
United States Department of Energy

Savannah River Site

**Land Use Control Assurance Plan
for the Savannah River Site**

WSRC-RP-98-4125

Revision.1.1

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Prepared for the U. S. Department of Energy Under Contract No. DE-AC09-96SR18500

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LIST OF ACRONYMS AND ABBREVIATIONS

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
USDOE	United States Department of Energy
USEPA	United States Environmental Protection Agency
ER	Environmental Restoration
FFA	Federal Facility Agreement for the Savannah River Site
LUC	Land Use Control
LUCAP	Land Use Control Assurance Plan
LUCIP	Land Use Control Implementation Plan
MOA	Memorandum of Agreement
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
SCDHEC	South Carolina Department of Health and Environmental Control
SROO	Savannah River Operations Office
SRS	Savannah River Site
WSRC	Westinghouse Savannah River Company

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1.0 INTRODUCTION

On April 21, 1998, the United States Environmental Protection Agency (USEPA) Region IV Federal Facilities Branch issued a memorandum entitled *Assuring Land Use Controls at Federal Facilities* (Johnston, 1998). By implementing this policy, USEPA Region IV sought development of Land Use Control Assurance Plans (LUCAPs) by federal facilities that utilize land use controls (LUCs) as components of Resource Conservation and Recovery Act (RCRA)/Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) remedies. The United States Department of Energy (USDOE)-Savannah River Operations Office (SROO) recognizes the memorandum as setting forth policy guidance that does not carry the force of law as is established through rulemaking. Thus, as a matter of comity and cooperation and, most importantly, for the purpose of advancing the goal of protecting human health and the environment at the Savannah River Site (SRS), this LUCAP has been developed as a means to facilitate accomplishment of this shared objective.

The USDOE-SROO, the USEPA, and the South Carolina Department of Health and Environmental Control (SCDHEC) are herein after referred to as “the Parties”. Definitions for terms used in this document are provided in Appendix A.

2.0 SITE DESCRIPTION

2.1 Savannah River Site Description

The SRS covers 310 square miles, encompasses parts of Aiken, Barnwell, and Allendale counties in western South Carolina, and borders the Savannah River. The SROO manages SRS as a controlled area with limited public access. Open fields and pine and hardwood forests comprise 73 percent of the SRS; wetlands, streams, and two large reservoirs cover approximately 22 percent; and production and support areas, roads, and utility corridors account for the remaining 5 percent. Land adjacent to the SRS is used mainly for forest and agricultural purposes.

2.2 SRS Land Use Planning Process

SRS utilizes a comprehensive planning process. This entails a systematic method for ensuring a site-wide approach to moving the site from the present into the future based on SRS strategic planning. A comprehensive plan is developed that addresses such things as land use, facilities, infrastructure, cultural resources, and natural resources. A site procedure (SRIP 430.2) is in place to ensure that proposed land and facility activities are considered for consistency with the comprehensive plan. This process, along with the Site Use Permit system, ensures that sites selected for an activity are the most appropriate and that any potential conflicts or problems are identified and solved prior to approval.

2.3 Environmental Restoration Program Description

The goal of the SRS Environmental Restoration (ER) Program is to investigate, and if needed, remediate releases of hazardous substances to minimize or eliminate potential risks to human health and the environment. SRS personnel began inventorying waste units in 1981 and have identified 477 inactive waste and groundwater units to date. Waste units range in size from a few square feet to tens of acres and include basins, pits, piles, burial grounds, landfills, tanks, and groundwater contamination. Soil, groundwater, and surface water have been contaminated with radionuclides and hazardous chemicals as a result of 40 years of site operations (WSRC, 1998).

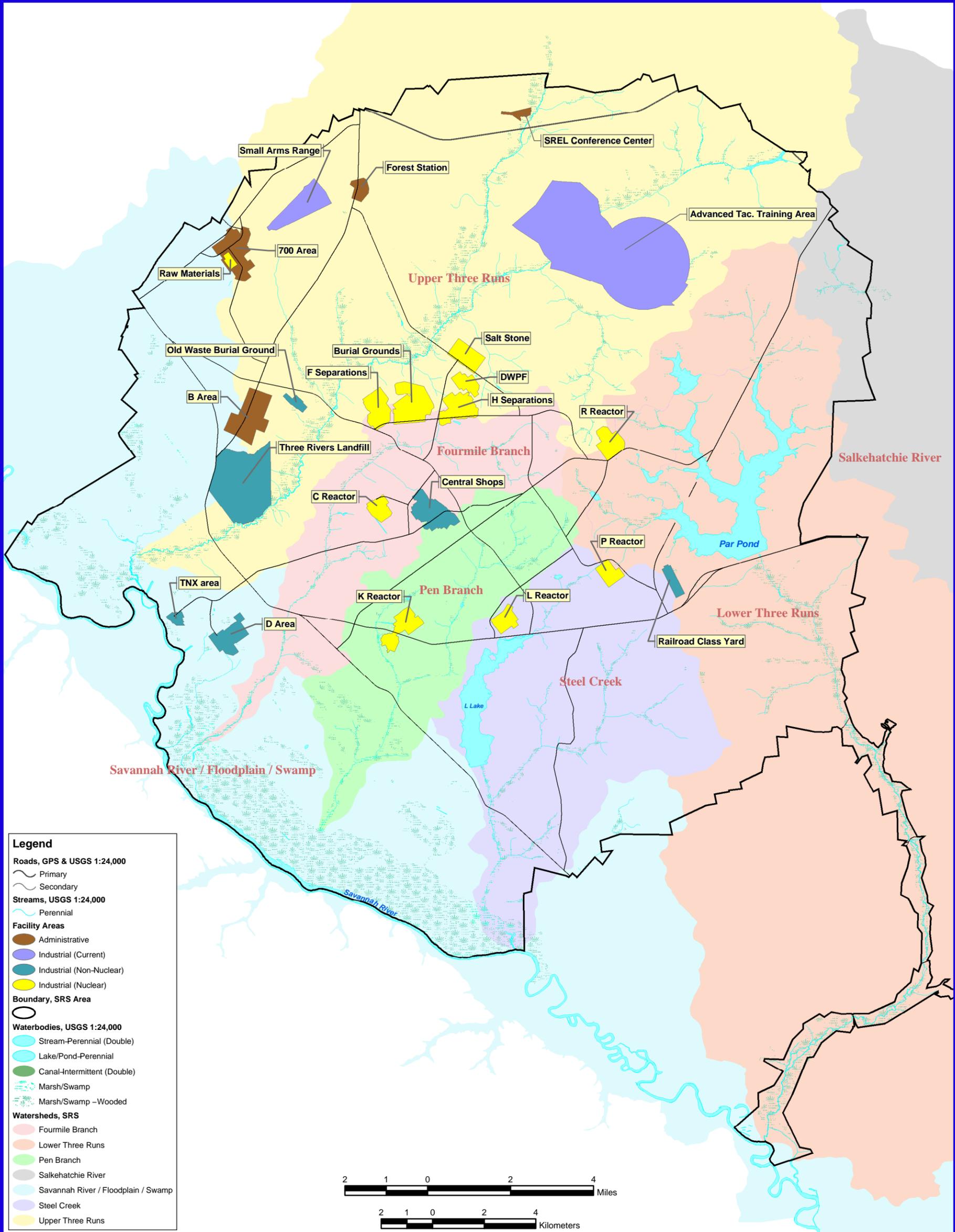
Remediation of the waste units is regulated under the RCRA 3004 (u), 3004 (v), 3005, and CERCLA. In 1993, SRS entered into a Federal Facility Agreement (FFA) with the USEPA and the SCDHEC to ensure that the environmental impacts associated with past and present activities at SRS were thoroughly investigated, and that appropriate corrective/remedial action would be taken to protect public health and welfare and the environment. Figure 1 depicts the watersheds within the SRS. The current industrial areas with buffers, heavy industrial (nuclear facility) areas, heavy industrial (non-nuclear facility) areas, and administrative facility areas are also shown on Figure 1. Figures 2 through 7 show the ER waste units that have been, are currently undergoing, or are planned for investigation and remediation, if needed, within each watershed. Tables 1 through 6 provide a list of the waste units within each watershed that have land use controls/institutional controls as part of the selected remedy. As the three Parties agree upon remedial decisions, the figures and table will be updated to highlight those waste units that require LUCs as part of the remedial decision. Appendix C provides a more comprehensive listing of the waste units in each watershed.

Because the SRS is currently and will likely remain under Federal ownership, the SROO desires future site remedy decisions that take land use into account. The Parties agree that when LUCs are necessary to assure the reliability of land use assumptions, a plan is needed to ensure that LUCs will be maintained for as long as necessary to keep the selected remedy fully protective of human health and the environment.

LUCs include, but are not limited to, institutional controls, and are defined in Appendix A of this document. Institutional controls are actions that may be used to supplement engineering controls to prevent or limit exposure to contaminants at a site to ensure protection of human health. Institutional controls may be applied to limit or prevent exposures to contaminants and to ensure that selected land uses are maintained. The advantage of these administrative mechanisms is that they can be employed to provide flexibility in the risk decision-making process. Institutional controls also mitigate health risks by physically restricting land use at a waste unit. These controls may include fences, security guards, warning signs, deed restrictions, and land-use restrictions.

Savannah River Site

Land Use Map - LUCAP



Legend

Roads, GPS & USGS 1:24,000

- Primary
- Secondary

Streams, USGS 1:24,000

- Perennial

Facility Areas

- Administrative
- Industrial (Current)
- Industrial (Non-Nuclear)
- Industrial (Nuclear)

Boundary, SRS Area

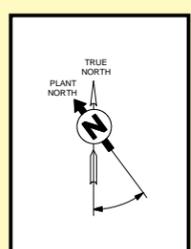
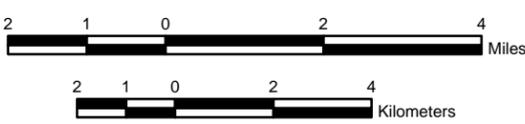
- SRS Area Boundary

Waterbodies, USGS 1:24,000

- Stream-Perennial (Double)
- Lake/Pond-Perennial
- Canal-Intermittent (Double)
- Marsh/Swamp
- Marsh/Swamp -Wooded

Watersheds, SRS

- Fourmile Branch
- Lower Three Runs
- Pen Branch
- Salkehatchie River
- Savannah River / Floodplain / Swamp
- Steel Creek
- Upper Three Runs



Projection: Universal Transverse Mercator
 Datum: North American Datum 1927
 Zone: 17

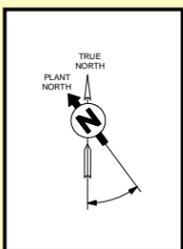
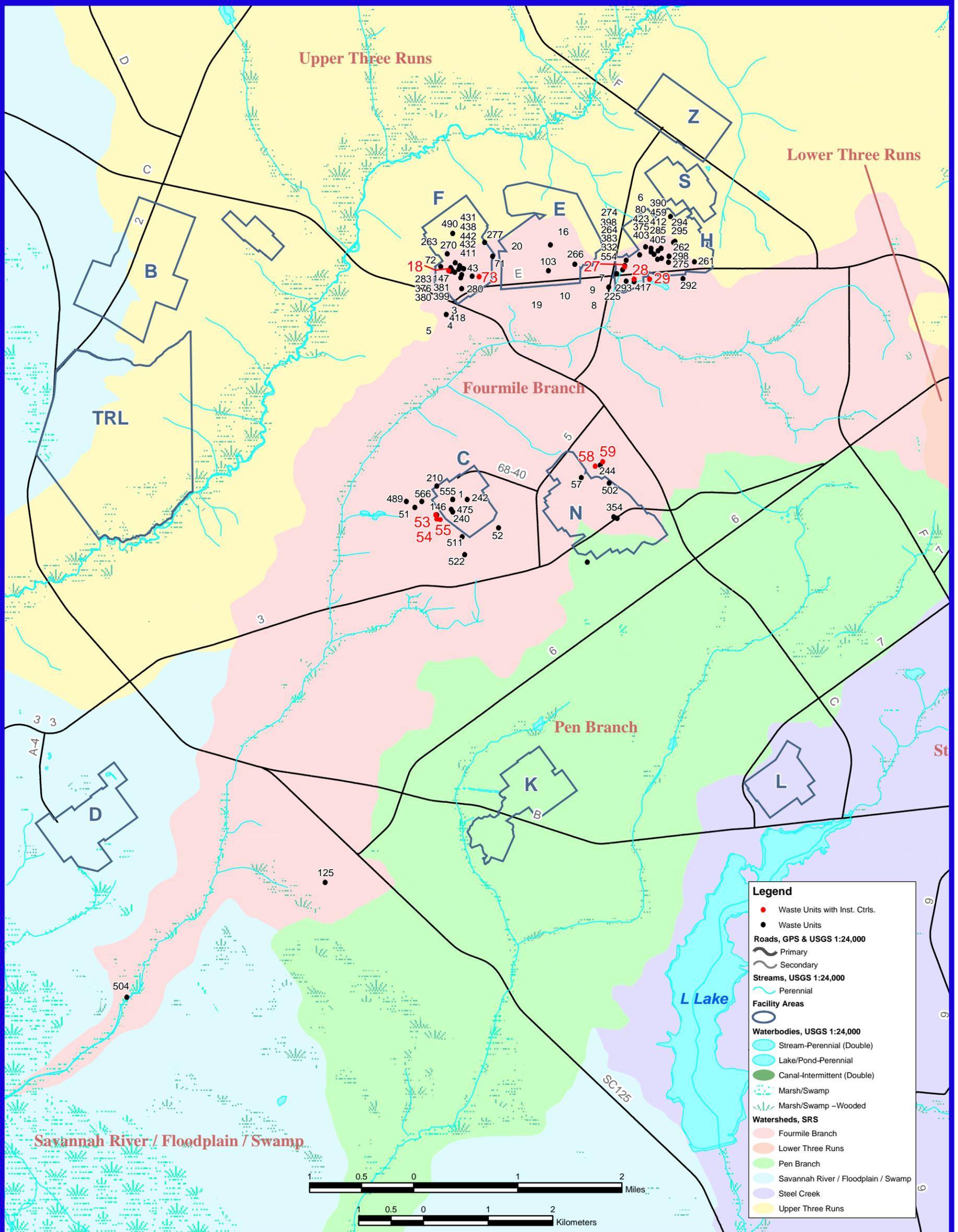
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EGIS	S-G	SOIL AND GEOSPHERE	CLIMATE PROJECTS
Land Use Map -LUCAP			
CREATED BY: Chris Shanks	DATE: 05/01/03	APPROVED BY: Gerry Stejskal	DATE: 05/01/03

