continued interim action and continued characterization
TNX Outfall Delta, Lower Discharge Gulley, and Swamp	Continued characterization
Steel Creek Watershed	
L-Area Hot Shop	Continued characterization
L-Area Oil and Chemical Basin	Completed remedial action
L-Area Reactor Seepage Basin	Finalized remedy selection
L-Area Southern Groundwater	Continued characterization
P-Area Reactor Seepage Basin	Initiated remedy selection
P-Area Burning/Rubble Pit	Initiated remedy selection
Upper Three Runs Watershed	
A-Area Burning/Rubble Pits and Rubble Pit	Continued interim action
A-Area Miscellaneous Rubble Pile	Finalized remedy selection
M-Area HWMF – A/M Groundwater	Continued remediation system operation
M-Area HWMF – Vadose Zone	Continued remediation system operation
Met Lab Basin/Carolina Bay	Continued remediation system operation
Miscellaneous Chemical Basin/Metals Burning Pit	Continued interim action
Mixed Waste Management Facility (including RCRA-regulated portions of LLRWDF)	Continued interim corrective action measures
Sanitary Landfill Groundwater	Continued interim-measure remediation system operation
SRL Seepage Basins	Completed remedial action

Editors' note: The "Environmental Compliance" chapter is unique in that its number of contributing authors is far greater than the number for any other chapter in this report. Space/layout constraints prevent us from listing all of them on the chapter's first page, so we list them here instead. Their contributions, along with those of the report's other authors, continue to play a critical role in helping us produce a quality document—and are very much appreciated.

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