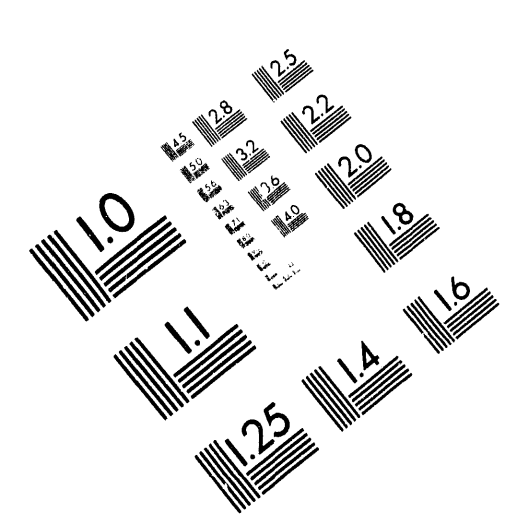
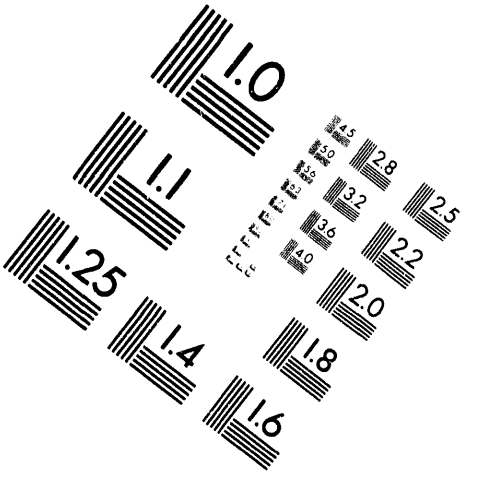
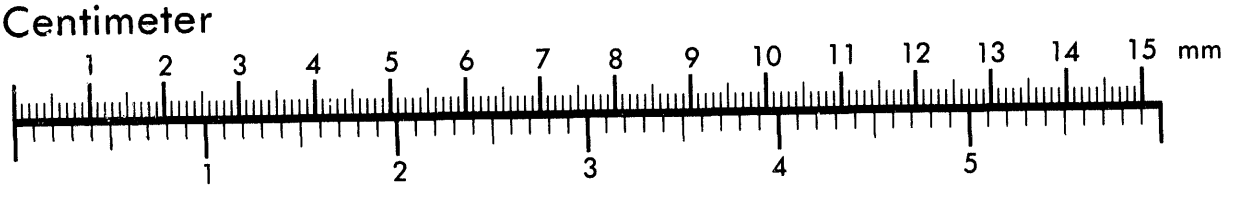


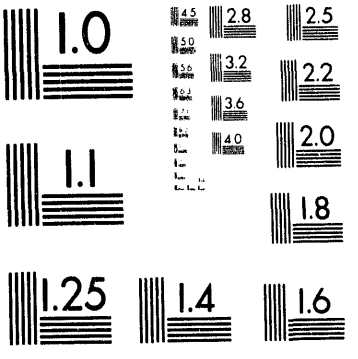
Association for Information and Image Management

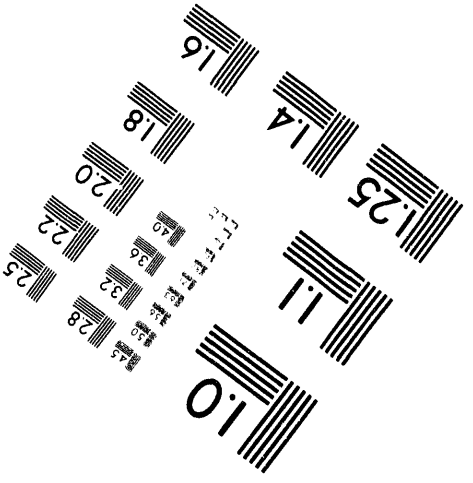
1100 Wayne Avenue, Suite 1100
Silver Spring, Maryland 20910

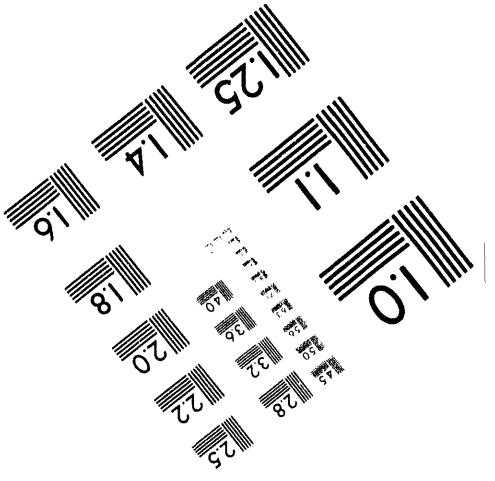
301/587-8202











MANUFACTURED TO AIIM STANDARDS
BY APPLIED IMAGE, INC.

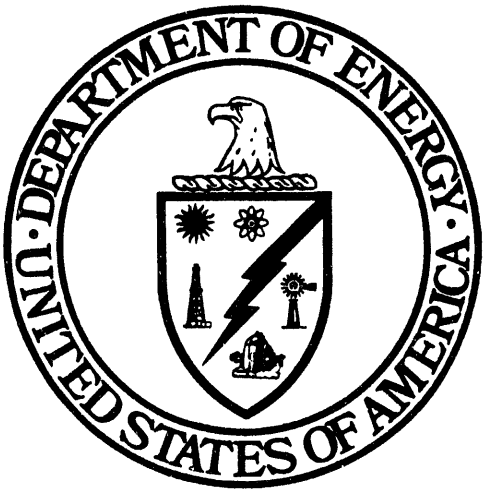
1 of 2

DOE/EH-0362

Environmental Audit

of the

Savannah River Ecology Laboratory (SREL)



U.S. Department of Energy
Office of Environmental Audit
Washington, DC 20585

September 1993

This page intentionally left blank.

PREFACE

This page intentionally left blank.

PREFACE
U.S. DEPARTMENT OF ENERGY
COMPREHENSIVE BASELINE ENVIRONMENTAL AUDIT
CONDUCTED AT THE
SAVANNAH RIVER ECOLOGY LABORATORY (SREL)

The Secretary of Energy's July 20, 1993, Environment, Safety and Health Policy establishes daily excellence in the protection of the worker, the public, and the environment as the hallmark and highest priority of all DOE activities. That policy also calls for a proactive program of continuous improvement to move the Department beyond minimal compliance with standards. In furtherance of that policy, the Office of Environment, Safety and Health (EH) has established, as part of the internal oversight responsibilities within DOE, a program within the Office of Environmental Audit (EH-24), to conduct environmental assessments of DOE programs and operating facilities. The ultimate goal of this program is enhancement of environmental protection and minimization of risk to public health and the environment through systematic and periodic evaluations of the Department's environmental programs within line organizations.

Through its environmental audit program, EH-24 is committed to helping establish DOE as a model of responsible environmental stewardship. In addition, this program will serve to reinforce the Secretary's goal of building on the efforts currently ongoing to attain and maintain compliance in cooperation with the regulatory authorities and other affected stakeholders.

This document contains the results of the Comprehensive Baseline Environmental Audit of the Savannah River Ecology Laboratory (SREL). This audit was conducted by EH-24 from September 13 through September 23, 1993. The audit included a review of SREL operations and facilities supporting DOE-sponsored activities. The objective of the audit is to advise the Secretary of Energy, through the Assistant Secretary for Environment, Safety and Health, as to the compliance status of DOE facilities with regard to environmental requirements, adequacy of DOE environmental management programs, and corrective actions to address identified problem areas.

September 1993
Washington, DC

This page intentionally left blank.

TABLE OF CONTENTS

This page intentionally left blank.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

EXECUTIVE SUMMARY

This page intentionally left blank.

EXECUTIVE SUMMARY

This report documents the results of the environmental audit conducted at the Savannah River Ecology Laboratory (SREL) at the Savannah River Site (SRS), principally in Aiken and Barnwell Counties, South Carolina. The audit was conducted by the U.S. Department of Energy's (DOE's), Office of Environmental Audit (EH-24), beginning September 13, 1993, and ending September 23, 1993.

The scope of the audit at SREL was comprehensive, addressing environmental activities in the technical areas of air; surface water/drinking water; groundwater/soil, sediment, and biota; waste management; toxic and chemical materials; inactive waste sites; radiation; quality assurance; and environmental management. Specifically assessed was the compliance of SREL operations and activities with Federal, state, and local regulations; DOE Orders; and best management practices.

Onsite activities included inspection of SREL facilities and operations; review of site documents; interviews with DOE and contractor/subcontractor personnel; and reviews of previous appraisals. Using these sources of information, the environmental audit team developed findings, which fell into two general categories: compliance findings and best management practice findings. Each finding also identifies apparent causal factor(s) that contributed to the finding and will assist line management in developing "root causes" for implementing corrective actions.

The environmental audit team identified several strengths in the SREL facilities and activities that were audited including several examples of biota-related programs; a quality assurance program that is well designed and implemented; and a waste management program, including a waste minimization program, that is well developed and implemented.

A total of 18 findings were identified in this audit. Sixteen of these represent conditions which, in the opinion of the audit team, do not meet the requirements of Federal or state regulations, and applicable DOE Orders. Two findings reflect a lack of adherence to best management practices. None of the findings identified by the audit team appear to pose significant near term threats to public health and the environment.

The "key findings" identified by the audit team involve issues related to SR guidance and oversight of SREL environmental activities, and formality of operations as it pertains to the University of Georgia Research Foundation (UG).

- Inadequacies pertaining to SR guidance and oversight of SREL environmental programs include a lack of guidance from SR to UG regarding implementation of DOE Orders and overall conduct of operations. SR has not provided adequate oversight of SREL to ensure their compliance with applicable environmental requirements.

- UG does not have a comprehensive and formalized environmental management program that would enable them to identify and comply with DOE requirements. Internal and external communications are informal which inhibits the transmission of environmental information. Environmental data is informally reviewed and roles, responsibilities, and accountabilities are not well defined.

The causal factor which appeared to contribute most often to the findings was policy implementation, which was identified in all disciplines except Waste Management.

The overall conclusion of the audit is that SREL has recently made some progress in developing and implementing environmental protection programs; however, complete implementation of DOE and Federal and state regulatory requirements have not been achieved.

SECTION 1.0

INTRODUCTION

This page intentionally left blank.

1.0 INTRODUCTION

This report documents the results of the Savannah River Ecology Laboratory (SREL) Comprehensive Baseline Environmental Audit, located at the Savannah River Site (SRS), primarily in Aiken and Barnwell Counties, South Carolina (see Figures 1-1 and 1-2). The audit was conducted from September 13 through September 23, 1993, by DOE's Office of Environmental Audit (EH-24).

DOE 5482.1B, "Environment, Safety and Health Appraisal Program," establishes the mission of EH-24 to provide comprehensive, independent oversight of Department-wide environmental programs on behalf of the Secretary of Energy. The ultimate goal of EH-24 is enhancement of environmental protection and minimization of risk to public health and the environment. EH-24 accomplishes its mission using systematic and periodic evaluations of the Department's environmental programs within line organizations, and through use of supplemental activities which serve to strengthen self-assessment and oversight functions within program, field, and contractor organizations.

These evaluations function as a vehicle to apprise the Secretary and Program Office Officials of the current status and vulnerabilities of Departmental environmental activities and environmental management systems. Several types of evaluations have been conducted, including:

- comprehensive baseline environmental audits;
- periodic routine reaudits;
- environmental management assessments;
- special issue reviews; and
- environmental crosscuts as a component of Environment, Safety and Health (ES&H) Progress Assessments.

The purpose, scope, and approach of this environmental audit is described below.

1.1 PURPOSE

The purpose of the environmental audit is to provide the Secretary of Energy with concise information pertaining to the following issues:

- compliance status with environmental laws and regulations;
- compliance with DOE directives which address environmental programs;
- adherence to best management and accepted technical practices;
- DOE vulnerabilities and liabilities associated with compliance status, environmental conditions, and management practices;

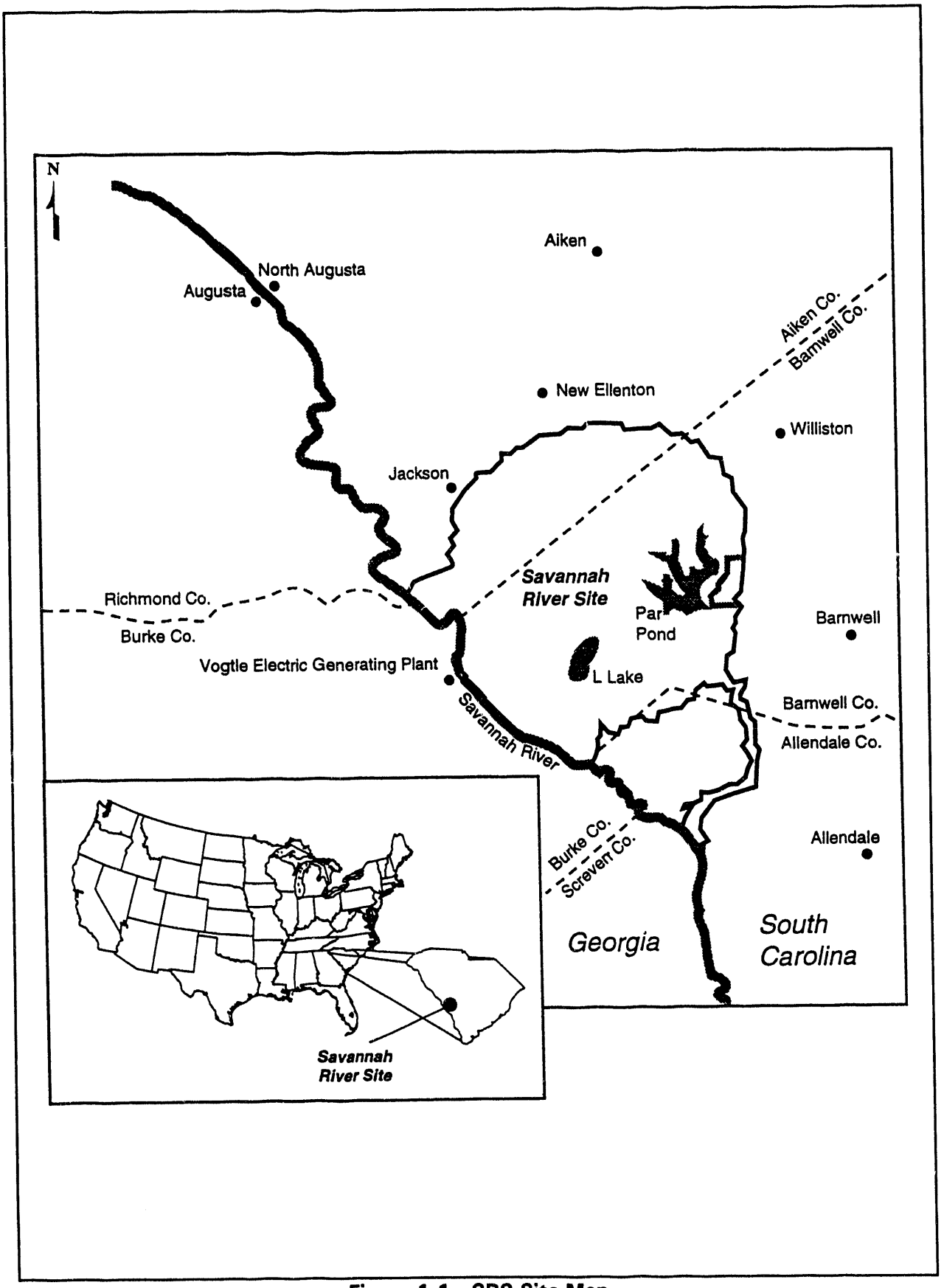


Figure 1-1. SRS Site Map

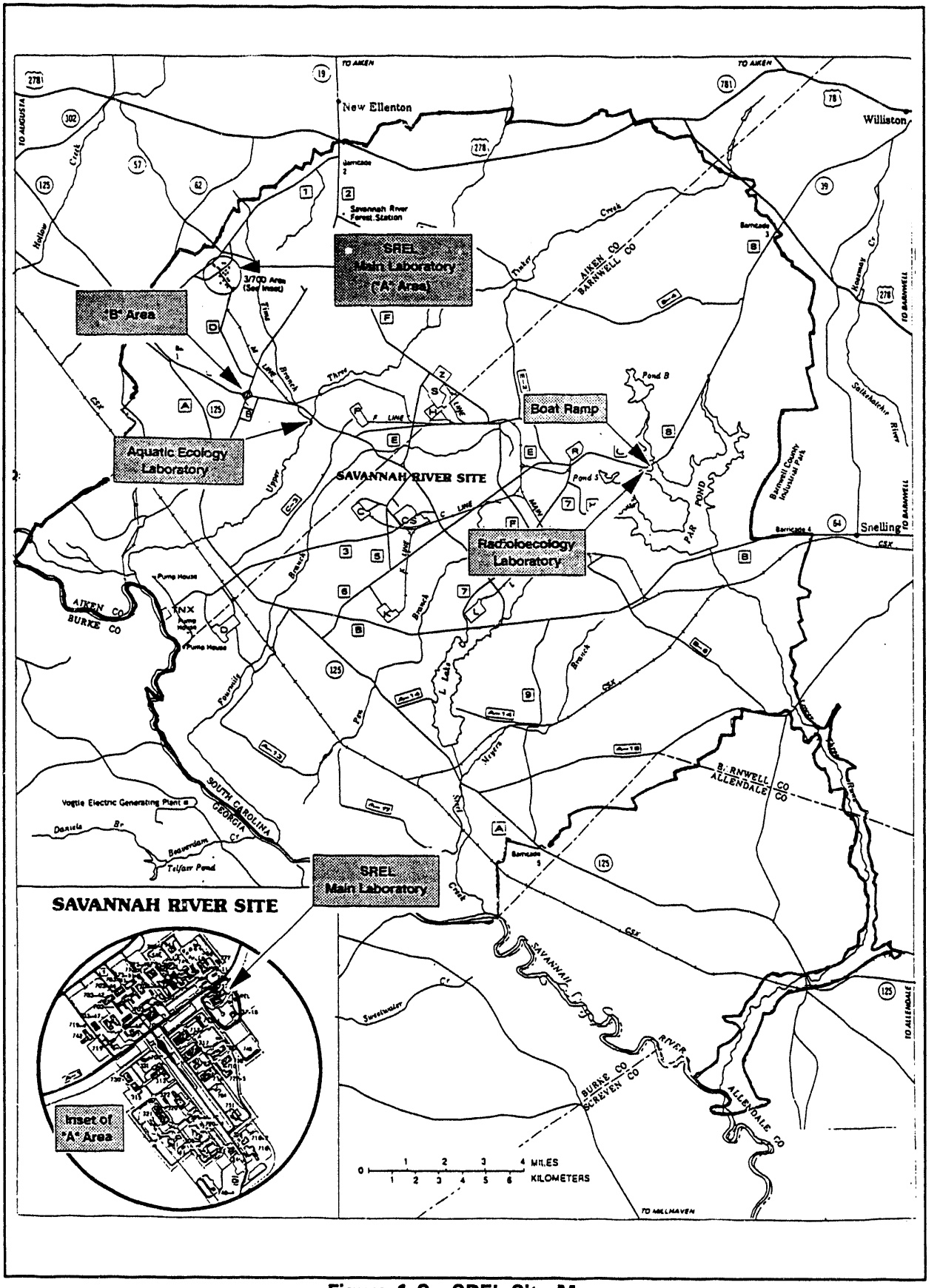


Figure 1-2. SREL Site Map

- identification of causal factors associated with each deficiency to determine root causes;
- adequacy of environmental programs and plans;
- special issues; and
- noteworthy practices.

The information gathered during this audit and embodied in this report will assist DOE in determining patterns and trends in environmental deficiencies, as well as apparent causal factors contributing to the observed deficiencies. Line management is expected to fully utilize this information to develop corrective actions, to make appropriate modifications to internal self-assessment programs to prevent recurrence, and to supplement their formalized lessons learned programs to ensure broad applications to other operations, programs, and facilities.

1.2 SCOPE

The scope of the environmental audit was comprehensive, addressing all environmental media and Federal, state, and local regulations, with the exception of environmental programs pertaining to the National Environmental Policy Act. Also addressed were DOE Orders and formalized facility or program operating procedures, as well as best management practices. The technical disciplines addressed were air; surface water/drinking water; groundwater/soil, sediment, and biota; waste management; toxic and chemical materials; quality assurance; radiation; environmental management and inactive waste sites. In addition, the environmental audit included a review of the environmental monitoring programs and related sampling and analysis, and the effectiveness of environmental management programs including the oversight of the SREL by the DOE Savannah River Operations Office (SR).

1.3 APPROACH

The environmental audit was conducted in accordance with the DOE Environmental Audit Program Guidance (DOE/EH-0232, January 1992), and the DOE Environmental Audit Manual (DOE/EH-0125, January 1990), and followed accepted audit techniques. The audit was conducted by a team of professionals managed by a DOE Headquarters Audit Team Leader and a Deputy Team Leader from EH-24, and staffed by contractor technical support personnel. The names, areas of responsibility, affiliations, and biographical sketches of the team members are provided in Appendix A. The audit included three phases: planning, onsite activities, and reporting.

During the planning phase, a memorandum was sent to the SREL announcing the environmental audit and requesting information about the selected sites and the program in general. A pre-audit site visit was conducted July 13-15, 1993. The site's response to the information request memorandum combined with the pre-audit site visit formed the basis for the Environmental Audit Plan (see Appendix B), including the onsite agenda. Once onsite, the audit team modified the original agenda as more information was obtained and additional areas of interest were identified. The final daily activity schedule is contained in Appendix C.

Onsite activities were conducted from September 13 through September 23, 1993, and included interviews with both DOE and contractor/subcontractor personnel; document reviews, including previous audits and self-assessment reports; physical inspection of facilities; and observations of field sampling activities and certain operations. Lists of site documents reviewed and interviews performed are provided in Appendices D and E, respectively. The audit team conducted daily debriefings that were open to DOE and site personnel. Using these sources of information, the audit team developed findings as discussed in Sections 2.0 and 3.0 of this report.

The problems identified are categorized as either compliance findings or best management practice findings. Compliance findings are conditions that, in the judgment of the audit team, may not satisfy environmental regulations, applicable DOE Orders, internal environmental policies and formal procedures, enforcement actions, permit conditions, or compliance agreements with regulatory agencies. Best management practice findings are derived from regulatory agency guidance, accepted industry practice or technical standards, draft DOE Orders or guidance, and professional judgment.

Within the "compliance" and "best management practice" categories, each finding is prefaced by a performance objective(s) according to the DOE Performance Objectives and Criteria for Conducting DOE Environmental Audits (DOE/EH-0229). The performance objectives specify the particular compliance or best management practice standards that were not being met. The findings are not arranged in order of significance.

Site activities were reviewed for any noteworthy practices, activities, or programs that may have general application to DOE facilities and may warrant documentation for the purpose of information transfer among DOE facilities.

In an effort to understand why a finding was identified, a systematic approach was implemented to perform an "apparent causal factor" analysis (see Appendix F for definitions of causal and contributing factors). This approach is initiated by a series of "why?" questions concerning the cause(s) of a finding. The apparent cause(s) are compiled and reasons for the selection of specific cause(s) developed are provided within the supporting information for each finding. The causal factors are then used to determine the full scope of corrective action required to correct identified findings and to prevent recurrence.

It is the intent of this environmental audit to identify the causal factors that contributed to the observed environmental deficiencies. When developing root causes, an identification of the apparent causal factors contributing to each finding is essential. If one or more of these causal factors can be identified as contributing to a specific finding, it will be included in the supporting information for each finding. The apparent causal factors are then used to determine the corrective actions required to correct identified findings.

1.4 HISTORICAL BACKGROUND AND FACILITY DESCRIPTION

In early 1951, the Atomic Energy Commission (AEC) made it known that it was interested in funding ecological studies on the land surrounding its recently established Savannah River Plant (SRP), which was soon to begin producing plutonium for nuclear weapons. The AEC recognized the need to inventory the local plants and animals before the reactors were built and put into operation in order to assess the environmental effects of their

presence. Since 1951, researchers have conducted independent environmental studies of SRS, surrounding streams and ponds, and the Savannah River. Some of the first studies performed at SRS included biological inventories of plant and animal species, competition in animal and plant communities, and the use of radioactive tracers to understand food chains.

In 1961, the Laboratory of Radiation Ecology was established after research efforts and results clearly demonstrated the need for a permanent onsite laboratory. In 1964, the laboratory took on its present name of Savannah River Ecology Laboratory (SREL), reflecting the broad spectrum of ecological studies being conducted at the site. The SREL is operated by the University of Georgia Research Foundation (UG) under contract with the U.S. Department of Energy. The research programs have evolved through the years and now are carried out by three major divisions: biogeochemical ecology, wildlife ecology and toxicology, and wetlands ecology. A fourth division focuses on environmental outreach and education activities as part of SREL's overall mission to acquire and communicate knowledge of ecological processes and principles.

Research activities focus on both freshwater and terrestrial systems in natural and disturbed habitats, and are coordinated by SREL in association with the National Environmental Research Parks program.

SREL facilities include several buildings in the A Area, three buildings in the B Area, an Aquatic Ecology Laboratory, and a newly constructed radioecology laboratory at Par Pond. UG and SR have not been able to formally document the SREL property boundaries at the B Area and Par Pond facilities. In addition, SREL is charged with developing and implementing a research and management program for 30 "Set-Aside" areas located throughout SRS (see Figures 1-3 and 1-4). These "Set-Aside" areas comprise 14,290 acres or 7.2 percent of the total SRS acreage (198,344 acres), and provide researchers with representative natural areas, unaffected by site operations or management.

1.5 ENVIRONMENTAL PROGRAMS AND ORGANIZATION

Office of Defense Programs (DP)/Site Integration Division, within DOE Headquarters, is the Program Office with responsibility for establishing environmental policy, program goals and objectives, and programmatic guidance for DOE activities at SREL (see Figure 1-5). SR is responsible to DP for field oversight of SREL and implementing programs in accordance with the goals, objectives, and budgets established by DP. The SR Manager has assigned overall responsibility for carrying out these responsibilities to the Assistant Manager for Environment, Health, Safety and Quality Programs (EHS&QP). EHS&QP has subsequently assigned responsibilities and authorities for managing activities at SR to the SREL Facility Representative through the Division Director, Environmental and Laboratory Programs Division.

UG is the managing and operating contractor for the SREL and has direct responsibility for conducting environmental protection activities as directed by the DOE Contracting Officer, in accordance with the terms of the contract for operation of SREL. UG is not required by DOE to develop many of the formal plans and programs required by DOE Orders. Rather, SR instructs UG to implement sitewide requirements that are developed by SR and WSRC. For example, SREL is part of the sitewide programs for pollution prevention awareness and

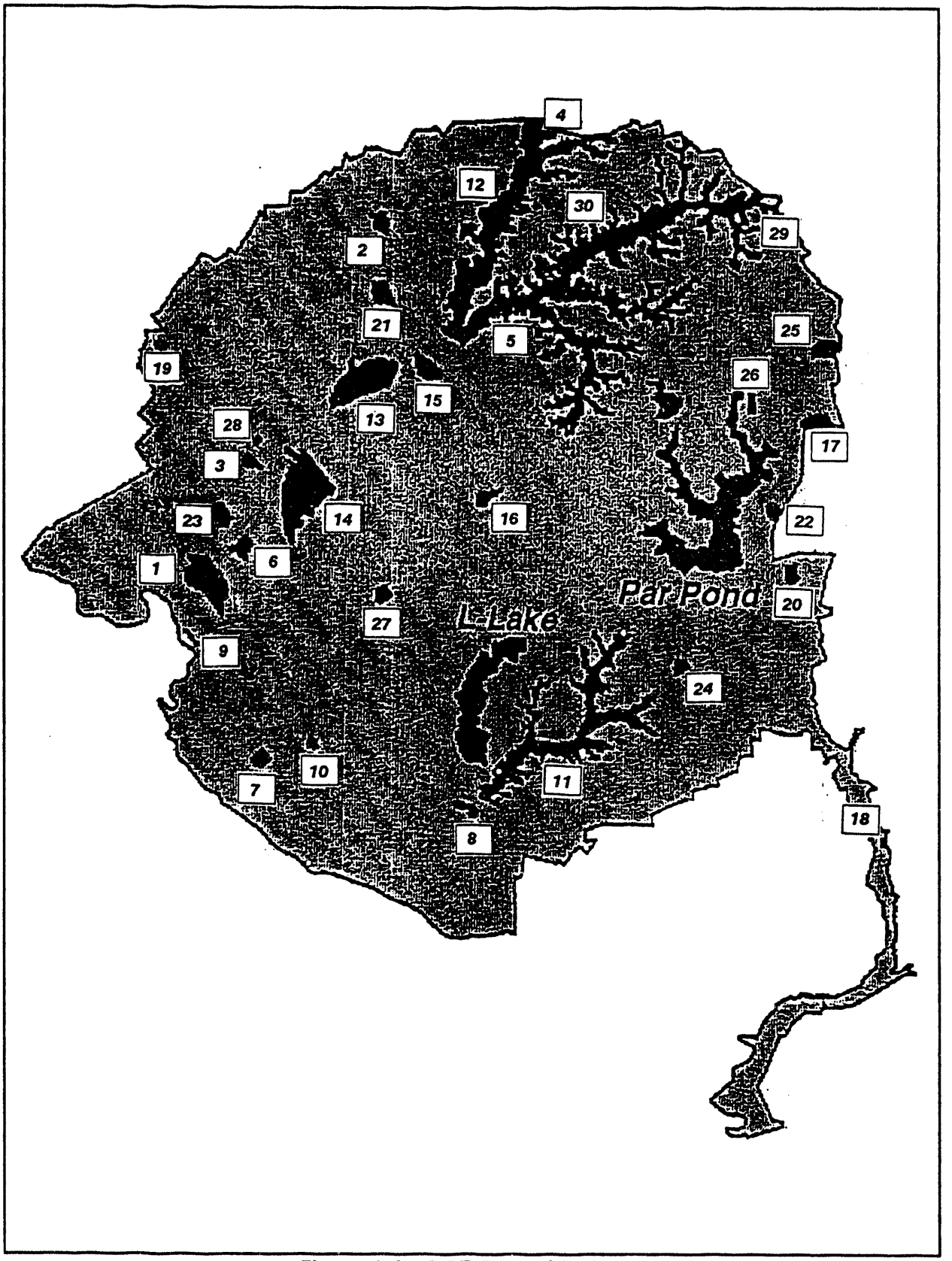


Figure 1-3. DOE Set-Aside Areas

1. Field 3-412
2. UGA Old Lab Site
3. Sandhills
4. Loblolly Pine Stand
5. Oak-Hickory Forest
6. Beech-Hardwood Forest
7. Mixed Swamp Forest
8. Steel Creek Bay
9. Cypress Grove
10. Risher Pond/Expansion
11. Meyers Branch
12. Oak-Hickory Forest
13. Organic Soils
14. Mature Hardwood Forest
15. Whipple/OHER Study Site
16. Rainbow Bay
17. Craig's Pond/Sarracenia Bay
18. Boiling Springs Natural Area
19. Ginger's Bay
20. Thunder Bay
21. Flamingo Bay
22. Little Cypress Bay
23. Dry Bay
24. Cypress Bay
25. Mona Bay/Woodward Bay
26. Sandhills Fire Site
27. Road 6 Bay
28. Field 3-409
29. Scrub Oak Natural Area
30. Upper Three Runs Creek/ Tinker Creek Corridors

Figure 1-4. List of DOE Set-Aside Areas

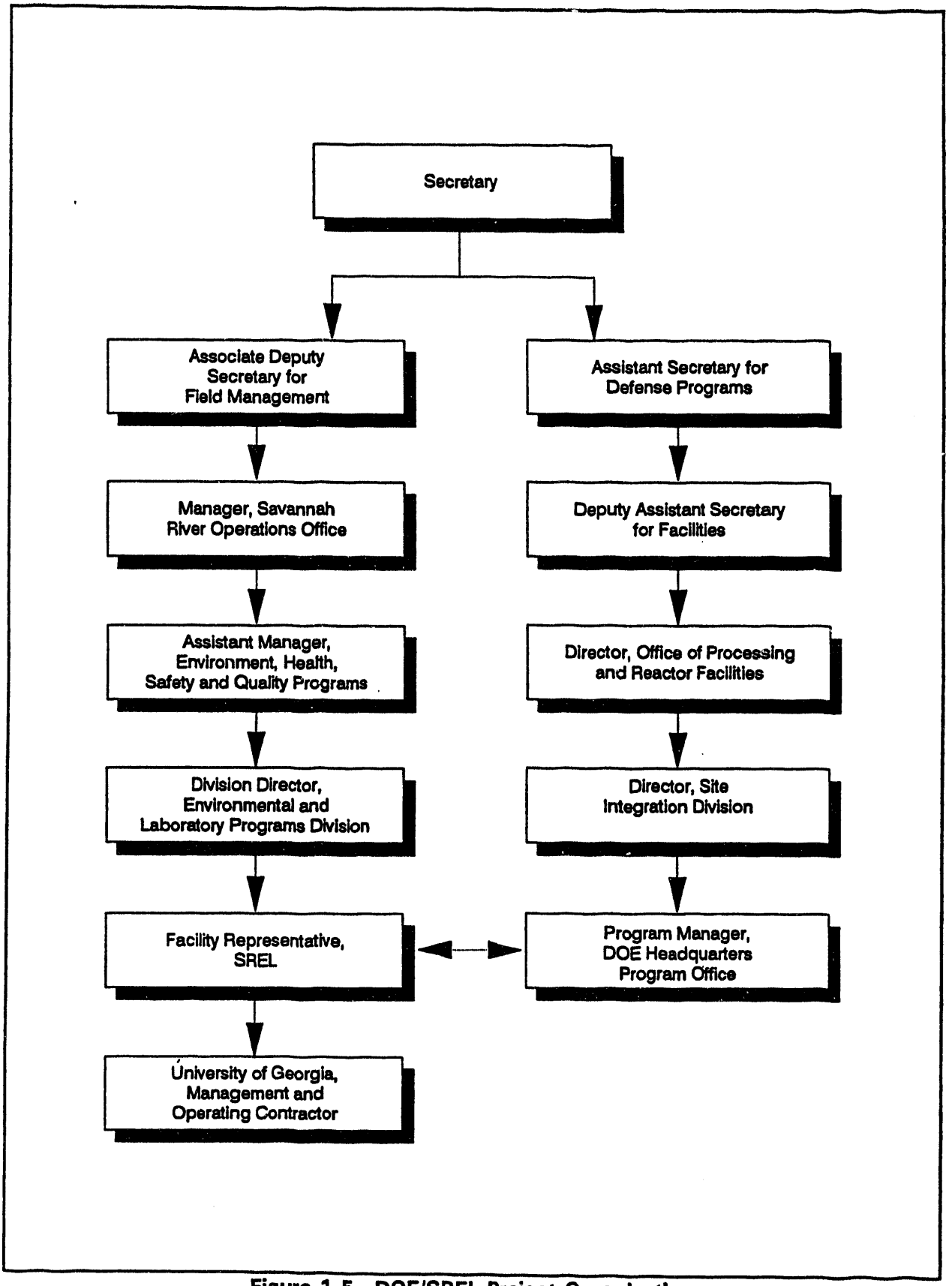


Figure 1-5. DOE/SREL Project Organization

groundwater protection management, which are required by DOE 5400.1. A Memorandum of Agreement has been executed between SREL and WSRC under which UG can request environmental services. Under this agreement, when UG requests WSRC services, it agrees to fully comply with all procedures and guidelines as required by law or contract.