Savannah River Site

Map of Fourmile Branch Waste Units - LUCAP



Projection: Universal Transverse Mercator
Datum: North American Datum 1927
Zone: 17

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Aiken, South Carolina



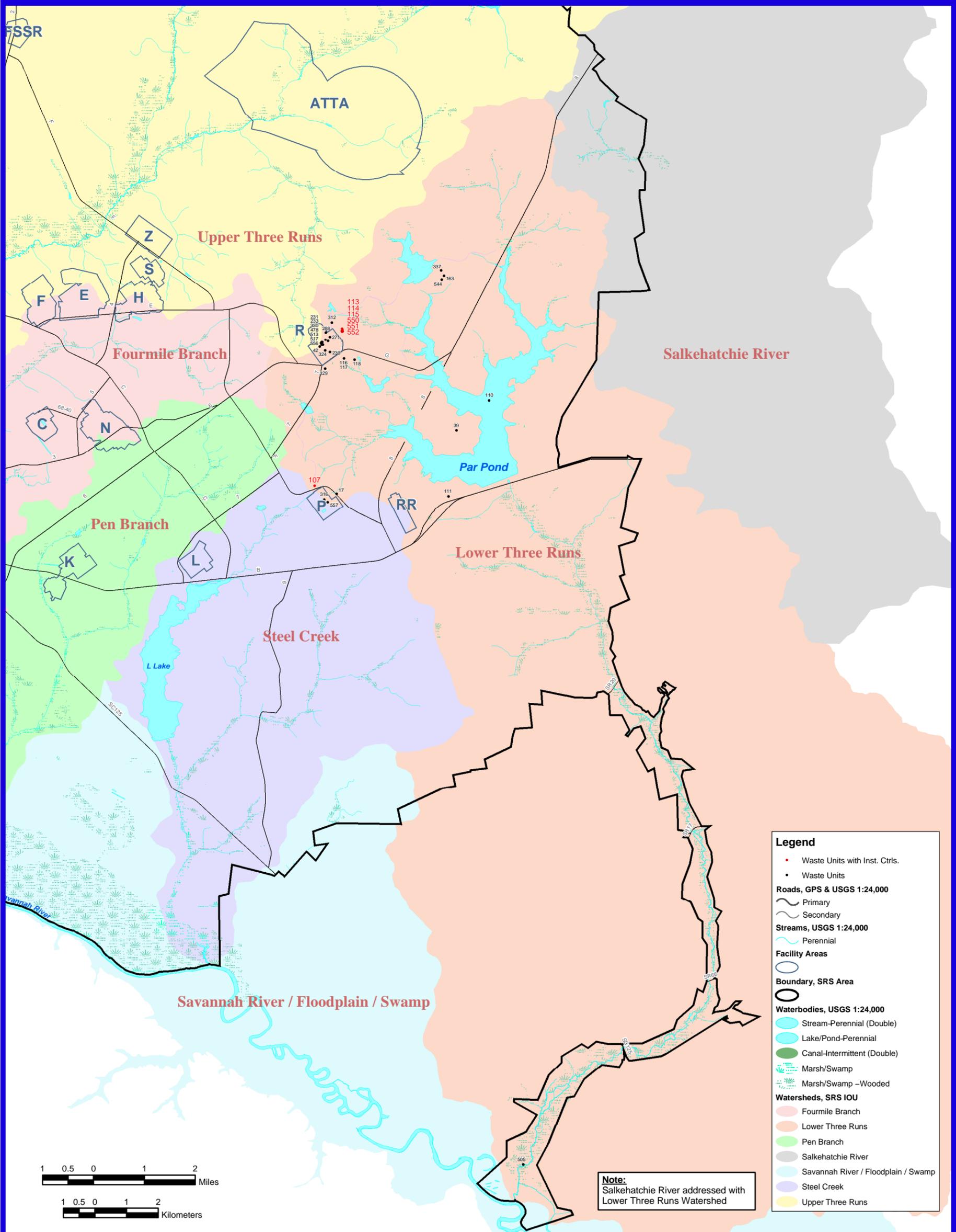
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Map of Fourmile Branch Waste Units - LUCAP			
PREPARED BY: Chris Shanks	DATE: 04/23/03	APPROVED BY: Gerry Shestak	DATE: 04/23/03

Table 1. Fourmile Branch Watershed Waste Units That Have Land Use Controls/Institutional Controls As A Component of the Selected Remedy

Unit No.	Unit Name
18	Old Radioactive Waste Burial Ground (Including Solvent Tanks) (643-E)
27	Warner's Pond (685-23G)
28	H-Area Seepage Basin (281-3H)
29	HP-52 Ponds
53	C-Area Reactor Seepage Basin, 904-66G
54	C-Area Reactor Seepage Basin, 904-67G
55	C-Area Reactor Seepage Basin, 904-68G
58	Central Shops Burning/Rubble Pit, 631-1G
59	Central Shops Burning/Rubble Pit, 631-3G
73	F-Area Retention Basin, 281-3F

Savannah River Site

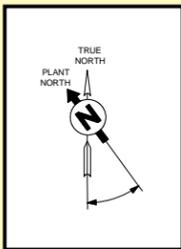
Map of Lower Three Runs Waste Units - LUCAP



Legend

- Waste Units with Inst. Ctrls.
- Waste Units
- Roads, GPS & USGS 1:24,000**
 - ~ Primary
 - ~ Secondary
- Streams, USGS 1:24,000**
 - ~ Perennial
- Facility Areas**
 - Boundary, SRS Area
- Waterbodies, USGS 1:24,000**
 - ~ Stream-Perennial (Double)
 - ~ Lake/Pond-Perennial
 - ~ Canal-Intermittent (Double)
 - ~ Marsh/Swamp
 - ~ Marsh/Swamp -Wooded
- Watersheds, SRS IOU**
 - ~ Fourmile Branch
 - ~ Lower Three Runs
 - ~ Pen Branch
 - ~ Salkehatchie River
 - ~ Savannah River / Floodplain / Swamp
 - ~ Steel Creek
 - ~ Upper Three Runs

Note:
Salkehatchie River addressed with Lower Three Runs Watershed



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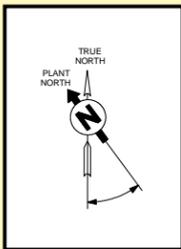
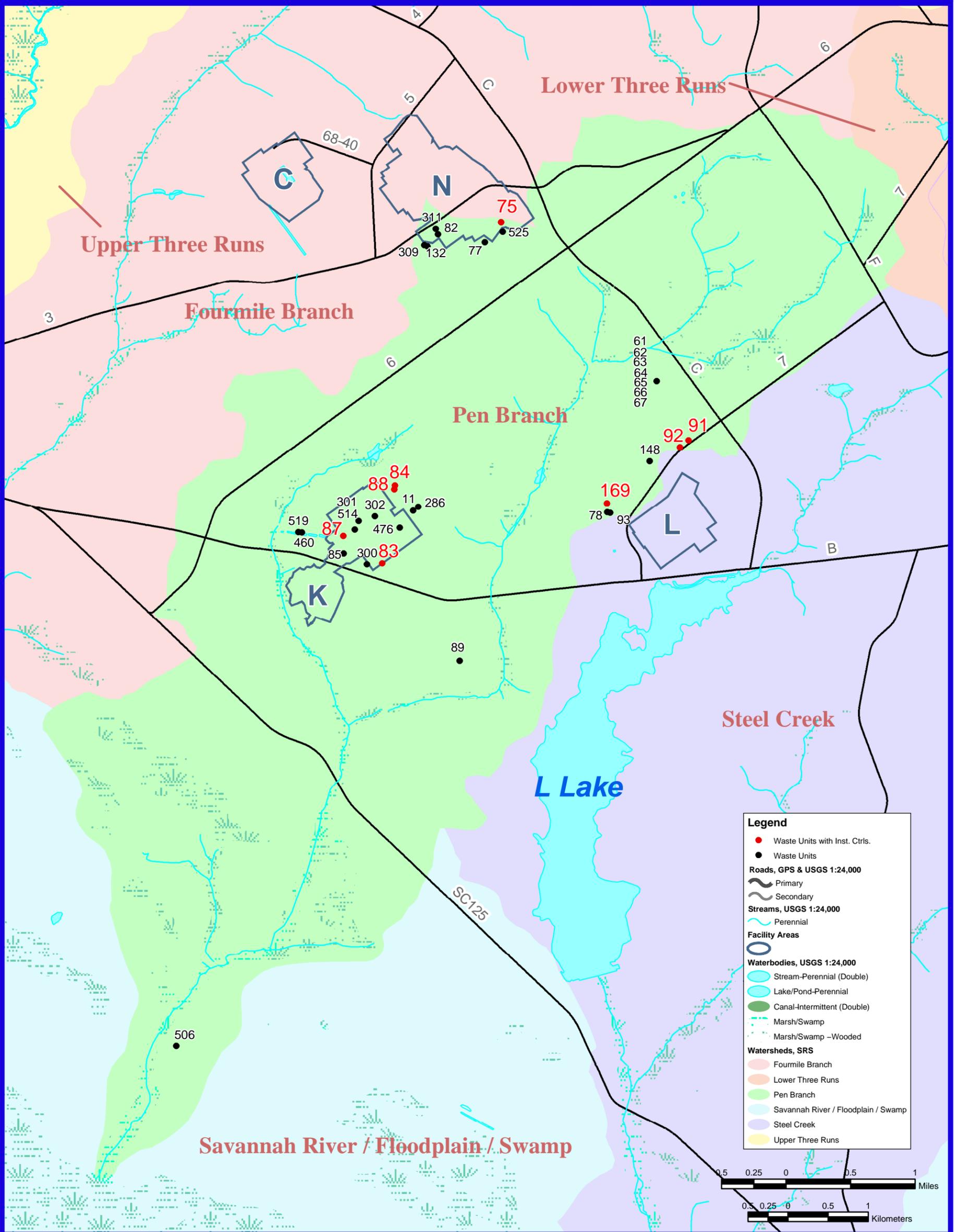
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EGIS S&G
Map of Lower Three Runs Waste Units -LUCAP
DATE: 04/23/03
APPROVED BY: Gerry Bengtson
DATE: 04/23/03

Table 2. Lower Three Runs Watershed Waste Units That Have Land Use Controls/Institutional Controls As A Component of the Selected Remedy

Unit No.	Unit Name
107	P-Area Bingham Pump Outage Pit, 643-4G
113	R-Area Bingham Pump Outage Pits, 643-10G
114	R-Area Bingham Pump Outage Pits, 643-8G
115	R-Area Bingham Pump Outage Pits, 643-9G
550	R-Area Unknown Pit #1 (RUNK-1), NBN
551	R- Area Unknown Pit #2 (RUNK-2), NBN
552	R- Area Unknown Pit #3 (RUNK-3), NBN

Savannah River Site

Map of Pen Branch Waste Units - LUCAP



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EGIS S&G SRS AND UNDERPINNER COLLABORATION

Map of Pen Branch Waste Units -LUCAP

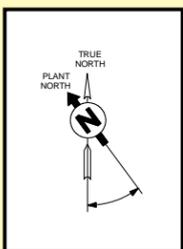
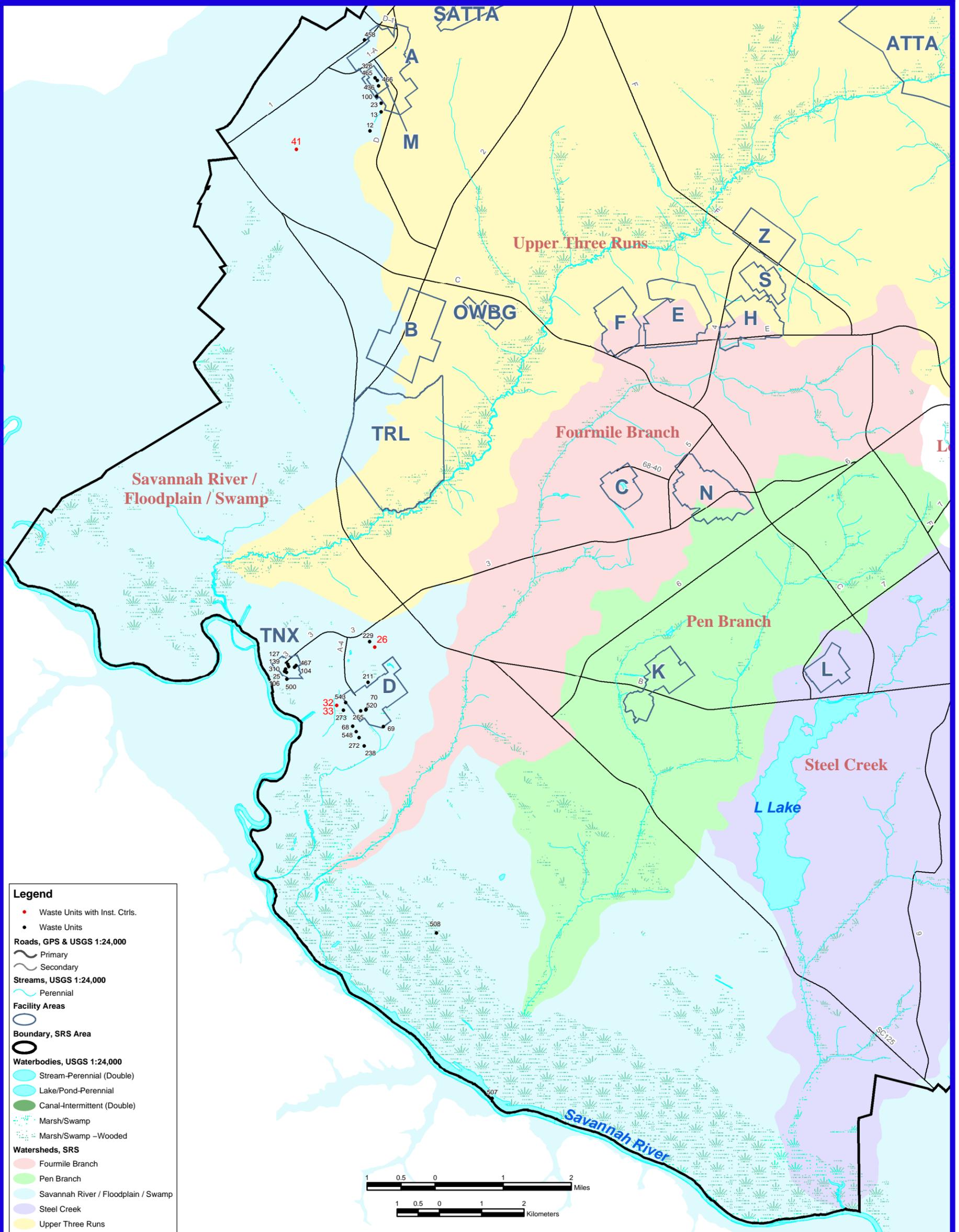
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Table 3. Pen Branch Watershed Waste Units That Have Land Use Controls/Institutional Controls As A Component of the Selected Remedy