Primary responsibility for environmental compliance resides in the Safety Organization; programmatic assistance is provided by the Assistant Director and Quality Assurance organizations (see Figure 1-6). Research Managers within each of the three SREL Research Divisions are informally responsible for environmental compliance of research projects within their respective organizations.

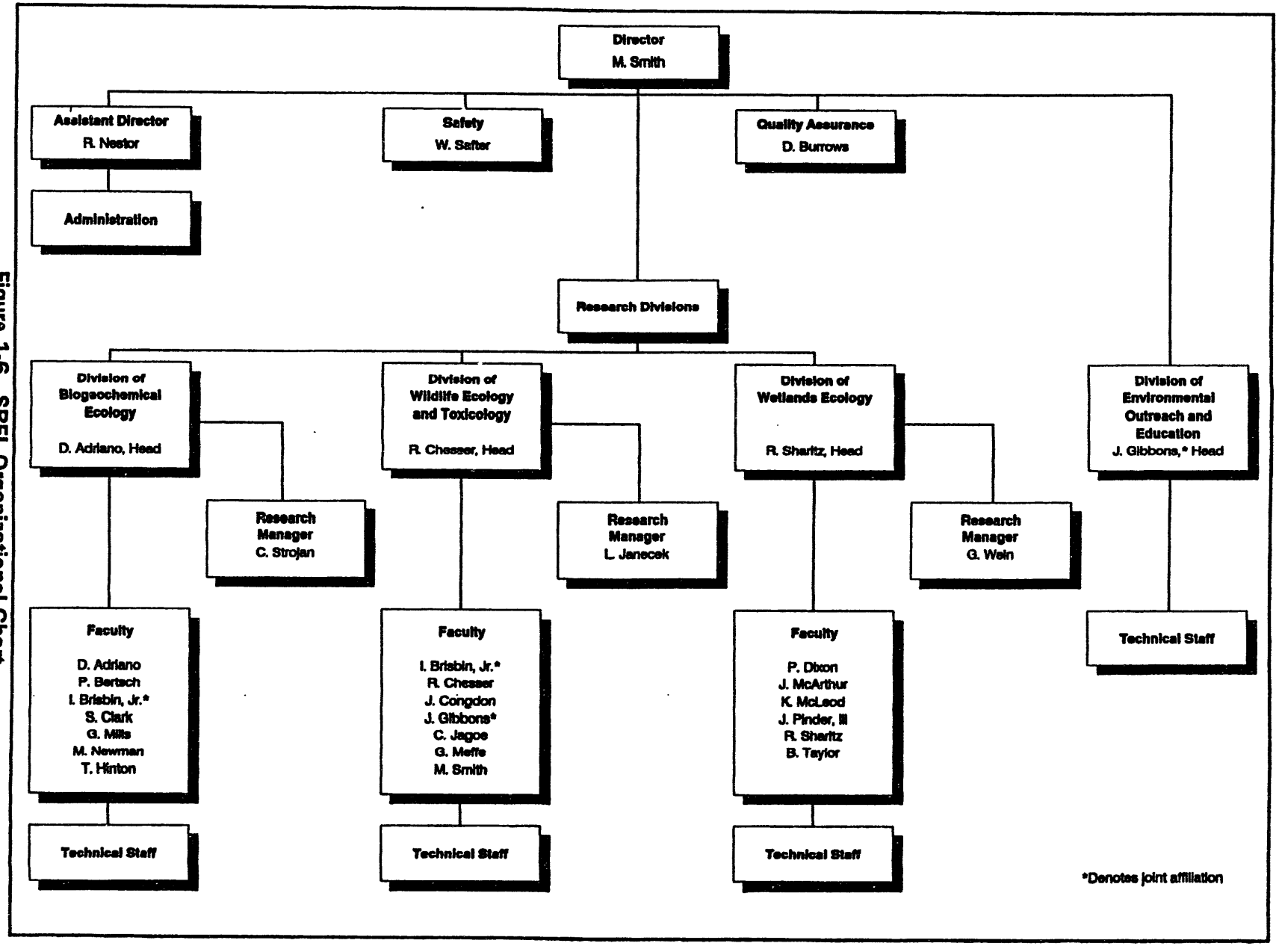


Figure 1-6. SREL Organizational Chart

This page intentionally left blank.

SECTION 2.0

SUMMARY OF ENVIRONMENTAL AUDIT RESULTS

This page intentionally left blank.

2.0 SUMMARY OF ENVIRONMENTAL AUDIT RESULTS

This section of the report summarizes the results and conclusions of the Office of Environmental Audit's (EH-24's) Comprehensive Baseline Environmental Audit of SREL conducted from September 13 to September 23, 1993.

The overall conclusion of the audit is that the SREL has recently made some progress in developing and implementing environmental protection programs; however, the audit team noticed a lack of awareness with respect to environmental requirements.

2.1 SREL STRENGTHS

The environmental audit team identified the following strengths in the SREL facilities and activities that were audited:

- Ecological studies conducted by UG at SRS have been a source of pride for SR and UG for over 40 years. Diverse, ongoing ecological studies conducted by UG at the SRS involve studying the effects of past, present, and proposed site operations on the natural resources of SRS (i.e., soil, water, sediments, flora and fauna), and continue to provide beneficial data to SRS to enhance management of these natural resources. UG researchers are involved in activities focused on the development of mathematical and computer models that will allow biologists to predict population structure and levels of inbreeding in populations of the federally endangered red-cockaded woodpecker. These models will also aid in managing other flora and fauna native to the SRS, including some federally-listed endangered species (i.e., southern bald eagle, wood stork, shortnose sturgeon and the smooth purple coneflower).

- The SREL quality assurance program is well designed and implemented. The computer-based archiving system being developed will incorporate both historical and ongoing research data and be available for scientists studying ecological patterns. The eventual goal is to merge this data base with those that WSRC and SRFS are developing. It should also be noted that the SREL Quality Assurance Manager has an excellent understanding of quality assurance programs and their specific application to SREL activities.

- The waste management program at SREL appears to be well managed. Procedures have been developed and are utilized for the management of hazardous, nonhazardous, mixed, and radioactive wastes. SREL also has a waste minimization plan that has resulted in a reduction of hazardous waste generation. This is evidenced by the fact that SREL's gel electrophoresis program has been able to reduce waste alcohol generation from 75 to about 3 gallons per year.

The successes of these and other programs sponsored by or in collaboration with the SREL are the result of the technical expertise and dedication exhibited by the personnel of SREL.

2.2 KEY FINDINGS

The key findings presented below are, in the judgment of the audit team, findings that are integral to understanding the nature and scope of the environmental issues existing at SREL.

SR Guidance and Oversight of SREL Environmental Programs: In the area of environmental management, there is inadequate guidance and oversight by SR. UG has received minimal direction from SR regarding implementation of DOE requirements and overall conduct of operations. SR does not take a proactive and formal approach to ensure that applicable directives are appropriately implemented. Although SR developed a Directive Implementation Instruction Program to transmit DOE environmental requirements to SRS contractors, including SREL, it has not been fully implemented, resulting in a general lack of awareness at SREL of UG's responsibilities with respect to environmental compliance and environmental protection program implementation. SR has not ensured that UG develops implementation plans for Contract Administration Notices (CANs), which include DOE environmental requirements, as stipulated in the contract between SR and UG. SR has, for the most part, delegated the responsibility for development of environmental program plans to WSRC for the entire SRS. SR, however, did not ensure that WSRC included SREL in all of these sitewide programs (e.g., Environmental Monitoring Plan), nor did SR oversee UG implementation of sitewide program requirements (e.g., the Pollution Prevention Awareness Program Plan). In addition, SR has not ensured that programs have been established to meet all DOE environmental requirements.

Formality of Environmental Programs: UG lacks a comprehensive and formalized environmental management program to ensure compliance with Federal, state, and local laws and regulations and DOE Orders. UG has not developed a formal program to evaluate environmental requirements transmitted by SR. UG has not developed implementation plans for the Contract Administration Notices; or a formal program, including implementing procedures, for CANs evaluations, and implementation plan preparation. The lack of formality has contributed to incorrect determinations of regulatory applicability pertaining to SREL operations. The environmental programs that do exist at SREL lack formality in their design and implementation, with the exceptions of waste management and toxic and chemical materials. Internal and external communications are informal, inhibiting the transmission of environmental information. There has been informality in review of environmental data. Roles, responsibilities, and accountabilities of professional staff with respect to environmental requirements are not adequately formalized and are neither well defined nor well understood by UG.

The following section presents an overview of each audit discipline, the findings identified within that discipline, and the causal factors that contributed to the findings.

2.3 FINDINGS SUMMARY

The following paragraphs briefly describe the findings in each of the disciplines included in the SREL Environmental Audit. The number of findings identified during an environmental audit is not directly proportional to the level of environmental protection offered by a facility or program. This is exemplified by the situation where a facility with no program in a particular area may have a single overall finding on the absence of that program;

however, a facility with a sound program in one particular area may have multiple findings on relatively minor components of the program.

During the audit, 18 findings were identified. Sixteen of the findings are considered to represent situations where conditions or practices do not meet the requirements of Federal and state regulations, and/or DOE Orders and directives and, thus, are termed "compliance findings." Two findings reflect a lack of adherence to "best management practices." However, none of the findings identified by the audit team appear to pose near term threats to public health and the environment. The number of compliance findings and best management practice findings by environmental audit discipline are depicted in Figure 2-1 and finding titles are shown in Table 2-1.

Air:

There was one compliance finding in the area of nonradiologic air emissions related to a failure to address air management program requirements of DOE 5400.1.

Surface Water/Drinking Water:

There were two compliance findings identified in this discipline relating to omissions in the Spill Prevention Control and Countermeasures (SPCC) Plan, and UG's lack of formality in elements of the UG National Pollutant Discharge Elimination System (NPDES) compliance assurance program.

Groundwater/Soil, Sediment, and Biota:

Three compliance findings were identified in this discipline relating to a failure to register SREL's underground storage tanks; development of a groundwater program for research wells; and delays in remediating petroleum contaminated soils at the Par Pond Boat Ramp.

Waste Management:

There was one compliance finding and one best management practice finding identified in this discipline pertaining to lack of verification of the quality of WSRC waste management services, and the lack of a program to periodically remove litter from experiment sites, respectively.

Toxic and Chemical Materials:

Two compliance findings were identified in this discipline relating to deficiencies in implementation of the SRS Pollution Prevention Awareness Program (PPAP) Plan at SREL, and the UG program for management of toxic and chemical materials, respectively.

Quality Assurance:

The quality assurance portion of the audit identified one compliance finding relating to SR environmental quality assurance audits and oversight, and one best management practice issue relating to good laboratory practices.

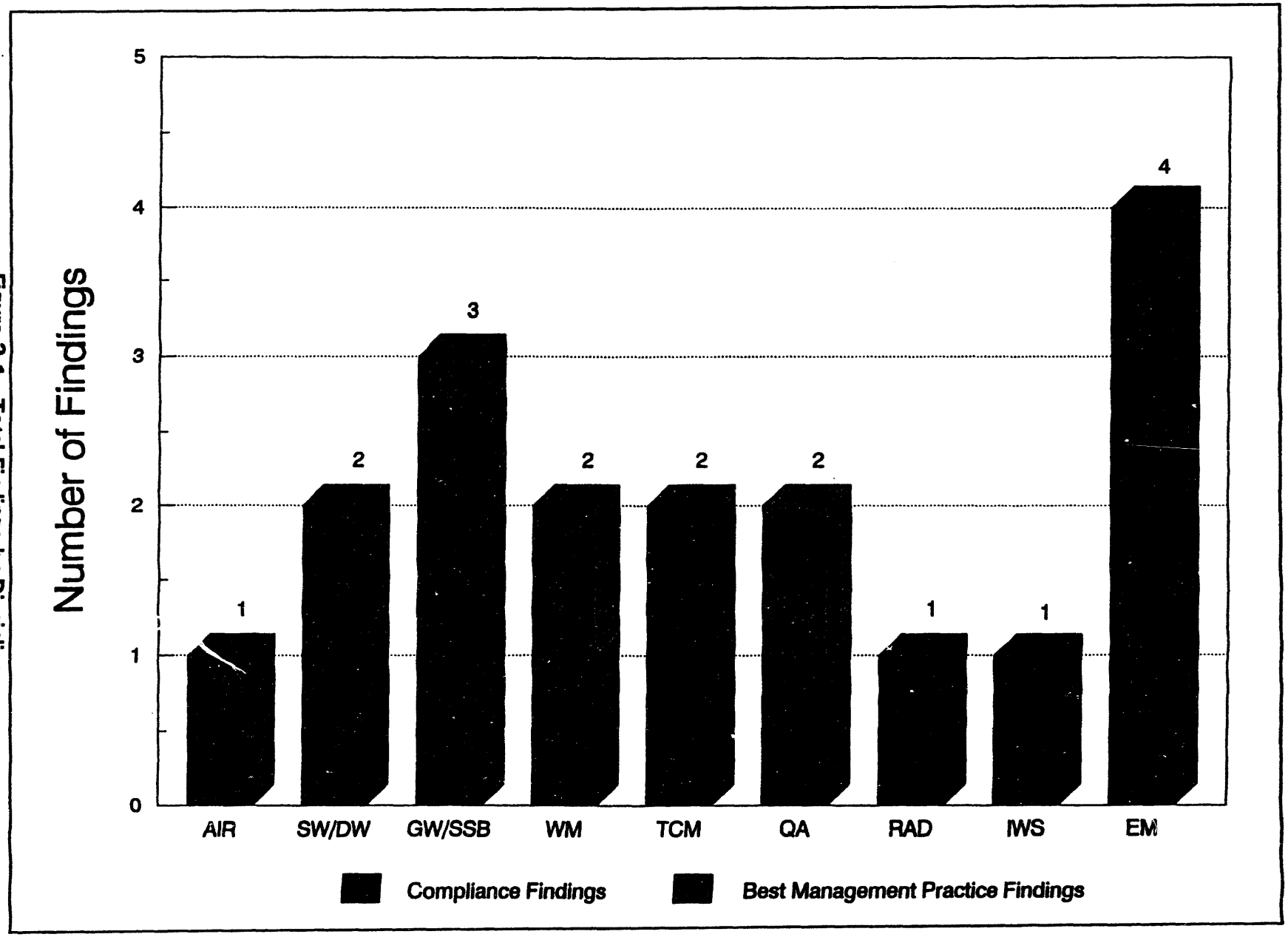


Figure 2-1. Total Findings by Discipline

Table 2-1
Environmental Audit Team Findings

Finding Number	Title of Finding	Page
	Air (A)	
A/CF-1	Air Management Programs	3-5
	Surface Water/Drinking Water (SW)	
SW/CF-1	Spill Prevention Control and Countermeasure (SPCC) Plan	3-10
SW/CF-2	UG NPDES Compliance Assurance Program	3-12
	Groundwater/Soil, Sediment, and Biota (GW)	
GW/CF-1	Underground Storage Tank Registrations	3-18
GW/CF-2	UG Groundwater Management Program	3-19
GW/CF-3	Releases at the Former Aboveground Storage Tank Area	3-20
	Waste Management (WM)	
WM/CF-1	Verification of Hazardous Waste Treatment, Storage, and Disposal	3-24
WM/BMPF-1	Research Site Cleanup	3-25
	Toxic and Chemical Materials (TCM)	
TCM/CF-1	Pollution Prevention Awareness Program Plan	3-29
TCM/CF-2	Storage of Toxic Chemicals And Materials	3-30
	Quality Assurance (QA)	
QA/CF-1	Internal Quality Assurance Oversight	3-35
QA/BMPF-1	Environmental Data Quality	3-37
	Radiation (RAD)	
RAD/CF-1	Environmental Radiation Programs	3-43
	Inactive Waste Sites (IWS)	
IWS/CF-1	Inactive Waste Site Program	3-49
	Environmental Management (EM)	
EM/CF-1	Formality of Environmental Program	3-54
EM/CF-2	Roles, Responsibilities, and Accountabilities	3-56
EM/CF-3	SR Oversight of SREL	3-57
EM/CF-4	UG Verification of Quality of Support Services Provided by WSRC	3-59

Radiation:

One compliance finding was identified relating to a determination of the applicability of environmental radiation programs.

Inactive Waste Sites:

There was one compliance finding identified in this discipline that addressed full development of a program that identifies inactive waste sites.

Environmental Management:

Four compliance findings were identified relating to a lack of a formal process within UG for reviewing applicability of DOE Orders and regulations to SREL operations; a failure within UG to establish environmental accountabilities and responsibilities; a lack of oversight of SREL operations by SR; and a lack of UG verification of the quality of support services provided by WSRC under the terms of the Memorandum of Agreement.

2.4 CAUSAL FACTORS SUMMARY

In an effort to understand why a finding occurred, a systematic approach was initiated to perform a "root cause" analysis. This is a two-step process that first identifies the likely underlying reasons the audit team believes contributed to each specific finding. This is completed by asking a series of "why" questions to determine the apparent cause(s) for the findings. These "causal factors" and related rationale(s) are identified at the end of the discussion section of the appropriate finding. The next step is for SREL line management to identify the "root cause(s)" for the findings. Root causes are the most basic fundamental causes which, if corrected, will prevent recurrence of the issues of concern.

The causal factors considered by the audit team are defined in Appendix F of this report. The team identified eight causal factors it believes contributed to occurrence of the findings (see Table 2-2 and Figure 2-2). The causal factor that appeared most frequently was policy implementation, which was evident in all but the waste management discipline and appeared in 14 of the 18 findings.

Table 2-2

Summary of Apparent Causal and Contributing Factors Identified by Audit Finding

FINDING NUMBER	CAUSAL AND CONTRIBUTING FACTORS													
	Policy	Policy Implementation	Procedures	Personnel	Resources	Training	Change	Risk	Design	Human Factors	Barriers and Controls	Supervision	Quality Assurance/Control	Contributing Factor Assessed/Audit Replaces
Air (A)														
A/CF-1		✓												
Surface Water/Drinking Water (SW)														
SW/CF-1			✓						✓					
SW/CF-2		✓	✓											
Groundwater/Soils, Sediment, and Biota (GW)														
GW/CF-1		✓												✓
GW/CF-2		✓						✓						
GW/CF-3 (SSB)		✓						✓						
Waste Management (WM)														
WM/CF-1	✓													
WM/BMPF-1	✓													
Toxic and Chemical Materials (TCM)														
TCM/CF-1		✓												
TCM/CF-2		✓												
Quality Assurance (QA)														
QA/CF-1		✓												
QA/BMPF-1	✓													

Table 2-2

Summary of Apparent Causal and Contributing Factors Identified by Audit Finding

FINDING NUMBER	CAUSAL AND CONTRIBUTING FACTORS													
	Policy	Policy Implementation	Procedures	Personnel	Resources	Training	Change	Risk	Design	Human Factors	Barriers and Controls	Supervision	Quality Assurance/Control	Contributing Factor Agencies/Audits/Reviews
Radiation (RAD)														
RAD/CF-1		✓										✓		
Inactive Waste Sites (IWS)														
IWS/CF-1		✓				✓		✓						
Environmental Management (EM)														
EM/CF-1		✓												
EM/CF-2		✓												
EM/CF-3		✓												✓
EM/CF-4		✓												
Totals	3	14	2	0	0	1	0	3	1	0	0	1	0	2

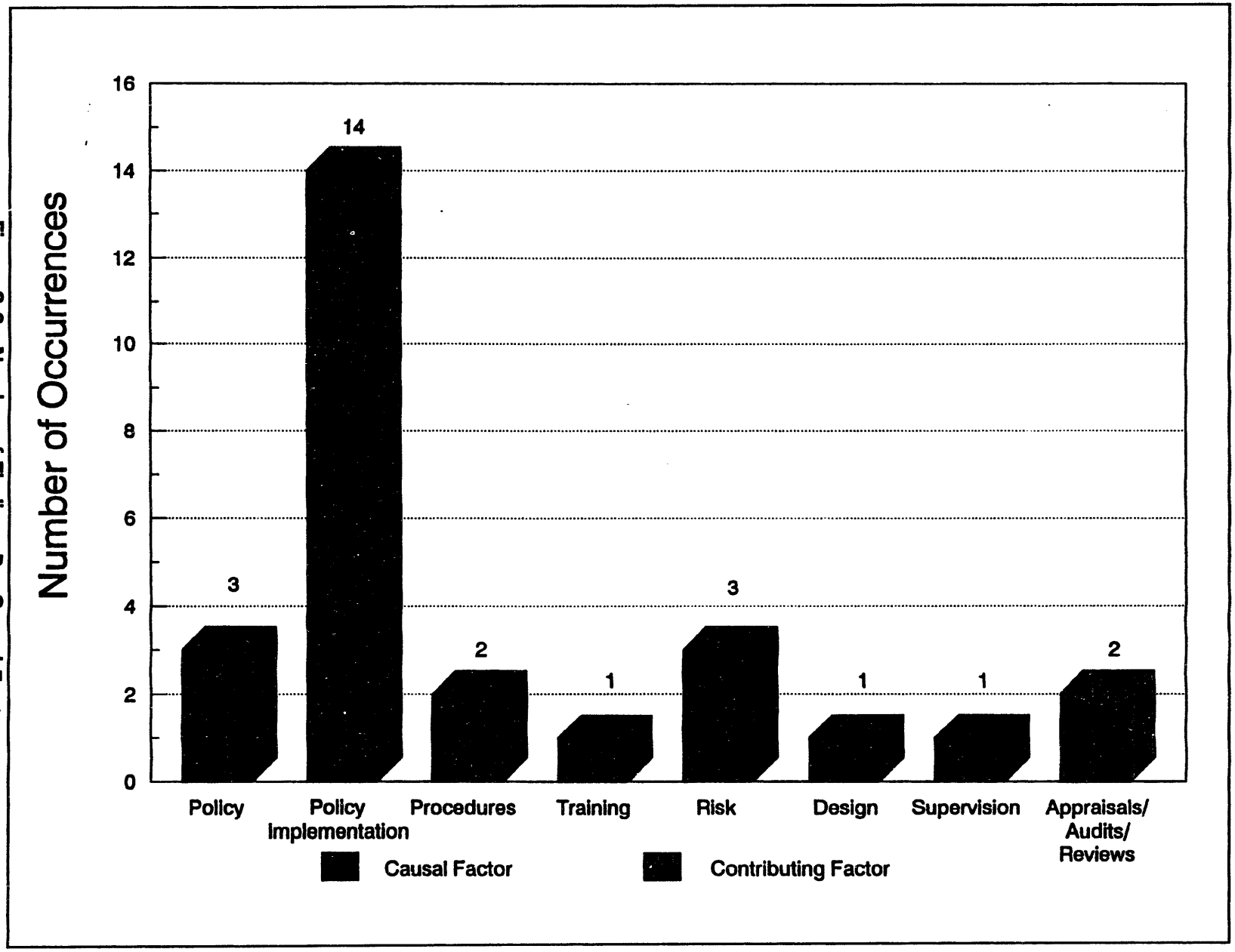


Figure 2-2. Number of Findings Per Causal Factor

This page intentionally left blank.

SECTION 3.0

ENVIRONMENTAL OVERVIEWS AND AUDIT FINDINGS

This page intentionally left blank.

3.0 ENVIRONMENTAL OVERVIEWS AND AUDIT FINDINGS

The audit findings presented in the following pages are not necessarily in order of importance. They are grouped by area of investigation, as listed in the Performance Objectives and Criteria for Conducting DOE Environmental Audits (DOE/EH-0229), and are preceded by an overview. The overview describes the approach taken by the technical specialist in conducting that portion of the audit; SREL programs and activities related to the area of investigation; characterization of the strengths and weaknesses of SREL activities; and a brief summary of the findings.

Each finding is organized into three sections: the performance objective, the finding statement, and a discussion. The performance objectives specify the particular practices or standards against which the finding is being evaluated, as described in the DOE/EH-0229 report listed above. The discussion details the facts and observations supporting the finding. The discussion also provides a summary of the causal factors for the deficiency.

Within each finding, references to other findings, interviews, and documents are presented parenthetically. An example of a referenced finding is: "(see Finding A/CF-1 or A/BMPF-1)," in which "A" reflects "Air," "CF" reflects "Compliance Finding," "BMPF" reflects the "best management practices finding," and "1" is the finding number. Other abbreviations used to identify findings are as follows:

A	Air
SW	Surface Water/Drinking Water
GW	Groundwater/Soil, Sediment, and Biota
WM	Waste Management
TCM	Toxic and Chemical Materials
QA	Quality Assurance
RAD	Radiation
IWS	Inactive Waste Sites
EM	Environmental Management

These abbreviations are used so that the reader can more easily determine the specific areas of investigation from which the finding was derived.

Several of the technical specialists on the audit team covered more than one of the areas listed above. As such, interviews and document reviews quite often were completed with multiple areas of responsibility in mind. In order to reduce unnecessary duplication when referencing interviews and documents, they are identified as follows. An example of a referenced interview is (I-A-1) where "I" signifies an interview, "A" represents an individual audit area, and "1" is the specifically assigned sequential interview number. Additional designations for individual audit areas are as follows:

A	Air, Radiation, and Environmental Management
B	Surface Water, Groundwater, and Inactive Waste Sites
C	Soil, Sediment, and Biota
D	Waste Management, Toxic and Chemical Materials, and Drinking Water
E	Quality Assurance and Toxic and Chemical Materials

Documents referenced for this environmental audit are numbered starting with "SREL," and followed by a sequential number. The lists of documents reviewed and interviews conducted are presented in Appendices D and E, respectively. Additionally, apparent causal factors are discussed for each finding and are defined in Appendix F.

3.1 AIR

3.1.1 Overview

The purpose of the air portion of the environmental audit was to review the programs developed by SREL to comply with Federal and state regulations, DOE Orders, and other standards of performance. A list of the air regulations, requirements, and guidelines used in this review are presented in Table 3-1.

The general approach to conducting the review of the air management program at SREL included interviews with the UG, SR, and WSRC staff. Documents pertaining to air emission source evaluations, submissions for reporting and others were reviewed. Inspections of SREL laboratory and Par Pond facilities were performed as well.

The contract for the operation of SREL requires compliance with the Clean Air Act, as well as the DOE Orders and Federal regulations transmitted to UG via the Contractor Administrative Notice (CAN) directive system. A Memorandum of Agreement (MOA) established between SREL and WSRC provides an arrangement for UG to obtain support services from WSRC to assist in implementing program requirements to meet DOE Orders and Federal and state regulations. The decision to use WSRC environmental support services rests exclusively with UG. However, no one at UG has been given the responsibility to ensure compliance with the DOE Orders and Federal and state regulations with respect to air management.

Air emission sources at SREL include chemicals and radionuclides from laboratory fume hoods, vents, and air handling devices associated with operation of the buildings, six stationary and one portable diesel generators, and aboveground diesel fuel storage tanks. Air pollution control and permitting in South Carolina is regulated by the South Carolina Department of Health and Environmental Control (SCDHEC). SCDHEC regulations require permitting, an air emissions inventory, and the submission of an air toxics emissions report. No permits have been issued to SREL, although one of six diesel generators did require permitting when it was installed in 1985. A pre-audit review by SR identified the unpermitted diesel generator, and an application for exemption was submitted to, and granted by, SCDHEC prior to the onsite portion of the environmental audit. WSRC developed the air emissions inventory, and submitted the air toxics report to the SCDHEC for the entire SRS, including SREL.

WSRC used the SRS air emissions inventory for dose evaluation and reporting necessary to meet the National Emission Standards for Hazardous Air Pollutants (NESHAPs). However, a dose evaluation was not performed for the SREL radioactive air source emission point, and it was not included in the SRS NESHAPs report to the EPA. This omission was identified in the pre-audit review by SR, and was corrected. Other than these two instances, WSRC has not undertaken any activities to assist SREL in meeting air quality regulatory requirements.

One compliance finding was identified in the air management portion of the environmental audit: SREL has not addressed the requirements of DOE 5400.1 with respect to air management programs.

Table 3-1
List of Air
Regulations, Requirements, and Guidelines

Regulations/ Requirements/ Guidelines	Sections/Titles	Authority
DOE 5400.1	General Environmental Protection Program	DOE
DOE/EH-0173T	Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance	DOE
40 CFR 50-88	Clean Air Act Implementing Regulations	EPA
40 CFR 61	National Emissions Standards for Hazardous Air Pollutants (NESHAPs)	EPA
NQA-1	Quality Assurance Program Requirements for Nuclear Facilities	ANSI/ASME
EPA-450/4-87-013	On-Site Meteorological Program Guidance for Regulatory Modeling Applications	EPA
Titles III-IV	Clean Air Act Amendments of 1990	EPA
Reg. No. 62.1	South Carolina Air Pollution Control Regulations and Standards	SCDHEC
Reg. No. 62.5	Air Pollution Control Standards	SCDHEC
Reg. No. 62.6	Control of Fugitive Particulate Matter	SCDHEC
Standard No. 8	Toxic Air Emissions	SCDHEC

3.1.2 Compliance Finding

A/CF-1: Air Management Programs

Performance Objective: The contract for the operation of SREL states that the contractor agrees to comply with all the requirements of the Clean Air Act, as well as with regulations transmitted to SREL via the Contractor Administration Notices (CANs) directive system.

DOE 5400.1, "General Environmental Protection Programs," specifies several programs that are required to be in place to ensure compliance with DOE Orders and Federal and state regulations with respect to air management. One specific element of this Order states that "Airborne radiation and radioactive materials discharged from DOE facilities shall comply with the requirements of 40 CFR Part 61, 'National Emission Standards for Hazardous Air Pollutants'."

Finding: SREL has not addressed the requirements of DOE 5400.1 with respect to air management programs.

Discussion: Air emission sources at SREL include numerous laboratory fume hoods, ventilation and air conditioning equipment, diesel generators, and aboveground diesel fuel storage tanks. All of these sources except one of the diesel generators are exempt from SCDHEC regulations as identified during a pre-audit review by SR. SREL submitted an application for exemption, which was granted by SCDHEC, prior to the onsite portion of the environmental audit.

Although the air emission sources at SREL are exempt from SCDHEC regulations, there still are DOE requirements for the management of air emission sources and issues that may be applicable to SREL. UG has not addressed the need to develop the following air management programs and plans as required by DOE 5400.1:

- Air Effluent Source Monitoring Program;
- Ambient Air Surveillance Monitoring Program; and
- Meteorological Information/Monitoring Program.

In addition, UG has not developed the following programs to ensure compliance with DOE 5400.1 and Federal regulations:

- Air Emission Source Permitting Program;
- Regulatory Awareness Program; and
- Notification and Reporting Program.

UG did not address the need for these programs because they assumed that all air management issues and responsibilities onsite had been incorporated into the WSRC Air Management Program (I-A-9). In addition, UG did not verify that WSRC accepted the responsibility for maintaining SREL in a compliant status with air requirements. UG's

assumption was inconsistent with the requirements of the contract which places the responsibility for compliance with the Clean Air Act and applicable DOE Orders upon UG. WSRC has made their services available to SREL under the Memorandum of Agreement, but in general, has not included SREL in the WSRC Air Management Program (I-A-6). WSRC has only included SREL when instructed by SR to review the site as a whole. Examples of when this occurred include the following:

- WSRC developed a sitewide Air Emissions Inventory, and made the proper air toxics submission to the SCDHEC, which included SREL (SREL-017; I-A-6).

- WSRC was instructed to perform the required National Emission Standards for Hazardous Air Pollutants (NESHAPs) submission to the EPA for the SRS as a whole. However, SREL was omitted from the SRS NESHAPs Report.

The apparent causal factor for this finding is policy implementation, in that SREL did not implement the terms and conditions of the contract.

3.2 SURFACE WATER/DRINKING WATER

3.2.1 Overview

The purpose of the surface water/drinking water portion of the environmental audit was to evaluate compliance with Federal, state, and local water pollution control requirements, and accepted best management practices. The surface water portion of the audit focused on compliance with the requirements of the National Pollutant Discharge Elimination System (NPDES), Spill Prevention Control and Countermeasures (SPCC) Plan, and Safe Drinking Water Act (SDWA).

The general approach to the surface water/drinking water portion of the audit included interviews with SR, UG, and WSRC personnel; document reviews of plans, permits, and procedures; and inspections of facilities and land under the control of UG. Interviews and discussions were coordinated with other audit specialists to ensure that all potential issues were addressed. The data and information collected from audit activities were evaluated with respect to compliance with the Federal and state regulations, DOE Orders, and SREL and WSRC procedures presented in Table 3-2.

The management of NPDES permits and reporting for the SRS is the responsibility of WSRC. SREL contributes to the effluent discharge of three NPDES outfalls, which are identified as FS-1, T-1, and A-005. SREL is the custodian of a fourth outfall (FS-2) located at the Aquatic Ecology Laboratory; however, no effluent discharge has occurred since SREL assumed custodian responsibilities. In addition, there are no effluent discharges from outfalls FS-1 and T-1. WSRC is responsible for the sitewide NPDES program. WSRC performs the required sampling and reporting for all outfalls at SRS. However, UG has not requested any guidance from WSRC regarding it's responsibilities as a contributor, and custodian of, outfalls. UG does not have a program to oversee sampling of NPDES outfalls to which they are a contributor in order to ensure that they are accurately represented in reporting (see Finding EM/CF-4).

The SPCC requirements for SRS are managed under the SPCC Plan implemented by WSRC. SREL is specifically identified in the SPCC Plan due to the presence of underground and aboveground storage tanks, as well as oil-filled transformers. The Safety Program Coordinator and the Assistant Director share responsibilities for implementing their portion of the plan. However, SREL's portion of the SPCC Plan is not accurate, and UG does not fully implement their responsibilities prescribed in the plan.

The requirements of the Safe Drinking Water Act are managed for the SRS by the Power Operations Department of WSRC. The Power Operations Department also provides SREL's potable and non-potable water from onsite wells. To meet the requirements, WSRC prepared and implemented programs to perform all required sampling and analyses, monitored for lead and copper, installed and tested backflow protection devices, and developed a cross-connection control program for the SRS, which included operations at SREL (I-D-5). The environmental audit team did not identify any findings in this area.

Overall, UG is not fully aware of it's responsibilities with respect to NPDES and SPCC requirements as they apply to SREL facilities and operations. This is primarily due to individuals not performing their assigned roles and responsibilities, as well as a failure by UG to recognize responsibilities for participation in WSRC sitewide programs and plans.

Table 3-2
List of Surface Water/Drinking Water
Regulations, Requirements, and Guidelines

Regulations/ Requirements/ Guidelines	Sections/Title	Authority
33 USC 1344	Clean Water Act	EPA
DOE 5400.1	General Environmental Protection Program	DOE
DOE 5400.5	Radiation Protection of Public and the Environment	DOE
DOE 5480.19	Conduct of Operations Requirements for DOE Facilities	DOE
DOE 5484.1	Environmental Protection, Safety and Health Protection Information Reporting Requirements	DOE
DOE 6430.1A	General Design Criteria	DOE
33 CFR 320	General Regulatory Policies	U.S. Water Resources Council
40 CFR 110	Discharge of Oil	EPA
40 CFR 112	Oil Pollution Prevention	EPA
40 CFR 122/123/124	National Pollutant Discharge Elimination System (NPDES)/State Pollution Discharge Elimination System (SPDES)	EPA
40 CFR 136	Guidelines Establishing Testing Procedures for the Analysis of Pollutants	EPA
40 CFR 141/142	National Primary Drinking Water Regulations	EPA
40 CFR 143	National Secondary Drinking Water Regulations	EPA
40 CFR 144	Underground Injection Control Program	EPA

The surface water/drinking water portion of the audit identified two compliance findings. The first finding addresses omissions in the SPCC Plan, and the second finding describes UG's lack of formality in elements of the UG NPDES compliance assurance program.

3.2.2 Compliance Findings

SW/CF-1: Spill Prevention Control and Countermeasure (SPCC) Plan

Performance Objective: 40 CFR 112.3(a) states that an SPCC Plan be prepared in accordance with 40 CFR 112.7 if an owner or operator of an onshore facility could reasonably be expected to discharge oil in harmful quantities into or upon navigable waters of the United States. 40 CFR 112.1 and 112.3 also require that departments of the Federal government prepare an SPCC Plan within 6 months of March 25, 1976, and to implement the plan within 1 year of the effective date.

DOE 6430.1A, "General Design Criteria," requires that oil-filled equipment have dikes and drainage provisions built in accordance with 40 CFR 112.

It is a best management practice that an SPCC program for organizations with direct responsibility for tanks contain a management commitment statement, records of sheen observations, and documentation that the professional engineer certifying the SPCC Plan had visited the facilities.

Finding: The SREL SPCC Plan does not include all tanks containing petroleum or all of the elements required by 40 CFR 112.7.

Discussion: The SREL SPCC Plan is included at Section 18 of the Savannah River Site SPCC Plan. This section was amended and certified by a professional engineer on May 7, 1993 (SREL-007). 40 CFR 112.3 states that each prepared and certified SPCC Plan must be fully implemented. Implementation may consist of procedures, containment, and training to ensure that the facilities are operated in a manner that complies with Federal, state, and local spill control regulations. The environmental audit team identified the following issues with respect to SPCC Plan content and implementation:

- Not all petroleum sources at SREL are included in the SPCC Plan, including approximately 50, 5 to 6-gallon capacity gasoline containers in the gasoline storage shed at A Area, an aboveground gasoline storage tank at the Boathouse at Par Pond, and the new aboveground diesel storage tank at Par Pond.

- There is no secondary containment at the gasoline storage shed at A Area, or the aboveground gasoline storage tank at the Boathouse at Par Pond, as required by DOE 6430.1A. The aboveground storage tank is currently not operational.

- No 24-hour emergency phone number(s) are provided in the SREL SPCC Plan.

- The emergency phone numbers for the SREL receptionist, or the Assistant Emergency Coordinator/Safety Officer are not provided in the plan.

- The SPCC Plan refers personnel to the SREL Safety Manual (SREL-171) as the "essence of the SREL reporting plan." The plan, however, does not

include spill reporting requirements or procedures, except for instructions in Appendix II to: "Notify someone of the spill . . ."

- Annual tank integrity inspections are not performed by UG (I-B-16).

In addition, the SREL SPCC Plan lacks certain elements that are considered best management practices.

- The SREL SPCC Plan does not have the full approval of UG management at a level or authority to commit the necessary resources for plan implementation (I-B-16).

- UG could not provide documentation of any records of observations of oil sheens prior to the drainage of rainwater from diked areas (I-B-16).

- SPCC Plans require the examination of facilities by registered professional engineers in order to be familiar with equipment and potential spill direction. Evidence of actual field inspections by the professional engineer that certified the SREL SPCC Plan could not be provided (I-B-16).

The apparent causal factors for this finding are design, in that the SPCC Plan does not include all petroleum tanks, and a lack of development of procedures to implement the requirements of 40 CFR 112.

SW/CF-2: UG NPDES Compliance Assurance Program

Performance Objective: DOE 5400.1, "General Environmental Protection Program," states "it is DOE policy to conduct the Department's operations in compliance with the letter and spirit of applicable environmental statutes, regulations and standards . . . DOE is committed to good environmental management of all its programs . . . to minimize risks to the environment or public health, and to anticipate and address potential environmental problems before they pose a threat to the quality of the environment." It also includes requirements for a Quality Assurance Program that includes chain-of-custody procedures.

National Pollutant Discharge Elimination System (NPDES) Permit SC0000175 specifies effluent limitations and monitoring requirements for outfalls FS-1, FS-2, T-1, and A-005. Monitoring requirements include physical and chemical measurements.

WSRC 3Q, ECM 2.2, Rev. 0, requires NPDES outfall custodians to ensure compliance of all effluents to the outfall.

It is a best management practice to ensure that effluent sampling of an outfall to which SREL contributes is conducted according to established sampling procedures.

Finding: The UG NPDES program lacks formality with respect to evaluating process changes, maintaining the wastewater treatment sump, and ensuring representative sampling of outfalls.

Discussion: SREL facilities contribute to four NPDES permitted outfalls that discharge effluents to SREL-controlled properties. SREL is a co-contributor to three outfalls, including FS-1, A-005, and T-1. SREL is the sole contributor to a fourth outfall, FS-2. WSRC is the custodian of outfalls FS-1, A-005, and T-1, while SREL is the custodian of FS-2. Currently, outfalls FS-1, FS-2, and T-1 do not discharge effluents.

SREL does not actively manage and oversee a program for compliance with NPDES permit requirements. The audit team observed that there is no program at SREL to ensure that changes to SREL operations that could effect NPDES permits are communicated to WSRC; that the SREL wastewater treatment sump is regularly inspected and maintained; and that sampling conducted on outfalls to which SREL contributes is performed in compliance with effluent sampling procedures. These issues are discussed below.

<u>NPDES Permit Maintenance</u>

UG has changed the nature of operations at SREL to the extent that the existing permits may not reflect current conditions. For example, the radiologically controlled area in the main laboratory uses a number of radionuclides not included in the current permit. UG has a responsibility to report any process changes to the outfall custodian, who must in turn notify the WSRC Environmental Protection Department. There is no formal procedure at UG to evaluate changes in operations with respect to NPDES permit conditions and notify the outfall custodian, nor is there any evidence to suggest that UG has notified an outfall custodian of process changes.

Waste Water Neutralization Sump

The SREL main laboratory has a waste water neutralization sump that treats effluent from laboratory sinks and floor drains passively, with limestone. The sump can only neutralize acids; no mechanism exists (other than dilution) for treatment of bases. All wastewater from the sump goes to outfall A-005 (I-B-34). There is no formal preventative maintenance system, including schedule and procedures, for limestone replacement (I-B-30).

NPDES Sampling

WSRC developed and implements procedures to conduct NPDES sampling as required in DOE 5480.19. Although SREL is not the custodian of A-005, it could be held responsible for permit violations and therefore has an interest in ensuring that sampling of the outfall is representative, as required by best management practice. The audit team identified the following procedural deficiencies with the NPDES compliance sampling event of outfall A-005 conducted by WSRC:

- The technician did not have a field copy of the most recent sampling procedures as required by DOE 5480.19 (SREL-077 and SREL-182).
- The sampler did not physically possess the field book at all times as required by the WSRC procedure (SREL-077).
- The following equipment stated in the sampling procedure (SREL-077) was not present during the sampling event: snakeproof boots; one flow meter; and carpenters ruler.
- The preservation of the oil and grease samples with sulfuric acid was not conducted "immediately" after collecting the sample, as required by the sampling procedure (SREL-077).
- Flow was estimated by the technician rather than measured by using either a flow recorder, partial flume, or Gurley velocity meter as required by the sampling procedure (SREL-077). The permit allows flow to be estimated.
- The permit requires temperature measurements "In stream after mixing"; however, the temperature was measured after the samples were brought to the support vehicle.

The apparent causal factors for this finding are procedures, in that the sampling technician did not adhere to WSRC environmental sampling procedures, and policy implementation in that the requirements of DOE Orders were not implemented.

3.3 GROUNDWATER/SOIL, SEDIMENT, AND BIOTA

3.3.1 Overview

The purpose of the groundwater/soil, sediment, and biota portion of the environmental audit was to evaluate the programmatic and technical status of protection and monitoring programs for these media. The groundwater portion of the audit evaluated compliance against criteria established in applicable state and local regulations, permits, and industry-accepted best management practices (see Table 3-3). The soil, sediment, and biota portion of the audit included observation of known or suspected soil/sediment contamination areas and review of assessment techniques and sampling procedures.

The general approach to the audit included interviews with personnel from SR, UG, WSRC, and U.S. Fish and Wildlife Service; and review of hydrogeologic and soil, sediment, and biota-related reports, available site documents, and field reconnaissance of the facility with attention to potential sources of groundwater and soil/sediment contamination.

Groundwater

UG has approximately 175 piezometers and wells located throughout SREL and the Set-Aside areas. Almost all of these installations support SREL research activities. However, seven wells installed by UG and located near the SRS coal pile are sampled by WSRC, who has responsibility for implementing the sitewide groundwater protection program required by DOE 5400.1. SR, in the SRS Environmental Program Implementation Plan, required WSRC to develop and implement a sitewide Groundwater Protection Management Program, thereby relieving SREL of the responsibility to develop an independent program. UG does not provide groundwater data from the research projects to WSRC for inclusion in SRS sitewide Quarterly Reports prepared as part of the sitewide groundwater protection program. Only the seven wells near the SRS coal pile are included in the sitewide Groundwater Protection Management Program (I-B-38).

Potential sources of groundwater contamination at SREL include two underground diesel storage tanks, three aboveground diesel storage tanks for generators, two septic systems, one aboveground gasoline storage tank located at the Par Pond, and various external toxic and chemical materials storage buildings.

SREL has two underground storage tanks containing fuel for emergency power generators at the Aquatic Ecology Laboratory and the main laboratory in A Area, respectively. These tanks are exempt from many of the state underground storage tank regulations because they are used for emergency power. The tanks, however, are not registered with the South Carolina Department of Health and Environmental Control (SCDHEC), as required by regulation.

Overall, the groundwater program at SREL needs further development. UG does not have a program to ensure that piezometers and wells are locked, secured, or inventoried. Roles, responsibilities, and accountabilities for the groundwater program have not been established. In addition, a program for management of the underground storage tanks has not been implemented.

Soil, Sediment, and Biota

SREL samples wildlife for both radioactive and nonradioactive constituents as part of their ongoing research programs. SRS, through WSRC, sponsors a number of public hunts each year of white-tailed deer and feral hogs for population control. WSRC is responsible for monitoring these game species to ensure that they will not pose a health threat if utilized for human consumption before they are released to hunters. In addition, the Savannah River Forest Station (SRFS) supervises removal of additional feral hogs as part of a program to control nuisance animals. SREL provides information to SRFS by identifying specific Set-Aside areas where feral hogs have become a nuisance and could cause adverse impacts to these areas. During the public deer hunts SREL personnel obtain blood, tissue, and parasite samples at the hunt checkpoints as part of ongoing research programs.

SREL is charged with developing and implementing a Set-Aside research and management program under the administrative responsibility of SR. Currently, 30 Set-Aside areas at SRS have been designated accounting for 14,290 acres. These Set-Aside areas are reserved for non-manipulative research, not for intensive management objectives. SREL maintains an accurate and readily-accessible inventory of Set-Aside areas to ensure they are not inadvertently included in site use activities. SREL, in cooperation with SRFS, is responsible to ensure that all boundaries are clearly marked and periodically refurbished, that forest roads serving Set-Aside areas are properly maintained, that timber salvage operations are coordinated, and that essential erosion control measures are implemented. SREL's Research Coordinator for Set-Aside areas oversees conditions applied to site-use permits for research activities in Set-Aside areas. SREL agrees that a more formalized approach for verifying that commitments made regarding Set-Aside areas in conditionally approved Site Use Permits is warranted. Recognizing this need, SR has scheduled a verification surveillance for September 1993.

Although no noteworthy practices were identified in the soil, sediment, and biota discipline, some areas warrant special mention. SREL studies, in coordination with the SRFS, have focused on the development of mathematical and computer models that will allow biologists to predict population structure and levels of inbreeding in populations of the federally endangered red-cockaded woodpecker, and thus aid the SRFS in managing this and other endangered and non-endangered species. The wood stork program at SRS continues to be a success story. Several years ago DOE was due to start up the "L" reactor, which would have caused an adverse impact on the water depth in Steel Creek Delta, a prime wood stork feeding area on SRS. Through the intervention of SREL personnel, alternative artificial feeding ponds were constructed at Kathwood Lake on the National Audubon Society's Silverbluff Plantation Sanctuary, and have proven to be very successful feeding areas for the wood stork. Although not an endangered or threatened species, the hooded pitcher plant is currently known from only one colony at SRS, which was discovered by SREL researchers. SREL has coordinated with the SRFS to protect this isolated colony. The efforts of SREL personnel seem to have secured the continued survival of this plant species. During genetic analyses of freshwater mussels by SREL in 1992, seven species were identified, including one species found in the Upper Three Runs drainage that is considered rare and potentially of special concern in South Carolina. Several other examples of biota enhancement are discussed in the SRS Annual Site Environmental Report for 1992 including research involving diversity, physiology, and genetics of various groups of vertebrate and invertebrate organisms; sedimentation

Table 3-3
List of Groundwater/Soil, Sediment, and Biota Regulations, Requirements, and Guidelines

Regulations/ Requirements/ Guidelines	Sections/Title	Authority
DOE 4320.1B	Site Development Planning	DOE
DOE 5400.1	General Environmental Protection Program	DOE
DOE 5400.4	Comprehensive Environmental Response, Compensation, and Liability Act Requirements	DOE
DOE 5400.5	Radiation Protection of the Public and the Environment	DOE
DOE 5484.1	Environmental Protection, Safety, and Health Protection Information Reporting Requirements	DOE
DOE 6430.1A	General Design Criteria	DOE
DOE/EH-0173T	Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance	DOE
40 CFR 112	Oil Pollution Prevention	EPA
OSWER Directive 9283.1-2	Guidance on Remedial Actions for Contaminated Groundwater at Superfund Sites	EPA
OSWER Directive 9502.00-6D	RCRA Facility Investigation (RFI) Guidance	EPA
OSWER Directive 9950.1	RCRA Ground Water Monitoring Technical Enforcement Guidance Document Guidance for Conducting Remedial Investigations	EPA
R.61-71	South Carolina Well Standards and Regulations	SCDHEC
WSRC-RP-90-1001	Memorandum of Agreement	WSRC

studies; hazardous waste in soils; effects on organisms of exposure to organic and heavy metal contaminants; and various ecological and wetlands studies. The SREL Division of Environmental Outreach and Education is active in a variety of onsite and offsite educational programs.

In general, the soil, sediment, and biota program is well-implemented and managed throughout SREL. Soil, sediment, and biota are routinely analyzed for radionuclides by WSRC, mostly in conjunction with contaminant assessment. The soil, sediment, and biota sampling conducted by SREL is directly related to their research projects and is not conducted for monitoring programs required by regulatory agencies and/or DOE Orders; that responsibility lies with WSRC. The soil and sediment sampling conducted by WSRC is conducted as a part of their overall sitewide monitoring program; however, SREL can initiate soil and sediment sampling through the Memorandum of Agreement with WSRC. SREL's operations, which are research-oriented, have had only minimal adverse impact on soil, sediment, and biota. The only impact of SREL's operations on these media identified by the audit team is an area of petroleum-contaminated soil near the Par Pond Boat Ramp. No examples of adverse impacts of SREL's operations on sediment or biota were identified.

Groundwater/Soil, Sediment, and Biota Findings

The groundwater/soil, sediment, and biota portion of the environmental audit identified three compliance findings pertaining to the underground storage tank notification requirements, development of a UG groundwater program for research wells, and petroleum-contaminated soil near the Par Pond Boat Ramp.

3.3.2 Compliance Findings

GW/CF-1: Underground Storage Tank Registrations

Performance Objective: South Carolina Underground Storage Tank Control Regulations R.61-92, Section 280.22, "Notification Requirements," Paragraph (a), states "By January 1, 1986 any owner of an existing tank storing or having stored regulated substances on or before January 1, 1986 shall notify the Department of the existence of such a tank specifying the type, location, storage capacity, age, and uses of such a tank (i.e., operational status at the time of notification) and of any known past failure(s) and corrective action taken as a result of the failure."

Finding: SREL has not registered two diesel underground storage tanks as required by South Carolina Underground Storage Tank Control Regulations.

Discussion: SREL has two operational underground storage tanks for diesel fuel that are used for the emergency generators (SREL-007). Tank A, a 500-gallon diesel fuel tank is located at Building 737-4A. Tank D, a 300-gallon diesel fuel tank is located at Building 652-8G (Aquatic Ecology Laboratory). Both tanks are owned and operated by SREL, but are not registered with the South Carolina Department of Health and Environmental Control (SCDHEC) as required by R.61-92, Section 280.22 (I-B-21).

The apparent causal factor for this finding is policy implementation, in that notification was not submitted to WSRC or SCDHEC. A secondary contributing factor for this finding is a lack of appraisals/audits/reviews to identify noncompliance with R.61-92, Section 280.22.

GW/CF-2: UG Groundwater Management Program

Performance Objective: DOE 5400.1, "General Environmental Protection Program," Chapter III, Section 4(a), requires DOE facilities to design and implement a groundwater monitoring program.

DOE 5400.1, Chapter IV, Section 9, states "Groundwater that is or could be affected by DOE activities shall be monitored to determine and document the effects of operations on groundwater quality and quantity, and to demonstrate compliance with DOE requirements and applicable Federal, state, and local laws and regulations."

South Carolina Well Standards and Regulations, R.61-71, Section 71.11(c)(6), states that "all monitoring wells shall have locking cap or other security devices to prevent damage and/or vandalism."

Finding: UG has not developed a program to ensure that research wells comply with DOE 5400.1, and South Carolina well standards and regulations.

Discussion: UG has approximately 175 piezometers and wells located throughout SREL and the Set-Aside areas. Almost all of these installations support SREL research activities. However, seven wells installed by UG and located near the SRS coal pile are sampled by WSRC, who has responsibility for implementing the sitewide groundwater protection program required by DOE 5400.1. SR, in the SRS Environmental Program Implementation Plan, required WSRC to develop and implement a sitewide Groundwater Protection Management Program, thereby relieving SREL of the responsibility to develop an independent program. UG does not provide groundwater data from the research projects to WSRC for inclusion in SRS sitewide Quarterly Reports prepared as part of the sitewide groundwater protection program and most of the SREL wells are not included in the sitewide program (I-B-38).

The environmental audit team observed several deficiencies in groundwater protection management of wells at SREL.

- A well located at the A Area main laboratory was not labelled or identified (I-B-11).
- Approximately 50 piezometers at Meyers Branch were not secured to prevent vandalism, which could impact the environment (I-B-11).
- There is no comprehensive inventory of SREL research wells to ensure they are adequately secured.

The apparent causal factors for this finding are lack of policy implementation of South Carolina Department of Health and Environmental Control (SCDHEC) well security requirements and risk, in that key environmental personnel at SREL do not have sufficient expertise in groundwater issues to assess the risk associated with groundwater contamination.

GW/CF-3: Releases at the Former Aboveground Storage Tank Area

Performance Objective: DOE 5400.1, "General Environmental Protection Program," Paragraph 5, Subparagraph b, states "DOE expects its management and operating contractors to conduct their operations in an environmentally sound manner that limits the risk to the environment and protects the public health."

40 CFR 112.7(e)(2)(vi) states that ". . . the outside of the [aboveground] tank should frequently be observed by operating personnel for signs of deterioration, leaks which might cause a spill, or accumulation of oil inside diked areas."

WSRC-RP-90-1001: Memorandum of Agreement (MOA) between SREL and WSRC for Provision of Support Services requires that SREL contact the EPD for support with remediation efforts.

Finding: UG has not responded in a timely manner to remediate the soil contamination at the previous location of the gasoline storage tank, at the SREL boat dock at Par Pond, as required by DOE 5400.1, and the MOA established between SREL and WSRC.

Discussion: SREL owns an aboveground gasoline tank that was removed in the early spring of 1992 from its original location at the Par Pond Boat Ramp after the drawdown of the Par Pond was completed (I-C-19). The tank was originally placed upgradient of Par Pond and approximately 10 feet from the high water line near the boat dock. The tank was situated on sandy soil that was not sufficiently impervious to contain spilled fuel, which is required by 40 CFR 112.7.

Prior to and after removal of the tank, which was requested by UG and performed by the Power Department of WSRC, fuel stained areas were visible inside the diked area beneath the tank (I-B-11). In April 1992, the WSRC Power Department took a series of soil samples from within and outside of the diked area. These soil samples were analyzed for gasoline constituents (i.e., benzene, toluene, ethylbenzene, and xylene) and total petroleum hydrocarbons (TPH). The WSRC Power Department received the results of the analysis on May 20, 1992. Soil sample results indicated TPH in excess of regulatory guidelines (SREL-175).

UG has not formally requested that WSRC provide remediation support per the MOA. Furthermore, UG assumed that the responsibility for remediating the tank area was WSRC's (I-B-23). In conclusion, UG has not responded in a timely manner to remediate the soil contamination at the previous location of the gasoline storage tank, at the SREL boat dock at Par Pond, as required by DOE 5400.1 and the MOA.

The apparent causal factors for this finding are risk, in that the potential for adverse environmental impact for not remediating the petroleum contaminated soils may not have been perceived; and lack of policy implementation in that remediation efforts were not implemented.

3.4 WASTE MANAGEMENT

3.4.1 Overview

The purpose of the waste management portion of the environmental audit was to evaluate the management of solid, hazardous, and mixed waste, including generation, accumulation, and transportation. The SREL waste management program was examined to determine compliance with DOE Orders, Federal and state statutes and regulations, WSRC requirements, and applicable permits. Also, the Memorandum of Agreement (MOA) between SREL and WSRC was evaluated with regard to waste management issues. The DOE Orders, Federal and state regulations, and other guidelines used for this portion of the environmental audit are listed in Table 3-4.

The general approach to the waste management portion of the audit included: (1) inspection of satellite accumulation areas and operating logs; (2) interviews with waste generators and UG staff responsible for waste management and environmental compliance; (3) interviews with WSRC staff responsible for implementing the waste management portion of the MOA; (4) interviews with SR staff responsible for oversight of waste management activities at SREL; and (5) a review of documentation pertaining to waste management, including waste characterization determinations, training records, policies, procedures, self-assessments, and previous audits and assessments.

SREL generates solid, hazardous, and mixed wastes during the conductance of its research activities at the Savannah River Site (SRS). During 1992, the laboratory generated approximately 1,000 pounds of hazardous wastes. SREL does not have its own EPA hazardous waste generator identification number; rather it operates under the number issued to SR for all of SRS. Through the MOA, WSRC transfers hazardous waste from SREL to WSRC for interim storage in the WSRC permitted area prior to shipment to a treatment, storage, and disposal facility.

Hazardous and mixed wastes generated by SREL are managed in satellite accumulation areas, each controlled by a laboratory chemical coordinator who is responsible to the SREL Faculty. When a filled hazardous waste container is ready for transfer to WSRC control (i.e., the contents meet the WSRC waste acceptance criteria), the required documentation is prepared by UG staff, and the filled waste containers are collected by WSRC. The wastes are then stored in WSRC's permitted storage facility until shipment.

Documentation necessary for transfer of the hazardous waste to WSRC control includes: a Hazardous Waste Storage/Disposal Record (SREL-145), a Hazardous Waste Data Sheet (SREL-146), a Savannah River Site Waste Characterization form (SREL-147), and a Hazardous Materials Shipment-Public Access Roads form (SREL-148). WSRC ships Land Disposal Restricted (LDR) wastes generated at SREL to an out-of-state incinerator, and has accepted responsibility for preparation of the standard formal LDR documentation. WSRC requests that each generator include a memo with each waste transfer identifying which wastes are restricted from land disposal (I-D-14).

Overall, waste management at SREL appears to be very good. UG has prepared and implemented procedures for the management of hazardous, nonhazardous, mixed, and radioactive wastes and has a well-defined waste minimization plan that has resulted in a

Table 3-4
List of Waste Management
Regulations, Requirements, and Guidelines

Regulations/ Requirements/ Guidelines	Sections/Title	Authority
DOE 5400.1	General Environmental Protection Program	DOE
DOE 5400.2A	Environmental Compliance Issues Coordination	DOE
DOE 5400.3	Hazardous and Radioactive Mixed Waste Program	DOE
DOE 5400.3A	Occurrence Reporting and Processing of Operations Information	DOE
DOE 5480.19	Conduct of Operations Requirements for DOE Facilities	DOE
DOE 5820.2A	Radioactive Waste Management	DOE
40 CFR 260-262, 268	Hazardous Waste Regulations	EPA
C1 SCCR R.61-79.124 through 79.270	South Carolina Hazardous Waste Management Regulations	SCDHEC
N/A	SREL Hazardous/Nonhazardous Waste Management Procedures, Rev. 6	SREL
N/A	SREL Waste Minimization Plan, Rev. 3	SREL
WSRC-RP-90-1001 Rev. 1	Memorandum of Agreement with SREL for the Provision of Support Services in WSRC	WSRC/ SREL
N/A	DOE SRS Waste Minimization Plan, Rev. 5	WSRC
3Q Manual, Procedure ECM 6.9	Hazardous or Mixed Waste Management at Satellite Accumulation Areas	WSRC

reduction in hazardous waste generation. For example, a gel electrophoresis program has reduced waste alcohol generation from 75 to about 3 gallons per year (I-D-15).

There was one compliance finding and one best management practice finding in the waste management portion of the environmental audit. The compliance finding pertains to the lack of verification with respect to treatment, storage, and disposal facilities that manage UG hazardous wastes. The best management practice finding relates to the lack of a program to periodically remove litter from experiment sites.

3.4.2 Compliance Finding

WM/CF-1: Verification of Hazardous Waste Treatment, Storage, and Disposal

Performance Objective: DOE 5700.6C, Section 9.b.(2)(c), Criterion 7-Procurement, requires UG to "ensure that procured items and services meet established requirements and perform as specified."

The Memorandum of Agreement (MOA) between UG and WSRC in Section I, "Purpose," states that "to the extent directed by DOE pursuant to the WSRC contract, certain . . . support services may be provided to other SRS organizations not under the control of WSRC." Section II of the MOA states "DOE policy requires that its site contractors . . . conduct their operations . . . consistently with all applicable Federal and state laws, regulations and requirements. Responsibility and accountability for compliance with these requirements resides with each organization respectively."

40 CFR 260.10 defines a generator as "any person, by site, whose act, or process, produces hazardous waste identified or listed in (40 CFR 261) of this chapter or whose act first causes a hazardous waste to become subject to regulation."

CERCLA, Section 107, establishes that generators of hazardous substances may be considered to be strictly liable for any releases of those hazardous substances from a treatment, storage, or disposal facility.

Finding: UG does not verify that waste management services provided by WSRC per the Memorandum of Agreement do not result in liability to UG.