Unit No.	Unit Name
75	Ford Building Seepage Basin, 904-91G
83	K-Area Bingham Pump Outage Pit, 643-1G
84	K-Area Burning/Rubble Pit, 131-K
87	K-Area Reactor Seepage Basin, 904-65G
88	K-Area Rubble Pile, 631-20G
91	L-Area Bingham Pump Outage Pit, 643-2G
92	L-Area Bingham Pump Outage Pit, 643-3G
169	L-Area Rubble Pile, 131-3L

Savannah River Site

Map of Savannah River / Floodplain / Swamp Waste Units - LUCAP

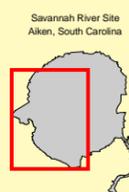


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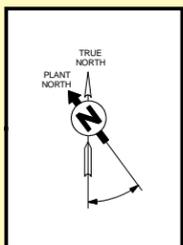
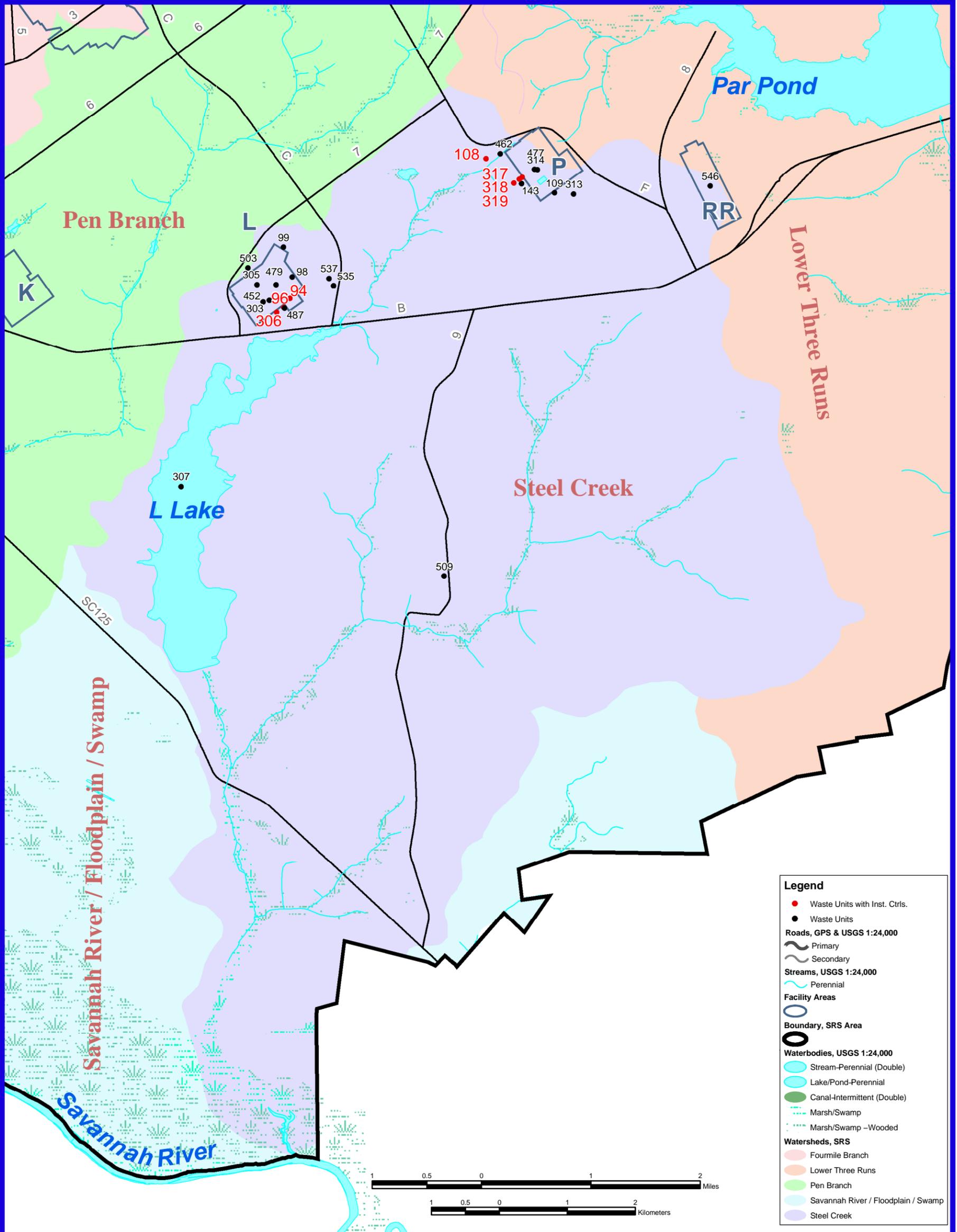
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Map of Savannah River / Floodplain / Swamp Waste Units - LUCAP			
CREATED BY: Chris Shavis	DATE: 04/22/03	APPROVED BY: Gerry Shejkal	DATE: 04/22/03

Table 4. Savannah River Flood Plain Swamp Watershed Waste Units That Have Land Use Controls/Institutional Controls As A Component of the Selected Remedy

Unit No.	Unit Name
26	D-Area Oil Seepage Basin, 631-G
32	D-Area Burning/Rubble Pits, 431-1D
33	D-Area Burning/Rubble Pits, 431-D
41	Silverton Road Waste Site, 731-3A

Savannah River Site

Map of Steel Creek Waste Units - LUCAP



Projection: Universal Transverse Mercator
 Datum: North American Datum 1927
 Zone: 17

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 Aiken, South Carolina

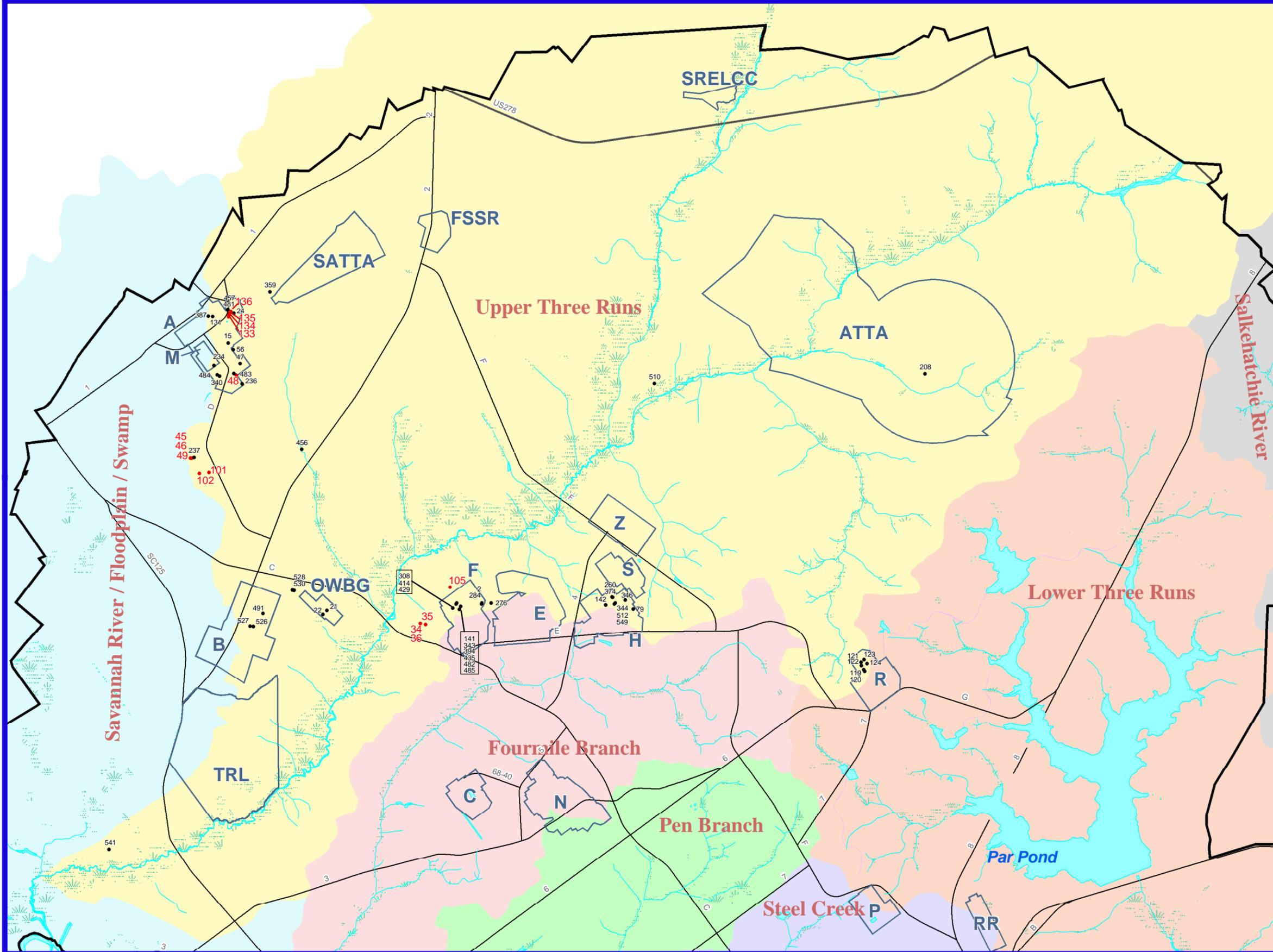


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EGIS	SG	Green	
Map of Steel Creek Waste Units - LUCAP			
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Chris Shanks	04/21/03	Gary Shepsal	04/21/03

Table 5. Steel Creek Watershed Waste Units That Have Land Use Controls/Institutional Controls As A Component of the Selected Remedy

Unit No.	Unit Name
94	L-Area Hot Shop (Including Sandblast Area CML-003, NBN), 717-G
96	L-Area Oil/Chemical Basin, 904-83G
108	P-Area Burning/Rubble Pit, 131-P
306	L-Area Reactor Seepage Basin, 904-064G
317	P-Area Reactor Seepage Basin, 904-061G
318	P-Area Reactor Seepage Basin, 904-062G
319	P-Area Reactor Seepage Basin, 904-063G

Savannah River Site
Map of Upper Three Runs Waste Units - LUCAP



Legend

- Waste Units with Inst. Ctrls.
- Waste Units
- Roads, GPS & USGS 1:24,000**
 - Primary
 - Secondary
- Streams, USGS 1:24,000**
 - Perennial
- Facility Areas**
- Boundary, SRS Area
- Boundary, SRS Area
- Waterbodies, USGS 1:24,000**
 - Stream-Perennial (Double)
 - Lake/Pond-Perennial
 - Canal-Intermittent (Double)
 - Marsh/Swamp
 - Marsh/Swamp -Wooded
- Watersheds, SRS**
 - Fourmile Branch
 - Lower Three Runs
 - Pen Branch
 - Salkehatchie River
 - Savannah River / Floodplain / Swamp
 - Steel Creek
 - Upper Three Runs



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ERWU292G5 1 10/22/03 SRS

EGIS S-G SRS

Map of Upper Three Runs Waste Units -LUCAP

CREATED BY: Chris Shanks DATE: 04/22/03 APPROVED BY: Gerry Stejskal DATE: 04/22/03

Figure 7 Page 14 of 24

Table 6. Upper Three Runs Watershed Waste Units That Have Land Use Controls /Institutional Controls As A Component of the Selected Remedy

Unit No.	Unit Name
34	F-Area Burning/Rubble Pits, 231-1F
35	F-Area Burning/Rubble Pits, 231-2F
36	F-Area Burning/Rubble Pits, 231-F
45	A-Area Burning/Rubble Pit, 731-1A
46	A-Area Burning/Rubble Pit, 731-A
48	A-Area Miscellaneous Rubble Pile, 731-6A
49	A-Area Rubble Pit, 731-2A
101	Miscellaneous Chemical Basin, 731-4A
102	Metals Burning Pit, 731-5A
105	Old F-Area Seepage Basin, 904-49G
133	SRL Seepage Basin, 904-51G1
134	SRL Seepage Basin, 904-53G2
135	SRL Seepage Basin, 904-54G
136	SRL Seepage Basin, 904-55G

3.0 LAND USE CONTROL GOALS, OBJECTIVES, AND STRATEGIES

3.1 Purpose

This LUCAP was developed to assure the effectiveness and reliability of the required LUCs for as long as any LUCs continue to be required in order for the response action to remain protective. The requirements described herein are only applicable to those waste units listed in the Federal Facility Agreement (FFA, 1993) Appendices C and H, for which LUCs were selected as part of the corrective/remedial action.

For the units in Appendix H, the LUC requirements are discussed and approved as part of the closure/post-closure/permit application process for these waste units.

As the corrective/remedial action that includes LUCs is selected for individual waste units, a unit-specific Land Use Control Implementation Plan (LUCIP) will be developed. Appendix B of this LUCAP contains the unit-specific LUCIPs. As LUCIPs are finalized and appended to this LUCAP, Appendix B will be updated to reflect any additions or deletions of units that require LUCs as part of the selected remedy. Table B-1 provides a list of all LUCIPs that are a part of this LUCAP. Copies of all updates will be distributed to the USEPA and the SCDHEC for inclusion in their copies of the LUCAP.

3.2 Access Controls

3.2.1 On-Site Workers

In accordance with procedures in place and maintained at SRS, use of all lands and waters on the SRS shall be coordinated via the Site Use Program. No use of land (i.e., excavation or any other land use) shall be undertaken without prior approval documented by a Site Use Permit. Also, in accordance with procedures, all work at SRS that adds or modifies features or facilities portrayed on the SRS development maps (i.e., plot plans of facilities/utilities at SRS) is authorized by a Site Clearance Permit before execution. All Site Clearance requests are reviewed to verify that either an approved Site Use Permit has been obtained, or that an existing Site Use Permit has sanctioned the request. Verification of the USDOE approval for intended land use must be obtained before issuance of a Site Clearance Permit. The Site Use and Site Clearance processes are applicable to all activities and personnel on site (including subcontractors). The processes are controlled within the SRS Quality Assurance Program.

The SRS identifies all buildings and facilities on maps used in the Site Use/Site Clearance Program and includes a 200-foot buffer zone around each facility. Each waste unit is identified on these maps.

Any work proposed at the waste units will be strictly controlled and workers will be appropriately trained and briefed about health and safety requirements if work is deemed necessary for maintenance. Any changes in the use or disturbance of the waste units will

require advance notification to the USEPA and the SCDHEC before the disturbance occurs. To prevent unknowing entry and to ensure that unrestricted use of the waste units do not occur while under the ownership of the government, identification signs will be posted at the waste unit access points. Figures will be included in the unit-specific LUCIPs that indicate where the signs will be posted. The signs will be legible from a distance of at least 25 feet. The signs will read:

Waste Unit Name and Building Number
“Danger – Unauthorized Personnel Keep Out.
This waste unit was used to manage hazardous substances.
Do not dig or excavate. Do not enter without contacting the
waste site custodian.”
Custodian: Manager, Post Closure Maintenance
Phone: (803) 952-6882

3.2.2 Trespassers

Additionally, while under the ownership of the USDOE, access control of the entire SRS will continue to be maintained in accordance with the 1992 RCRA Part B Permit Renewal Application, Volume I, Section F.1. This section describes the security procedures and equipment (R.61-79.264.14; 270.14(b)(4)), 24-hour surveillance system (R.61-79.264.14(b)(1)), artificial or natural barriers (R.61-79.264.14(b)(2)(i)), control entry systems (R.61-79.264.14(b)(2)(ii)), and warning signs (R.61-79.264.14(c)) in place at the SRS boundary to comply with the security requirements for a RCRA-permitted facility.

3.3 Federal Facility Program and Point-of-Contact

The person responsible for ensuring that unit-specific LUCIPs and the LUCAP are monitored, maintained, and enforced is the Manager of the SROO. The SROO Assistant Manager for Closure Project is the point-of-contact and can be reached as follows:

US Department of Energy
Assistant Manager for Closure Project
Soils and Groundwater Closure Project
P. O. Box A
Aiken, SC 29802

Phone: (803) 952-8394

Federal Express deliveries: SRS Road 1 should be used instead of the P. O. Box.

3.4 Funding

The Parties expect that all obligations of the SROO arising under the LUCAP will be fully funded through congressional appropriations. Consistent with congressional limitations on future funding, the USDOE SROO will use its best efforts to request timely funding to meet its obligations under this plan.

If appropriate funds are not available to fulfill SROO's obligations, USEPA and SCDHEC will be notified as soon as the SROO is aware of the potential shortfall.

3.5 Decision Documents

The Parties agree when unit-specific LUCs are to be implemented, an adequate description of the LUCs along with conditions for their use should be included in the appropriate decision documents (i.e., proposed plan, record of decision (ROD), RCRA permit, as appropriate, etc.) that reflects the selected remedy for a unit. Additionally, Appendix D of this document contains a sample of the standard language for inclusion in such decision documents.

During the 5-year ROD reviews or RCRA permit renewals, the need for LUCIPs for decision documents approved prior to April 21, 1998, in which LUCs were selected as part of the remedy, will be decided. A LUCIP will then be developed as agreed to by the three Parties.

3.6 Land Use Control Implementation Plan

As a component of the post-ROD documentation for waste units that require LUCs as part of the corrective measure/remedial action, a unit-specific LUCIP must be developed and approved following remedy selection through the unit-specific ROD and permit modification. The LUCIP should:

- a) identify the area that is under restriction via a survey plat that is certified by a professional land surveyor. In the case of LUCs and groundwater, an appropriate survey will be prepared to delineate the groundwater under LUCs;
- b) identify each LUC objective for the waste unit (e.g., prohibit residential use, etc.); and
- c) specify the specific controls and mechanisms required to achieve each identified objective (e.g., install/maintain a fence, post warning signs, etc.).

For waste units where the corrective measure/remedial action is institutional controls only, a single post-ROD document identifying the LUCs will be developed. For waste units where institutional controls are combined with an active corrective measure/remedial action, the LUCIP will be developed as an appendix to the agreed upon post-ROD document (i.e., the Corrective Measures/Remedial Design Work Plan, the Corrective Measures/Remedial Design Report, the Corrective Measures/Remedial Action

Work Plan, post-Construction Report, etc., or any combination of the listed documents). Upon approval, each unit-specific LUCIP will be appended to this LUCAP to serve as a single source for documenting all LUCs.

If a 5-year ROD review or RCRA permit renewal analysis determines that a LUCIP should be required for any LUC selected in a decision document approved prior to April 21, 1998, that LUCIP will be developed and included in Appendix B.

3.7 Monitoring and Field Inspections

For waste units that require LUCs, quarterly on-unit monitoring will be performed throughout the remediation period, unless the Parties, in the unit-specific LUCIP, approve another monitoring frequency. Justification for a different monitoring frequency will be provided in the unit-specific LUCIP, where appropriate. In addition, field inspections will be conducted at least annually to assess the conditions of all units subject to LUCs. These inspections are to be conducted to determine whether the current land use remains protective and consistent with all corrective measure/remedial action objectives outlined in the unit-specific decision documents (e.g., engineering controls remain in place, etc.). The mechanisms and methodology for the monitoring and field inspections will be established in the unit-specific LUCIPs.

3.8 Notifications

3.8.1 Major Land Use Changes

In the event that SROO anticipates any “major changes in land use” for the waste units subject to LUCs, the SROO shall determine whether the contemplated changes will or will not necessitate the need for re-evaluation of the selected response action or implementation of specific measures to ensure continued protection of human health and the environment. The SROO shall evaluate such changes that impact RODs pursuant to 40 CFR 300.430(f)(3)(ii) and 40 CFR 300.435(c)(2). The SROO will notify the USEPA and the SCDHEC in writing of such changes at least sixty (60) days prior to the initiation of such changes to obtain USEPA and SCDHEC positions on the proposed changes. Each notification shall include:

- a) an evaluation of whether the anticipated land use change will pose unacceptable risks to human health and the environment or negatively impact the effectiveness of the remedy;
 - b) an evaluation of the need for any additional remedial action(s) resulting from the anticipated land use changes; and
 - c) a proposal for any necessary changes to the selected remedial action and identification of documentation requirements (e.g., ROD amendments, ROD Explanation of Significant Differences, RCRA permit modification, etc.) for the proposed changes.
-

Upon notification by the SROO of an anticipated major land use change, the US EPA and the SCDHEC shall evaluate the information provided and shall issue comments within sixty (60) days so as to minimize any potential adverse impacts to the SRS activities or operations. Together with such comments, the USEPA and SCDHEC will each indicate their agreement or disagreement with USDOE's determinations as to whether the anticipated change in use, considering any changes to the selected remedial action(s) and/or implementation of additional measures proposed by USDOE, will ensure continued protection of human health and the environment. In the event USDOE proceeds with a major land use change that USEPA and/or SCDHEC determine will render a selected remedial action no longer protective of human health and the environment, USEPA and/or SCDHEC may take any action consistent with their respective authorities under applicable laws to ensure continued protection of human health and the environment.

The Parties agree that "major changes in land use" are defined as:

- a) a change in land use that is inconsistent with the exposure assumptions in the risk assessment that was the basis for the LUCs (either human health or ecological risk assessment). Examples include: the human health risk assessment assumed that a unit is in "caretaker" status with a worker visiting the waste unit once a week for 2 hours, and the proposed change would have the worker at the waste unit for 8 hours a day, 5 days a week; any change from industrial, commercial, or recreational land use to a more sensitive land use, such as housing, schools, hospitals, and/or daycare centers is a major land use change; any change from industrial or commercial land use to recreational land use; any change in a land use that has been prohibited in order to protect the environment;
- b) any action that may disrupt the effectiveness of the remedial action. For example, excavation at a landfill, groundwater pumping that may impact a groundwater pump and treat system, or a construction project that may result in unacceptable exposure to an ecological habitat protected by the remedy; and
- c) any other action that might alter or negate the need for the LUC. For example, any plan to actively remediate a waste unit subject to LUCs in order to allow for unrestricted land use.

In addition, the SROO will immediately notify the USEPA and the SCDHEC upon discovery of any activity inconsistent with any LUCIP. This notification will provide all pertinent information as to the nature and extent of the change and describe any measures implemented or to be implemented (to include a timetable for future completion) to reduce or prevent human health or ecological impacts.

3.8.2 Property Transfer

In the event that the SROO determines to enter into any contract for the sale or transfer of any of the SRS, the SROO will comply with the requirements of Section 120(h) of CERCLA, 42 United States Code § 9620(h), in effectuating that sale or transfer, including all notice requirements. In addition, the SROO will include notice of the FFA in any document transferring ownership or operation of the SRS to any subsequent owner and/or operator of any portion of the SRS and will notify USEPA and SCDHEC of any such sale or transfer at least ninety (90) days prior to such sale or transfer while the FFA is in effect. No property transfer of the SRS or any portion thereof or notice pursuant to Section 120(h) of CERCLA, 42 United States Code § 9620(h), will relieve the SROO of its obligation to perform remediation pursuant to the FFA. No property transfer of the SRS or any portion thereof will be consummated by the SROO without provision for continued maintenance of any containment system, treatment system, or other response action(s) installed or implemented pursuant to the FFA. In the event of any property transfer of the SROO or any portion thereof, USDOE will consider the need for measures to ensure continued maintenance of any LUCs selected as part of a response action associated with the unit subject to transfer. The USDOE will include in the above-referenced notice of transfer a discussion of its conclusions regarding the need for any such measures and any specific measures to be employed attendant to the transfer.

3.9 Certification

The Manager, SROO, will annually certify that SRS is in compliance with all unit-specific LUCIP requirements in the FFA Annual Progress Report. The annual report will also serve to notify the USEPA and the SCDHEC of any change in the designated officials or of land use changes that are not considered major as described in Section 3.8.1 of this document.

3.10 Change in Applicable or Relevant and Appropriate Standards

Nothing included in this LUCAP should be construed to preclude SRS from proposing at any time or from the Parties otherwise agreeing to effect the deletion of any unit from coverage under the terms of this LUCAP on account of either:

- a) a post-remedy implementation change to applicable or relevant and appropriate Federal or State cleanup standards; or
- b) a change in previously documented contaminant concentration levels allowing for unrestricted use.

3.11 Future Communications

In accordance with FFA Section XXVIII, the FFA Project Managers shall receive all correspondence and communications on behalf of the Parties pertaining to all matters falling under the terms of this LUCAP.

3.12 Site Access

All Parties agree to use the procedures set forth in the FFA, Section XXX. Access/Data/Document Availability, regarding site access and data and document availability with regards to this LUCAP.

3.13 Reservation of Rights

It is agreed and understood that the USEPA and SCDHEC reserve all rights and authorities each agency may currently have or hereafter acquire by law to require SRS to comply with those Federal and State laws and regulations applicable to the investigation, cleanup, and near- and long-term maintenance of those waste units to be covered by this LUCAP. It is also understood that the SROO herein reserves those rights and authorities granted to the SROO by Federal or State law, regulation, or executive order. The SROO further reserves the right to put all property under its domain to those uses deemed necessary for mission accomplishment or otherwise deemed necessary by appropriate authority to meet the needs of the SROO.

3.14 Anti-Deficiency Act

No provision in this document shall be interpreted to require obligation or payment of funds in violation of the Anti-Deficiency Act (31 United States Code §1341).

3.15 Amendments

Any minor modifications to the LUCAP Memorandum of Agreement (MOA) and/or this LUCAP incorporated herein shall be made effective upon written approval of the Parties' FFA Project Managers. Any major modification shall be made effective upon the written approval by each of the signatories to the MOA (or their successors). A modification will be considered major if so determined by any of the three Parties hereto.

3.16 Effective Date

The LUCAP shall become effective on the date that the last of the authorized representatives of the Parties signs the MOA incorporating this LUCAP. The LUCAP requirements shall then apply to LUCs in any corrective measure/remedial action for which the decision document was approved on or after April 21, 1998.

4.0 REFERENCES

Federal Facility Agreement (FFA), 1993. *Federal Facility Agreement for the Savannah River Site*, Administrative Docket Number 89-05-FF, Effective Date: August 16, 1993, WSRC-OS-94-42.

Johnston, J. D. (EPA-Region IV), 1998. *EPA Region IV Policy, Assuring Land Use Controls at Federal Facilities*, Letter to T. Heenan (DOE-SR) (April 21).

WSRC, 1998. *Management Action Plan*, WSRC-MS-95-0054, Revision 5.0, Westinghouse Savannah River Company, Aiken, SC (May).

5.0 APPENDICES

Appendix A - Definitions

Appendix B - Waste Unit-Specific Land Use Control Implementation Plans

Appendix C - Maps and Tables of Waste Units Within Each Watershed

Appendix D - Sample Land Use Control Language for Inclusion in Decision Documents

Appendix E - Memorandum of Understanding

Appendix F - Modification Record

Appendix G - Annual Land Use Certification Required Under Section 3.9

APPENDIX A

DEFINITIONS

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CERCLA, as defined in the NCP, is the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986.