Discussion: Interviews with UG staff indicate they believe SREL is no longer responsible for hazardous waste that has been generated by UG at SREL and transferred to the custody of WSRC, as per the MOA (I-D-9). The MOA states that UG is responsible for compliance with all applicable regulatory requirements, which includes the "cradle-to-grave" responsibility under the Resource Conservation and Recovery Act (RCRA), but does not contain provision for UG to verify proper management of hazardous wastes once these wastes are transferred to WSRC.

While SR oversees WSRC waste management, SR has given no written direction to UG with regard to the need for oversight of the WSRC waste management program (I-D-16).

The apparent causal factor for this finding is the lack of <u>policy</u> regarding UG verification of waste management services provided by WSRC.

3.4.3 Best Management Practice Finding

WM/BMPF-1: Research Site Cleanup

Performance Objective: Best management practices suggest that sites of research experiments should be returned to their former states, if feasible, and that all manmade materials should be periodically removed to the extent practical.

Finding: UG has no program to ensure that all experimental equipment and trash generated and accumulated at research sites is periodically removed.

Discussion: During the course of the environmental audit, waste materials, including demolition debris, research equipment (flagging and netting), and signs were observed at SREL research sites, including the Meyers Branch Set-Aside area, Par Pond, and B Area (I-B-11). In addition, other sites that contain debris were identified by SR including Twin Lakes and G-2 (I-B-31).

UG does not have a program or policy with respect to removal of "ecotrash" from sites used for research experiments, including Set-Aside areas (I-C-7). The lack of such a program, particularly with respect to Set-Aside areas, is contrary to best management practices for minimizing environmental impacts.

The apparent causal factor for this finding is a lack of SREL policy to require periodic cleanup of sites by researchers.

3.5 TOXIC AND CHEMICAL MATERIALS

3.5.1 Overview

The purpose of the toxic and chemical materials portion of the environmental audit was to evaluate current operational practices and programs to determine the extent of compliance with Federal regulations, DOE Orders, and commonly accepted industry practices and standards of performance concerned with management and use of chemical materials, with specific attention to handling, storage, and disposal. Toxic and chemical materials management was assessed against the particular requirements of the Toxic Substances Control Act (TSCA), the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), Occupational Safety and Health Act (OSHA) regulations for hazardous materials storage, and portions of the Clean Water Act concerned with the storage of petroleum products. Table 3-5 lists environmental regulations, requirements, and guidelines that were used in this portion of the audit.

The toxic and chemical materials portion of this audit was conducted by reviewing pertinent documents, including procedures, policies, inspection logs, records of purchases, inventories, audit reports, OSHA Hazard Communications (HAZCOM) program documentation, and material safety data sheet (MSDS) files. Interviews were conducted with SR, WSRC, and UG personnel, and inspections of SREL buildings and surrounding areas were performed. As a part of the toxic and chemical materials audit, reviews were coordinated with other environmental audit specialists to ensure that toxic and chemical materials were identified and evaluated.

SREL uses few chemicals in large (bulk) quantities. Laboratory solvents and reagents are used in small quantities on an as-needed basis; all purchases must be approved by the Waste Minimization Officer or his/her designee to ensure waste minimization. Gasoline and oil are stored at SREL for use in outboard boat motors and other engines including six stationary emergency power generators.

There are 19 transformers on SREL property; the transformers either do not contain PCBs, or contain PCBs at concentrations below 50 parts per million. Maintenance of these transformers is the responsibility of WSRC. The WSRC Environmental Protection Department (EPD) is responsible for the annual PCB document log. Individual WSRC departments are responsible for other records. No SREL subcontractors use equipment containing PCBs.

The HAZCOM program is implemented by annual training which includes discussions and video lectures on hazard evaluation, MSDSs, and container labelling. Fourteen laboratory chemical coordinators are charged with the responsibilities of maintaining current inventories in their assigned areas, maintenance of relevant MSDSs, and implementation of container labelling requirements. Documentation of employee training is the responsibility of the SREL Laboratory Safety Officer.

UG has not fully implemented the sitewide Pollution Prevention Awareness Program Plan. Each research program maintains its own store of chemicals-in-use, after procurement is approved by the SREL Program Safety Coordinator or his/her designee. Surplus reagents are "excessed" and offered to the UG faculty and staff.

Table 3-5
List of Toxic and Chemical Materials
Regulations, Requirements, and Guidelines

Regulations/ Requirements/ Guidelines	Sections/Titles	Authority
DOE 5400.1	General Environmental Protection Program	DOE
DOE 5480.3	Safety Requirements for the Packaging and Transportation of Hazardous Materials, Hazardous Substances, and Hazardous Waste	DOE
DOE 6430.1A	General Design Criteria	DOE
29 CFR 1910	Hazardous Materials Storage	OSHA
40 CFR 165	Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), Pesticide Storage/Disposal Regulations	EPA
40 CFR 761	(TSCA) Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, Use Prohibitions	EPA
49 CFR 171, 173, 177, 178, and 397	Transportation of Hazardous Materials, Packaging, Marking, Spill Reporting, etc.	DOT
N/A	Safety Manual	UG
N/A	Polychlorinated Biphenyl (PCB) Management Manual	WSRC

Overall, UG's toxic and chemical materials program is to be commended for its attention to its responsibilities to properly procure, store, and manage toxic and chemical materials. However, a few elements of the toxic and chemical materials program require improvements in implementation.

The toxic and chemical materials portion of the environmental audit identified two compliance findings: (1) UG has not fully implemented the sitewide Pollution Prevention Awareness Program Plan; and (2) the UG program for management of toxic and chemical materials is not fully implemented.

2.5.2 Compliance Findings

TCM/CF-1: Pollution Prevention Awareness Program Plan

Performance Objective: DOE 5400.1, "General Environmental Protection Program," establishes DOE policy on environmental protection. Chapter III.4.c requires the Head of a Field Organization to prepare a Pollution Prevention Awareness Program (PPAP) Plan that includes elements for employee awareness. "All mission statements and project plans shall recognize a requirement for pollution prevention, where appropriate. The documented program, including elements for employee awareness through specific training . . . campaigns, and incentives and awards programs shall be implemented." The plan was to be implemented by November 9, 1989, reviewed annually, and updated every 3 years.

Finding: UG has not fully implemented the sitewide PPAP Plan.

Discussion: A PPAP Plan, as required by DOE 5400.1., Chapter III.4.c, should provide for pollution prevention in mission statements and project plans, specify training, related awareness campaigns, and include incentives and award programs. These elements are intended to promote the goals of DOE 5400.1. UG has not implemented the sitewide PPAP Plan (SREL-228; I-D-17). In addition, UG personnel with responsibility for ES&H, including PPAP implementation, were not aware of the sitewide PPAP Plan.

The apparent causal factor for this finding is a lack of policy implementation with respect to sitewide PPAP requirements.

TCM/CF-2: Storage of Toxic Chemicals And Materials

Performance Objective: DOE 5400.1, "General Environmental Protection Program," requires DOE facilities to conduct operations in an environmentally sound manner that limits risks to the environment and to develop and implement programs to execute environmental protection compliance programs and policies.

DOE 5480.19, "Conduct of Operation Requirements for DOE Facilities," Attachment I, Chapter VIII, states "Operators should be knowledgeable about aspects of facility processes and safety that affect operation and should be able to analyze off-normal situations and take appropriate action to correct the cause(s) of problems." Examples of the types of concepts and processes that operations personnel should be familiar with include: "The purpose and hazards associated with the facility storage and use of such chemicals . . . acids, caustics, . . . and chemicals containing organics."

The SREL Safety Manual establishes requirements for compliance with DOE Orders with respect to toxic and chemical material management.

It is a best management practice to provide secondary containment for large bottles of flammables, acids, and bases stored in laboratory cabinets, and label transformers as to PCB content.

The WSRC Polychlorinated Biphenyl (PCB) Management Manual requires that PCB-contaminated (less than 50 ppm) transformers have a label with a green background.

Finding: UG's program for management of toxic and chemical materials is not fully implemented.

Discussion: SREL personnel store and use toxic and chemical materials, including laboratory reagents, cleaning solvents, and gasoline and lubricating oil in operation areas, laboratories, and in vehicles. Chemicals are stored in various amounts ranging from laboratory quantities to bulk storage tanks. The Environmental Health and Safety Program Manager appointed by the Director, directs both the laboratory and radiation safety programs at SREL. The SREL Safety Officer, who reports to the Environmental Health and Safety Program Manager, is responsible for industrial safety and hygiene.

SREL's toxic and chemical materials program is described in the SREL Safety Manual (SREL-171). The manual defines practices for chemical storage and use inside laboratories. The environmental audit team observed general compliance with the requirements of the toxic and chemical materials program, with the following exceptions:

- Greater than 10 gallons of flammable liquids were stored outside of flammable storage cabinets in building SREL 40.

- Flammable chemicals and an oxidizer were found stored in close proximity in a storage area at SREL in building SREL 40.

In addition, the following deficiencies with respect to best management practices were observed:

- Identification numbers and labels to indicate PCB status were not visible on, or absent from, some transformers located at SREL. It is a best management practice to clearly label all transformers as to PCB content to assist decisionmaking in the event of an emergency.

- The SREL Safety Manual does not address secondary containment for flammables, acids, or bases stored in laboratory cabinets. It is a best management practice to provide secondary containment for these materials. The environmental audit team noted that some SREL research staff have, on their own initiative, implemented secondary containment practices for materials under their direct control. Eleven of 24 laboratories inspected did not have any secondary containment for bottles of acids, bases, and/or flammables being stored in cabinets.

The apparent causal factor for this finding is policy implementation, in that SREL personnel failed to follow established policy.

3.6 QUALITY ASSURANCE

3.6.1 Overview

The purpose of the quality assurance portion of the environmental audit was to evaluate current operational practices and programs to determine the extent of compliance with Federal regulations, DOE Orders, and accepted industry quality assurance and quality control practices and standards of performance. Table 3-6 lists environmental quality assurance regulations, DOE Orders, and guidelines that were used during this audit.

The environmental quality assurance audit included interviews with SR and UG employees, inspection of SREL facilities, review of environmental research quality assurance plans, observation of environmental sampling and analysis activities, and a review of documents, procedures, and records associated with environmental monitoring and surveillance programs. As a part of the quality assurance audit, reviews were coordinated with other environmental audit team members in the areas of soil, sediment, and biota; groundwater; surface water; air; radiation; and waste management.

The Savannah River Site, administered by SR, produces nuclear material for government and civilian purposes. Groups onsite conducting environmental monitoring programs include WSRC, SREL, and Savannah River Forest Station. Responsibility for SR oversight of SREL resides in the Laboratory Programs Branch of the Environmental and Laboratory Programs Division. The SR Quality Assurance Program Manual describes the requirements to be filled to satisfy DOE 5700.6C criteria. Organizational structure, function, and responsibilities are defined in the SR Directive Implementation Instruction (DII) 110X.1. Together, the Quality Assurance Program Manual and DII 110X.1 comprise the SR Quality Assurance Program. The Quality Assurance Program implements SR policies and procedures.

UG, as the SREL contractor, conducts applied and basic research for SR at SRS. Principal and related research programs are designed to provide ecological data and analyses to support DOE efforts to assure incorporation of national environmental protection goals in the formulation of energy programs, and to advance the goals of restoring, protecting, and enhancing environmental quality. Where possible, UG utilizes the information collected in the environmental research programs to develop and test hypotheses that will contribute to the ecological foundation necessary to understand the effects of energy production trends, proposed energy technologies, and SRS operations. Recent SREL activities concentrate on the effects of past, present, and proposed SRS operations, on methods to contain or mitigate the effects of hazardous wastes in soils, on the effects on organisms of exposure to organic and heavy metal contaminants, and on long-term ecological effects of thermal effluents from past nuclear reactor operations. SREL's Environmental Outreach and Education Program promotes public awareness of environmental issues by presenting aspects of its programs to civic, educational, and professional groups and by conducting site tours that emphasize ecological and environmental developments.

Quality assurance/quality control programs mandated by DOE contract are developed, implemented, and updated by UG at SREL by the Quality Assurance Manager. The present SREL Quality Assurance Plan was submitted to DOE for approval in October 1991 and

Table 3-6
List of Quality Assurance
Regulations, Requirements, and Guidelines

Regulations/ Requirements/ Guidelines	Sections/Title	Authority
DOE 1324.5	Records Management Program	DOE
DOE 5400.1	General Environmental Protection Program Requirements	DOE
DOE 5480.19	Conduct of Operations for DOE Facilities	DOE
DOE 5700.6C	Quality Assurance	DOE
Regulatory Guide	Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance	DOE
ASME NQA-1-1989	Quality Assurance Program Requirements for Nuclear Facilities	ANSI/ASME
SW-846	Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods	EPA
DII 110X.1A	Organizations and Functions	SR
SRM 5700.6.X.X.1	SR Quality Assurance Program Manual	SR
WSRC-RP-90-1001, Rev. 1	Memorandum of Agreement with SREL for the Provision of Support Services by WSRC	WSRC

approved by SR in July 1992. The plan complies with the requirements of DOE 5700.6C as it pertains to applied research and is consistent with the Implementation Guide for Quality Assurance Programs for Basic and Applied Research (DOE-ER-STD-6001-92). Many environmental, safety, and radiological support services at SREL are provided by WSRC under the terms of an existing Memorandum of Agreement. The UG Quality Assurance Manager for SREL maintains liaison with DOE and other contractors to coordinate SREL activities with the activities of all other contractors at SRS.

Overall, UG's Quality Assurance Program is well designed and implemented. Great strides are being made to formalize and execute procedures that will ensure that ecological data collected and published under SREL auspices is collated and archived in an easily referenced format for future use by investigators studying historical patterns. The Document Control Coordinator has implemented a procedure to verify the contents of document inventories and record archives. A computer-based archiving system has been developed and implemented that incorporates both historical and ongoing studies. The audit team's primary concern is a lack of quality assurance oversight by SR. Laboratory practices that warrant attention are calibration and maintenance of equipment, operating procedure control, data collection practices, and records management.

The quality assurance portion of the environmental audit identified one compliance finding relating to audits and oversight and one best management practices finding relating to good laboratory practices.

3.6.2 Compliance Finding

QA/CF-1: Internal Quality Assurance Oversight

Performance Objective: DOE 5400.1, "General Environmental Protection Program," requires that "a quality assurance program consistent with DOE 5700.6B (superseded by DOE 5700.6C) shall be established covering each element of environmental monitoring and surveillance programs commensurate with its nature and complexity."

DOE 5700.6C, "Quality Assurance," Section 9.b(3)(b), requires that "Planned and periodic independent assessments shall be conducted to measure item quality and process effectiveness and to promote improvement. Paragraph 10.e(1) further requires that Field Offices "ensure the adequacy and implementation of contractors' quality assurance programs by performing independent assessments in accordance with Paragraph 9.b(3)(b)."

ASME NQA-1, Basic Requirement 18, "Audits," states that "Planned and scheduled audits shall be performed to verify compliance with all aspects of the quality assurance program and to determine its effectiveness. These audits shall be performed in accordance with written procedures or checklists by personnel who do not have direct responsibility for performing the activities being audited." Basic Requirement 18 further states that "internal or external quality assurance audits shall be scheduled in a manner to provide coverage and coordination with on-going quality assurance activities."
SRM 5700.6.X.X.1, "Quality Assurance Program Manual," and DII 110X.1A, "Organizations and Functions," together comprise the SR Quality Assurance Program. SRM 5700.6.X.X.1, Section 10.2.2, states that "Division/Office Directors shall establish and implement processes to plan and perform periodic independent assessments of contractors' functions and activities."

Finding: SR has not implemented a program for conducting planned and periodic independent assessments of environmental quality assurance at SREL as required by DOE 5400.1, DOE 5700.6C, NQA-1, and the SR Quality Assurance Program.

Discussion: SREL conducts applied and basic research for SR at SRS. Principal and related research programs are to be "designed to provide ecological data and analyses required to permit DOE to assure incorporation of national environmental protection goals in the formulation of energy programs, and to advance the goals of restoring, protecting, and enhancing environmental quality" (SREL-107). Where possible, SREL is to "utilize the information collected in the environmental research programs to develop and test hypotheses which will contribute to the ecological foundation necessary to understand the effects of energy production trends, proposed energy technologies and SRS operations" (SREL-107). SREL research activities concentrate on the effects of past, present, and proposed site operations, methods to contain or mitigate the effects of hazardous wastes in soils, the effects on organisms from exposure to organic and heavy metal contaminants, and long-term ecological effects of thermal effluents from past nuclear reactor operations (SREL-076 and SREL-138). SREL also conducts an educational and outreach program designed to promote public awareness of environmental issues (SREL-076).

Part of the mission of SR and its contractors at SRS is to safely produce nuclear materials while protecting the environment (SREL-214). To that end, and to comply with

DOE 5400.1, SR is committed to continuous quality improvement. Auditing is the principle mechanism for monitoring the effectiveness of a quality assurance program. Through the systematic application of internal audits conducted by an independent group, it is possible to not only identify a threat to quality, but also to conduct a process of continuous quality improvement. However, this is not being done.

The SR Quality Assurance Program requires performance of walk-throughs and audits. Through examination of SR Quality Assurance Programs and interviews with SR personnel it was evident that management walk-throughs at SREL are conducted by SR personnel at regularly scheduled intervals (I-E-5; SREL-157). However, these are not intended to verify conformance to regulations, product standards, or established procedures, but rather to evaluate customer and employee perceptions of quality issues (SREL-214).

The SR Quality Assurance Program requires audits to be performed. However, audits of quality assurance at SREL by SR have not been conducted and none have been scheduled for the immediate future (I-E-13).

The apparent causal factor for this finding is policy implementation, in that DOE policy requiring quality assurance audits has not been implemented by SR.

3.6.3 Best Management Practice Finding

QA/BMPF-1: Environmental Data Quality

Performance Objective: DOE 5700.6C, "Quality Assurance," Section 9.b(2)(a), states that "work shall be performed to established technical standards and administrative controls. Work shall be performed under controlled conditions using approved instructions, procedures, or other appropriate means. Items shall be identified and controlled to assure their proper use. Items shall be maintained to prevent their damage, loss, or deterioration. Equipment used for process monitoring or data collection shall be calibrated and maintained." DOE 5700.6C also lists guidance documents that apply to environmental issues, including EPA SW-846, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods."

SREL Quality Assurance Plan, Section Q-91-0001, Revision 1, Part 6.0, "Relationship to DOE Criteria," states "The Department of Energy (DOE) has established ten criteria in DOE Order 5700.6C 'Quality Assurance' that are to be the basis for quality assurance programs for DOE-funded work. The SREL quality assurance program is consistent with the basic requirements of that Order."

DOE contract, DE-AC09-76SR00819, Section C, Part I(b), "Research Programs," states "The Contractor shall conduct environmental research programs subject to prior DOE approval. The principal research programs shall be designed to provide the ecological data and analyses required to permit DOE to assure incorporation of national environmental protection goals in the formulation and implementation of energy programs, and to advance the goals of restoring, protecting, and enhancing environmental quality." This Section also states "The Contractor shall conduct research programs to provide information required by DOE to manage the SRS in accordance with national environmental protection goals, environmental regulations and consistent with its status as a National Environmental Research Park." SW-846, "Test Methods for Evaluating Solid Waste Physical/Chemical Methods," Chapter 1, Section 6.3, states "All records should be written in indelible ink." Section 4.3.1 states that "procedures describing the receipt, handling, scheduling and storage of samples shall be specified." It further states that "these procedures describe the storage conditions for all samples, verification and documentation of daily storage temperature, and how to ensure that custody of the sample is maintained in the laboratory."

Finding: Laboratory practices associated with some SREL research projects do not conform with best management practices.

Discussion: UG conducts applied and basic research for SR at SRS. Research programs are to be "designed to provide ecological data and analyses required to permit DOE to assure incorporation of national environmental protection goals in the formulation of energy programs, and to advance the goals of restoring, protecting, and enhancing environmental quality." (SREL-107). Where possible, SREL is to "utilize the information collected in the environmental research programs to develop and test hypotheses which will contribute to the ecological foundation necessary to understand the effects of energy production trends, proposed energy technologies and SRS operations." (SREL-107). Recent SREL activities concentrate on the effects of past, present, and proposed site operations, on methods to contain or mitigate the effects or hazardous wastes in soils, on

the effects on organisms of exposure to organic and heavy metal contaminants, and on long-term ecological effects of thermal effluents from past nuclear reactor operations (SREL-076 and SREL-138). SREL also conducts an educational and outreach program designed to promote public awareness of environmental issues (SREL-076).

Part of the mission of SR and its contractors at SRS is to safely produce nuclear materials while protecting the environment (SREL-214). Ongoing and proposed collaborative research projects include a joint SREL/WSRC program to inventory and map gamma-emitting radionuclides in Par Pond sediments, examination of sub-surface transport of diesel fuel contaminants from leaking storage tanks in the Central Shops area at SRS (SREL-138), and a project with the U.S. Fish and Wildlife Service to determine changes in mercury levels in large food fish at the Par Pond (SREL-223). At SREL, the detail with which operations affecting quality are documented and controlled is client-demand-driven. Quality assurance requirements other than those described in the SREL Quality Assurance Plan are addressed on a case-by-case basis. Quality Assurance Program Plan content ranges from highly detailed plans tailored specifically for proposals to clients who demand rigorous control of precision and accuracy (SREL-165), to less detailed plans for clients whose requirements can be accommodated by the SREL Quality Assurance Plan's general implementing procedures.

While touring SREL facilities, the audit team examined notebooks, and procedures, checked equipment used to collect data or to store or analyze samples, and observed ongoing laboratory practices. Some observed practices deviated from best management practices. Examples of these include the following:

- Two of three Salinity/Conductivity/Temperature meters at the Par Pond Boat Laboratory had no maintenance or calibration labels. The third meter had a blank label.

- A Ludlum Model 12 Radiation Survey Meter in a counting laboratory at the Par Pond Radioecology Laboratory was last calibrated on March 23, 1990. Associated with this meter were two Monitor-4 radiation alert monitors, and one unidentifiable survey meter, all with no indication of service or calibration status.

- A torsion balance in Building 737-A had no indication of service or calibration status.

- Freezers and refrigerators in the B Area buildings and in the Aquatic Ecology Laboratory had no temperature logs or recorders, had no max/min alarms, and were secure only to the extent that the buildings were locked.

- Three of six SOP's randomly examined in a loose-leaf SOP notebook in a B Area laboratory contained hand-written additions (SREL-155). The SOP's examined were written in January 1991 for a study concluded soon after (I-E-24). These and other associated documents have apparently lain unattended for at least 2 years.

- A laboratory notebook in Building 737-A contained data and notes recorded entirely in pencil. The SREL procedure Q-91-0006, "Documentation of

Research Activities," recommends, but does not require, that entries be made on non-erasable media (SREL- 222).

The apparent causal factor for this finding is policy, in that the existing SREL QAP does not adhere to the best management practices contained in DOE 5700.6C, Section 9.b(2).

3.7 RADIATION

3.7.1 Overview

The purpose of the radiation portion of the environmental audit was to review compliance with DOE Orders, Federal and state regulations, and best management practices. A list of the DOE Orders and Federal and state regulations used in the evaluation of SREL's radiological environmental programs and practices is presented in Table 3-7.

During the conduct of this audit, the radiation specialist performed an inspection of the radiologically controlled area at SREL where radioactive materials are used and stored; reviewed site records, procedures, and data; and interviewed personnel from UG, SR, and WSRC. In some instances, coordination between the radiation specialist and other specialists was required due to overlapping issues.

Activities involving the use and disposal of radioactive materials at SREL are limited to check sources, biological tracers, and radioactive materials in an unsealed form. The check sources are used to ensure that radiation detection and measurement equipment are operating properly. The biological tracers are compounds possessing a radioactive atom that allows them to be accurately identified and tracked when introduced into biological systems. Radioactive materials in an unsealed form are used to study its uptake by biota. All radioactive materials are used and stored in controlled areas at SREL. Small amounts of low-level radioactive waste are generated as a result of these activities.

The Radiation Protection Program at SREL is managed by the UG Environmental, Health and Safety Program Manager. The scope of SREL's radiation program is limited to the requirements of health and safety and radioactive waste management, which are governed by the programs and procedures of WSRC manuals.

UG has not evaluated the need to establish environmental radiation programs. Such programs would include performing environmental surveillance and effluent monitoring of both air and water for radioactive contaminants. In addition to air effluent monitoring, National Emission Standards for Hazardous Air Pollutants (NESHAPs) requires that the potential for radioactive air emissions at SREL be determined, although the likelihood for actual emissions is low. However, SREL was omitted from the SRS NESHAPs report. Radioactive materials are not allowed to be disposed of via the sanitary system of SREL facilities; however, at the Par Pond Radioecology Laboratory, pond water samples containing levels of Cesium-137 and tritium slightly above background are disposed of via the drain to the Par Pond septic tank and leach field. All such releases may be subject to environmental ALARA considerations.

In general, the need for environmental radiation programs at SREL has not been determined. This is due, in part, to the lack of a UG staff member having the assigned responsibility for ensuring compliance with environmental radiation requirements, as well as a lack of instructions from SR to develop and implement a few specific requirements of DOE Orders.

Table 3-7
List of Radiation
Regulations, Requirements, and Guidelines

Regulations/ Requirements/ Guidelines	Sections/Titles	Authority
DOE 5400.1	General Environmental Protection Program	DOE
DOE 5400.3	Hazardous and Radioactive Mixed Waste Program	DOE
DOE 5400.5	Radiation Protection of the Public and the Environment	DOE
DOE 5480.4	Environmental Protection, Safety, and Health Protection Standards	DOE
DOE 5480.6	Radiological Control Manual	DOE
DOE 5480.19	Conduct of Operations Requirements for DOE Facilities	DOE
DOE 5484.1	Environmental Protection, Safety, and Health Information Reporting Requirements	DOE
DOE 5700.6B	Quality Assurance	DOE
DOE 5820.2A	Radioactive Waste Management	DOE
40 CFR 61	National Emission Standards for Hazardous Air Pollutants	EPA
DOE/EH-0229	Performance Objectives and Criteria for Conducting DOE Environmental Audits	DOE
DOE/IG-0308	Packaging, Transporting and burying Low-Level Waste	DOE
Interim Guide March 8, 1991	DOE Guidance on the Procedures in Applying the ALARA Process for Compliance with DOE 5400.5	DOE
NRC	Proposed Rulemaking to Establish Radiological Control for Decommissioning	NRC
NRC	Radiological Criteria for Decommissioning of NRC-1 Licensed Facilities; Workshops	NRC
NRC	Regulatory Guide 1.86, Termination of Operating License for Nuclear Reactors	NRC

The environmental audit identified one finding in the environmental radiation discipline. The finding related to the lack of an evaluation to determine whether or not environmental radiation programs are necessary for the activities and operations at SREL, and the lack of instructions from SR to develop and implement specific requirements when necessary.

3.7.2 Compliance Finding

RAD/CF-1: Environmental Radiation Programs

Performance Objective: The contract for the operation of SREL states that the contractor shall review and implement all regulations and guidelines transmitted to them via the Contractor Administration Notices (CANs) directive system specified in SR Order 1321.1c.

DOE 5400.1, "General Environmental Protection Programs," establishes for all contractors of the Department the programmatic and planning requirements necessary to meet the stated DOE policy for protection of the environment, and references DOE Orders in the 5400 series dealing with radiation protection of the public and the environment. In some instances, Field Elements are required to instruct contractors to develop and implement programs and plans.

DOE 5400.5, "Radiation Protection of the Public and the Environment," establishes the requirements with respect to environmental radiation protection that contractors and Field Elements must meet, as well as the programs that must be developed to ensure compliance.

The Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance (DOE/EH-0173T), provides guidance for evaluating the need to establish a program for radiological effluent monitoring and environmental surveillance, and the recommended elements that such programs, if needed, would include.

Finding: UG has not determined the applicability of environmental radiation programs required by DOE 5400.1 and 5400.5 to their operations. In addition, SR has not instructed UG to implement specific environmental radiation programs and plans as required by DOE 5400.5.

Discussion: SREL currently uses small quantities of radioactive materials in research projects. However, SREL maintains a larger quantity of radioactive materials in storage to meet future and potential research demands (SREL-069). The types of radioactive materials at SREL range from tritium and Carbon-14 to Plutonium-238 and Americium-241, and in activities ranging from microcuries to millicuries.

The contract between SR and UG requires that UG review the DOE Orders and regulations transmitted via the CAN directives system, and develop and submit to the Contracting Officer an implementation plan. UG did not use the guidance in DOE/EH-0173T to determine the applicability or develop an implementation plan, to comply with the radiological requirements of DOE 5400.1 and 5400.5 for the operations at SREL (I-A-9). In addition, SR did not verify that UG received DOE 5400.1 and 5400.5, and did not ensure that an implementation plan was developed by UG (I-A-5)(SREL-210). Also, SR did not instruct UG to develop and implement specific requirements when necessary. Examples of programs and plans specified in DOE Orders and Federal regulations that have not been evaluated for applicability to SREL operations are discussed below.

DOE 5400.1 requires that an Environmental Monitoring Plan (EMP) be developed and that, as part of this plan, an evaluation of need must be conducted to determine whether radiological environmental surveillance and effluent monitoring is necessary. SR instructed

WSRC to develop the EMP. However, the EMP does not include SREL. In addition, if radiological effluent monitoring is necessary, Radioactive Effluent and On-site Discharge Data Reports will be required to be submitted to the Waste Systems Information Branch.

DOE 5400.5 requires that an Environmental ALARA Program be developed by the Field Element who, in turn, shall require its implementation by the contractor. SR did not instruct UG to address the implementation of the ALARA Process (I-A-8).

The apparent causal factors for this finding are policy implementation, in that UG did not perform an applicability determination for DOE 5400.1 and 5400.5 requirements to the operations of SREL as required by the contract, and supervision, in that SR did not provide the required instructions to UG, or ensure that implementation plans were developed to comply with DOE 5400.1 and 5400.5.

3.8 INACTIVE WASTE SITES

3.8.1 Overview

The purpose of the inactive waste sites portion of the environmental audit was to evaluate the management system for the identification and characterization of inactive waste sites. The evaluation considered SREL performance with respect to inactive waste sites criteria established in Federal and state regulations, permits, industry guidance, and best management practices. Table 3-8 lists the regulations, requirements, and guidelines used for the inactive waste sites portion of the audit. The two primary regulatory guidelines for inactive waste sites are the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Resource Conservation and Recovery Act (RCRA).

The general approach to the audit included interviews with UG, SR, and WSRC, and review of available reports, including Superfund Amendments and Reauthorization Act (SARA) Title III reports, and site documents, including maps and aerial photography. Field reconnaissance was conducted on SREL lands and facilities including the main laboratory (A Area), B Area facilities, Par Pond Laboratory and Boathouse, Aquatic Ecology Laboratory, and selected Set-Aside areas. During the audit, team members from the waste management, toxic and chemical materials, surface water, and radiation disciplines were consulted regarding the potential for contamination.

Responsibility for the identification of inactive waste sites at SRS rests on SR, WSRC, UG, and other contractors. Following identification, management and characterization of inactive waste sites is the responsibility of WSRC. The UG inactive waste sites identification system lacks formal structure, roles, responsibilities, and accountability. Although SR has oversight responsibility, no formal SR oversight activities have considered inactive waste sites issues specific to SREL. UG is required to request assistance from WSRC after the identification of inactive waste sites; however, formal lines of communication have not been adequately developed.

Potential inactive waste sites resulting from previous laboratory activities that nave not been identified by SREL, WSRC, or the U.S. Army Corps of Engineers include the first headquarters, occupied in 1951; and the upper floor of Bush House, occupied in 1954. Existing potential inactive waste sites are the result of UG research projects at Meyers Branch, Pen Branch, and Steel Creek. Boardwalks constructed in these areas include 55-gallon drums that were labelled: "previously contained trichloroethane" (I-B-11). These drums were obtained from duPont surplus; however, no drum release criteria documentation was available to determine if the drums were effectively decontaminated (I-B-23). Although all streams at SRS are included in the sitewide inactive waste sites inventory, the potential contribution from UG experiments has not been evaluated.

UG laboratory chemical coordinators contribute to SARA Title III reports by submitting relevant data for their respective program to the Program Safety Coordinator for assimilation. The reports are submitted by the Program Safety Coordinator for incorporation into sitewide reports prepared by WSRC to fulfill the reporting requirements of SARA Title III, and the Emergency Planning and Community Right to Know Act.