Decision Document, as defined in the EPA Region IV Policy, refers to Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Records of Decision, Resource Conservation and Recovery Act (RCRA) Statement of Basis/Notices of Decision, and RCRA Permit Modifications.

Facility, as defined in the EPA Region IV Policy, refers to a military base or other entire federal installation.

Land Use Control (LUC), as defined in the EPA Region IV Policy and in regard to real property on federal facilities, means any restriction or control that limits the use of and/or exposure to any portion of that property, including water resources, arising from the need to protect human health and the environment. The term encompasses “institutional controls”, such as those involved in real estate interests, governmental permitting, zoning, public advisories, deed notices, and other “legal” restrictions. The term may also include restrictions on access, whether achieved by means of engineered barriers (e.g., fence or concrete pad) or by human means (e.g., the presence of security guards). Additionally, the term may involve both affirmative measures to achieve the desired restrictions (e.g., night lighting of an area) and prohibitive directives (e.g., no drilling of drinking water wells). Considered altogether, the LUCs for a facility will provide a tool for how its property should be used in order to maintain the level of protectiveness that one or more remedial/corrective actions were designed to achieve.

Land Use Control Assurance Plan (LUCAP), as defined in the EPA Region IV Policy, is a written facility-wide plan that sets out the procedure to assure LUCs remain effective over the long-term for all areas at the particular facility where they are required.

Land Use Control Implementation Plan (LUCIP), as defined in the EPA Region IV Policy, is a written plan, normally developed after a decision document has required one or more LUCs for some particular area (e.g., operable unit, contaminated unit, and/or solid waste management unit), that

- (1) identifies each LUC objective for that area (e.g., to restrict public access to the area for recreational use) and
- (2) specifies those actions required to achieve each identified objective (e.g., install/maintain a fence, post warning signs, record notice in deed records).

LUCIPs specify what must be done to impose and maintain the required LUCs, and are therefore analogous to design and/or operation and maintenance plans developed for active remedies.

Monitoring, as defined in the EPA Region IV Policy, is used to indicate a variety of investigative activities, ranging from “drive-by” visual observations to detailed scientific sampling and testing. The nature of the particular LUCs being implemented will

determine the type(s) and extent of any “monitoring” activities provided at an operable unit.

Proposed Plan(s), as defined in the FFA, mean the report(s) describing the corrective/remedial action(s) recommended for a waste unit, Section 117(a) of CERCLA, 42 USC § 9617.

RCRA is the Resource Conservation and Recovery Act, 1976, a Federal law that established a regulatory system to track hazardous substances from their generation to disposal. The law requires safe and secure procedures to be used in treating, transporting, storing, and disposing of hazardous substances. RCRA is designed to prevent the creation of new, uncontrolled hazardous waste units.

Record(s) of Decision (RODs), as defined in the FFA, mean the document(s) issued as the final corrective/remedial action plan for a waste unit, Section 117(b) of CERCLA, 42 USC § 9617

Statement(s) of Basis, as defined in the FFA, mean the report(s) describing the corrective measure(s)/remedial action(s) being conducted pursuant to South Carolina Hazardous Waste Management Regulations, as amended.

Waste Unit refers to a particular area (such as an “operable unit”) that makes up only a portion of the facility.

APPENDIX B

WASTE UNIT-SPECIFIC LAND USE CONTROL IMPLEMENTATION PLANS

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Table B- 1 Unit-Specific LUCIPs

Unit Name	Document Title	Issuance Date¹	Watershed Figure²
A-Area Burning/Rubble Pits, 731-A and -1A and A-Area Rubble Pit, 731-2A	Appendix A of <i>Post-Construction Report for the A-Area Burning/Rubble Pits, 731-A and -1A and A-Area Rubble Pit, 731-2A</i> , WSRC-RP-2003-4019, Revision.1, July 2003	09/12/2003	7
A-Area Miscellaneous Rubble Pile, 731-6A	Appendix A of <i>Corrective Measures Implementation/ Remedial Action Implementation Plan for A-Area Miscellaneous Rubble Pile, 731-6A</i> , WSRC-RP-2002-4067, Revision.1, July 2003	08/07/2003	7
C-Area Reactor Seepage Basins, 904-66G, -67G, and -68G	Appendix A of <i>Post-Construction Report/Final Remediation Report for C-Area Reactor Seepage Basins, 904-66G, -67G, and 68G</i> , WSRC-RP-2002-4219, Revision.1, January 2003	03/19/2003	2
Central Shops Burning/Rubble Pits, 631-1G and 631-3G	Appendix A of <i>Corrective Measures Implementation/ Remedial Action Implementation Plan for Central Shops Burning/Rubble Pits, 631-1G and 631-3G</i> , WSRC-RP-2003-4018, Revision.1, August 2003	09/12/2003	2
D-Area Oil Seepage Basin, 631-G	Appendix B of <i>Corrective Measures Implementation/ Remedial Design/Remedial Design Report/Remedial Action Workplan for the D-Area Oil Seepage Basin, 631-G</i> , WSRC-RP-99-4006, Revision.1, August 1999	08/16/1999	5

Table B-1. Unit-Specific LUCIPs (Continued)

Unit Name	Document Title	Issuance Date ¹	Watershed Figure ²
F-Area Retention Basin, 281-3F	Appendix A of <i>Corrective Measures Implementation/ Post-Construction Report/ Final Remediation Report for the F-Area Retention Basin, 281-3F</i> , WSRC-RP-2001-4049, Revision.1, September 2001	10/15/2001	2
Ford Building Seepage Basin, 904-91G	Appendix A of <i>Post-Construction Report/ Corrective Measures Implementation Report/Final Remediation Report for the Ford Building Seepage Basin, 904-91G</i> , WSRC-RP-2003-4038, Revision.1, October 2003	09/17/2003	4
General Separations Area Consolidation Unit Consisting of: <ul style="list-style-type: none"> • Old Radioactive Waste Burial Ground (Including Solvent Tanks) (643-E) • HP-52 Ponds • H-Area Retention Basin (281-3H) and Spill on 05/01/1956 of Unknown of Retention Basin Pipe Leak (NBN) • Warner's Pond (685-23G) and Spill on 03/08/1978 of Unknown of Seepage Basin Pile Leak in • H-Area Seepage Basin (NBN) and Spill on 02/08/78 of Unknown of H-Area Process Sewer Line Cave-In, NBN 	Appendix A of <i>Corrective Measures Implementation/ Remedial Action Implementation Plan for the General Separations Area Consolidation Unit</i> , WSRC-RP-2003-4053, Revision.1.1, November 2003	12/12/2003	2

Table B-1. Unit-Specific LUCIPs (Continued)

Unit Name	Document Title	Issuance Date¹	Watershed Figure²
K-Area Bingham Pump Outage Pit, 643-1G	Section 2 of <i>Final Remediation Report for the K-Area Bingham Pump Outage Pit, 643-1G</i> , WSRC-RP-98-4003, Revision.1, August 1998	10/05/1998	4
K-Area Burning/Rubble Pit, 131-K and K-Area Rubble Pile, 631-20G	Appendix D of <i>Post-Construction Report for the K-Area Burning/Rubble Pit and K-Area Rubble Pile Operable Unit</i> , WSRC-RP-2002-4095, Revision.1, October 2002	11/22/2002	4
K-Area Reactor Seepage Basin, 904-65G	Appendix A of <i>Post-Construction Report for the K-Area Reactor Seepage Basin</i> , WSRC-RP-2002-4030, Revision.1, July 2002	09/30/2002	4
L-Area Bingham Pump Outage Pits, 643-2G and – 3G	Section 2.0 of <i>Final Remediation Report</i> , WSRC-RP-2000-4030, Revision.0, March 2000	06/13/2000	4
L-Area Hot Shop, 717-G (Including the CML-003 Sandblast Area)	Appendix A of <i>Corrective Measures Implementation/ Remedial Action Implementation Plan for the L-Area Hot Shop, 717-G (Including the CML-003 Sandblast Area) Operable Unit</i> , WSRC-RP-2003-4021, Revision.1, June 2003	10/27/2003	6
L-Area Oil and Chemical Basin, 904-83G	Appendix A <i>Post-Construction Report/Final Remediation Report for the L-Area Oil and Chemical Basin, 904-83G</i> , WSRC-RP-2001-4078, Revision.1, September 2001	11/05/2001	6
L-Area Reactor Seepage Basin, 904-064G	Appendix A of <i>Post-Construction Report/Final Remediation Report for the L-Area Reactor Seepage Basin</i> , WSRC-RP-2003-4118, Revision.1, February 2004	03/19/2004	6

Table B-1. Unit-Specific LUCIPs (Continued)

Unit Name	Document Title	Issuance Date¹	Watershed Figure²
L-Area Rubble Pile (131-3L) and Groundwater Plume Operable Unit	Appendix A of Post-Construction Report for the L-Area Burning/Rubble Pit (131-L), Gas Cylinder Disposal Facility (131-2L) and L-Area Rubble Pit (131-3L), WSRC-RP-2003-4126, Revision.1, February 2004	03/29/2004	4
Miscellaneous Chemical Basin/Metals Burning Pit, 731-4A and 731-5A	Appendix A of <i>Interim Post-Construction Report for the Miscellaneous Chemical Basin/Metals Burning Pit, 731-4A and 731-5A</i> , WSRC-RP-2002-4038, Revision.1.1, December 2002	03/13/2003	7
Old F-Area Seepage Basin, 904-49G	Appendix A of <i>Post-Construction Report for the Old F-Area Seepage Basin, 904-49G</i> , WSRC-RP-2000-4100, Revision.1, August 2001	08/01/2001	7
P-Area Bingham Pump Outage Pit, 643-4G	Section 2.0 of <i>Final Remediation Report</i> , WSRC-RP-2000-4030, Revision.0, March 2000	06/13/2000	3
P-Area Burning/Rubble Pit, 131-P	Appendix A of <i>Corrective Measures Implementation /Remedial Action Implementation Plan P-Area Burning /Rubble Pit, 131-P</i> , WSRC-RP-2002-4216, Revision.1, August 2003	09/26/2003	6
P-Area Reactor Seepage Basins, 904-61G, -62G, and -63G	<i>Land Use Control Implementation Plan for P-Area Reactor Seepage Basins, 904-61G, -62G, and -63G</i> , WSRC-RP-2003-4139, Revision.1, January 2004	03/03/2004	6
R-Area Bingham Pump Outage Pits, 643-8G, -9G, and -10G and R-Area Unknown Pits #1, #2, and #3, RUNKS-1, -2, and -3	Appendix B of <i>Final Remediation Report for the R-Area Bingham Pump Outage Pits, 643-8G, -9G, and -10G and R-Area Unknown Pits #1, #2, and #3, RUNKS-1, -2, and -3</i> , WSRC-RP-2003-4061, Revision.1, July 2003	08/29/2003	3

Table B-1. Unit-Specific LUCIPs (Continued)

Unit Name	Document Title	Issuance Date¹	Watershed Figure²
SRL Seepage Basins, 904-51G1, - 53G2, -54G, and – 55G	Appendix A of <i>Corrective Measures Implementation Report/Post-Construction Report/Final Remediation Report for the SRL Seepage Basins, 904-51G1, - 53G3, -54G, and -55G</i> , WSRC-RP-2001-4123, Revision.1, February 2002	04/04/2002	7

¹ Date of the latest regulatory approval received.

² This refers to the location of the unit on the watershed figures in the LUCAP.

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LUCIP for the
A-Area Burning/Rubble Pits, 731-A and -1A
and A-Area Rubble Pit, 731-2A

Appendix A of Post-Construction Report for the A-Area Burning/Rubble Pits, 731-A and
-1A and A-Area Rubble Pit, 731-2A

WSRC-RP-2003-4019, Revision.1, July 2003

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Appendix A

Significant Reference Document

Unit-Specific Land Use Control Implementation Plan

for the A-Area Burning/Rubble Pits (731-A/1A) and Rubble Pit (731-2A)

APPENDIX A

LUCIP

A-Area Burning/Rubble Pits and Rubble Pit

Land Use Control Implementation Plan (LUCIP)

The A-Area Burning/Rubble Pits and Rubble Pit (ABRP) LUCIP will be appended to the Savannah River Site (SRS) Land Use Control Assurance Plan (LUCAP) which has been approved by the USDOE, USEPA, and SCDHEC.

Remedy Selection

The ABRP is located in the northwest portion of SRS, approximately 2.4 kilometers (1.5 miles) south of the A/M Area operations and 4.8 kilometers (3 miles) east of the SRS boundary (Figure A-1). The ABRP is located in the Upper Three Runs Creek Watershed and is situated on the west side of Road C-1, a dirt road (Figure A-1). Due to the receipt of waste from A/M Area, the ABRP is being addressed in the SRS Resource Conservation and Recovery Act/Comprehensive Environmental Response, Compensation, and Liability Act (RCRA/CERCLA) program.

Between 1951 and 1973, Pits 731-A and 731-1A were used to burn paper, plastics, wood, rubber, rags, cardboard, oil, degreasers, and solvents. Combustible materials were burned monthly. Pit 731-2A was only used as a rubble pit. After burning was discontinued in 1973, Pits 731-A and 731-1A were also converted to rubble pits and used to dispose of concrete rubble, bricks, tile, asphalt, plastics, metal, wood products, and rubber. When the pits were filled to capacity, they were covered with compacted clay-rich native soils and vegetation was established. The actual closing date is not recorded. However, the

estimated time is 1978. After the last use of Pit 731-2A in 1983, the area was backfilled and seeded.

Ground penetrating radar data show the two Burning/Rubble Pits (731-A/1A) to be approximately 22 feet wide, 9 to 10 feet deep and 250 feet in length. The arial dimensions of the Rubble Pit (731-2A) are believed to be approximately 40 feet (width) by 650 feet (length); the depth is not known, but is suspected to be up to 20 feet. The Pits Area is defined as Pits 731-A, 731-1A, and 731-2A.

Two other areas within the operable unit (OU) were investigated. The first area (designated as the "Potential Pit") has been tentatively identified approximately 500 feet east of the Pits Area (Figure A-1). The Potential Pit was identified based on physical evidence (depression and subsidence) along the ground surface and interviews with SRS personnel. The second area (designated as the "Depressional Area" due to its lower elevation) is located approximately 300 feet east of the Potential Pit (Figure A-1). No specific disposal records or historical use information is available for the Potential Pit or the Depressional Area. The Land Use Controls (LUCs) do not apply to this Potential Pit and Depressional Area.

The IAPP was submitted in accordance with the Federal Facility Agreement (FFA) and the approved implementation schedule, and was approved by the United States Environmental Protection Agency (USEPA) and the South Carolina Department of Health and Environmental Control (SCDHEC) on December 6, 1999. The IROD documented the selected remedial action and was approved by USEPA on May 25, 2000 and SCDHEC on May 24, 2000.. In summary, the ABRP surface soils contaminated with benzo(a)pyrene will be covered with a one-foot soil cover. The groundwater will be treated using AS combined with passive/active soil vapor extraction.

The combination of alternatives for soil cover, groundwater remediation, and institutional controls is intended to be an interim action for the ABRP OU as a whole, to reduce risk to

human health and the environment. However, the selected alternative for the soils represents a final action because it will meet the final remedial action objective (RAO) and final remedial goal (RG) established in the IROD. An interim action for this OU was chosen because of the uncertainty of the groundwater remediation within the overall unit remediation strategy. The uncertainty in the groundwater remediation strategy is based on 1) possible discontinuities within the confining unit that separates the M-Area aquifer zone from the underlying uppermost confined aquifer (Lost Lake), and therefore the potential for contamination of the underlying Lost Lake aquifer; 2) a volatile organic compound (VOC) groundwater plume located upgradient from the ABRP. The groundwater plume is associated with the M-Area Hazardous Waste Management Facility (HWMF) (a facility closed under RCRA and undergoing corrective action for the contaminated groundwater associated with that unit). Since the plume is moving in the general direction of the ABRP, it is not clear whether it may represent a future VOC source relative to the ABRP groundwater. An interim action for the ABRP groundwater subunit will allow an early start for remedial activities while generating additional data on the nature and extent of the groundwater interactions between the ABRP and A&M Area. These data will assist in development of the final groundwater RGs. The rationale for the proposed groundwater interim action is centered on remediating the "hot spot" portion of the groundwater plume.

The vadose zone remediation was added to the interim groundwater remedial strategy due to the discovery of VOC contamination beneath the "trench/pit". Some uncertainty also exists with respect to the vadose zone remediation strategy. The uncertainty in the vadose zone remediation strategy is based on 1) the implementation of the new microblower technology which has limited performance data in this type of application and 2) the extent of contamination in the trench/pit area. Evaluation of a full range of alternatives for vadose zone and groundwater remediation will be included in the final CMS/FS.

According to the *Savannah River Site Future Use Report* (USDOE 1996), the ABRP OU is located in an area designated for future residential use. However, due to the proximity of the ABRP OU to the A-Area Ash Pile, the two Materials Storage Areas (temporarily stored petroleum-contaminated soil), and the A/M and B-Area industrial zones, future industrial land use is the most likely scenario. The ABRP will not meet unrestricted land use criteria for soils following the soil cover detailed in the Interim Corrective Measures Implementation/ Remedial Action Implementation Plan (ICMI/RAIP). Groundwater beneath the unit exceeds the maximum contaminant levels (MCLs). Although institutional controls are included in all of the alternatives, the United States Department of Energy (USDOE) has recommended that residential use of SRS land in the vicinity of ABRP be controlled; therefore, prohibition of future residential use and potential residential water usage and other controls will be taken to ensure long-term protectiveness in this area (USDOE 1996).

A post-construction conceptual site model (CSM) for the ABRP, which illustrates the broken pathways after implementation of the remedy, is included as Figure A-2.

Land Use Controls

Institutional controls are intended to be an alternative that maintains control of the area and that is protective of human health and the environment. Implementation of this alternative will require some near-term actions.

For the ABRP, the land use control (LUC) objective necessary to ensure protectiveness of the preferred alternative is:

- Prevent direct contact with BaP-contaminated surface soils, such that the constituents of concern (COCs) are not a continued significant risk to human health.

- Prevent direct contact with the vadose zone and groundwater during the groundwater interim remedial action.

The institutional controls required to prevent unauthorized exposure to the contaminated media at the ABRP include the following:

- Controlled access to the ABRP through existing SRS security gates and perimeter fences and the site use/site clearance programs
- Signs posted in the area to indicate that waste remains in the vicinity of the ABRP above levels allowing for unrestricted land use and to contact the waste unit custodian prior to entry, and
- Notification of residual hazardous waste to any future landowner through deed notification, as required under CERCLA Section 120(h).

Figure A-1 shows the location of the ABRP OU and the SRS coordinates of the ABRP OU.

In the long term, if the ABRP OU is transferred to non-federal ownership, the need for deed restriction will be evaluated and performed through an amended ROD with USEPA and SCDHEC approval and actions taken pursuant to CERCLA 120(h). The actions will include a deed notification disclosing former waste management and disposal activities, as well as any remedial actions taken at the waste unit. The deed notification will, in perpetuity, notify any potential purchaser that the property has been used for the management and disposal of waste and other materials, including hazardous substances. At this time, RCRA deed notification requirements are not required for this waste unit since this is an interim action. The deed, if necessary, would include restrictions precluding residential use of the property. The need for deed restrictions may be re-evaluated at the time of transfer in the event exposure assumptions differ and/or

contamination no longer poses an unacceptable risk under residential use. Proposed changes in deed restrictions will require USEPA and SCDHEC review and approval. The survey plat will be reviewed and updated, as necessary, at the time the site is transferred and will be recorded with the Aiken County recording agency. This proposal is consistent with USEPA guidance and is an effective use of risk management principles.

The elements of the institutional control corrective action, which consists of land restrictions without any engineering controls, are composed of deed notifications when the parcel is transferred from USDOE ownership, access controls that include posting of identification signs, and field walkdowns for general site conditions. These land use controls will be implemented in perpetuity for this OU.

Each element of the institutional controls corrective action is discussed below.

Deed Notification

A deed notification shall be filed in the appropriate county records in accordance with CERCLA 120(h), which requires the government to create a deed when land on which any hazardous substance was stored, released, or disposed is transferred to non-federal ownership. The transference of the ABRP OU is unlikely. In the event the property is transferred, a deed notification will be filed with Aiken County. Per CERCLA 120(h)(3)(A), the deed shall contain, to the extent practical, such information as is available based on the complete search of agency files, including the following:

- A notice of the type and quantity of such hazardous substances;
- Notice of the time at which such storage, release, or disposal took place; and
- A description of the remedial action taken, if any.

Per CERCLA 120(h)(3)(B), the deed shall also contain a covenant warranting that

- All remedial action necessary to protect human health and the environment with respect to any such substance remaining on the property has been taken before the date of such transfer;
- Any additional remedial action found to be necessary after the date of such transfer shall be conducted by the United States Government, and
- A clause granting the United States Government access to the property in any case in which remedial action or corrective action is found to be necessary after the date of such transfer.

At this time, RCRA permit requirements are not applicable for this waste unit since this is an interim action.

Access Controls

On-Site Workers

In accordance with WSRC 1D, *Site Infrastructure and Services Manual*, Procedure 3.02, *Site Real Property Configuration Control*, use of all lands and waters on the SRS shall be coordinated via the Site Use Program. No use of land (i.e., excavation or any other land use) shall be undertaken without prior approval documented by a Site Use Permit. Also, in accordance with Procedure 3.02, all work at SRS that adds to or modifies features or facilities portrayed on the SRS development maps (i.e., plot plans of facilities/utilities at SRS) is authorized by a Site Clearance Permit before any excavation activities. All Site Clearance requests are reviewed to verify that either an approved Site Use Permit has been obtained or that an existing Site Use Permit has sanctioned the request. Verification of USDOE approval for intended land use must be obtained before issuance of a Site Clearance Permit. The Site Use and Site Clearance processes are applicable to all

activities and personnel on site (including subcontractors). The processes are controlled within the SRS Quality Assurance Program.

The SRS identifies all buildings and facilities on maps used in the Site Use/Site Clearance Program and includes a 200-foot buffer zone around each facility. This waste unit is identified on these maps as a CERCLA facility.

Any work proposed in these areas will be strictly controlled and workers will be appropriately trained and briefed about health and safety requirements if work is deemed necessary for maintenance. Any changes in the use or disturbance of the ABRP will be cleared with the USEPA and SCDHEC before disturbance occurs. To prevent unknowing entry and to ensure that unrestricted use of the waste unit does not occur while under ownership of the government, identification signs will be posted. The signs will be legible from a distance of at least 25 feet. See Figure A-1 for locations of the signs. The signs will read:

A-Area Burning/Rubble Pits (731-A/1A) and Rubble Pit (731-2A)

“Danger – Unauthorized Personnel Keep Out.

This unit contains hazardous substances. Do not dig or excavate.

Do not enter without contacting the waste site custodian.”

Custodian: Manager, Post Closure Maintenance

Phone: (803) 952-6882

Site-specific controls (i.e., fences) are not required for ABRP OU since the exposure to the casual worker or trespasser does not warrant this level of protection.

Trespassers

Additionally, while under the ownership of the USDOE, access control of the entire SRS will continue to be maintained in accordance with the 1992 RCRA Part B Permit Renewal Application, Volume I, Section F.1. This section describes the 24-hour surveillance system (R.61-79.264.14(b)(1)), artificial or natural barriers (R.61-79.264.14(b)(2)(i)), control entry systems (R.61-79.264.14(b)(2)(ii)), and warning signs (R.61-79.264.14(c)) in place at the SRS boundary to comply with the security requirements for a RCRA-permitted facility.

Field Walkdowns and Maintenance for Institutional Controls

“Monitoring” will be performed to verify that LUCIP requirements are met. Semi-annual monitoring of the ABRP OU, 731-A/1A and 731-2A, will be conducted for items such as accuracy and legibility of signs, visible subsidence or erosion of the waste unit, proper vegetative growth, mowing, etc. Subsidence or erosion will be corrected by backfilling the affected area with clean soil and seeding the area to prevent further erosion. USEPA and SCDHEC will be notified of the results of any inspection, event, and/or action that could indicate some potential compromise of institutional controls within 30 days of identification and will be documented in the Federal Facility Agreement Annual Progress Report. All other routine maintenance activities (i.e., mowing, etc.) will be documented and maintained in files that are subject to USEPA and SCDHEC review and audit. A copy of the completed inspection form is maintained in the Environmental Restoration Division administrative record files.

Inspections at the ABRP will be performed to ensure that institutional controls remain protective and consistent with all remedial action objectives. Semi-annual inspections will be conducted. The A-Area Burning/Rubble Pits (731-A/1A) and Rubble Pit (731-2A) Inspection Sheet is included in Appendix A (Figure A-3).

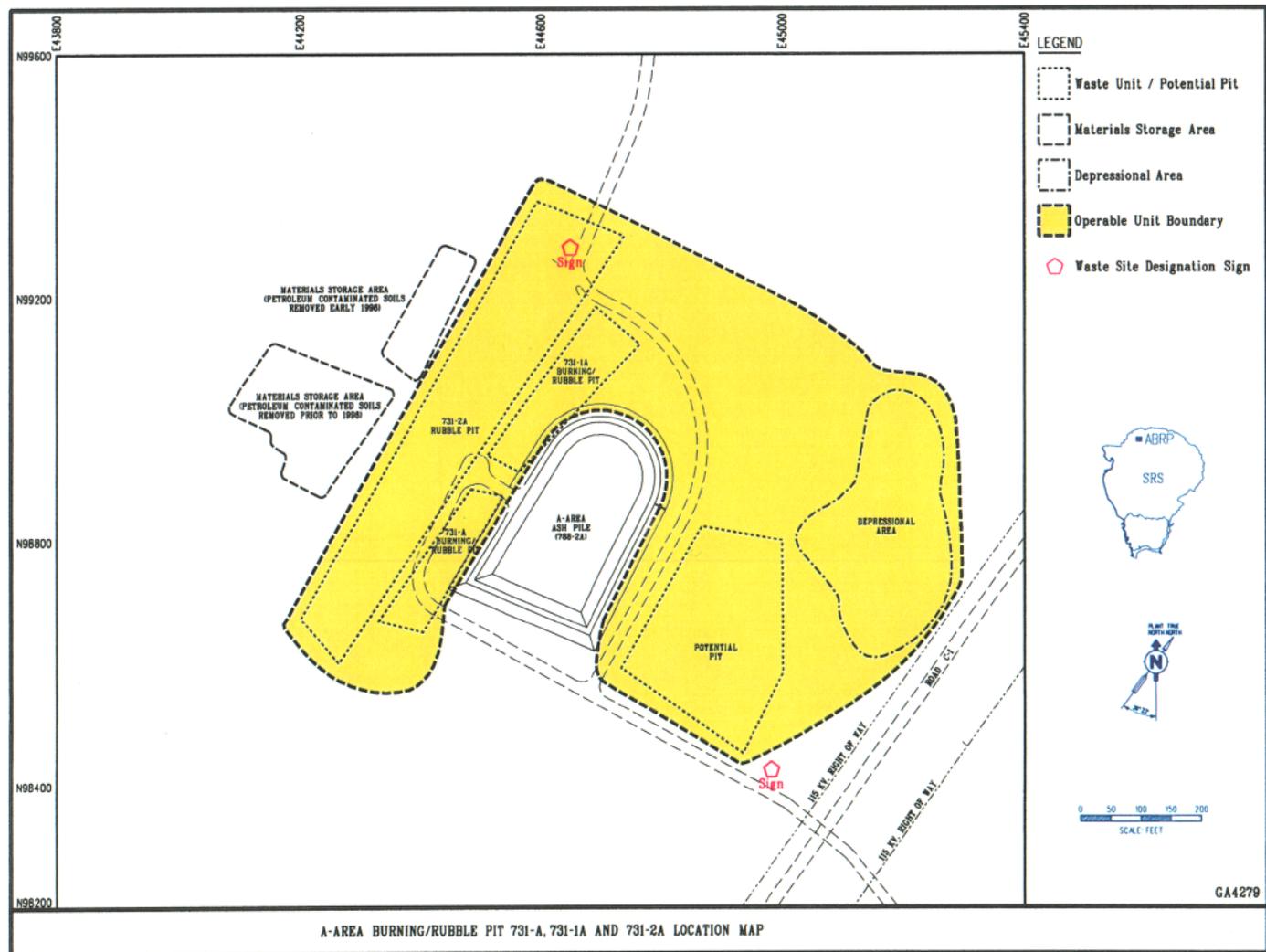


Figure A-1. The A-Area Burning/Rubble Pits (731-A/1A) and Rubble Pit (731-2A) Operable Unit