In conclusion, the UG inactive waste sites identification system is in its infancy with respect to formal structure, roles, responsibilities, and accountability. The environmental

Table 3-8
List of Inactive Waste Sites
Regulations, Requirements, and Guidelines

Regulations/ Requirements/ Guidelines	Sections/Title	Authority
CERCLA/SARA	Section 120 - Federal Facilities	EPA
DOE 4300.1A	Real Estate (Real Property) Management, Chapter III 1.g(18)	DOE
DOE 4300.1B	Real Property and Site Development Planning	DOE
DOE 4320.1B	Site Development Planning	DOE
DOE 4700.1	Project Management System	DOE
DOE 5000.3A	Occurrence Reporting and Processing of Operations Information	DOE
DOE 5400.1	General Environmental Protection Program	DOE
DOE 5480.19	Conduct of Operations	DOE
DOE 5484.1	Environmental Protection, Safety, and Health Protection Information Reporting Requirements	DOE
DOE 5500.2A	Emergency Notification, Reporting and Response Levels	DOE
DOE Guidance Document	Natural Resource Trusteeship and Ecological Evaluation for Environmental Restoration at DOE Facilities	DOE
29 CFR 1910	Part 1910.120 Occupational Safety and Health Standards	OSHA
40 CFR 300	National Oil and Hazardous Substances Contingency Plan	EPA
40 CFR 302	Designation, Reportable DOE-Headquarters Quantities, and Notification	EPA
40 CFR 370	Hazardous Chemical Reporting	EPA
40 CFR 372	Toxic Chemical Release Reporting	EPA

Table 3-8
List of Inactive Waste Sites
Regulations, Requirements, and Guidelines (continued)

Regulations/ Requirements/ Guidelines	Sections/Title	Authority
40 CFR 373	Reporting Hazardous Substance Activity when Selling or Transferring Federal Real Property	EPA
40 CFR 600	Trustees for Natural Resources	EPA
OSWER Directive 9950.1	RCRA Groundwater Monitoring Technical Enforcement Guidance Document	EPA
OSWER Directive 9950.3-01	Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA	EPA
OSWER Directive 9230.0.3B	Community Relations in Superfund - A Handbook, Interim Version	EPA
WSRC-RP-90-001, Rev. 1	Memorandum of Agreement with SREL for Support Services by the WSRC	WSRC
DII 5400.4A	Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Requirements	SR

audit team observed that there is a lack of awareness of inactive waste site issues at SREL.

The inactive waste sites portion of this audit identified one compliance finding that addressed the lack of a program to identify inactive waste sites.

3.8.2 Compliance Finding

IWS/CF-1: Inactive Waste Site Program

Performance Objective: DOE 5400.4, "Comprehensive Environmental Response Compensation and Liability Act (CERCLA) Requirements," Section 8.e, states that Heads of Field organizations at DOE facilities shall "gather information with respect to releases and potentially imminent releases of hazardous substances and maintain a field organization-wide record of all actions taken under this Order, CERCLA, as amended, the NCP, and applicable DOE policies, requirements, and procedures related to such releases."

DOE 4700.1, "Project Management Systems," Section 7.a, states that "the primary objective of this Order is to assure the application of sound management principles to provide a disciplined, systematic and coordinated approach to project management resulting in efficient planning, organization, coordination budgeting, management, review, and control of DOE projects."

SR Directive Implementation Instruction (DII) 5400.4A(b)(8), "Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Requirements," requires that "appropriate personnel have received adequate CERCLA training."

Finding: UG does not have a program to identify SREL inactive waste sites, as required by DOE 5400.4, DII 5400.4A(b)(8), and DOE 4700.1.

Discussion: SREL has created potential inactive waste during its 42-year existence. These include: the first headquarters, a two story barn from a private residence in 1951; the Bush residence in 1954; and the two former Gunsite buildings in 1961 (SREL-048). Additionally, UG has conducted scientific experiments at the Set-Aside areas that have resulted in at least one documented inactive waste site, the "West of Georgia Fields Unit" (SREL-211). A survey conducted by the United States Army Corp of Engineers identified several potential inactive waste sites, which include C23 SREL research area, C29 SREL research area, C30 research area, and C31 research area (SREL-207).

Ongoing UG research experiments which have the potential to create a release of hazardous materials to the environment that were identified by the environmental audit team include boardwalks constructed of 55-gallon drums located at Meyers Branch, Penn Branch, and Steel Creek Branch. The drums are labelled "Previously Contained Trichloroethane." UG also has a number of other potential inactive waste sites including debris piles at Par Pond Boat Ramp, Twin Lakes, C-2 (at Road 125), and B Area, which are the result of laboratory experiments (I-B-31 and I-B-23).

SR has issued DII 5400.4A(b)(8) to SREL requiring UG to report any inactive waste sites to WSRC, who has sitewide responsibility for environmental restoration activities, for subsequent characterization. However, UG does not have a functioning program that identifies SREL inactive waste sites, as evidenced by the following observations:

- UG cannot document that the drums used for boardwalks in Meyers Branch, Penn Branch, and Steel Creek Branch were effectively decontaminated (I-B-23).

- The audit team, during a brief onsite survey, identified several previously unknown potential inactive waste sites; however, UG representatives indicated that there were none (I-B-15 and I-B-29).

- The UG inactive waste site identification system lacks formal structure, roles, and responsibilities. UG staff indicated that no inactive waste site program had been developed to identify the potential releases of hazardous materials at UG experiments in Set-Aside areas (I-B-29).

- UG personnel have not received adequate CERCLA training to identify inactive waste sites as required (SREL-227).

The apparent causal factors for this finding are policy implementation, in that 40 CFR 300 requirements have not been implemented by UG; training, in that UG staff lack sufficient expertise to identify inactive waste sites issues; and the lack of understanding to appreciate the risk associated with inactive waste sites.

3.9 ENVIRONMENTAL MANAGEMENT

3.9.1 Overview

The purpose of the environmental management portion of the environmental audit was to evaluate the status and effectiveness of the SREL management as it related to ensuring environmental regulatory compliance and implementing DOE environmental protection policies and directives. The terms and conditions of the contract between UG and SR for the operation of SREL was used as the primary driver for the audit with respect to directing UG to comply with DOE Orders and Federal and state regulations. The specific performance objectives and criteria against which SREL environmental management was assessed included, in part, the Performance Objectives and Criteria for Conducting DOE Environmental Audits (DOE/EH-0229), and the Protocols for Conducting Environmental Management Assessments of DOE Organizations (DOE/EH-0326). In addition, the oversight performed by SR of SREL activities as it pertains to the environment was assessed with respect to the requirements for oversight of contractors as specified in DOE Orders. Table 3-9 lists the specific DOE Orders, guidelines, and site-specific requirements used in this audit to define the basis for functional relationships within and between DOE organizations and UG, and the management of environmental issues and programs within UG.

During the conduct of this portion of the environmental audit, SR and UG management and staff were interviewed, and SR and UG programs, plans, policies, procedures, and other related documentation were reviewed. In addition, all other environmental audit team members were consulted on environmental management and oversight issues pertaining to their respective functional disciplines.

The contract specifies that DOE will furnish Government-owned land, buildings, and equipment at SRS to UG so that they may perform the scope of work as set forth in the contract. The contract also specifies that the SR Contracting Officer will transmit Contractor Administration Notices (CANs) to UG that detail certain Federal, DOE-HQ, and SR Regulations and Directives that the Contracting Officer proposes for implementation by UG. The contract further requires UG to develop an implementation plan for CANs, and that it be submitted to SR. The contract also specifies that UG must comply with the Clean Air Act and the Clean Water Act.

SR transmits DOE Orders to UG pertaining to environmental protection programs under the CAN directive system. However, in some instances, SR did not transmit DOE Orders in a timely manner (SREL-210). In addition, UG did not develop implementation plans, nor did SR ensure that required implementation plans were developed. As a result, many of the DOE Orders have not been properly reviewed or implemented by UG (see Finding EM/CF-1).

UG signed a Memorandum of Agreement (MOA) with WSRC in 1990 for the provision of support services by WSRC. The MOA was revised in 1992. In the area of environmental management, the MOA specifies that UG is responsible for compliance with DOE Orders and Federal and state regulations, but UG may request that technical assistance be provided by WSRC. UG may also request that they be included in WSRC programs and plans. UG submitted a formal request to WSRC to be included in all environmental

Table 3-9
List of Environmental Management
Regulations, Requirements, and Guidelines

Regulations/ Requirements/ Guidelines	Sections/Title	Authority
DOE 5400.1	General Environmental Protection Program	DOE
DOE 5400.3	Hazardous and Radioactive Mixed Waste Program	DOE
DOE 5480.1B	Environment, Safety, and Health Program for Department of Energy Operations	DOE
DOE 5480.19	Conduct of Operation Requirements for DOE Facilities	DOE
DOE 5482.1B	Environment, Safety, and Health Appraisal Program	DOE
DOE 5700.6C	Quality Assurance	DOE
Contract No. DE-AC09-76SR00819	Contract Between SR and University of Georgia Research Foundation	SR
WSRC-RP-90-1001, Rev. 1	Memorandum of Agreement Between WSRC and SREL	WSRC

programs on August 10, 1993, just prior to the onsite portion of the environmental audit (SREL-097). Prior to the formal submission, UG assumed that they were automatically included in all WSRC environmental management programs, resulting in a failure to establish or determine the applicability of some environmental programs required by DOE Orders (see Finding EM/CF-1).

Within UG, the Assistant Director of SREL is responsible for environmental management, and the EH&S Program Manager is responsible for ensuring compliance with the environmental requirements of DOE Orders and Federal and state regulations (SREL-226; I-A-9). However, the Assistant Director has not reviewed the DOE Orders to determine their applicability to UG operations at SREL in the manner specified in the contract, nor was the EH&S Program Manager told that he was responsible for ensuring compliance with environmental requirements with the exception of waste management and toxic and chemical materials. The SR Assistant Manager for Environment, Safety, Health & Quality Programs assigned a Facility Representative who is responsible for ensuring that UG complies with all applicable DOE Orders and Federal and state regulations. However, SR did not ensure that UG was reviewing DOE Orders for applicability, or submitting implementation plans (I-A-5). Nor did SR review UG's compliance status as required (see Finding EM/CF-3).

Overall, UG has not addressed the need to develop many of the environmental protection programs required by DOE Orders, and Federal and state regulations. This is due, in part, to UG's lack of formality in assigning environmental responsibilities to appropriate staff, as well as a lack of awareness of contractual requirements for environmental responsibilities including the DOE Orders and Federal and state regulations. In addition, inadequate oversight by SR of SREL has contributed to many of the findings in this environmental audit.

The environmental management portion of the audit identified four compliance findings: the lack of a formal process for reviewing applicability of DOE Orders and regulations to SREL operations; individual accountabilities within UG do not include environmental responsibilities, and UG job descriptions are not consistent with responsibilities; a lack of SR oversight of SREL operations; and a lack of UG verification of support services provided by WSRC conducted under the provisions of the MOA.

AIIM

Association for Information and Image Management

1100 Wayne Avenue, Suite 1100
Silver Spring, Maryland 20910
301/587-8202

Centimeter

Inches

MANUFACTURED TO AIIM STANDARDS
BY APPLIED IMAGE, INC.

2 of 2

3.9.2 Compliance Findings

EM/CF-1: Formality of Environmental Program

Performance Objective: The contract for the operation of SREL requires that UG develop and submit an implementation plan for Federal, DOE, and SR regulations and/or directives transmitted to them via the Contractor Administrative Notice (CAN) directive system specified in SR 1321.1c.

DOE 5480.19, "Conduct of Operations Requirements for DOE Facilities," provides requirements and guidelines for the development of directives, plans, and procedures relating to the conduct of operations. This Order states that it is the policy of DOE that the conduct of operations at DOE facilities be managed with a consistent and auditable set of requirements, standards, and responsibilities. The policy statement also addresses the use of procedures to control conduct of operations, review of programs, and assessment of program effectiveness.

Protocols for Conducting Environmental Management Assessments of DOE Organizations (DOE/EH-0326), provides details of the required level of formality of environmental programs and supporting management systems that must be in place to assure compliance of day-to-day operations.

Finding: UG has not developed a formal program to evaluate environmental requirements transmitted by SR, and some of the environmental programs in place at SREL lack formality.

Discussion: The contract states that CANs will be transmitted to UG, and an implementation plan must be developed and submitted to the Contracting Officer. With respect to the formality of environmental programs required in the transmitted CANs, DOE 5480.19 requires that a formal process be used to develop environmental programs, and that the conduct of the programs be managed with a consistent and auditable set of requirements, standards, and responsibilities. However, UG has not developed or implemented a formal process to review the CANs sent by SR, has not developed and submitted implementation plans, and has not incorporated the requirements for conduct of operations in its existing programs and practices. Examples are provided below.

Currently, the UG Director receives CANs, signs the attached acceptance sheet, and sends the sheet back to SR to indicate that it has been received. The CANs are then sent to either the Assistant Director who reviews the CANs relating to environmental requirements, or the EH&S Program Manager who reviews those CANs relating to safety. If upon review either reader feels that the requirements stated in the CAN do not apply to SREL, they are disregarded (I-A-9 and I-A-10). If either reader believes the requirements in the CAN are applicable, steps are taken to comply. However, there are no formal procedures that UG uses to review the CANs for applicability to SREL operations in order to ensure that all possible implications are considered. Also, there are no procedures for the development of the required implementation plan (I-A-9 and I-A-11). This lack of formality of the CAN review process has contributed to the incorrect determination of applicability of regulatory requirements to SREL operations (see Findings IWS/CF-1, A/CF-1, and RAD/CF-1).

The environmental programs that do exist at SREL lack formality in their design and implementation. Examples of the lack of formality identified by the environmental audit team include the following:

- there is no formal inspection program for boundary postings for the Set-Aside areas (I-C-7);
- there is no formal Training Program Plan that considers environmental requirements (I-A-11);
- some procedures (used for research that may, in the future, be used in site environmental reports) are not signed, dated, and periodically reviewed (see Finding QA/BMPF-1).

The apparent causal factor for this finding is policy implementation in that UG has not instituted formality in practices and programs as required.

EM/CF-2: Roles, Responsibilities, and Accountabilities

Performance Objective: DOE 5480.19, "Conduct of Operations," states that contractors should establish personnel responsibilities, and that the personnel should clearly understand their authority, responsibility, and accountability. It also states that workers and supervisors should be held accountable for their performance, and that appraisals should be conducted to monitor their performance. Environmental goals should be used as a management tool for involving individuals, and these goals should be auditable, measurable, realistic, and challenging.

The contract requires the development of job descriptions for each employee job title, with the exception of faculty, and that a new description be furnished to the Contracting Officer whenever changes in a position are made.

Finding: UG personnel are not held accountable for their performance with respect to SR environmental goals. In addition, individual environmental responsibilities, as communicated by UG management, are not consistent with job descriptions.

Discussion: UG personnel at SREL are grouped into two areas defined by their function; the technical staff and the support staff. The technical staff include the faculty and the classifieds. The faculty are PhD-level researchers that manage and implement projects. The classifieds include scientific staff that possess MS or BS degrees and provide assistance to the faculty in their research. The support staff includes the environmental, health and safety (EH&S), administrative, and maintenance personnel.

Job descriptions are not developed for faculty, but are developed for classifieds and support staff. However, not all of the roles and responsibilities for environmental compliance at SREL were communicated to the appropriate support staff by management. For example, management did not communicate to the EH&S Program Manager that the responsibility for SREL's environmental compliance was included within his job description, nor was his job description shown to him at the time of his employment (I-A-10) (SREL-221). In addition, the job description for a Program Coordinator did not reflect the current duties assigned to the position (SREL-221). The lack of accurate job descriptions with respect to environmental responsibilities has contributed to UG's failure to address some of the environmental requirements of DOE policies and regulations.

Performance appraisals for the faculty are conducted by the laboratory Director (I-A-11). The directors of the various research divisions at SREL conduct the performance appraisals for the classifieds and administrative staff. The support staff performance appraisals are conducted by the Assistant Director and line management supervisors. However, there is no formal performance appraisal review process for either the technical or support staff, which would include accountability for an individual's performance towards meeting SR environmental goals (I-A-11).

The apparent causal factor for this finding is policy implementation in that UG did not formally assign or communicate environmental roles and responsibilities to appropriate staff at SREL as required by DOE 5480.19.

EM/CF-3: SR Oversight of SREL

Performance Objective: DOE 5400.1, "General Environmental Protection Programs," states that the Head of the Field Organization shall "Ensure that all operations under their authority comply with applicable environmental protection laws and regulations, and directives." It also requires that the Head of the Field Organization "Ensure that all required environmental permits are secured from the appropriate regulatory agency in a timely fashion." Environmental protection programs and plans must be developed by the Field Organization which must, in turn, require contractor implementation of these programs and plans.

DOE 5480.19, "Conduct of Operations," requires that Heads of Field Elements ensure that adequate contractor plans, procedures, and programs are in place, and assess the effectiveness of their implementation at sites under their jurisdiction. It also requires that a DOE Facility Representative be assigned the responsibility of overseeing the day-to-day conduct of operations of a facility to ensure accordance with the requirements of the Order.

The contract for the operation of SREL requires UG to develop and submit an implementation plan to SR that addresses the requirements of Federal, DOE, and SR Regulations and/or Directives transmitted to UG via Contractor Administration Notices (CANs).

Finding: SR has not provided adequate oversight of UG to ensure compliance with DOE Orders and Federal and state regulations.

Discussion: SR developed and implemented a Directive Implementation Instruction (DII) Program, and a Facility Representative Program to meet the requirements of DOE 5400.1 and 5480.19. The programs are designed to direct contractors to execute environmental protection compliance programs and policies, and provide for oversight, confirmation, and independent verification of those contractor programs. However, SR did not implement portions of the DII Program which are intended to ensure that contractors address Federal, DOE, and SR Regulations and/or Directives, nor did SR provide adequate oversight to ensure UG's compliance with environmental requirements.

The DII Program establishes a mechanism by which contractors are issued and instructed to comply with Federal, DOE, and SR Regulations and/or Directives, and includes a process to verify that transmittals were received. UG receives the transmitted SR Regulations and/or Directives, and signs and returns the acceptance sheet to SR. However, SR has not ensured that UG develops implementation plans to meet the requirements of the SR Regulations and/or Directives as required by the contract (I-A-5).

DOE 5400.1 requires the Field Element to develop an Environmental Monitoring Plan, and to instruct the contractor to implement the plans. SR delegated the responsibility for development of the program plans to WSRC for the entire SRS. However, SREL was not

included in the Environmental Monitoring Plan, which was not identified by SR. Additional examples for lack of SR oversight include the following:

- SR did not identify until recently that SREL was mistakenly omitted from the National Emission Standards for Hazardous Air Pollutants (NESHAPs) report (see Finding RAD/CF-1).

- SR did not ensure that a permit application was submitted for a diesel generator that was installed in 1985 (I-A-9) (see Air Overview).

- UG has not fully implemented the sitewide Pollution Prevention Awareness Program Plan and SR has not audited UG's implementation of the Pollution Prevention Awareness Program Plan (I-D-16).

- SR has not provided guidance or performed formal oversight of UG's operations with respect to identifying inactive waste sites (I-B-1).

The apparent causal factor for this finding is policy implementation in that SR did not implement requirements of DOE Orders. A secondary contributing factor is a lack of periodic SR audits/appraisals/reviews with respect to reviewing compliance with environmental requirements.

EM/CF-4: UG Verification of Quality of Support Services Provided by WSRC

Performance Objective: DOE 5700.6C, "Quality Assurance," Criterion 7 i., states "The quality of purchased items and services should be verified at intervals to a degree consistent with the item's or service's complexity, risk, quantity, and frequency of procurement."

Finding: UG does not verify the quality of support services provided by WSRC, which are used for compliance with DOE Orders and Federal and state regulations.

Discussion: The contract requires UG to implement Contractor Administration Notices (CANs) transmitted by the DOE Contracting Officers. CANs were sent to UG requiring implementation of DOE Orders pertaining to environmental matters. To partially address the need to comply with DOE environmental requirements, UG entered into a Memorandum of Agreement (MOA) with WSRC in 1990 for the provision of support services, which was renewed in October 1992 (SREL-005). UG is using WSRC support services to implement program elements used for regulatory requirements; however, UG is not verifying the quality of the support services that WSRC is providing. UG and SR management contend that the MOA does not explicitly discuss UG's authority for ensuring the quality of services provided by WSRC, or UG's recourse for services provided by WSRC that may place UG at variance with requirements. In addition, SR provides broad oversight of WSRC activities including those that support SREL. However, that oversight does not absolve UG from their responsibility under the contract, or from their responsibility to verify quality of services as required by DOE 5700.6C. The failure to do so has led to a number of deficiencies identified in this report. For example, WSRC manages SREL waste under the terms of the MOA. UG does not audit WSRC waste management operations, nor are they provided assurance that the waste was managed in accordance with regulatory requirements (see Finding WM/CF-1).

In addition to the above deficiencies, Attachment 2 of the MOA inaccurately lists or is missing certain facilities, including domestic and process wells (I-D-4 and I-D-6), and the Aquatic Ecology Laboratory (SREL-005).

The apparent causal factor for this finding is policy implementation in that UG is not performing oversight of vendor services as required in DOE 5700.6C.

This page intentionally left blank.

APPENDICES

This page intentionally left blank.

APPENDIX A

BIOGRAPHICAL SKETCHES OF THE ENVIRONMENTAL AUDIT TEAM

This page intentionally left blank.

APPENDIX A:

BIOGRAPHICAL SKETCHES OF THE ENVIRONMENTAL AUDIT TEAM

NAME: Atam P. (Al) Sikri, Ph.D., P.E.

AREA OF RESP: Team Leader

ASSOCIATION: U.S. Department of Energy

EXPERIENCE: 26 Years

- U.S. Department of Energy, Office of Environmental Audit, Washington, DC
  - Team Leader, Office of Environmental Audit. Provides guidance, direction, and assistance to a multi-disciplined group of professionals performing Environmental Audits and Assessments at DOE facilities. Team Leader for Environmental Audits of the Uranium Mill Tailings Remedial Action Project, Laboratory for Energy-Related Health Research, and West Valley Demonstration Project. Environmental Subteam Leader for Tiger Team Assessments of the Ames Laboratory, Naval Petroleum and Oil Shale Reserves, Stanford Linear Accelerator Center, and the Sandia National Laboratories. Also, served as a member of the Progress Assessment Team for the Savannah River Site.
  - Assessment and Validation Engineer, Office of Program/Project Management and Control. Provided independent appraisal of projects involving design/construction, environmental aspects, planning/scheduling, and cost estimating. Also, NEPA Compliance Officer for the Office of Procurement.
  - Program Manager/Assistant Director, Office of Fossil Energy. Responsible for directing and managing synthetic fuel research, development, and demonstration of technologies. Processes developed in full compliance with environmental regulations.
  - General Engineer, Office of Defense Programs. Worked with uranium enrichment technology, project management, and classification determination capability.
- Other Experience
  - Petroleum Engineer, U.S. Corps of Engineers. Work involved process design, project engineering, and cost studies.
  - Senior Process Design/Development Engineer. Worked with DuPont Company, Cities Service Company (now part of Occidental Petroleum Corporation), Johnson & Johnson, and Hoffmann-LaRoche, Incorporated.

EDUCATION:
Ph.D., Chemical Engineering, University of Pennsylvania
M.S.E., Chemical Engineering, University of Michigan
B.S.E., Metallurgical Engineering, University of Michigan
B.S.E., Chemical Engineering, University of Michigan

OTHER: Registered Professional Engineer

NAME: Leroy H. Banicki

AREA OF RESP: Deputy Team Leader and Soil, Sediments, and Biota

ASSOCIATION: U.S. Department of Energy

EXPERIENCE: 17 Years

- U.S. Department of Energy, Office of Environmental Audit, Washington, DC
  - — Environmental Protection Specialist responsible for providing guidance, direction, and assistance to a multidisciplined group of professionals performing Tiger Team Assessments, Management Assessments, and Environmental Audits at DOE facilities.
- Headquarters, Air National Guard, Andrews A.F.B., MD
  - — Project Officer for Installation Restoration Program activities at Air Guard bases nationwide.
- White Sands Missile Range, NM
  - — Deputy Director, Environmental and Natural Resources Office, with responsibility for hazardous waste management, asbestos abatement, spill control and countermeasure, and environmental training programs.
- U.S. Department of the Army, Fort Carson, CO
  - — Environmentalist, responsible for hazardous waste management, asbestos abatement, and cultural and natural resources programs.
- U.S. Army Corps of Engineers, Jacksonville, FL
  - — Biological Scientist, responsible for Environmental Assessment/Environmental Impact Statement preparation and Endangered Species programs.
- U.S. Department of Agriculture, Soil Conservation Service, Prosser, WA
  - — Soil Conservationist.
- Menominee Indian Nation, Neopit, WI
  - — Forest Inventory Specialist.
- University of Texas and El Paso Community College, El Paso, TX

  Biology Instructor.

EDUCATION: M.S., Biology, University of Texas at El Paso
B.S., Wildlife Management, McNeese State University

NAME: Donald Neal

AREA OF RESP: Team Coordinator

ASSOCIATION: Arthur D. Little, Inc.

EXPERIENCE: 10 Years

- Arthur D. Little, Inc., Cambridge, MA

  — Senior Consultant. Waste management specialist for the DOE Progress Assessments of Lawrence Livermore National Labcratory, Savannah River Site, Rocky Flats Plant, and the Tiger Team Assessments of the Oak Ridge K-25 Site, Ames Laboratory, the Naval Petroleum and Oil Shale Reserve, and the National Institute for Petroleum and Energy Research. Management specialist for the Environmental Management Assessment of the Waste Isolation Pilot Plan.

  — Provides technical guidance to commercial clients on hazardous waste management.

- CSI Resource Systems Inc., Boston, MA

  — Senior Associate. Managed environmental permitting of waste management facilities. Prepared solid and hazardous waste management plans for industry and municipalities and evaluated waste management facility compliance with environmental permits and regulations.

  — Investigated methods for and results of air pollution monitoring, air emissions control, and source testing.

- ENSR Consulting and Engineering, Concord, MA

  — Project Manager. Managed environmental assessments and permitting of industrial facilities.

- GCA/Technology Division, Bedford, MA

  — Project Manager for quality assurance of 1985 National Acid Precipitation Assessment Program (NAPAP) emissions inventory.

  — Designed and implemented Continuous Emissions Monitoring System for air emission sources.

EDUCATION: M.S., Biology, University of Massachusetts
B.S., Biology, University of Massachusetts

OTHER: Member: National Solid Waste Management Association, Society of Wetland Scientist, and Milton Conservation Commission

NAME: Lynne Day

AREA OF RESP: Administrative Support

ASSOCIATION: META, Inc.

EXPERIENCE: 16 Years

- META, Inc., Arlington, VA

  — Information Management Specialist. Provides administrative support for Environmental Audits; Environmental Management Assessments; Environment, Safety and Health (ES&H) Progress Assessments; and the Environmental Subteam on Tiger Team Assessments at DOE sites.

  — Participant in the Environmental Audits of the Component Development and Integration Facility, Environmental Measurements Laboratory, Alaska Power Administration, and the Coal-Fired Flow Facility; Environmental Management Assessments of the Uranium Mill Tailings Remedial Action Project, the Continuous Electron Beam Accelerator Facility, and the Fernald Environmental Management Project; ES&H Progress Assessments of the Fernald Environmental Management Project, Hanford Site, Brookhaven National Laboratories, Morgantown Energy Technology Center, and Idaho National Engineering Laboratory; and Tiger Team Assessments of the Solar Energy and Research Institute, Los Alamos National Laboratories, Strategic Petroleum Reserves, and Naval Petroleum Oil Shale Reserves.

  — Provided administrative support for production of the Environment, Safety and Health Progress Assessment Manual and attended Progress Assessment Training Program.

  — Assisted in the production of the Administrative Support Procedures and Guidance for the Office of Environmental Audit.

- INNOVA Communications, Inc., Arlington, VA

  — Office Administrator. Provided system, office automation, project management, data base management, graphic, and documentation support for a local and wide area network integration firm.

- Sandler & Greenblum, Arlington, VA

  — Word Processing Departmental Manager. Developed and coordinated activities related to the word processing department for law firm. Responsible for supervision and staffing of word processing department and hardware and software procurement and installations.

EDUCATION: A.A., Computer Science, Strayer College

NAME: Richard B. Lynch

AREA OF RESP: Technical Editor

ASSOCIATION: META,Inc.

EXPERIENCE: 5 Years

- META, Inc., Arlington, VA

  — Technical Editor. Provided technical writing and editing support for DOE on 13 Tiger Team Assessments, 9 ES&H Progress Assessments, 2 Environmental Audits, and 2 Environmental Management Assessments. Also, oversees the preparation of the final camera-ready copy of assessment and audit reports.

  — Writer/Editor. Provided technical writing and editing support to DOE's Office of New Production Reactors (NP), including writing NP's Correspondence Manual and a variety of technical articles for publication.

- Advanced Sciences, Inc., Arlington, VA

  — Writer/Editor. Researched, wrote, and edited fact sheets and information briefs on energy conservation and renewable energy topics for a DOE-funded energy information service.

  — Response Analyst/Media Liaison. Analyzed and researched inquiries on energy topics from the general public, U.S. Congress, and trade associations. Also, wrote information briefs, monthly news releases, and conducted media outreach activities.

EDUCATION: B.A., General Studies, Louisiana State University

NAME: Christopher B. Martel, CHP

AREA OF RESP: Air, Radiation, and Environmental Management

ASSOCIATION: Arthur D. Little, Inc.

EXPERIENCE: 10 Years

- Arthur D. Little, Inc., Cambridge, MA

  — Senior Consultant. Participated in Tiger Team Assessments of the Energy Technology Engineering Center, Stanford Linear Accelerator Center, National Institute for Petroleum and Energy Research, the Idaho National Engineering Laboratory, K-25 Site at Oak Ridge National Laboratory, and the Ames Laboratory. Also, participated in the baseline audit for the Fernald Environmental Management Project, and the Progress Assessment of the Savannah River Site.

  — Chairman of the Corporate Radiation Safety Committee for Arthur D. Little, Inc., providing guidance to the company's Radiation Safety Officer regarding all aspects of the Type A Broad Scope License issued by the Nuclear Regulatory Commission.

  — Project manager for radiological hazard assessments conducted for clients in the mining and biotechnology industries, and research and development laboratories. Assessments included conducting extensive surveys, material sampling, and air sampling; estimating worker internal and external doses; and providing detailed guidance on administrative and engineering controls in the workplace.

  — Performed several quantitative risk assessments for the transport of low-level and high-level radioactive waste shipments, and large quantity shipments of radioactive materials.

  — Performed remedial investigations to quantify environmental levels of a variety of radionuclides on several sites that included research reactors, accelerators, depleted uranium working facilities, and research laboratories.

  — Conducted radiological health and safety audits at oil and gas operations, hospitals, biotechnology laboratories, chemical plants, research and development laboratories, and government institutions.

EDUCATION: M.S., Health Physics, University of Lowell
B.S., Environmental Sciences, University of Lowell

OTHER: Certified in the Comprehensive Practice of Health Physics by the American Board of Health Physics
Certified Hazardous Waste Site Supervisor
Member of the National and New England Chapter of the Health Physics Society

NAME: James Jason Rea

AREA OF RESP: Groundwater, Surface Water, and Inactive Waste Sites

ASSOCIATION: Arthur D. Little, Inc.

EXPERIENCE: 10 Years

- Arthur D. Little, Inc., Cambridge, MA

  — Participated in the Environmental Management Assessment of the Fernald Environmental Management Project as the groundwater, soil, sediment, and biota support specialist. Participated in the Tiger Team Assessments of the Naval Petroleum and Oil Shale Reserves, K-25 Site at the Oak Ridge National Laboratory, Los Alamos National Laboratory, and Solar Energy Research Institute as the lead groundwater/soil, sediment, and biota specialist on the Environmental Subteam. Additionally, participated in the Tiger Team Assessment of the Strategic Petroleum Reserve as a surface water/drinking water specialist and for the SERI Tiger Team Assessment as the inactive waste sites specialist.

- Briggs Associates, Inc., Rockland, MA

  — Environmental Scientist with responsibilities of project manager. Conducted land transfer site assessments; emergency response spill/site assessments; remedial investigation/remedial design; regulatory agency interfacing; compliance management of RCRA, CERCLA, SARA, TSCA, and NPDES permitting; underground storage tank program management; surface and subsurface contaminant investigations; hydraulic contaminant flow modeling conditions; and surveying and field mapping.