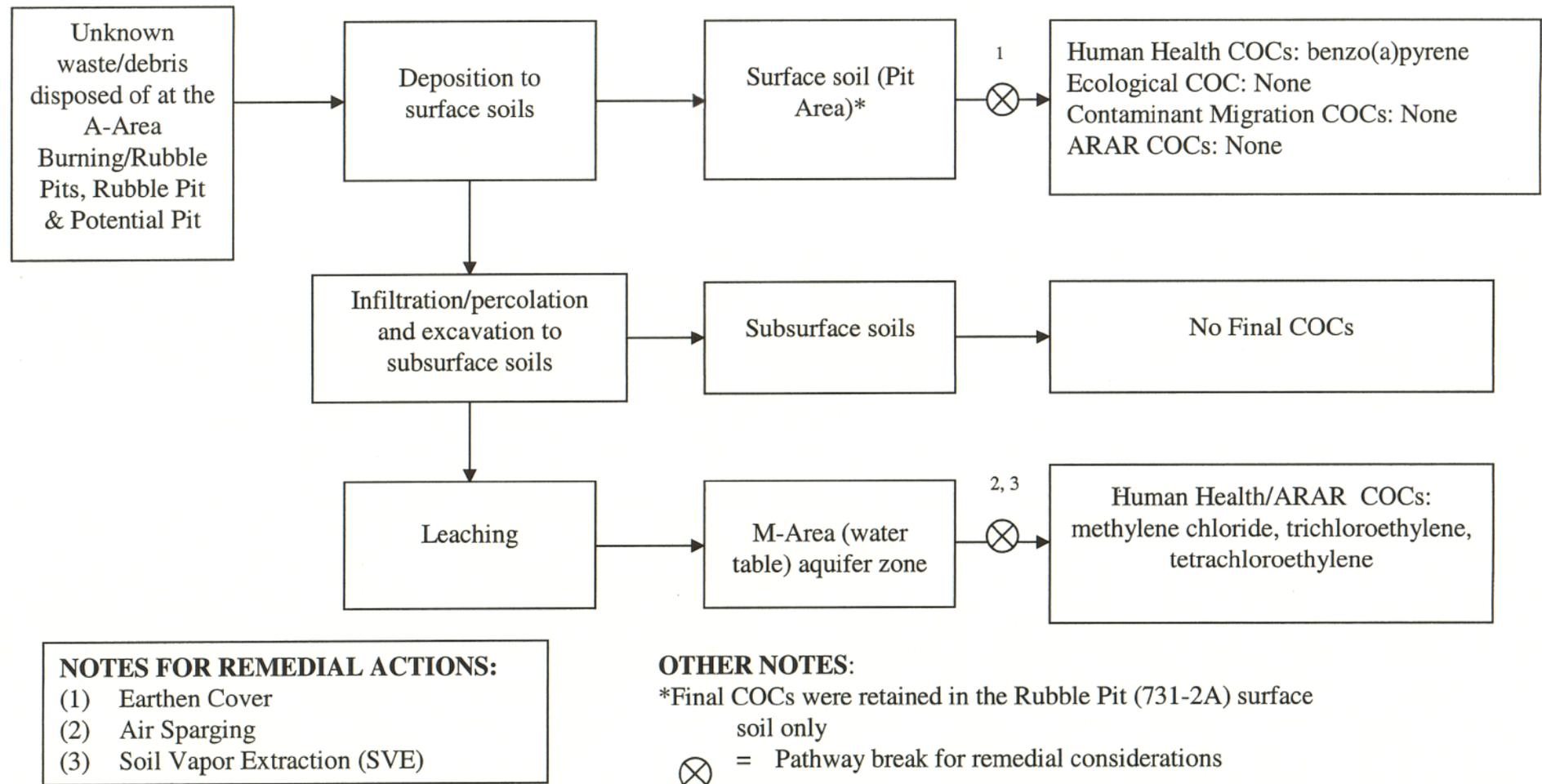


Figure A-2. Simplified Conceptual Site Model (CSM) for the A-Area Burning/Rubble Pits (713-A/1A) and Rubble Pit (731-2A) Operable Unit

ABRP (731-A/1A/2A) INSPECTION SHEET

A = Satisfactory X = Unsatisfactory (Explanation Required)	A or X	Observation or Corrective Action Taken
1. Verify that there is no excavating, digging or construction activity on the soil cover.		
2. Verify that there is no woody vegetation growing on the soil cover. Remove or identify as needed.		
3. Visual check vegetative cover for grass density, with no bare spots no more than 9 square feet in area. The height of the vegetation cover should not impair the visual inspection of the soil cover. This will be determined by the inspector.		
4. Verify the condition of the roads to the well sites and waste unit is adequate.		
5. Does unit show signs of erosion or subsidence?		
6. Are there any signs of burrowing animals (holes)?		
7. Verify condition of drainage ditches and sediment for presence of excessive erosion, sediment buildup, and any debris restricting water flow.		
8. Inspect general condition of site (housekeeping)		
9. Verify that the signs are correct and legible from a distance of at least 25 feet.		
10. Comments/Other		

CAUTION: The inspector shall notify the Post-Closure Manager and Environmental Compliance Authority **IMMEDIATELY** if there has been a breach or compromise of the institutional controls of this Waste Unit. Refer to Procedure SOP-019.

Inspected By: _____ / _____ Date: _____
 (Print Name) (Signature)

Reviewed By: _____ / _____ Date: _____
 Post-Closure (Print Name) (Signature)
 Manager

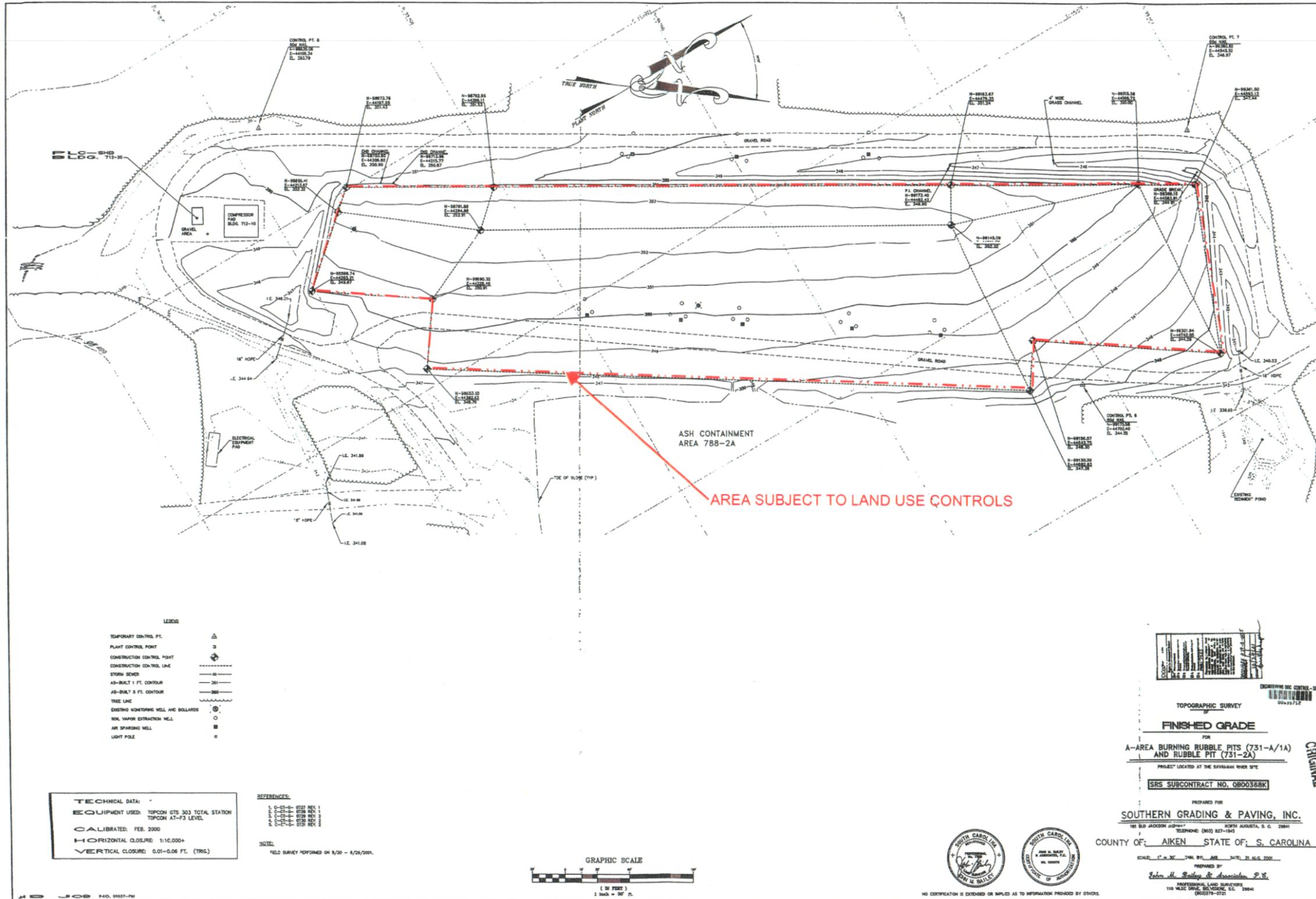
Figure A-3. Inspection Sheet

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Attachment 1

Survey Plat

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LUCIP for the
A-Area Miscellaneous Rubble Pile, 731-6A

Appendix A of Corrective Measures Implementation/Remedial Action Implementation
Plan for A-Area Miscellaneous Rubble Pile, 731-6A

WSRC-RP-2002-4067, Revision.1, July 2003

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APPENDIX A

**LAND USE CONTROL IMPLEMENTATION PLAN FOR THE
A-AREA MISCELLANEOUS RUBBLE PILE (731-6A) OPERABLE UNIT**

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Land Use Control Implementation Plan for the

A-Area Miscellaneous Rubble Pile (731-6A) Operable Unit

This A-Area Miscellaneous Rubble Pile (731-6A) Operable Unit (ARP OU) Land Use Control Implementation Plan (LUCIP) will be appended to the Savannah River Site (SRS) Land Use Control Assurance Plan (LUCAP).

The selected remedy leaves hazardous substances in place that pose a potential future risk and will require land use restrictions for an indefinite period of time. As negotiated with the United States Environmental Protection Agency (USEPA) and in accordance with USEPA Region IV policy (Johnston 1998), the SRS has developed a LUCAP (WSRC 2002) to ensure that land use restrictions are maintained and periodically verified. This LUCIP provides detailed and specific measures required for the land use controls selected as part of this remedy. The United States Department of Energy (USDOE) is responsible for implementing, maintaining, monitoring, reporting upon, and enforcing the land use controls described herein. Upon final approval, the LUCIP will be appended to the LUCAP and is considered incorporated by reference into the Post-Construction Report/Final Remediation Report (PCR/FRR), establishing land use controls implementation and maintenance requirements enforceable under the Comprehensive Environmental Response, Compensation, and Recovery Act (CERCLA). The approved LUCIP will establish implementation, monitoring, maintenance, reporting and enforcement requirements for the unit. The LUCIP will remain in effect until modified as needed to be protective of human health and the environment. LUCIP modification will only occur through another CERCLA document.

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1.0 REMEDY SELECTION

1.1 A-Area Miscellaneous Rubble Pile (731-6A) Operable Unit

The ARP OU is a Resource Conservation and Recovery Act/Comprehensive Environmental Response, Compensation, and Liability Act (RCRA/CERCLA) unit. The ARP OU is located in the northwest part of SRS within A Area. It is located approximately 1.1 mi from the nearest site boundary and approximately 0.7 mi south-southeast of the intersection of SRS Road 1-A and SRS Road D. A Area serves as the main administrative and research center for SRS. The ARP OU is situated immediately east of M Area. M Area is an industrial center with support and administration facilities. These two areas are collectively referred to as the A/M Area. Other RCRA/CERCLA units in the vicinity of the ARP OU are the A-Area Coal Pile Runoff Basin and the 716-A Motor Shop Seepage Basin. Within the vicinity of the ARP OU is the 782-3M Soil Vapor Extraction Unit (SVEU).

The ARP OU covers approximately 5.8 acres. The unit is bounded on the southwest and southeast by outfall drainages emanating from former National Pollutant Discharge Elimination System (NPDES) Outfall A-014 and Outfall A-011, respectively. The A-011 Outfall no longer exists and the A-014 Outfall has been relocated approximately 0.6 miles southeast of the ARP OU. A gravel road bounds the ARP OU to the north.

Disposal activities at ARP OU began in the early 1950s but the specific waste disposal at the unit was not documented. Field investigation and characterization of the unit identified construction rubble and an ash material as the primary wastes disposed of at the unit. Based on the results of the Phase II characterization, the ARP OU has been divided into three subunits: the Piles Area, the Ash Area and the Trenches Area.

The Piles Area, located on the eastern side of the unit, contains many small mounds of construction debris 2 to 5 ft high and covers a total area of approximately 2.3 acres. The debris primarily consists of construction materials that were disposed of directly on the ground surface. This material includes shingles and siding, concrete, brick, electrical boxes, roofing and wall

board materials, empty paint cans, empty drums and buckets, building materials, scrap metal, insulation, tar, plastic, glass, timbers, and transite containing non-friable asbestos.