- Chem-Nuclear Systems, Inc., Albuquerque, NM

  — Lead Health Physics Technician to support the U.S. Department of Energy's UMTRA Projects. Responsible for radiological engineering assessments; personnel and environmental dosimetry; decontamination and decommission health physics support; site and vicinity property excavation control support; and conducted various radionuclide laboratory analyses (e.g., operated opposed crystal system gamma spectroscopy equipment and analyzed radon gas monitoring reports).

- Benson, Motin and Greer Drilling Company, Farmington, NM

  — Drilling Fluid Engineer. Responsibilities included the design and maintenance of the drilling fluid programs for secondary recovery oil wells and natural gas injection wells.

EDUCATION: Graduate Studies, Hydrogeology and Environmental Studies
University of Montana
B.S., Conservation Science, Fort Lewis College

OTHER: Member of the American Chemical Society and Plenary Membership in the Health Physics Society

NAME: Clifford H. Summers

AREA OF RESP: Drinking Water, Waste Management, and Toxic and Chemical Materials

ASSOCIATION: Arthur D. Little, Inc.

EXPERIENCE: 32 Years

- Arthur D. Little, Inc., Cambridge, MA

  — Served as surface water/drinking water specialist for the Environmental Audits of the West Valley Demonstration Project and Fernald Environmental Management Project; surface water/drinking water specialist for the Tiger Team Assessments of Ames Laboratory, National Petroleum and Oil Shale Reserves, and National Institute for Petroleum and Energy Research; and waste management specialist for the Los Alamos National Laboratory Tiger Team Assessment.

  — Served as resident environmental coordinator on Johnston Island from September 1989 to June 1991 for the Office of Program Manager for Chemical Demilitarization. Resident environmental engineer on Johnston Island from October 1989 to July 1990 for U.S. Army Chemical Activity, Western Command. Oversaw environmental compliance activity of GOCO's five environmental engineers and five plant operations staff. Conducted inspections and audits for environmental compliance. Served on QA teams evaluating operational readiness and preoperational surveys.

  — Performed environmental audits of USAF bases as part of the ECAMP program and environmental audits of U.S. Army Corps of Engineers facilities in Virginia.

  — Performed environmental audits of petroleum refineries, petrochemical plants, manufacturing plants, and aerospace manufacturing facilities to determine compliance with regard to the Clean Water Act.

  — Trained client auditors in compliance auditing; led trainees through audits of client facilities.

EDUCATION: Graduate Studies at Louisiana State University and Northeastern University
A.B., Chemistry, Florida State University

NAME: Joseph Swiniarski

AREA OF RESP: Quality Assurance and Toxic and Chemical Materials

ASSOCIATION: Arthur D. Little, Inc.

EXPERIENCE: 32 Years

- Arthur D. Little, Inc., Cambridge, MA

  — Participated in the Tiger Team Assessments of the Idaho National Engineering Laboratory, Energy Technology Engineering Center, and Naval Petroleum Oil Shale Reserves as the quality assurance specialist. Also participated in Tiger Team preassessments of the Laramie Energy Technology Center and Oak Ridge Gaseous Diffusion Plant.

  — Evaluated quality assurance capabilities and good laboratory practices compliance for testing laboratories of a major U.S. cosmetics company.

  — Consultant and experimental preclinical therapeutic and toxicologic scientist (1963-present) with broad experience in laboratory management, radiation biology, and quality assurance monitoring within Arthur D. Little, Inc. Life Science Section. Responsibilities included managing contract work for the U.S. National Cancer Institute and the U.S. Army.

  — Managed Arthur D. Little, Inc. veterinary laboratories (1984-1989). Responsibilities included assurance of compliance with U.S. National Institutes of Health guidelines, U.S. Department of Agriculture regulations, U.S. Food and Drug Administration regulations, U.S. Environmental Protection Agency regulations, U.S. Nuclear Regulatory Commission regulations, Commonwealth of Massachusetts Department of Public Health regulations, and U.S. National Toxicology Program requirements for barrier toxicology testing facilities.

EDUCATION: M.A., Physiology, Minor, Biology, Boston University
B.S., Biology, Minor Chemistry, Northeastern University

OTHER: Member: American Association for Cancer Research, New York Academy of Sciences, American Association of Advancement of Sciences, American Association for Advancement of Laboratory Animal Sciences, and Laboratory Animal Management Association

This page intentionally left blank.

APPENDIX B

ENVIRONMENTAL AUDIT PLAN

This page intentionally left blank.

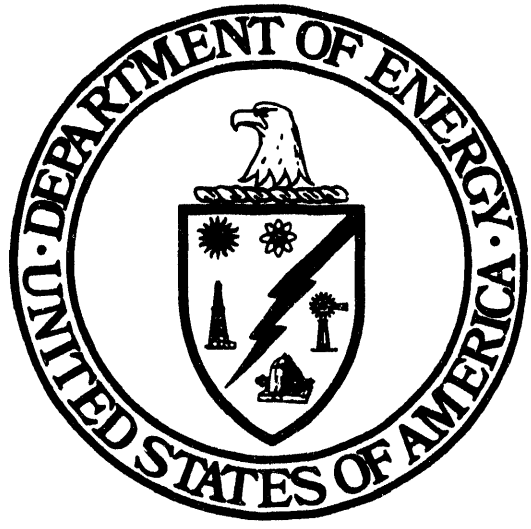
Plan for the

DOE Environmental Audit

of the

Savannah River Ecology Laboratory

Aiken County, South Carolina



U.S. Department of Energy

Office of Environmental Audit

September 1993

TABLE OF CONTENTS

PLAN FOR THE DOE ENVIRONMENTAL AUDIT OF THE SAVANNAH RIVER ECOLOGY LABORATORY (SREL)

1.0 INTRODUCTION

The Office of Environmental Audit (EH-24) within the Office of Environment, Safety and Health (EH) performs independent audits and assessments as part of DOE's Environmental Audit Program. The Environmental Audit Program, created in 1985, provides a continuing program of internal, independent oversight of line management's environmental performance to support DOE's broader goal of achieving full compliance and excellence in the environmental area. The Program's objectives include:

- Performing comprehensive, baseline environmental audits at facilities not subjected to Tiger Team Assessments;
- Performing audits of line program environmental management functions, including adequacy of self-assessment programs;
- Continuing technical reaudits of DOE facilities;
- Conducting special issue audits of high priority environmental issues at specific sites or across site and program lines; and
- Providing and updating audit protocols, training, and other mechanisms of transferring the special auditing expertise of EH-24 to the field in support of line management self-assessment programs.

An environmental baseline audit of the Savannah River Ecology Laboratory (SREL) will be performed from September 13 to September 23, 1993. The purpose of the environmental audit is to provide the Secretary with information on the current environmental regulatory compliance status and associated vulnerabilities, root causes for noncompliance, adequacy of environmental management programs, and response actions to address the identified problem areas. The "DOE Environmental Audit Program Guidance" (January 1992) and "Performance Objectives and Criteria for Conducting DOE Environmental Audits" (DOE/EH-0229, February 1992) will be used to perform this audit.

The scope of the SREL Comprehensive Baseline Environmental Audit includes all environmental media, DOE Orders, and Federal, state, and local regulations, requirements, and best management practices. The environmental disciplines to be addressed in this audit include air, surface water/drinking water quality, groundwater and soil/sediment/biota, waste management, toxic and chemical materials, inactive waste sites, environmental radiation protection, environmental quality assurance, and environmental management functions.

2.0 ENVIRONMENTAL AUDIT IMPLEMENTATION

The environmental audit of SREL will be conducted by a Team managed by a Team Leader and a Deputy Team Leader from the DOE's Office of Environmental Audit (EH-24) and technical specialists from Arthur D. Little, Inc. (ADL). Administrative and technical editing support will be provided by Maria Elena Torano Associates, Inc. (META). The names and responsibilities of the Team are listed below:

Al Sikri	DOE	Team Leader
Lee Banicki	DOE	Deputy Team Leader, Soils/Sediments/Biota
Don Neal	ADL	Technical Coordinator
Chris Martel	ADL	Air, Radiation, Environmental Management
James Rea	ADL	Surface Water, Groundwater, Inactive Waste Sites
Clifford Summers	ADL	Waste Management, Drinking Water, Toxic and Chemical Materials
Joseph Swiniarski	ADL	Environmental Quality Assurance, Toxic and Chemical Materials
Lynne Day	META	Administrator
Richard Lynch	META	Technical Editor

2.1 PRE-AUDIT ACTIVITIES

Pre-audit activities for the SREL Environmental Audit included the issuance of an introduction and information request memorandum, a pre-audit site visit, and initial review of documentation which was sent to the Environmental Team by SREL as a result of the information request memorandum.

A pre-audit site visit was conducted July 13-15, 1993 by the Team Leader, Deputy Team Leader, Technical Coordinator, and Administrator. The purpose of the pre-audit visit was to become familiar with the site, to review information being supplied and request additional information, and to coordinate plans for the upcoming audit with DOE and contractor personnel.

This Environmental Audit Plan is based upon the information received by the Environmental Team as of August 31, 1993.

2.2 ONSITE ACTIVITIES AND REPORTS

The onsite activities for the environmental audit will take place from September 13 through 23, 1993. Onsite activities will include field inspections, file/record reviews, and interviews with site personnel, including the DOE Savannah River Operations Office, the SREL contractor (University of Georgia), and the Savannah River Site (SRS) contractor (Westinghouse Savannah River Corporation). The preliminary schedule for the audit is shown in the attached agenda. The agenda will be modified as needed during the early part of the onsite audit. Any and all modifications to the agenda will be coordinated with the principle contacts from SREL and DOE. SREL is requested to identify, as soon as possible, any facility activities such as sampling, spill response, or inspections that may

occur during the audit so that team members may observe the operations. The overall and detailed schedules for onsite activities are shown in Attachment A.

A daily debriefing will be held each afternoon at 4:30 p.m. at which time team specialists will describe their activities and identify issues that may develop into findings. The debriefing also provides an opportunity to clarify any issues that may have developed, either through immediate feedback from the site, or by identifying sources of information (interviews or documents) that were previously not known to the Audit Team.

A closeout briefing will be conducted at the conclusion of the onsite activities on September 23, 1993, at which time findings and strengths identified by the environmental audit will be presented. A draft report containing the results of the audit will be provided to SREL, the Savannah River Operations Office, and the Office of the Assistant Secretary for Defense Programs for their review and comment.

2.3 POST-SITE ACTIVITIES

Following the onsite activities, SREL will have the opportunity to submit final comments on the draft audit report. After reviewing these comments, EH-24 will issue a final report. SREL will be responsible for preparing a corrective action plan that will be reviewed by EH-24. The following is a tentative schedule for completion of these post-site activities.

October 8, 1993	Site comments on draft audit report due
October 25, 1993	Final audit report issued by EH-24
November 8, 1993	Draft corrective action plan due (six weeks after closeout)
November 23, 1993	EH-24 comments on draft action plan
To Be Determined	Final action plan due

3.0 AIR

3.1 ISSUE IDENTIFICATION

The air portion of the Environmental Audit will assess SREL's determination of applicability of DOE Orders, and Federal and state regulations to air emission sources at SREL, and their compliance status with such regulations. The ability of SREL to be in compliance with the Orders and regulations hinges on the effectiveness of the Memorandum of Agreement (MOA) that has been established between Westinghouse Savannah River Company (WSRC) and SREL for the provision of support services in this environmental area. The primary issue with respect to air is SREL's cognizance of DOE Orders, and Federal and state regulations, which is necessary for SREL to determine when it is appropriate to request the support services of WSRC.

The infrastructure that SREL has developed to manage the air program will be reviewed. This review will emphasize:

- The training of the individual in charge of the air program;
- The determination of the need to conduct modeling to ascertain the potential impacts to both onsite and offsite environs;
- The mechanisms that are in place to ensure that air regulations are tracked for potential applicability, ensure that the addition or modification of existing sources is communicated and evaluated for regulatory applicability and included in the SRS air emissions inventory, and ensure that reporting requirements and information requests are handled appropriately;
- The quality assurance performed by SREL to ensure that services provided by WSRC accurately reflect the needs and conditions of SREL; and,
- The program in place to ensure that air emission sources and air pollution control devices are operating and are being maintained appropriately.

The status of compliance with the requirements of 40 CFR 61, "National Emission Standards for Hazardous Air Pollutants," Subpart H, will be reviewed. This review will involve examining documents generated during the evaluation of potential radionuclide emissions at SREL, and the submission of information required for the Annual NESHAP Report to the EPA. The required NESHAP Quality Assurance (QA) Program will also be reviewed.

The conduct of the air-related portion of the Environmental Audit will involve interviews with SREL, WSRC, and SR personnel. The audit will also include reviewing documentation generated to satisfy reporting requirements of the DOE Orders, and Federal and state regulations as well as those documents generated to support determinations of regulatory applicability. Physical inspections of facilities and locations where air emission sources will be conducted, including emergency electrical generators and laboratory exhaust hoods.

3.2 RECORDS REQUIRED

Documents and records that will be reviewed during the audit include:

- Source emission inventory;
- Individual source emission evaluations including regulatory applicability;
- Description of the air program submitted for the Environmental Monitoring Plan;
- Operating and testing/maintenance procedures for air pollution control equipment;
- Emergency response procedures for atmospheric releases;
- Correspondence with regulatory agencies on air issues;
- NESHAP submissions for 1990, 1991, and 1992;
- Annual Site Environmental Report submissions of the air program at SREL for 1990, 1991 and 1992; and
- NESHAP QA Program Plan.

4.0 SURFACE WATER/DRINKING WATER

4.1 ISSUE IDENTIFICATION

The surface water/drinking water portion of the Environmental Audit will evaluate the programmatic and technical status of surface water protection and monitoring as they are related to applicable regulations, DOE Orders, and best management practices (BMPs). Included in the review will be the rules and regulations of the South Carolina Department of Health and Environmental Control, and Aiken County Ordinances. Additionally, the audit will evaluate compliance with DOE Orders and Secretary of Energy Notices (SEN), and water pollution control operations accepted by Industry for Best Management Practices.

The scope of Surface Water/Drinking Water Assessment will include document reviews, interviews with DOE, SREL, SRS, and WSRC personnel. Inspections of SREL Buildings and properties will be conducted to determine facility compliance with surface water/drinking water requirements, including wastewater sampling and storm water runoff. Specific issues to be addressed include:

- Effectiveness of the SREL/WSRC MOA;
- Completeness and implementation of the Spill Prevention Control and Countermeasure Plan (SPCC), including secondary containment, spill reporting procedures, tank integrity testing, and personnel training records;
- Stormwater management;
- Management systems and compliance status pertaining to the NPDES outfall at the aquatic ecology laboratory;
- Mechanisms to control and characterize/monitor wastewater discharges such that pretreatment requirements are met; and
- Management of drinking water systems including the treatment of water to render it potable, the use, inspection and maintenance of backflow prevention devices, and the program to eliminate cross-connections as potential sources of contamination.

4.2 RECORDS REQUIRED

Specific documents and files to be examined as part of the review process include, but are not limited to the following:

- Piping and instrument diagrams (PIDs) for the potable water, septic wastewater, and stormwater systems;
- Inspection records, permit applications, pretreatment limits, and/or operator Certificates for NPDES, SPCC, and backflow preventors;
- Correspondence with state, or local regulatory agencies regarding potable water, wastewater, or stormwater issues;

- Internal correspondence between SREL and WSRC concerning potable water, wastewater, or stormwater, including sample collection;
- Well water testing and treatment program documents, including operators certification;
- NPDES compliance program plans and procedures;
- Backflow prevention program and evidence of implementation;
- Cross-connection identification and elimination program; and
- Potential impacts on wetlands areas from contaminated seeps.

5.0 GROUNDWATER/SOIL/SEDIMENT/BIOTA

5.1 ISSUE IDENTIFICATION

The purpose of the groundwater/soil/sediment/biota portion of the assessment is to evaluate programmatic and technical status of groundwater protection and monitoring programs. The programs will be evaluated with respect to applicable requirements contained in DOE Orders, Federal and state regulations, and industry and best management practices.

Groundwater

Key issues regarding groundwater at SREL relate to the preparation and execution of groundwater protection and monitoring plans. Review of site operations and site conditions will be used to determine if the present plans and programs are in compliance with DOE Orders, and Federal and state regulations.

Based on review of available SREL documents, the following preliminary areas of concern or issues have been identified for followup during the onsite portion of the audit:

- Degree of SREL or SRS understanding of the hydrogeologic regime on the property;
- Construction and potential for contamination of Par Pond drinking water well;
- Development and implementation of a comprehensive groundwater monitoring program, including representation in sitewide plans and programs addressing groundwater; and
- Potential for site impact on groundwater due to the presence of numerous above and below ground petroleum and chemical storage tanks, as well as the historic use of petroleum and chemical compounds, particularly in A Area and at Par Pond Laboratory.

Soil/Sediment/Biota

The Soil, Sediment, and Biota (SSB) portion of the SREL Comprehensive Baseline Environmental Audit will focus on the evaluation of existing reports, plans, and procedures in place to ensure compliance with Federal, state, and local regulations, and DOE guidelines and operating procedures. The approach will also include inspections of the facility to examine field implementation of the various activities. Because of the interrelation with other technical areas, close liaison will be maintained with the groundwater, surface water, radiation, and environmental management specialists.

Specific issues that will be investigated further include, but are not limited to:

- Research project impact on biota (including endangered and threatened species);

- Handling of hazardous chemicals during life of research project;
- Impact of research projects on biota in research areas by direct exposure to or consumption of contaminated surface water, uptake of contaminated groundwater and ingestion of contaminated plant, mammal, fish and benthic organisms;
- Soil contamination in research areas;
- Onsite soil disposal resulting from site activities such as, well drilling, excavation and construction; and
- Lake sediment sampling data for the Par Pond area to determine potential accumulation of radiologic and nonradiologic contaminants from surface runoff and groundwater discharge.

5.2 RECORDS REQUIRED

The following documents will be reviewed to evaluate the status of the groundwater and soil/sediment/biota programs:

- Groundwater Protection Program Management Plan;
- Environmental Protection Program Implementation Plan;
- Environmental Monitoring Plans (past and present);
- Annual Site Environmental Reports;
- Site specific reports of groundwater investigations, monitoring programs or remedial actions;
- Data and maps which contain information on subsurface geology, hydrology and potential or known areas of contamination;
- Field operations plans and work plans for conducting past or present groundwater investigations;
- Environmental Protection Implementation Plan;
- Waste Minimization Plan;
- Any site-specific reports of surface or subsurface soils or groundwater investigations;
- Sediment sampling data and recordkeeping documents;
- Field Operations Plans (with supporting SOP's) for conducting soils investigations;

- Federal, state, and local correspondence regarding SSB issues;
- Environmental Evaluation Checklists (EEC) (give blank copies to all specialists);
- Project Safety Appraisal forms;
- All onsite and offsite soil monitoring and sampling data, including analyses for organic contaminants and onsite excavation activities;
- Environmental Compliance Manual;
- Site map locating all soil and biota sampling points;
- Information characterizing the lateral and vertical extent of soil contamination onsite;
- SOPs for the collection of sediment and biota samples;
- Environmental training records;
- Section 7 (of the Endangered Species Act) consultation records;
- Section 404 (of the Clean Water Act) records;
- Any documents identifying onsite disposal of excavated soils; and
- List of all Federal and State of South Carolina Endangered and Threatened species.

6.0 WASTE MANAGEMENT

6.1 ISSUE IDENTIFICATION

The waste management portion of the Environmental Audit will address the generation and management of solid, hazardous, mixed and radioactive wastes by SREL, including characterization, accumulation, labeling, documentation, and transfer to the WSRC for subsequent treatment, storage, or disposal. Compliance with applicable DOE Orders; Federal, state, and local regulations; and good management practices will be evaluated.

The audit will include interviews with SR and SREL personnel who have responsibilities concerned with the generation and management of wastes at SREL, and WSRC personnel who accept these wastes, inspection of records relevant to the management of such wastes and the training of involved personnel, and inspections of waste generation points.

Specific issues to be addressed include:

- Appropriateness of sharing EPA Generator Identification Number with WSRC;
- Comprehensiveness of service provided by WSRC to SREL under the MOA and oversight of WSRC by SREL and/or SR;
- Waste characterization and segregation of mixed, hazardous, and nonhazardous waste;
- Management of Satellite Accumulation Areas;
- Management of infectious waste;
- Implementation of the waste minimization program;
- Effectiveness of waste generator training; and
- Management of waste-related records and waste tracking systems.

6.2 RECORDS REQUIRED

Specific files and documents to be reviewed as part of the audit include, but will not be limited to, the following:

- Written policies and procedures relating to waste management activities including waste management plans, internal procedures, and other guidance documents;
- Waste generation and characterization documentation;
- Waste accumulation records;

- Internal audits or assessments performed by the University of Georgia, SREL staff, SR, or WSRC with regard to waste management activities; and

- Staff environmental training records.

7.0 TOXIC AND CHEMICAL MATERIALS

7.1 ISSUE IDENTIFICATION

The toxic and chemical materials portion of the assessment will address the management and use of raw materials and chemical materials with reference to their handling, storage, and disposal. Substances regulated by the Toxic Substances Control Act (TSCA) (for example, polychlorinated biphenyls and chlorofluorocarbons) and the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) will be evaluated. Any storage tanks used for chemicals and fuels, drum storage and dispensing facilities, and storage cabinets will also be included in the audit. Information obtained will be evaluated to assess whether the management and control of toxic and hazardous substances at SREL are in compliance with DOE Orders, Federal, state, and local regulations, and best management practices. The effectiveness of the SREL/WSRC Memorandum of Agreement will also be examined.

Records pertaining to the purchase and use of toxic and hazardous materials (including oil) will be reviewed along with procedures for storage, handling and use of any hazardous materials. Areas where these materials are stored will be inspected, and the material safety data sheet (MSDS) inventory will be reviewed for chemicals used at SREL. The audit will evaluate SREL compliance with hazardous material inventory, reporting and emergency planning responsibilities.

Other issues that will be examined include:

- Spill control and emergency preparedness plans for above-ground storage;
- Management of excess or unusable chemicals;
- Chemical review procedures to ensure that new chemicals can be managed to protect the environment;
- Management of peroxide forming chemicals;
- SARA Title III reporting systems;
- Pesticide program implementation;
- PCB recordkeeping; and
- HAZCOM program implementation, including training and MSDS management.

7.2 RECORDS REQUIRED

Specific documents and files to be reviewed as part of the audit include, but will not be limited to, the following:

- Toxic substances labeling and tracking system;

- Procedures for the procurement, handling, storage, control, use, and management of toxic substances;
- Pesticide purchasing, training, handling, storage, disposal records, and environmental monitoring;
- Special procedures involving handling, storage, use, and disposal of halogenated organic solvents;
- Spill control and emergency preparedness plans for aboveground storage tanks;
- Audits or inspection reports pertaining to the toxic substances program; and
- Material Safety Data Sheets (MSDSs).

8.0 QUALITY ASSURANCE

The Quality Assurance (QA) portion of the Environmental Audit will consist of an evaluation of the QA procedures for general environmental programs and an evaluation of the sampling and analysis procedures performed by SREL onsite or offsite contractors conducting analyses on environmental samples, to ensure that they provide scientifically valid and defensible data.

The assessment will evaluate environmental protection programs in four areas: environmental surveillance, effluent monitoring, waste management, and chemical and radiological analyses. Each of these areas require analyses of various sample media. The primary focus of the quality assurance assessment will be the programs at SREL within the Savannah River Site.

8.1 ISSUE IDENTIFICATION

The QA procedures for SREL environmental programs will be reviewed for the effectiveness of implementation and compliance with DOE requirements. The review will include an assessment of the QA organization and structure developed by DOE site offices, SREL, and SREL contractors to meet the requirements of Federal and state regulations, DOE Orders, QA standards, and EPA guidance manuals. QA activities will be specifically evaluated in accordance with DOE 5700.6C, DOE 5400.1, "General Environmental Protection Program," and other DOE Orders in the 5400 series, as well as accepted industry practices and standards of performance. In addition, assessment of SREL QA practices will be coordinated with other specialists to ensure that all potential quality assurance problems related to environmental programs are identified. Primary contacts are expected to be QA representatives of site organizations, and SREL personnel responsible for the various environmental programs.

Aspects of QA programs related to environmental management by SREL contractors that will be reviewed include operator training, equipment calibration and maintenance, precision and accuracy evaluation, blank, split, and spike sample analyses, sample handling and chain-of-custody procedures, data reduction and validation, reports and documentation. If time and scheduling constraints permit, technical operations in the field will be observed to verify sample acquisition and transfer practices. Standard operating procedures for sampling and analysis will be reviewed to ensure proper implementation and conformance with accepted practices. Internal quality assurance auditing practices will be examined. Quality assurance programs and procedures of offsite laboratories subcontracted by SREL organizations will be included in the assessment. The following issues will be specifically reviewed:

- Analytical lab certifications for sample analyses at analytical laboratories;
- QA oversight of offsite analytical laboratories;
- Contractual agreements with offsite laboratories;
- Environmental monitoring programs at SREL;
- QA Plans and QA Project Plans referencing SREL;

- Environmental sample integrity at DOE contractor laboratories;
- Standard operating procedures for sampling and analysis at the SREL sites; and
- Groundwater, surface water, ambient air, and emissions monitoring at SREL sites.

8.2 RECORDS REQUIRED

Some specific documents and files pertaining to SREL that may be reviewed in this phase of the assessment include, but are not limited to, the following:

- QA plans for SREL, DOE site offices, and site contractors;
- QA manuals and implementing procedures for the environmental monitoring and surveillance programs;
- Annual QA summary reports for SREL and site contractors;
- Environmental sampling and analysis procedures manuals;
- Procurement documents or contractual agreements for offsite analytical and radiological laboratory services;
- QA audits of environmental sampling and analysis at SREL and at site contractor facilities;
- QA audits of offsite analytical and radiological laboratories under contract to SREL-directed facilities;
- Results of QA sample analysis of external performance evaluation samples from EPA or DOE Environmental Measurements Laboratory;
- Results of internal precision and accuracy studies of environmental analyses;
- Training records for sampling technicians and laboratory staff at SREL and site contractors;
- Laboratory notebooks, data reporting forms, and sampling logbooks;
- Instrument maintenance, repair, and calibration records for laboratory and field equipment; and
- Computer program validation and verification.

9.0 RADIATION

9.1 ISSUE IDENTIFICATION

The radiation portion of the Environmental Audit will focus on the methods employed by SREL to comply with the requirements of DOE Orders, and Federal and state regulations as they pertain to the protection of the public and the environment from the use and disposal of radioactive materials. The responsibility of ensuring the safe use and disposal of radioactive materials lies with SREL; however, the Memorandum of Agreement between the SREL and WSRC allows WSRC to provide support services to SREL to assist in compliance purposes when requested. The determination of which DOE Orders and Federal and State regulations pertain to the limited activities using radioactive materials at SREL will be reviewed. The programs, plans, and procedures used in the implementation of the applicable requirements will be evaluated, as will the documents generated in support of demonstrating compliance including SREL's submissions to WSRC for the Environmental Monitoring Plan, Annual Site Environmental Report, Onsite Discharge Information System, and NESHAPs.

The infrastructure that SREL has developed to manage the use and disposal of radioactive material will be reviewed. This review will examine how SREL determines which DOE Orders and Federal regulations apply to its operations, and the manner in which it achieves compliance. SREL release criteria from radiologically-controlled areas and mixed waste management (in conjunction with the waste management specialist) will be critically evaluated. For those instances when WSRC is requested to assist with achieving compliance, the manner by which SREL ensures that the product received meets it's needs and is accurate will be reviewed.

The conduct of the radiation portion of the Environmental Audit will involve interviews with SREL, WSRC, and SR personnel. Physical inspection will also be conducted of locations where radioactive materials are used and stored. The radioactive waste storage area, as well as areas in the laboratories where radioactive wastes are generated, will be inspected.

9.2 RECORDS REQUIRED

Although the use of radioactive materials is limited to research activities at SREL, there are requirements of the DOE, EPA, and DOT that are applicable. The audit will include a review of the following:

- The policy and procedures on wipe testing research areas after the use of radioactive materials;
- The policy and procedures on wipe testing incoming and outgoing packages of radioactive materials;
- Emergency response procedures;
- Policy on the use of radiation survey instruments during research activities using radioactive materials;

- Policy and procedures on the release of materials from radiologically controlled areas;
- Policy and records of the discharge of radioactive materials via the sanitary sewer, storm drains, or exhaust systems;
- Data on liquid and airborne radionuclide emissions submitted for the Annual Site Environmental Report;
- Environmental ALARA Program;
- Description of liquid and air effluent and surveillance programs in the Environmental Monitoring Plan; and
- Annual Radioactive Waste Management Plan.

10.0 INACTIVE WASTE SITES

10.1 ISSUE IDENTIFICATION

The inactive waste site portion of the environmental audit will asses the compliance status of the SREL activities relative to the identification of past disposal sites, contaminated structures and location of spills/releases of hazardous materials. The compliance audit will be based on the following requirements: The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reorganization Act (SARA); The National Contingency Plan (NCP), the National Resource Trusteeship under CERCLA, the Corrective Action provisions of the Resource Conservation and Recovery Act (RCRA) as amended by the Hazardous and Solid Waste Amendments (HSWA) of 1984, DOE 5400.4 for CERCLA compliance requirements, Executive Order 12580 (Superfund implementation), and DOE 5000.3A for occurrence reporting.

The environmental audit will evaluate past and planned activities for technical consistency with applicable EPA regulations and DOE Orders. The following potential sources of contamination will be examined for past or present impacts:

- "Seeps" of contaminated effluent from SRS processes that could impact SREL lands;
- Storage tanks, pumps, and associated piping;
- Septic systems; and
- Effluents contributing to NPDES outfall.

The property transfer between contractors for the B Area facilities will be assessed for adherence to BMPs for contamination evaluation.

The audit will include a review of relevant documents relating to SREL efforts at discovery identification and characterization of past releases to the environment. The current status of ongoing studies are response actions will be evaluated. Documents will be reviewed, site inspections performed and key personnel will be interviewed to assess the adequacy of inactive waste site management.

10.2 RECORDS REQUIRED

Prior to the environmental audit, we need to review any SREL site investigations, characterization studies, or remedial plans.

On site, we need to have the following documents available for review:

- Community Relations Plans;
- Historic and current aerial photographs of SREL operations;

- Information on the historic generation and disposal of wastes; and
- Spill reports and other historical information related to potential spills or releases.

11.0 ENVIRONMENTAL MANAGEMENT

11.1 ISSUE IDENTIFICATION

The environmental management portion of the assessment will focus on environmental protection programs and the formality in which they are conducted. The other issues involved with environmental management, including program evaluation, organizational structure, environmental commitment, communication, and planning and resources will be addressed in less detail. The Memorandum of Agreement between WSRC and the SREL has defined environmental compliance as being the University of Georgia's responsibility. However, SREL may request assistance from WSRC in essentially all compliance matters. In order for SREL to take advantage of the services that WSRC will provide, SREL must be cognizant of the requirements specified in DOE Orders and Federal and state regulations. Therefore, environmental protection programs at SREL will be reviewed with respect to their formality and comprehensiveness.

Specific areas of review will include:

- Adequacy of the organizational structure at SREL to ensure that environmental protection programs are developed as required and that SREL staff is properly trained to their responsibilities under DOE Orders, and Federal and state regulations;
- MOA implementation;
- Communication of environmental awareness throughout SREL;
- Formality of environmental programs, and internal and external communication;
- SREL oversight of WSRC and SR oversight of SREL; and
- Adequacy of required environmental protection programs.

This review will involve interviews with EHS staff and line management at SREL, SR and WSRC. The interviews will be conducted to determine the level of development and implementation of environmental programs and plans. In addition, "vertical" slices of SRELs air and radiation program will be conducted to ascertain the effectiveness of environmental management. Documents will also be reviewed.

11.2 RECORDS REQUIRED

The types of documents that will be reviewed include:

- Environmental program plans;
- Reports to management and regulatory agencies;

- Incident reporting procedures; and
- Assistance requests made to WSRC.

As part of the formality of environmental protection programs we will also review the process by which SREL uses documents generated by WSRC to comply with DOE Orders, Federal and state regulations.

APPENDIX C

ENVIRONMENTAL AUDIT TEAM SCHEDULE OF ONSITE ACTIVITIES

This page intentionally left blank.

APPENDIX C:

SCHEDULE OF ONSITE ACTIVITIES

Week 1	Mon. 9/13/93	Tues. 9/14/93	Wed. 9/15/93	Thurs. 9/16/93	Fri. 9/17/93	Sat. 9/18/93
C. Martel am Air (A) Radiation (RAD) Environmental Management (EM)	• Badging • Interviews - J. Knox, SR, Environmental Protection Program Management - J. Layden, SR, Air Program Management • Document Review	• Interviews - R. Nestor, SREL, Environmental Protection Programs - W. Safter, SREL, Environmental Protection Programs • Document Review	• Interviews - M. Smith, SREL, Staff Resources and Training and Directives - W. Safter, SREL, Systems, Organizational Structure, and Corrective Action Systems - D. Mosser, SREL, Training Records and Inspections • Document Review	• Develop One-Liners • Document Review • Report Writing	• Air Factual Accuracy Review (FAR) Package to Site • RAD FAR Package to Site	• Report Writing
pm	• Interviews - W. Safter, SREL, Radiation Program Management - G. Whitney, SR, NESHAP Submissions and Compliance • Document Review • Daily Debrief	• Inspect Buildings and Conduct Impromptu Interviews with Laboratory Staff Regarding Environmental Awareness • Inspect Par Pond Laboratory Facilities • Document Review • Daily Debrief	• Interview - C. Eldridge, SREL, HWCTR Inspection of Facilities • Inspection - HWCTR SREL Facilities • Document Review • Daily Debrief	• Team Meeting to Review One-Liners • Document Review • Report Writing • Daily Debrief	• Air FAR • RAD FAR	• Report Writing

SCHEDULE OF ONSITE ACTIVITIES (continued)

Week 1	Mon. 9/13/93	Tues. 9/14/93	Wed. 9/15/93	Thurs. 9/16/93	Fri. 9/17/93	Sat. 9/18/93
J. Rea am Surface Water (SW) Groundwater (GW) Inactive Waste Sites (IWS)	• Badging • Inspection - SREL Site • Interviews - G. Wein, SREL, Overview and Field Inspections - D. Stewart, WSRC, NPDES Sampling Event - W. Safter, SREL, NPDES Sampling Procedures - P. Carrol, WSRC, Maintenance Shop Floor Drains • Document Review	• Interviews - R. Nestor, SREL, NPDES, IWS, SW - V. Harper, SREL, SPCC, Surface Water - M. Wilson, WSRC, IWS, CERCLA	• Interviews - R. Nestor, SREL, Aboveground Storage Tanks, Floor Drains, Discharge Monitoring Reports, Drums - W. Whitaker, SR, Drums, CERCLA, Waterwell Inventory - W. Zweifel, SR, NPDES Formality - P. Barnard, WSRC, Waterwell Inventory - J. Price, WSRC, NPDES/DMR Release Document - M. Smith, SREL Environmental Programs, Roles and Responsibilities	• Develop One-Liners • Interviews - A. Doswell, SR, Par Pond Aboveground Storage Tank - G. Garvin, SREL, Sump Neutralization Blueprints, Septic System at Par Pond • Report Writing • Document Review	• Interview - B. Nestor, SREL, IWS and Georgia Fields • Report Writing • Document Review • GW FAR Package to Site	• Report Writing
pm	• Site Inspections - A Area Lab - B Area Lab - Par Pond - Meyers Branch - Boardwalk • Document Review • Daily Debrief	• Interviews - J. Knox, SR, GW, SW, and IWS - R. Wiegel, WSRC, NPDES - J. Keyes, WSRC, NPDES Sampling - J. Knox, SR Underground Storage Tanks - D. Zweifel, SR Aboveground Storage Tanks	• Interviews - G. Garvin, SREL, Neutralization Sump, Outfall No. 5, Blueprints - P. Dukes, SR, Par Pond Area/CERCLA, Ecotrash Debris Piles, Drums/Boardwalks - T. Richardson, WSRC, Drums and Sitewide RCRA Survey • Document Review • Daily Debrief	• Team Meeting to Review One-Liners • Interview - J. Kneece, SCDHEC, Underground Storage Tank Regulations • Report Writing • Document Review • Daily Debrief	• Report Writing • Document Review • GW FAR	• Report Writing

SCHEDULE OF ONSITE ACTIVITIES (continued)

Week 1	Mon. 9/13/93	Tues. 9/14/93	Wed. 9/15/93	Thurs. 9/16/93	Fri. 9/17/93	Sat. 9/18/93
L. Banicki am Soil, Sediment, and Biota (SSB)	• Badging • Interviews - M. Smith, SREL, Overview of SREL - R. Nestor, SREL, EECs - B. Fisher, SREL, Area B • Field Inspections - Par Pond - Aquatic Ecology Lab - Area B - Rainbow Bay - Craig Pond - Set-Aside Areas • Document Review	• Interviews - L. Duncan, USF&WLS, Endangered Species Issues (Phone Interview) - K. Hooker, SR, Endangered Species - J. Knox, SR, Endangered Species - C. Davis, SREL, Set-Aside Areas • Document Review	• Document Review • Report Writing • Interview - L. Janecek, SREL Par Pond	• Develop One-Liners • Document Review • Report Writing	• SSB FAR Package to Site	• Report Writing
pm	• Document Review • Daily Debrief	• Document Review • Report Writing • Daily Debrief	• Document Review • Report Writing • Daily Debrief	• Team Meeting to Review One-Liners • Document Review • Report Writing • Daily Debrief	• SSB FAR • Interview - A. Doswell, SR, Par Pond	• Report Writing

SCHEDULE OF ONSITE ACTIVITIES (continued)

Week 1	Mon. 9/13/93	Tues. 9/14/93	Wed. 9/15/93	Thurs. 9/16/93	Fri. 9/17/93	Sat. 9/18/93
C. Summers am Waste Management (WM) Toxic and Chemical Materials (TCM) Drinking Water	• Badging • Interviews - V. Harper, SREL, RCRA/SARA - W. Safter, SREL, TCM, RCRA, and Drinking Water - R. Nestor, SREL, Drinking Water, Oversight of WSRC Implementation of MOA • Document Review	• Interview • D. Mosser, SREL, Laboratory Inspection, TCM • Inspection of Laboratories • Document Review	• Interviews - P. Johns, SREL, Waste Minimization - J. Knox, SR, DOE Oversight of Drinking Water and Waste Management - R. Nestor, SR, DOE 5400.1 Compliance • Records Review - RCRA - TCM • Document Review	• Develop One-Liners • Followup Interviews • Followup Inspections • Document Review • Report Writing	• Report Writing • Document Review • Followup Interviews and Return Visits to Inspection Sites	• Report Writing
pm	• Interviews - J. Layden, SR, DOE Oversight of SREL re: Drinking Water - L. Davis, SR, DOE Oversight of SREL re: TSCA • Document Review • Daily Debrief	• Interview • G. Froidl, SR, Acceptance of SREL Wastes • Inspection of SAAs • Document Review • Daily Debrief	• Training and SARA Title III Records Review • Document Review • Daily Debrief	• Team Meeting to Review One-Liners • Document Review • Report Writing • Daily Debrief	• Document Review • Report Writing	• Report Writing

SCHEDULE OF ONSITE ACTIVITIES (continued)

Week 1	Mon. 9/13/93	Tues. 9/14/93	Wed. 9/15/93	Thurs. 9/16/93	Fri. 9/17/93	Sat. 9/18/93
J. Swiniarski am Quality Assurance (QA) Toxic and Chemical Materials (TCM)	• Badging • Interviews - D. Burrows, SREL, QA Oversight - R. Rollins, SR, QA Oversight - G. May, SR, QA Oversight • Document Review	• Interview - T. Ciravolo, SREL, Pesticide Management - J. Albright, SREL, Toxic Chemicals, Pesticide Use - P. Stone, SREL, PCBs • Inspections - Main Lab - 737A, 718A - Par Pond Boathouse and Vicinity	• Inspect Aquatic Ecology Lab • Inspect B Area Trailer • Document Review	• Interview - D. Burrows, SREL, QA Program • Develop One-Liners • Followup Interviews • Document Review • Report Writing	• Document Review • Report Writing	• Report Writing
pm	• Interviews - L. Davis, SR, PCBs, Chemical and Pesticide Management, TSCA - D. Mosser, SREL, PCBs, Chemical and Pesticide Management - V. Osteen, WSRC, PCBs, Chemical and Pesticide Management - J. Jackson, HNUS, PCBs, Chemical and Pesticide Management - J. Knox, SR, PCBs, Chemical and Pesticide Management - G. May, SR, QA Oversight - W. Whitaker, SR, SARA • Daily Debrief	• Interviews - V. Harper, SREL, Pesticide Management - C. Davis, SREL, TCM Management and Use - R. Dorsett, WSRC, QA Relationship to SREL and SR • Document Review • Daily Debrief	• Interview - J. Heuer, SREL, Document Control and Data and Report Archiving - J. Gregory, SREL, Records Management - D. Burrows, SREL, Equipment Maintenance and Records Management • Inspection • Document Review • Daily Debrief	• Team Meeting to Review One-Liners • Document Review • Report Writing • Daily Debrief	• Report Writing • Document Review	• Report Writing

SCHEDULE OF ONSITE ACTIVITIES (continued)

Week 2		Mon. 9/20/93	Tues. 9/21/93	Wed. 9/22/93	Thurs. 9/23/93	Fri. 9/24/93	Sat. 9/25/93
Overall Schedule	am	IWS, TCM, EM, QA, WM, and SW FAR Packages to Site IWS FAR	Revise Findings and Overviews Draft Executive Summary, Key Findings, Causal Factors (Chapters 1-2)	Report Editing Prepare for Closeout	Closeout Draft Report to Site	Offsite	Offsite
	pm	TCM FAR EM FAR QA FAR WM FAR SW FAR	Complete Findings and Overviews Complete Executive Summary, Key Findings, Causal Factors (Chapters 1-2) Specialists Offsite	Prepare for Closeout Report Editing and Production	Offsite	Offsite	Offsite

APPENDIX D

LIST OF SITE DOCUMENTS REVIEWED BY THE ENVIRONMENTAL AUDIT TEAM

This page intentionally left blank.

APPENDIX D:

LIST OF SITE DOCUMENTS REVIEWED BY THE ENVIRONMENTAL AUDIT TEAM

Doc. No.	Title/Description	Author	Organization	Recipient	Doc. Date
SREL-001	Groundwater Protection Management Program (WSRC-TR-93-296)	Not Provided	WSRC	Various	6/21/93
SREL-002	Chapter 16 of 1992 SRS Environmental Report	L. Janecek	SREL	Various	1992
SREL-003	National Safe Drinking Water Act, SRS Self-Monitoring Report	B. Kuglar	Water Services Department	D. Cook, SCDHEC	5/93
SREL-004	Savannah River Site Environmental Protection Implementation Plan Pursuant to DOE Order 5400.1 for Fiscal Year 1990	Not Provided	SR	Various	7/26/90
SREL-005	Memorandum of Agreement with SREL for the Provision of Support Services by the WSRC (WSRC-RP-90-1001, Rev. 1)	M. Smith	SREL	A. Schwallie, WSRC	10/92
SREL-006	Waste Minimization Plan (Rev. 3)	V. Harper	SREL	Various	1/29/93
SREL-007	Spill Prevention Control and Countermeasure Plan *including Flowing Streams Laboratory and* 700-A Areas SREL SPCC Facilities maps	Not Provided	Bechtel Environmental, Inc.	Various	1/91
SREL-008	Best Management Practices Plan (WSRC-IM-90-49)	Not Provided	WSRC	Various	2/91
SREL-C09	Introduction to Natural Resources Management at the Savannah River Site	Not Provided	SR	Various	7/93
SREL-010	Letter re: Biological Assessment for the Wood Stork and Operations of the Savannah River Plant	M. Sires	SR	J. Pulliam, U.S. Fish and Wildlife Service	3/29/84
SREL-011	Letter re: the Biological Opinion of the Fish and Wildlife Service Concerning the Effects of SRP Operations on the Endangered Wood Stork	W. Parker	US Dept. of Interior, Fish and Wildlife Service	M. Sires, SR	6/28/84
SREL-012	Notification of Hazardous Waste Activity	M. Stetson	SRP	R. Malpses, SCDHEC	12/19/79

LIST OF SITE DOCUMENTS REVIEWED BY THE ENVIRONMENTAL AUDIT TEAM (continued)

Doc. No.	Title/Description	Author	Organization	Recipient	Doc. Date
SREL-013	Construction Permit Application Package; Individual Sewage Disposal System for SREL Laboratory at Par Pond	W. Dunaway	WSRC	D. Angle, SCDHEC	9/30/92
SREL-014	Well Installation Report, SREL Par Pond Research Facility Water Well	W. Schuneman	Sirrine Environmental Consultants	SREL	7/91
SREL-015	Draft SREL Hazardous/Nonhazardous Waste Management Procedures (Rev. 6)	Not Provided	SREL	Various	6/25/93
SREL-016	List of Past and Present Waste Streams and their Primary Constituents	Not Provided	SREL	Not Provided	Undated
SREL-017	List of Emission Points by Discipline	Not Provided	SREL	Not Provided	5/18/93
SREL-018	Maps re: Set Aside Areas	Not Provided	SREL	Not Provided	Various
SREL-019	Set-Aside Protection and Management at the Savannah River Site	L. Janecek	SREL	Not Provided	5/3/93
SREL-020	Savannah River Site Set-Aside Task Group Charter	C. Strojan	SREL	Various	7/28/92
SREL-021	DOE Research Set-Asides File	C. Davis, et al.	SREL	Various	Undated
SREL-022	Information on Set-Asides, including History, Role, Philosophy, 7 Major Plant Communities, Listing, and Map of SRS Set-Aside Programs/Areas	L. Janecek	SREL	L. Banicki, DOE	9/3/93
SREL-023	Completed Environmental Evaluation Checklist (EEC) re: Installation of Artificial Stream Units	D. Fletcher	SREL	Not Provided	7/21/93
SREL-024	Sample Procedure re: Fish Collecting with Seine or Dipnet	G. Meffe	SREL	Various	Undated
SREL-025	Memorandum re: SREL Laboratory Radiotracer Hazards Analysis	L. Burckhalter	WSRC	W. Safter, SREL	1/14/93
SREL-026	Project Safety Appraisal Form re: Effects of Chronic Exposure to Radionuclides in Yellow Bullhead Catfish	I. Brisbin	SREL	C. McCreedy, SREL	8/7/93

LIST OF SITE DOCUMENTS REVIEWED BY THE ENVIRONMENTAL AUDIT TEAM (continued)

Doc. No.	Title/Description	Author	Organization	Recipient	Doc. Date
SREL-027	Policy re: Domestic Water Cross Connection Control Program	Not Provided	WSRC	Various	8/14/92
SREL-028	Site Awareness Inter Office Memoranda	Various	WSRC	Various	Various
SREL-029	Water Services Department Cross Connection Inspection Report Forms (Samples)	Various	Various	Various	Various
SREL-030	Cross Connection Tracking Records	Not Provided	SREL	Not Provided	Various
SREL-031	Cross Connection Control Device Record	Not Provided	SREL	Not Provided	Various
SREL-032	Advance Notice for Testing Backflow Prevention Device(s) SCDHEC Requirement Standard Form	Not Provided	SREL	Not Provided	Undated
SREL-033	Cross Connections Indicator and Measures (Graphs)	Not Provided	SREL	Not Provided	Various
SREL-034	Memorandum re: NPDES Outfall, indicating Outfall FS-2 and B1 are no Longer in service	R. Nestor	SREL	R. Weigel	1/15/91
SREL-035	List of NPDES Exceedances During 1992	Not Provided	Not Provided	Not Provided	Various
SREL-036	List of NPDES Exceedances During 1991	Not Provided	Not Provided	Not Provided	Various
SREL-037	List of NPDES Permit Exceedance for CY 1990	Not Provided	Not Provided	Not Provided	Various
SREL-038	Memorandum re: 1992 NPDES 3560 Audit Results	R. Weigel	WSRC	Various	3/17/93
SREL-039	NPDES Compliance Inspection Report	J. Chapman	SCDHEC	SRS	11/9/92
SREL-040	Memorandum re: 1991 NPDES 3560 Compliance Sampling Inspection Results	R. Weigel	WSRC	Various	1/14/92
SREL-041	NPDES Compliance Inspection Report	J. Chapman	SCDHEC	SRS	11/18/91
SREL-042	Boilerplate Conditions for SRS National Pollutant Discharge and Elimination System, Permit SC0000175, including Outfall Specific Effluent Limitations	Various	SRS	Various	9/23/86

LIST OF SITE DOCUMENTS REVIEWED BY THE ENVIRONMENTAL AUDIT TEAM (continued)

Doc. No.	Title/Description	Author	Organization	Recipient	Doc. Date
SREL-043	Letter Re: Modification to NPDES Permit SC0000175, including Effluent Limitations and Monitoring Requirements	H. Gibson	SCDHEC	R. Morgan, SR	6/14/84
SREL-044	Maps re: Silverton Road Waste Site, the A and M Areas, Lost Lake, and Nearby Active and Abandoned Wells	Not Provided	Not Provided	Not Provided	Not Provided
SREL-045	List of Field Projects Conducted at Par Pond, AEL, and HWCTR	Not Provided	Not Provided	Not Provided	Not Provided
SREL-046	Description of Savannah River Ecology Laboratory Programs	Not Provided	Not Provided	Not Provided	1988
SREL-047	Chapter 13 of 1992 SRS Environmental Report	C. Strojan	SREL	Various	1991
SREL-048	SREL Brochure Entitled 40 Years and Beyond	Various	SREL	Various	1992
SREL-049	SREL Brochure Entitled Institutions of Science reprinted from Encyclopedia Britannica	A. Gibbons	SREL	Various	Undated
SREL-050	Procedure re: SREL Research Quality Assurance Plan, Rev. 1 (Q-91-0001)	M. Smith	SREL	Various	9/30/92
SREL-051	Procedure re: Quality Assurance Assessments and Surveillances, Rev. 1 (Q-91-0003)	D. Burrows	SREL	Various	9/30/92
SREL-052	Procedure re: Quality Assurance Records Retention, Rev. 1 (Q-91-0007)	D. Burrows	SREL	Various	9/30/92
SREL-053	Procedure re: Training and Professional Development, Rev. 1 (A-92-0001)	R. Nestor	SREL	Various	9/30/92
SREL-054	Work Authorization System Field Work Proposal for Research Program Entitled Ecosystem Alterations by Chemical Pollutants	P. Bertsch	SREL	Not Provided	1/12/92
SREL-055	Procedure re: SREL Controlled Work Authorization System Documents, Rev. 2 (A-92-0032)	R. Nestor	SREL	Various	7/13/92
SREL-056	Strategic Plan for the SREL (A-92-0036)	M. Smith	SREL	Various	4/15/93

LIST OF SITE DOCUMENTS REVIEWED BY THE ENVIRONMENTAL AUDIT TEAM (continued)

Doc. No.	Title/Description	Author	Organization	Recipient	Doc. Date
SREL-057	Procedure re: Management Assessments, Rev. 0 (A-92-0037)	M. Smith	SREL	Various	9/30/92
SREL-058	Procedure re: SREL Quality Assurance Implementation Plan (Rev. 0 (Q-92-0002)	M. Smith	SREL	Various	3/15/92
SREL-059	Procedure re: Data Collection and Analysis, Rev. 1 (Q-92-0004)	D. Burrows	SREL	Various	9/30/92
SREL-060	Procedure re: Special Quality Assurance Plan for Research Associated with New Production Reactor Pre-Operational Environmental Surveillance, Rev. 0 (Q-92-0005)	D. Borrows	SREL	Various	3/15/92
SREL-061	Letters to Georgia Dept. of Natural Resources, U.S. EPA-Region IV, and SCDHEC Offering the Opportunity to Observe Environmental Audit Activities	S. Wright	SR	Various	6/30/93
SREL-062	Letter re: WSRC Support of Environmental Audit of SREL	H. Etheridge	WSRC	M. Smith, SREL	6/25/93
SREL-063	Organization Charts re: Environmental and Laboratory Programs Division Organization and Responsibilities	Not Provided	SR	Not Provided	8/14/92
SREL-064	Environmental Operating Reference Manual, Chapter 2 re: Mission and Mandates of the Environmental Compliance division and Environmental and Laboratory Programs Division	Not Provided	HALLIBURTON NUS Environmental Corp.	Savannah River Field Office	8/92
SREL-065	Organization Chart for Savannah River Field Office	Not Provided	SR	Various	1/29/93
SREL-066	Facility Representative Handbook, Environmental and Laboratory Programs Division	Not Provided	SREL	Various	10/15/92
SREL-067	SREL Mission Statement	Not Provided	SREL	Not Provided	Undated
SREL-068	Organization Chart for Savannah River Ecology Laboratory	Not Provided	SREL	Not Provided	Undated

LIST OF SITE DOCUMENTS REVIEWED BY THE ENVIRONMENTAL AUDIT TEAM (continued)

Doc. No.	Title/Description	Author	Organization	Recipient	Doc. Date
SREL-069	Total Source Inventory (737-A)	Not Provided	SREL	Not Provided	3/17/93
SREL-070	Letter re: DOE Environmental Audit of SREL (including schedule)	S. Wright	SR	M. Smith, SREL	6/23/93
SREL-071	Report on 1993 Comprehensive Monitoring Evaluation (CME) for Compliance with Hazardous Waste Regulations	J. Burckhalter	SCDHEC	J. Roberts, WSRC	6/3/93
SREL-072	Final Consent Order for Deficiencies Noted During the 1990 Comprehensive Monitoring Evaluation	Not Provided	SCDHEC and WSRC	Not Provided	7/7/92
SREL-073	Comprehensive Monitoring Evaluation (CME) Report	Not Provided	EPA	SRS	4/16-20/92
SREL-074	Environmental Appraisal Report, Environmental Compliance Appraisal	Not Provided	SR	SREL	10/92
SREL-075	Summary Pamphlet for SRS Environmental Report for 1992	Not Provided	WSRC	SRS	1992
SREL-076	SRS Environmental Report for 1992	Not Provided	WSRC	SRS	1992
SREL-077	Procedure re: Compliance Sampling of National Pollution Discharge Elimination System (NPDES) Outfalls, Rev. 0 (WSRC-3Q1-3)	Not Provided	WSRC	Various	4/2/92
SREL-078	Procedure re: Chain of Custody Procedure, Rev. 0 (WSRC-3Q1-3)	Not Provided	WSRC	Various	11/1/89
SREL-079	Procedure re: Quality Control Compliance Sampling of National Pollutant Discharge Elimination System (NPDES) Outfalls, Rev. 0 (WSRC-3Q1-3)	Not Provided	WSRC	Various	4/2/92
SREL-080	Form SR-88 re: Application and Permit for Site Use - SRP (Short Title Site Use)	Not Provided	Not Provided	Various	10/8/91
SREL-081	Instructions for Completing Form SR 88	Not Provided	Not Provided	Various	Undated
SREL-082	Form OSR 14-347 re: Environmental Evaluation Checklist (EEC)	Not Provided	Not Provided	Various	1/6/93

LIST OF SITE DOCUMENTS REVIEWED BY THE ENVIRONMENTAL AUDIT TEAM (continued)

Doc. No.	Title/Description	Author	Organization	Recipient	Doc. Date
SREL-083	Memorandum re: Off-Normal Potential Emission Sources at the SREL not Included in the NESHAP Program	J. Knox	SREL	W. Brumley, et al.	8/18/93
SREL-084	Occurrence Report re: Failure to Comply with NESHAP, Subpart H	W. Safter	SREL	Not Provided	8/18/93
SREL-085	Memorandum re: Environmental Compliance Walkdown of the SREL - Compliance with DOE 5400.1 and DOE 5400.5 Requirements (with attached Walkdown Report)	J. Arnett	SREL	J. Knox, et al., SREL	8/27/93
SREL-086	Letter re: SRS Radionuclide National Emission Standards for Hazardous Air Pollutants (NESHAP) Federal Facility Compliance Agreement (FFCA), (with attached August 1993 Monthly Status Report)	R. Peterson	SREL	B. Spagg, EPA	9/9/93
SREL-087	Memorandum to File re: Telephone Conversation with EPA-IV - Identification of Radiological Emission Source at SREL	G. Whitney	SREL	File	8/18/93
SREL-088	Memorandum re: SCDHEC Permit to Operate #209191AI; SREL Par Pond Domestic Water System (with attached Permit to Operate)	J. Lintern	WSRC	J. Ormand	8/30/93
SREL-089	Certificates for Testers of Backflow Prevention Devices	Not Provided	SCDHEC	R. Guy and N. Shah	Undated
SREL-090	Letter re: Environmental Compliance Appraisal of SREL	M. Smith	SREL	B. Gould, Savannah River Field Office	1/28/93
SREL-091	SREL Occurrence Reporting Procedures	Not Provided	SREL	Not Provided	Undated
SREL-092	Letter re: Proposed Corrective Action Plan, SREL Environmental Compliance Appraisal (with attached comments)	A. Gould	SR	M. Smith, SREL	4/9/93
SREL-093	Module 3 from Training Program re: Hazardous Waste Determination	Not Provided	Not Provided	Not Provided	6/90

LIST OF SITE DOCUMENTS REVIEWED BY THE ENVIRONMENTAL AUDIT TEAM (continued)

Doc. No.	Title/Description	Author	Organization	Recipient	Doc. Date
SREL-094	Grading Permit Application with attached Erosion and Sediment Control Plan and Detail of Sediment Basin - Detention Pond)	Not Provided	Planning and Development Dept.	Not Provided	Undated
SREL-095	Letter re: No Underground Storage Tanks Nor Spills to Report	V. Harper	SREL	D. Neal, ADL	9/2/93
SREL-096	Letter re: SREL Not Included in Site Environmental Monitoring Plan (Including Groundwater Monitoring)	V. Harper	SREL	D. Neal, ADL	9/3/93
SREL-097	Letter re: SREL Request to be Included in Site Environmental Monitoring Plan	M. Smith	SREL	J. Roberts, WSRC	8/10/93
SREL-098	Procedure re: Sanitary Landfill Permitted Waste	Not Provided	WSRC	Various	3/31/91
SREL-099	Letter re: UST Fuel Contaminated Soil Disposal	J. Odum	WSRC	R. Peterson, SR	3/20/90
SREL-100	Letter re: Proposal for Pre-Approved Waste to be Landfilled	D. Pearson	SCDHEC	T. Treger, SRS	4/20/89
SREL-101	Memorandum re: SRS Proposal for Pre-Approved Waste to be Landfilled	H. Seabrook	SCDHEC	M. Lindler, SCDHEC	4/17/89
SREL-102	Memorandum re: Guidelines for the Disposal of Petroleum Contaminated Soils (with attached Guidelines)	H. Seabrook	SCDHEC	District Solid/ Hazardous Waste Consultants	1/23/90
SREL-103	SRS "SMARTS" Program re: Operating Requirements for Regulated Facilities, Rev. 1 (WSRC-IM-90-90)	Not Provided	WSRC	Various	12/31/92
SREL-104	Letter re: Sanitary Landfill Permit for SRS Landfill (DWP-087A) (with Attached Permit)	D. Pearson	SCDHEC	S. Wright, SR	2/6/92
SREL-105	Procedure re: Hazardous or Mixed Waste Management at Satellite Accumulation Areas, Rev. 2 (ECM 6.9)	Not Provided	WSRC	Various	9/30/92
SREL-106	Petroleum Lists	R. Fanning	Not Provided	Not Provided	Undated

LIST OF SITE DOCUMENTS REVIEWED BY THE ENVIRONMENTAL AUDIT TEAM (continued)

Doc. No.	Title/Description	Author	Organization	Recipient	Doc. Date
SREL-107	Contract between the University of Georgia Research Foundation, DOE, and SREL (DE-AC09-76SR00819)	Not Provided	Not Provided	University of GA, SREL, DOE	Not Provided
SREL-108	Graphic re: SREL Operating Budget Funding by Research Division	Not Provided	SREL	Audit Team	8/93
SREL-109	SREL Budget for FY 1993	Not Provided	SREL	Not Provided	1993
SREL-110	List of DNC Responsibilities	Not Provided	SREL	Audit Team	8/93
SREL-111	Number of SREL Personnel for FY 1993	Not Provided	SREL	Audit Team	8/93
SREL-112	Graphic re: EEC Tracking and Filing, Sitewide CXs	Not Provided	SREL	Audit Team	8/93
SREL-113	Graphic re: Budgets for FY 1992 and 1993	Not Provided	SREL	Audit Team	8/93
SREL-114	Federal Insecticide, Fungicide, and Rodenticide Act Implementation Program Comprehensive Compliance Assurance Review Report (Report No. 07-01-93-0004)	Not Provided	Halliburton NUS Corporation	WSRC	2/93
SREL-115	MSDS Procurement Procedures, Rev. 0	Not Provided	Not Provided	Not Provided	3/31/93
SREL-116	SREL Clearance Sheet	Not Provided	SREL	Not Provided	Undated
SREL-117	In Processing Sheet for New Employees	Not Provided	SREL	Not Provided	3/1/93
SREL-118	Procedure re: SREL Environmental Evaluation Procedure, Rev. 0 (A-93-0006)	Not Provided	SREL	Various	7/9/93
SREL-119	Procedure re: Document Control, Rev. 1 (A-91-0001)	Not Provided	SREL	Various	9/30/92
SREL-120	Environment, Safety, and Health Annual Self Assessment	Not Provided	SREL	Various	7/92
SREL-121	Safe Drinking Water Act, 1986 Amendments (EPA 570/9-86-002)	Not Provided	EPA	Various	8/86

LIST OF SITE DOCUMENTS REVIEWED BY THE ENVIRONMENTAL AUDIT TEAM (continued)

Doc. No.	Title/Description	Author	Organization	Recipient	Doc. Date
SREL-122	Memorandum re: Document Requests for Environmental Audit (with Attached Document Request List)	J. Knox	SREL	M. Jalbert, ADL	7/1/93
SREL-123	SREL Controlled Document List	Not Provided	SREL	Not Provided	7/13/93
SREL-124	Memorandum re: Exemption of SREL Emergency Diesel Generator	C. Cook	WSRC	M. Smith, SREL	8/24/93
SREL-125	Letter re: Exemption of SREL Emergency Generator	R. Gibson	SCDHEC	M. Dukes, WSRC	8/19/93
SREL-126	SREL Safety Office Primary Responsibilities Matrix for FY 1993	Not Provided	SREL	Various	10/27/92
SREL-127	Letter re: Regulatory Compliance at the SRS	S. Wright	SR	M. Smith, SREL	3/1/93
SREL-128	Set-Aside Areas, National Environmental Research Park (SRO-819-11)	H. Hillestad and S. Bennett	Southeastern Wildlife Services	SREL	1982
SREL-129	Quality Assurance Evaluated Supplies	D. Burrows	SREL	Not Provided	10/1/92
SREL-130	Evaluated Suppliers List	Not Provided	WSRC	Not Provided	7/24/91
SREL-131	QAP Description for Research Associated with NPR Preoperational Environmental Surveillance Rev. 1 (Q-91-0004)	Not Provided	SREL	Not Provided	1/31/92
SREL-132	Documentation of Research Activity Rev. 1 (Q-91-0006)	Not Provided	SREL	Not Provided	9/30/92
SREL-133	Reviews of Research by Others (Q-91-0002)	Not Provided	SREL	Not Provided	9/30/92
SREL-134	Special Purchases (Q-92-0003)	Not Provided	SREL	Not Provided	9/30/92
SREL-135	Validation of Computer Software (Q-91-0005)	Not Provided	SREL	Not Provided	9/30/92
SREL-136	SRS Environmental Monitoring Plan, Vol. 1 (WSRC-3Q1-2)	Not Provided	SRS	Not Provided	6/93

LIST OF SITE DOCUMENTS REVIEWED BY THE ENVIRONMENTAL AUDIT TEAM (continued)

Doc. No.	Title/Description	Author	Organization	Recipient	Doc. Date
SREL-137	Attachment 1 to SRS Environmental Monitoring Plan re: SREL, SRTC, and WSRC Current and Planned Aquatic Research/Monitoring of the Savannah River	Not Provided	SRS	Not Provided	6/93
SREL-138	SRS Environmental Report for 1991 (WSRC-TR-92-186)	Not Provided	SRS	Not Provided	6/30/92
SREL-139	Job Specific Training for New Lab/Field Personnel Form (JS101)	Not Provided	SREL	Not Provided	Undated
SREL-140	Job Specific Training for Administrative Personnel Form (JS103)	Not Provided	SREL	Not Provided	Undated
SREL-141	Job Specific Training for New Lab/Field Personnel Form (JS101)	Not Provided	SREL	Not Provided	Undated
SREL-142	Safety Orientation for New Employees Form (SO100)	Not Provided	SREL	Not Provided	Undated
SREL-143	Job Specific Training for Maintenance/Electrical Personnel (JS102)	Not Provided	SREL	Not Provided	Undated
SREL-144	Locations of Satellite Areas	V. Harper	SREL	Not Provided	9/10/93
SREL-145	Hazardous Waste Storage/Disposal Record Form (ORS-29-3)	Not Provided	SREL	Not Provided	6/88
SREL-146	Hazardous Waste Data Sheet, Rev. 9	Not Provided	Not Provided	Not Provided	9/25/90
SREL-147	SRS Waste Characterization Form (WCF) for Hazardous/Mixed Waste (WCF-1/4)	Not Provided	SRS	Not Provided	7/7/92
SREL-148	Hazardous Materials Shipment Public Access Roads Form (OSR-16-69)	Not Provided	SREL	Not Provided	6/83
SREL-149	List of SREL Personnel who have Received RCRA Training	Not Provided	SREL	Not Provided	9/13/93
SREL-150	Environmental Appraisal Report, Polychlorinated Biphenyl Program	Not Provided	WSRC	Not Provided	1/92

LIST OF SITE DOCUMENTS REVIEWED BY THE ENVIRONMENTAL AUDIT TEAM (continued)

Doc. No.	Title/Description	Author	Organization	Recipient	Doc. Date
SREL-151	Quality Assurance Program Description for Research Associated with New Production Reactor Pre-Operational Environmental Surveillance, Rev. 1 (Q-91-0004)	Not Provided	SREL	Various	1/31/92
SREL-152	Evaluated Suppliers List (ESL)	Not Provided	Not Provided	Not Provided	7/24/91
SREL-153	Organization Chart, Environment, Safety, Health, and Quality Programs	Not Provided	Not Provided	Not Provided	3/2/93
SREL-154	Quality Assurance Branch Assignments	Not Provided	Not Provided	Not Provided	5/6/93
SREL-155	Procedure re: Enzyme Kinetic Analysis	V. Kramer	Not Provided	Not Provided	1/29/91
SREL-156	Comprehensive Compliance Assurance Reviews (Section 3.))	Not Provided	SR	Not Provided	Undated
SREL-157	Memorandum re: Management Walkthrough Schedule, Fourth Quarter, Fiscal Year (FY 1993)	T. Heenan	SR	Various	7/27/93
SREL-158	Draft Savannah River Ecology Laboratory Management Plan, Rev. 1 (A-93-0002)	Not Provided	SREL	Various	9/29/93
SREL-159	Draft Research Records Retention (Q-91-0007)	Not Provided	SREL	Not Provided	9/93
SREL-160	Department of Energy Schedule, Research and Development Records	Not Provided	DOE	Not Provided	Undated
SREL-161	Memorandum re: Annual Surveillance Schedule - 1993, Rev. 3 (ESH-DQA-930081)	R. Dorsett	WSRC	Various	7/9/93
SREL-162	Memorandum re: Independent Assessment	P. Brammer	WSRC	R. Dorsett, WSRC	7/6/93
SREL-163	Improving the Quality of Geographic Information System Data	Not Provided	SREL	Not Provided	Undated
SREL-164	Memorandum re: Periodic QA Assessment of Environmental Monitoring Section (ESH-DQAA-920114)	R. Dorsett and P. Brammer	WSRC	J. Burgess	9/18/92

LIST OF SITE DOCUMENTS REVIEWED BY THE ENVIRONMENTAL AUDIT TEAM (continued)

Doc. No.	Title/Description	Author	Organization	Recipient	Doc. Date
SREL-165	Quality Assurance Project Plan for Comparative Risk Assessment of Climate Change and Other Anthropogenic Stressors: Habitat and Biological Diversity on the SRS, Rev. 2	R. Pulliam, et al.	Not Provided	SREL	2/20/93
SREL-166	SREL Vendor Checklist: Analytical Services	Not Provided	SREL	Not Provided	Undated
SREL-167	Pesticide Inventory	Not Provided	SREL	Not Provided	9/13/93
SREL-168	Memorandum re: QA Evaluated Suppliers (with attached list of suppliers)	D. Burrows	Not Provided	Division Heads, Research Managers	10/1/92
SREL-169	Letter re: Safety Concerns at the Savannah River Ecology Laboratory (SREL) as the Result of a Review by SR	T. Heenan	SREL	M. Smith, SREL	10/16/91
SREL-170	Memorandum re: Satellite Accumulation Areas	V. Harper	SREL	H. Morris, EPD	12/1/91
SREL-171	Safety Manual	Not Provided	SREL	Various	12/91
SREL-172	Letter re: Wetlands Review	M. Smith	SREL	G. Peck, EPA	12/10/91
SREL-173	Miscellaneous Information and Lists of Threatened and Endangered Animals in South Carolina	Various	Various	Various	Various
SREL-174	Par Pond Monthly Meeting Agenda	Not Provided	Not Provided	Not Provided	9/8/93
SREL-175	Memorandum re: Par Pond Boat Ramp Bubble-Up Tank Soil Samples	M. Jones	WSRC	M. Davis	5/20/93
SREL-176	Letter re: Notification of Sewage and Petroleum Spills at SRS	J. Keyes	WSRC	M. Reece, SCDHEC	3/5/93
SREL-177	1993 South Carolina Scientific Collecting Permit Request (with attached cover letter)	L. Janecek	SREL	B. McTeer, SCWMRD	11/24/92
SREL-178	1993 Scientific Collecting Permit Application and 1992 Scientific Collecting Report (with attached cover letter)	M. Smith	SREL	B. Fletcher, GADNR	Various

LIST OF SITE DOCUMENTS REVIEWED BY THE ENVIRONMENTAL AUDIT TEAM (continued)

Doc. No.	Title/Description	Author	Organization	Recipient	Doc. Date
SREL-179	Letter re: Renewal and Amendment of Endangered Species Permit (PRT-677776) Concerning the Wood Stork (Mycteria Americana)	L. Bryan	SREL	R. Gooch, USFWS	12/29/92
SREL-180	Letter re: Renewal of Scientific Collecting Permit #PRT-696382 Concerning Migratory Waterfowl	M. Smith	SREL	USFWS	9/23/92
SREL-181	ES&H Tiger Team Assessment	Various	DOE	Various	6/90
SREL-182	Procedure re: Environmental Sampling, Rev. 0 (WSRC-3Q1-3)	Not Provided	WSRC	Various	6/1/92
SREL-183	Procedure re: Environmental Sampling, category (3), Rev. 0 (WSRC-3Q1-3)	Not Provided	WSRC	Various	6/1/92
SREL-184	South Carolina Safe Drinking Water Regulations, Chapter 61-58.1 re: Construction and Operation Permits	Not Provided	SC	Various	Undated
SREL-185	Letter re: National Pollutant Discharge Elimination System (NPDES) Discharge Monitoring Report (DMR), April 1990	T. Anderson	WSRC	H. Gibson, SCDHEC	5/25/90
SREL-186	Letter re: WSRC Letters of Request and Transmittal Concerning Appointment of Manager of Surface Water, Wetlands, and Land Protection Group	M. Dukes	WSRC	M. Sadler, SCDHEC	10/1/92
SREL-187	Application and Permit for Site Use re: Transport of Dissolved Organic Carbon Through Wetland Soils	P. Bertsch and M. Dosskey	SREL	R. Jernigan	6/26/92
SREL-188	Memorandum re: 1993 Vacation Schedule	M. Dukes	SREL	Various	7/16/93
SREL-189	Letter re: National Pollutant Discharge Elimination System (NPDES) Discharge Monitoring Report (DMR), June 1993	M. Dukes	SREL	J. Bristol, SCDHEC	7/28/93
SREL-190	Discharge Monitoring Reports (DMRs) for 1991, 1992, and 1993	Various	SREL	Various	Various
SREL-191	Underground Storage Tank Control Regulations	Not Provided	SCDHEC	Various	3/23/90

LIST OF SITE DOCUMENTS REVIEWED BY THE ENVIRONMENTAL AUDIT TEAM (continued)

Doc. No.	Title/Description	Author	Organization	Recipient	Doc. Date
SREL-192	Title 44, Chapter 2, with Revisions from 1992 Appropriations Act, Section 43 re: State Underground Petroleum Environmental Response Bank Act	Not Provided	SCDHEC	Not Provided	Undated
SREL-193	Underground Storage Tank Assessment Guidelines	Not Provided	SCDHEC	Various	8/13/93
SREL-194	Petroleum Hydrocarbon Analytical Methodology for Ground-water and Soil Assessment	Not Provided	SCDHEC	Various	1/21/92
SREL-195	Underground Storage Tank Program Expanded Assessment Guidance Document	Not Provided	SCDHEC	Various	2/6/92
SREL-196	Soil/Ground-Water Remediation Guidance Document	Not Provided	SCDHEC	Various	3/3/92
SREL-197	SC State Underground Petroleum Environmental Response Bank Act of 1988	Not Provided	SCDHEC	Various	2/6/92
SREL-198	Musts for USTs	Not Provided	EPA	Various	9/88
SREL-199	Straight Talk on Tanks	Not Provided	EPA	Various	8/90
SREL-200	Dollars and Sense	Not Provided	EPA	Various	12/88
SREL-201	Miscellaneous Information on Wells Located at SRS, including Lists, Maps, Field Geologic Logs, Evaluation Worksheets, Construction Details, and Installation and Development Reports	Various	Various	Various	Various
SREL-202	Lab Book re: C Transport, Bertsch Labs	Not Provided	SREL	Not Provided	Various
SREL-203	Lab Book re: C Cycling, Bertsch Labs	Not Provided	SREL	Not Provided	Various
SREL-204	Memorandum re: Environmental Investigations Requiring SCDHEC Well Construction Approval Permits (with Attached Summary of Investigations)	M. Fogarty	WSRC	C. Amobi	9/3/93
SREL-205	Program Plan for Soil Organic Matter Study (ESH-ERG-920473)	M. Dosskey	SREL	WSRC	6/26/92

LIST OF SITE DOCUMENTS REVIEWED BY THE ENVIRONMENTAL AUDIT TEAM (continued)

Doc. No.	Title/Description	Author	Organization	Recipient	Doc. Date
SREL-206	Program Plan for Soil Organic Matter Research (ESH-ERG-93-0309)	M. Dosskey	SREL	WSRC	4/12/93
SREL-207	Interim Report, Survey of Potential RCRA Sites	Not Provided	Corps of Engineers	SR	12/4/90
SREL-208	Miscellaneous Records for Wells Installed on 9/9/92 in Upper Fourmile Br. Area and 9/16-17/82 in Lower Meyer's Br. Area	M. Dosskey	SREL	J. Janssen	Various
SREL-209	Miscellaneous Correspondence and Research Information re: Well Installations	Various	Various	Various	Various
SREL-210	List of Directive Implementation Instructions	Not Provided	SR	Not Provided	9/15/93
SREL-211	Georgia Fields Work Plan Cover Sheet and Outfalls/NPDES Permit	R. Futch	CH^2M Hill	J. Hammock, WSRC	1/91
SREL-212	Letter re: SREL Research Quality Assurance (QA) Plan, Q-91-0001, Rev. 0, 10/31 and Other Supporting Documents (with attached list of QA Program Documents and Implementation Plan)	T. Heenan	SR	M. Smith, SREL	7/29/92
SREL-213	Directive Implementation Instructions	Not Provided	SR	Various	11/23/92
SREL-214	Quality Assurance Program Manual (SRM 5700.6.X.X.1)	Not Provided	SR	Various	8/1/93
SREL-215	Directive Implementation Instructions (DII)	Not Provided	SR	Not Provided	8/30/93
SREL-216	Quality Programs Division Procedures Manual, Volume I (Division)	Not Provided	SR	Various	6/22/93
SREL-217	Savannah River Implementing Procedures Manual	Not Provided	SR	Various	9/9/93
SREL-218	Procedure re: Performance Assurance Assessments (SRIP 5700.6.11A)	E. Broaden	SR	Various	7/26/93
SREL-219	Procedure re: Conducting SR Surveillances (SRIP 5700.6.7B)	J. Crenshaw	SR	Various	8/24/93

LIST OF SITE DOCUMENTS REVIEWED BY THE ENVIRONMENTAL AUDIT TEAM (continued)

Doc. No.	Title/Description	Author	Organization	Recipient	Doc. Date
SREL-220	List of SREL Job Families/Employees and Job Descriptions	Various	SREL	Various	Various
SREL-221	Notices of Requests for Classification Actions for Program Coordinators	Various	SREL	Various	Various
SREL-222	SREL Quality Assurance Program Plan	Not Provided	SREL	Not Provided	Various
SREL-223	Special Quality Assurance Plan for Par Pond Mercury Studies at the Savannah River Site, Rev. 0 (Q-93-0001)	Not Provided	SREL	Various	7/12/93
SREL-224	A Suggested Scope for Studies of Bald Eagle Use of the Savannah River Site with Respect to Par Pond Drawdown	T. Haines	SREL	Various	2/10/93
SREL-225	Memorandum re: Indication that Individual has Read and Understands Quality Assurance-Related Procedures that Apply to Their Work	D. Burrows	SREL	Various	Undated
SREL-226	South Caroline Well Standards and Regulations	Not Provided	SCDHEC	Various	6/2/85
SREL-227	Directive Implementation Instructions re: Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Requirements(DII 5400.4a)	Not Provided	SR	Various	3/8/93
SREL-228	Waste Minimization Plan, Rev. 5	Not Provided	SR	Various	11/30/92
SREL-229	Facilities Inspection Report for OSHA Compliance	H. Bryant	Not Provided	SREL	8/6/93
SREL-230	Program Manual for Comprehensive Environmental Protection Evaluation Program, Rev. 1	Not Provided	NUS Corporation	SR	10/90
SREL-231	Procedure re: NPDES Dicharge Permit Reporting Requirements, 3Q Manual, Rev. 0	Not Provided	WSRC	Various	3/31/91

This page intentionally left blank.

APPENDIX E

LIST OF CONTACTS AND INTERVIEWS CONDUCTED BY THE ENVIRONMENTAL AUDIT TEAM

This page intentionally left blank.

APPENDIX E:

LIST OF CONTACTS AND INTERVIEWS CONDUCTED BY THE ENVIRONMENTAL AUDIT TEAM

Ref. No.	Date	Auditor	Organization	Position	Topic
Air, Radiation, and Environmental Management					
I-A-1	8/17/93	C. Martel	SR	Environmental Engineer	Air, radiation, and environmental protection programs
I-A-2	8/17/93	C. Martel	SR	Environmental Scientist	Air, radiation, and environmental protection programs
I-A-3	8/17/93	C. Martel	SR	Environmental Scientist	Air, radiation, and environmental protection programs
I-A-4	9/8/93	C. Martel	SR	Environmental Scientist	Environmental protection programs
I-A-5	9/13/93	C. Martel	SR	Environmental Scientist	Environmental protection program management
I-A-6	9/13/93	C. Martel	SR	Environmental Engineer	Air program management
I-A-7	9/13/93	C. Martel	SREL	Environmental Health and Safety Manager	Radiation program management
I-A-8	9/13/93	C. Martel	SR	Environmental Scientist	NESHAP submissions and compliance
I-A-9	9/14/93	C. Martel	SREL	Assistant Director	Environmental protection programs
I-A-10	9/14/93	C. Martel	SREL	Environmental Health and Safety Manager	Environmental protection programs
I-A-11	9/15/93	C. Martel	SREL	Director	Staff resources and training and directives
I-A-12	9/15/93	C. Martel	SREL	Environmental Health and Safety Manager	Systems, organizational structure, and corrective action systems
I-A-13	9/15/93	C. Martel	SREL	Laboratory Safety Technician	Training records and inspections
I-A-14	9/15/93	C. Martel	SREL	MSDS Coordinator	HWCTR inspection of facilities

LIST OF CONTACTS AND INTERVIEWS CONDUCTED BY THE ENVIRONMENTAL AUDIT TEAM (continued)

Ref. No.	Date	Auditor	Organization	Position	Topic
Surface Water, Groundwater, and Inactive Waste Sites					
I-B-1	8/30/93	J. Rea	SR	Environmental Scientist	Organization/contacts
I-B-2	9/1/93	J. Rea	SCDHEC	Receptionist	Underground storage tank registration regulations
I-B-3	9/2/93	J. Rea	SCDHEC	Staff	Aboveground storage tank regulations
I-B-4	9/3/93	J. Rea	SREL	Safety Program Coordinator	NPDES/DMR's
I-B-5	9/7/93	J. Rea	SREL	Safety Program Coordinator	Set aside lands - IWS
I-B-6	9/7/93	J. Rea	Horse Creek Pollution Control Authority	Engineer	Sanitary effluent
I-B-7	9/8/93	J. Rea	SR	Environmental Scientist	Well locations
I-B-8	9/9/93	J. Rea	SCDHEC	Engineer	Well regulations
I-B-9	9/9/93	J. Rea	Horse Creek Pollution Control Authority	Engineer	Sanitary effluent pretreatment requirements
I-B-10	9/9/93	J. Rea	SREL	Program Manager	Piezometers and well files
I-B-11	9/13/93	J. Rea	SREL	Program Manager	Overview and field inspections
I-B-12	9/13/93	J. Rea	WSRC	Environmental Sampling Technician	NPDES sampling event
I-B-13	9/13/93	J. Rea	SREL	Environmental Health and Safety Manager	NPDES sampling procedures
I-B-14	9/13/93	J. Rea	WSRC	Maintenance Shop Foreman	Maintenance shop floor drains
I-B-15	9/14/93	J. Rea	SREL	Assistant Director	NPDES, inactive waste sites, and surface water
I-B-16	9/14/93	J. Rea	SREL	Environmental Coordinator	SPCC and surface water
I-B-17	9/14/93	J. Rea	WSRC	Environmental Engineer	Inactive waste sites, CERCLA

LIST OF CONTACTS AND INTERVIEWS CONDUCTED BY THE ENVIRONMENTAL AUDIT TEAM (continued)

Ref. No.	Date	Auditor	Organization	Position	Topic
Surface Water, Groundwater, and Inactive Waste Sites (continued)					
I-B-18	9/14/93	J. Rea	SR	Environmental Scientist	Groundwater, surface water, and inactive waste sites
I-B-19	9/14/93	J. Rea	WSRC	NPDES Permit Coordinator	NPDES
I-B-20	9/14/93	J. Rea	WSRC	Surface Water Manager	NPDES Sampling
I-B-21	9/14/93	J. Rea	SR	Environmental Scientist	UST registrations
I-B-22	9/14/93	J. Rea	SR	Environmental Scientist	Par Pond above ground storage tanks
I-B-23	9/15/93	J. Rea	SREL	Assistant Director	Aboveground storage tanks, floor drains, discharge monitoring reports, drums
I-B-24	9/15/93	J. Rea	SR	Environmental Scientist	Drums, CERCLA
I-B-25	9/15/93	J. Rea	SR	Environmental Scientist	NPDES Formality
I-B-26	9/15/93	J. Rea	SR	Environmental Scientist	Waterwell Inventory
I-B-27	9/15/93	J. Rea	WSRC	Environmental Engineer	Waterwell Inventory
I-B-28	9/15/93	J. Rea	WSRC	Environmental Engineer	NPDES/DMR release document
I-B-29	9/15/93	J. Rea	SREL	Director	Environmental programs, roles and responsibilities
I-B-30	9/15/93	J. Rea	SREL	Project Supervisor	Neutralization Sump, Outfall No. 5, blueprints
I-B-31	9/15/93	J. Rea	SR	Environmental Scientist	Par Pond area/CERCLA, ecotrash debris piles, drums/boardwalks
I-B-32	9/15/93	J. Rea	WSRC	Environmental Coordinator	Drums and sitewide RCRA survey
I-B-33	9/16/93	J. Rea	SR	Environmental Scientist	Par Pond aboveground storage tank
I-B-34	9/16/93	J. Rea	SREL	Maintenance Manager	Neutralization sump, blueprints
I-B-35	9/16/93	J. Rea	SREL	Maintenance Manager	Septic system at Par Pond
I-B-36	9/16/93	J. Rea	SCDHEC	Staff	Underground storage tank regulations

LIST OF CONTACTS AND INTERVIEWS CONDUCTED BY THE ENVIRONMENTAL AUDIT TEAM (continued)

Ref. No.	Date	Auditor	Organization	Position	Topic
Surface Water, Groundwater, and Inactive Waste Sites (continued)					
I-B-37	9/17/93	J. Rea	SREL	Assistant Director	IWS, Georgia Fields
I-B-38	9/21/93	J. Rea	SREL	Research Manager	GW, D Area Wells
I-B-39	9/21/93	J. Rea	WSRC	Surface Water Manager	3Q, NPDES Permit Records
Soil, Sediment, and Biota					
I-C-1	9/2/93	L. Banicki	DOE	Chief, Environmental Compliance	Par Pond
I-C-2	9/2/93	L. Banicki	EPD	Special Programs	Par Pond
I-C-3	9/3/93	L. Banicki	SREL	Environmental Coordinator	EEC; Environmental Sampling
I-C-4	9/3/93	L. Banicki	SREL	Research Manager	Biota; Set-Asides
I-C-5	9/3/93	L. Banicki	SR	Environmental Scientist	NEPA
I-C-6	9/3/93	L. Banicki	SR	Environmental Scientist	Biota
I-C-7	9/8/93	L. Banicki	SREL	Research Coordinator	Set-Asides
I-C-8	9/8/93	L. Banicki	WSRC	NEPA Coordinator	EECs
I-C-9	9/8/93	L. Banicki	WSRC	Manager, Environmental Sampling	Environmental Sampling
I-C-10	9/8/93	L. Banicki	SRTC	Manager, Ecology Group	Environmental Sampling
I-C-11	9/13/93	L. Banicki	SREL	Director	SREL Overview
I-C-12	9/13/93	L. Banicki	SREL	Assistant Director	EECs
I-C-13	9/13/93	L. Banicki	SREL	Research Coordinator	Area B
I-C-14	9/14/93	L. Banicki	USF&WLS	Biologist	Endangered Species
I-C-15	9/14/93	L. Banicki	SR	Chief, Environmental Programs	Endangered Species
I-C-16	9/14/93	L. Banicki	SR	Environmental Scientist	Endangered Species

LIST OF CONTACTS AND INTERVIEWS CONDUCTED BY THE ENVIRONMENTAL AUDIT TEAM (continued)

Ref. No.	Date	Auditor	Organization	Position	Topic
Soil, Sediment, and Biota (continued)					
I-C-17	9/14/93	L. Banicki	SREL	Research Coordinator	Set-Aside Areas
I-C-18	9/15/93	L. Banicki	SREL	Research Manager	Par Pond
I-C-19	9/17/93	L. Banicki	SR	Environmental Scientist	Par Pond
Waste Management, Toxic and Chemical Materials, and Drinking Water					
I-D-1	8/23/93	C. Summers	SREL	Environmental Coordinator	SREL Waste Management Programs
I-D-2	8/30/93	C. Summers	SREL	Environmental Coordinator	SREL Waste Management Programs
I-D-3	9/8/93	C. Summers	WSRC	Senior Scientist	SREL Drinking Water Program
I-D-4	9/8/93	C. Summers	WSRC	Senior Engineer, Drinking Water Permitting	Drinking Water Permitting and SREL Domestic Water Wells
I-D-5	9/8/93	C. Summers	WSRC	Senior Engineer	Programs for Managing Backflow Prevention Devices and Cross-Connection Control
I-D-6	9/8/93	C. Summers	WSRC	Dom[illegible]r Engineer	Domestic Water Wells Under SREL Ownership
I-D-7	9/10/93	C. Summers	WSRC	Domestic Water Engineer	Domestic Water Wells Under SREL Ownership
I-D-8	9/13/93	C. Summers	SREL	Environmental Coordinator	RCRA/SARA
I-D-9	9/13/93	C. Summers	SREL	Environmental Health and Safety Manager	Toxic and chemical materials, RCRA, and drinking water
I-D-10	9/13/93	C. Summers	SREL	Assistant Director	Drinking water, oversight of WSRC implementation of MOA
I-D-11	9/13/93	C. Summers	SR	Environmental Engineer	DOE oversight of SREL regarding drinking water
I-D-12	9/13/93	C. Summers	SR	Environmental Scientist	DOE oversight of SREL regarding TSCA
I-D-13	9/14/93	C. Summers	SREL	Safety Officer	Laboratory Inspection, TCM

LIST OF CONTACTS AND INTERVIEWS CONDUCTED BY THE ENVIRONMENTAL AUDIT TEAM (continued)

Ref. No.	Date	Auditor	Organization	Position	Topic
Waste Management, Toxic and Chemical Materials, and Drinking Water (continued)					
I-D-14	9/14/93	C. Summers	SR	Hazardous Waste Facilitator and Cognizant Engineer	Acceptance of SREL wastes
I-D-15	9/15/93	C. Summers	SREL	Research Coordinator I	Waste minimization
I-D-16	9/15/93	C. Summers	SR	Environmental Scientist	DOE oversight of drinking water and waste management
I-D-17	9/15/93	C. Summers	SREL	Assistant Director	DOE 5400.1 compliance
Quality Assurance and Toxic and Chemical Materials					
I-E-1	9/2/93	J. Swiniarski	SREL	Quality Assurance Program Manager	Quality assurance and scheduling
I-E-2	9/9/93	J. Swiniarski	SREL	Environmental Coordinator	Toxic and chemical materials
I-E-3	9/10/93	J. Swiniarski	SREL	Quality Assurance Program Manager	Quality assurance and scheduling
I-E-4	9/13/93	J. Swiniarski	SREL	Quality Assurance Program Manager	Quality assurance oversight
I-E-5	9/13/93	J. Swiniarski	SR	Quality Assurance Officer	Quality assurance oversight
I-E-6	9/13/93	J. Swiniarski	SR	Mechanical Engineer	Quality assurance oversight
I-E-7	9/13/93	J. Swiniarski	SR	Environmental Scientist	PCBs, chemical and pesticide management
I-E-8	9/13/93	J. Swiniarski	SREL	Lab Safety Officer	PCBs, chemical and pesticide management
I-E-9	9/13/93	J. Swiniarski	WSRC	RCRA Permits (Part B) and PCB Program Coordinator	PCBs, chemical and pesticide management
I-E-10	9/13/93	J. Swiniarski	HALLIBURTON NUS	Staff	PCBs, chemical and pesticide management
I-E-11	9/13/93	J. Swiniarski	SR	Environmental Scientist	QA Oversight
I-E-12	9/13/93	J. Swiniarski	SR	Environmental Scientist	PCBs, chemical and pesticide management
I-E-13	9/13/93	J. Swiniarski	SR	Mechanical Engineer	Quality assurance oversight

LIST OF CONTACTS AND INTERVIEWS CONDUCTED BY THE ENVIRONMENTAL AUDIT TEAM (continued)

Ref. No.	Date	Auditor	Organization	Position	Topic
Quality Assurance and Toxic and Chemical Materials (continued)					
I-E-14	9/13/93	J. Swiniarski	SR	Environmental Scientist	SARA
I-E-15	9/14/93	J. Swiniarski	SREL	Research Associate	Pesticide management
I-E-16	9/14/93	J. Swiniarski	SREL	Staff	Toxic chemicals, pesticide use
I-E-17	9/14/93	J. Swiniarski	SREL	Environmental Engineer	PCBs
I-E-18	9/14/93	J. Swiniarski	SREL	Environmental Coordinator	Pesticide management
I-E-19	9/14/93	J. Swiniarski	SREL	Research Coordinator	Toxic and chemical materials management and use
I-E-20	9/14/93	J. Swiniarski	WSRC	Manager Division Quality Assurance Division	WSRC QA relationship to SREL and SR
I-E-21	9/15/93	J. Swiniarski	SREL	Document Control	Document control and data/report archiving
I-E-22	9/15/93	J. Swiniarski	SREL	Document Coordinator	Records management
I-E-23	9/15/93	J. Swiniarski	SREL	Quality Assurance Program Manager	Equipment maintenance and records management
I-E-24	8/30/93	J. Swiniarski	SREL	Environmental Coordinator	Toxic and chemical materials
I-E-25	9/8/93	J. Swiniarski	SREL	Quality Assurance Program Manager	Quality assurance
I-E-26	9/13/93	J. Swiniarski	WSRC	NPDES Sampler	NPDES sampling
I-E-27	9/16/93	J. Swiniarski	SREL	Quality Assurance Program Manager	Quality assurance program

This page intentionally left blank.

APPENDIX F

DEFINITIONS OF APPARENT CAUSAL FACTORS AND CONTRIBUTING FACTORS

This page intentionally left blank.

APPENDIX F:

DEFINITIONS OF APPARENT CAUSAL FACTORS AND CONTRIBUTING FACTORS

Causal Factor	Definition
Policy	Evaluate if ineffective, outdated, or nonexistent policies contributed to the finding.
Policy Implementation	Ascertain if written policies reflecting Federal, state, and local laws and regulations, codes, and standards were appropriately disseminated, implemented, and updated. If not, evaluate if this is a contributing factor to the finding.
Procedures	Identify if written procedures that have been prepared to effectively implement site policy, DOE Orders, and Federal, state, and local laws and regulations were a contributing factor to the finding. Determine if unfamiliarity with or unavailability of those procedures contributed to the finding.
Personnel	Identify if the educational and work experience backgrounds for personnel holding responsible positions contributed to the finding. Determine if the level of personnel knowledge about the technical and safety aspects of their jobs contributed to the finding.
Resources	Ascertain if the number of personnel assigned to a job was a contributing factor in the finding. Evaluate if inadequacies in facilities and equipment were a contributing factor to the finding.
Training	Identify if adequate personnel training on implementing site policy, DOE Orders, and applicable Federal, state, and local laws and regulations was a contributing factor to the finding.

DEFINITIONS OF APPARENT CAUSAL FACTORS AND CONTRIBUTING FACTORS (continued)

Causal Factor	Definition
Change	Evaluate if changes in site mission, function, operation and established requirements, which rendered existing policies or procedures inadequate or inappropriate were contributing factors to the finding.
Risk	Evaluate if the site personnel responsible for a situation contributing to a finding have assessed and were aware of the relative degree of risk involved in the action.
Design	Evaluate if inadequate design of a system was a contributing factor to the finding.
Human Factors	Ascertain if human factors, such as fatigue or deliberate circumvention of a safety system, were contributing factors to the finding.
Barriers and Controls	Determine if inadequacies in established barriers and controls, both administrative and physical, including operational readiness, routine inspections and preventive maintenance, and/or a lack of these controls, contributed to the finding.
Supervision	Identify if ineffective supervisory controls for implementing policies, procedures, standards, laws, etc., were a contributing factor to the finding.
Quality Assurance/Control	Identify if inadequacies in the quality assurance/ control program were causal factors in the identified finding. This includes inadequate followup to previously identified findings.
Appraisals/Audits/Reviews	Determine if ineffective or insufficient appraisals, audits, and reviews, and/or inadequate followup, were contributing factors to the finding. This factor should only be used as a secondary contributing factor to the finding.

APPENDIX G

LIST OF ACRONYMS AND ABBREVIATIONS

This page intentionally left blank.

APPENDIX G:

LIST OF ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
A	Air
AEC	Atomic Energy Commission
BMPF	Best Management Practice Finding
CAN	Contractor Administrative Notice
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CF	Compliance Finding
CFR	Code of Federal Regulations
DII	Directive Implementation Instruction
DOE	Department of Energy
DP	Defense Programs
EH-24	Office of Environmental Audit
EHS&QP	Environment, Health, Safety and Quality Programs
EM	Environmental Management
EPA	Environmental Protection Agency
ES&H	Environment, Safety, and Health
GW	Groundwater
IWS	Inactive Waste Sites
MOA	Memorandum of Agreement
NESHAPs	National Emission Standards for Hazardous Air Pollutants
NPDES	National Pollutant Discharge Elimination System
OSHA	Occupational Safety and Health Act/Administration
PCB	Polychlorinated Biphenyls
PPAP	Pollution Prevention Awareness Program
RAD	Radiation
RCRA	Resource Conservation and Recovery Act
SARA	Superfund Amendments and Reauthorization Act

LIST OF ACRONYMS AND ABBREVIATIONS (continued)

Acronym/Abbreviation	Definition
SCDHEC	South Carolina Department of Health and Environmental Control
SPCC	Spill Prevention Control and Countermeasures (Plan)
SR	Savannah River Operations Office
SREL	Savannah River Ecology Laboratory
SRFS	Savannah River Forest Station
SRP	Savannah River Plant
SRS	Savannah River Site
SSB	Soil, Sediment, and Biota
SW	Surface Water
TCM	Toxic and Chemical Materials
TPH	Total Petroleum Hydrocarbons
UG	University of Georgia Research Foundation
WM	Waste Management
WSRC	Westinghouse Savannah River Company

DATE
FILMED
7/7/94

END