The Ash Area is located in the central portion of the unit and is approximately 1.8 acres. Boreholes drilled in this area encountered buried construction debris (including transite) and an ash layer. The ash layer was primarily in the upper 4 ft and consisted of a dark-gray, low-density ash material that was physically distinct from the orange sandy silts of the native soils.

The Trenches Area is approximately 1.6 acres located in the westernmost portion of the ARP OU. It consists of a wooded area approximately 200 by 100 ft and a grassy area which covers the remainder of the Trenches Area. The wooded area is located in the northwest portion of the Trenches Area. Debris piles consisting of the same types of material found in the Piles Area are scattered throughout this area. The T-shaped trench is approximately 8 to 12 ft deep.

The figure in Attachment A-1 provides a unit map of the ARP OU.

1.2 Nature and Extent of Contamination in the ARP OU

Based on the existing analytical data, an evaluation was conducted to estimate the human health and environmental problems that could result from the current physical and waste characteristics of the ARP OU. The risks associated with each subunit are presented in the following paragraphs.

Piles Area

At the Piles Area, two very small, localized areas of concern were identified:

- the polychlorinated biphenyl/polycyclic aromatic hydrocarbon (PCB/PAH) waste pile, and
- the lead hot spot.

The arsenic and aroclor-1254 (a PCB) associated with these two small hot spots in the Piles Area pose potential carcinogenic risks of 9×10^{-6} and 7×10^{-5} to future industrial workers and residents, respectively. The risks associated with the PAHs in the waste pile were not quantified in the baseline risk assessment because composite samples from the waste pile were not included in the

0- to 0.3-m (0- to 1-ft) exposure data set. The waste pile in question was created during the characterization by physically pushing soil and debris aside to allow for 0- to 1-foot soil samples to be collected adjacent to the debris piles. Based on the physical shape of the pile, it was not appropriate to designate 0- to 1-foot samples. Grab and composite samples were taken from the pile by auguring into the side of the pile at several locations. These data were used to determine if the waste pile is principal threat source material (PTSM). The lead hot spot contains elevated levels of lead (maximum concentration of 9.6 percent) that contribute to unacceptable levels of the potential non-carcinogenic risk. Aroclor-1254, arsenic, lead, and PAHs [human-health constituents of concern (COCs)] are present in the Piles Area at acceptable risk levels (less than 1×10^{-6} under a hypothetical future residential scenario) if the two hot spots are removed.

The PCB/PAH waste pile was identified as PTSM due to the high toxicity of benzo(a)pyrene (average concentration of 910 mg/kg exceeds 1×10^{-3} risk to an industrial worker) and because it occupies a significant volume. The lead hot spot is not PTSM because it was not considered a discernible source although lead concentrations are high.

Ash Area

In the Ash Area, arsenic was identified as a human-health COC for the future industrial worker and resident exposed to surface soil (ingestion risk 2×10^{-6} and 2×10^{-5} , respectively). Average arsenic concentrations are approximately two times higher than average unit-specific background concentrations.

Trenches Area

In soil at the Trenches Area, human-health COCs include arsenic and the following PAHs: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenzo(a,h) anthracene. The total carcinogenic risks associated with exposure to soil for a future industrial worker and resident are 3×10^{-5} and 2×10^{-4} , respectively. The primary contaminants are benzo(a)pyrene (associated with the asphaltic debris source area) and arsenic (throughout the subunit).

There are no unacceptable risks to ecological receptors at any of the three subunits (Piles Area, Ash Area, and Trenches Area) associated with the ARP OU.

Modeling was performed to evaluate the potential for soil contaminants to leach to groundwater. Based on the results of the modeling, no contaminant migration COCs are associated with the following ARP OU subunits: Piles Area and Ash Area. However, the modeling did predict that tetrachloroethylene (PCE) and trichloroethylene (TCE) would exceed their respective maximum contaminant levels of $5 \mu\text{g/L}$ in about 500 and 200 years, respectively, in the Trenches Area. Soil samples taken from the vadose zone show that PCE and TCE have not migrated from the trench. Therefore, these constituents are identified as refined contaminant migration COCs for the Trenches Area. The PCE and TCE are limited to the western portion of the T-shaped trench.

1.3 Remedial Action Overview

Based on the ARP OU characterization results, the ARP OU has been subdivided into three subunits: the Piles Area, the Ash Area, and the Trenches Area. The ARP OU future land use will be industrial. Unrestricted land use is inappropriate at the Ash and Trenches subunits due to the presence of contaminated soil. After implementation of the Piles subunit remedy, the Piles subunit will be available for unrestricted land use and no land use controls will be required. However, the groundwater beneath the ARP OU has been impacted by SRS operations not associated with the unit. The groundwater contamination is being addressed under the RCRA corrective action program for A/M Area. The selected alternatives for the ARP OU are described in the following paragraphs.

Piles Area

The selected alternative for the Piles Area subunit is Removal and Disposal of Lead Hot Spot and PCB/PAH Waste Pile. The selected remedy for this subunit entails the following:

- Excavate the lead hot spot soil (2 yd³) and remove the PCB/PAH waste pile (10 yd³).
- Remove the excavated soil and transport it from SRS to a permitted offsite disposal facility.
- Backfill the excavated spots with clean soil from an SRS borrow pit.
- Grade the clean soil to match the surrounding topography and cover the backfilled spots with vegetative cover to minimize erosion.

Excavation and removal of contaminated soil from the Piles Area will remove the PTSM (benzo(a)pyrene) from the ARP OU and protect future industrial workers or residents from exposure to refined COCs at the Piles Area (arsenic and lead at the lead hot spot; and arochlor-1254, and benzo(a)pyrene, and other PAHs at the PCB/PAH waste pile).

Ash Area

The selected alternative for the Ash Area subunit is Institutional Controls. The selected remedy for this subunit entails the following:

- Implement institutional controls that would prohibit future residential land use and limit activities by future industrial workers. Institutional controls implemented at the Ash Area will protect future industrial workers from exposure to surface soil containing arsenic (ingestion risk = 2×10^{-6}).
- Install access control warning signs to restrict access to the unit and activities at the unit by future industrial workers.

Trenches Area

The selected alternative for the Trenches Area subunit is Active Soil Vapor Extraction (ASVE), Institutional Controls, and 1-foot Soil Cover. The selected remedy for this subunit entails the following:

- Cover the contaminated portion of the Trenches Area with a 1-foot soil cover (minimum) to reduce the exposure of current remedial workers and future workers to surface contamination.
- Install 7 ASVE and 12 monitoring wells, connect the ASVE wells to an existing SVEU (782-3M) that is adjacent to the unit, and operate (estimated remediation time is 5 years) the system until the TCE and PCE are removed from the soil to the levels where they no longer pose a migration threat to the groundwater.
- Install access control warning signs and implement institutional controls to prohibit future residential land use and restrict access to the unit and activities at the unit by future industrial workers.

For the Ash Area and the Trenches Area, the USDOE currently controls access to SRS through fencing, security gates and badging requirements. SRS activities at any specific OU are controlled through the site use/site clearance program. The field conditions at the Ash Area will be evaluated to determine the effectiveness of the selected alternative and to identify whether further or additional remedial action is appropriate for this subunit during the 5-year remedy reviews. These institutional controls would be in place in perpetuity.

The post-remedial action conceptual site model (see Attachment A-4) shows the broken pathways and the remaining residual risk to the future industrial worker.

According to the SRS Future Use Project Report (USDOE 1996a), residential use of SRS land should be prohibited.

2.0 LAND USE CONTROLS

Institutional controls are intended to be an alternative that maintains control of the area and that is protective of human health and the environment. Considering the residual risk mentioned above, the land use control objectives at the ARP OU are to:

- provide controlled access to the ARP OU through existing SRS security gates and perimeter fences and the site use/site clearance programs,
- post signs in the area to indicate that waste remains in the vicinity of the ARP OU above levels allowing for unrestricted land use and to contact the waste unit custodian prior to entry,
- maintain the use of the Ash and Trenches Areas for industrial activities only, and
- prevent unauthorized access to the closed CERCLA unit as long as the waste remains a threat to human health or the environment.

Current access controls and deed notification needed to maintain the LUCs are described in the following sections of this LUCIP.

2.1 Access Controls

2.1.1 *On-Site Workers*

In accordance with WSRC 1D, *Site Infrastructure and Services Manual*, Procedure 3.02, "Site Real Property Configuration Control," use of all lands and waters on SRS shall be coordinated via the Site Use Program. All employees, contractors, and visitors to the SRS require adherence to the Site Use Program. This program ensures authorization of all work performed on the SRS that adds, modifies, or removes features portrayed on the SRS development maps. No use of land (i.e., excavation or any other land use) shall be undertaken without prior approval documented by a Site Use Permit. This authorization is obtained through the completion of a Site Clearance Request Form. Also, in accordance with Procedure 3.02, all work at SRS that adds to or modifies features or facilities portrayed on SRS development maps (i.e., plot plans of

facilities/utilities at SRS) will be authorized by a Site Clearance Permit before any excavation activities are conducted. All site clearance requests will be reviewed to verify that either an approved Site Use Permit has been obtained or that an existing Site Use Permit has sanctioned the request.

SRS, specifically the Site Development Control Department, is responsible for updating, maintaining, and reviewing site maps, including Federal Facility Agreement (FFA 1993) OU identifications. If a site clearance request is made that may impact an FFA OU, the Site Clearance Request Form is sent to the FFA OU reviewer, who is in the SGCP, for either approval or disapproval. The roles and responsibilities of each individual are detailed in WSRC 1D, Procedure 3.02, Verification of USDOE approval for intended land use must be obtained before issuance of a Site Clearance Permit. The site use and site clearance processes are applicable to all activities and personnel on site (including subcontractors).

The processes are controlled within the SRS Quality Assurance (QA) Program. The SRS QA program is the governing QA program for all SRS activities, including those in SGCP. The activities that are performed in SGCP must comply with SRS QA Program procedures as well as with SGCP-specific procedures.

SRS identifies all buildings and facilities on maps used in the Site Use/Site Clearance Program. This waste unit is identified on these maps as a CERCLA facility.

Any work proposed in these areas will be strictly controlled and workers will be appropriately trained and briefed about health and safety requirements if work is deemed necessary for maintenance. No major change in land use or excavation at the ARP OU shall be undertaken without USEPA and SCDHEC approval. To prevent unknowing entry and to ensure that unrestricted use of the waste unit does not occur while under ownership of the government, identification signs will be posted at the unit. The access control warning signs will be legible from a distance of at least 25 feet and will be located as shown on the ARP OU LUCIP Drawing (Drawing No. SK-C-53137, Attachment A-2 of this LUCIP).

The signs will read as follows:

A-Area Miscellaneous Rubble Pile Operable Unit (731-6A)

“Danger – Unauthorized Personnel Keep Out. This unit contains radiological or mixed hazardous substances. Do not dig or excavate. Do not enter without contacting the waste site custodian.”

Custodian: Manager, Post Closure Maintenance

Phone: (803) 952-6882

The Post-Closure Maintenance Group within SGCP will maintain custodial responsibilities for maintenance and inspection of the ARP OU.

2.1.2 Trespassers

While under the ownership of USDOE, access control of the entire SRS will be maintained in accordance with the 1992 RCRA Part B Permit Renewal Application, Volume I, Section F.1. This section describes the 24-hour surveillance system (R.61-79.264.14(b)(1)), artificial or natural barriers (R.61-79.264.14(b)(2)(I)), control entry systems (R.61-79.264.14(b)(2)(ii)), and access control warning signs (R.61-79.264.14(c)) in place at the SRS boundary to comply with the security requirements for a RCRA-permitted facility.”

2.2 LUCIP Deed Notification

In the long-term, if the property is ever transferred to non-federal ownership, the U.S. Government will take those actions necessary pursuant to Section 120(h) of CERCLA. Those actions will include a deed notification disclosing former waste management and disposal activities as well as remedial actions taken on the site. The contract for sale and the deed will contain the notification required by CERCLA Section 120(h). The deed notification shall, in perpetuity, notify any potential purchaser that the property has been used for the management and disposal of waste. These requirements are also consistent with the intent of RCRA deed

notification requirements at final closure of a RCRA facility if contamination will remain at the unit.

The deed shall also include deed restrictions precluding residential use of the property, specifically the Ash and Trenches Areas. However, the need for these deed restrictions may be re-evaluated at the time of transfer in the event that exposure assumptions differ and/or the residual contamination no longer poses an unacceptable risk under residential use. Any re-evaluation of the need for the deed restrictions will be done through an amended ROD with USEPA and SCDHEC review and approval.

In addition, if the site is ever transferred to non-federal ownership, a survey plat of the OU will be prepared, certified by a professional land surveyor, and recorded with the appropriate county recording agency.

Per Section 3.6 of the LUCAP, the post-construction revision of this LUCIP will identify the area under land use restriction via a survey plat certified by a professional land surveyor. The line marked "AREA SUBJECT TO LAND USE CONTROL (INSTITUTIONAL CONTROL)" on A-Area Miscellaneous Rubble Pile (ARP) Operable Unit LUCIP Drawing (Attachment A-1, Drawing No. SK-C-53137) defines the area subject to LUCs.

2.3 Field Walkdown and Maintenance for Institutional Controls

"Monitoring" will be performed to verify that LUCIP requirements are met. Semi-annual monitoring of the ARP OU, 731-6A, will be conducted for items such as accuracy and legibility of signs, visible subsidence or erosion of the waste unit, proper vegetative growth, mowing, etc. Subsidence or erosion will be corrected by backfilling the affected area with clean soil and seeding the area to prevent further erosion. The results of any events and or actions that indicate some potential compromise of institutional controls will be documented in the FFA Annual Progress Report. All other routine maintenance activities will be documented and maintained in

files subject to USEPA and SCDHEC review and audit. A copy of the complete inspection form is maintained in the SGCP Administrative Record Files.

Inspections at the ARP OU will be performed to ensure that institutional controls remain protective and consistent with all RAOs. Semi-annual inspections will be conducted. The ARP OU (731-6A) Inspection Checklist is included as Attachment A-3. A copy of the inspection checklist will be provided to USEPA and SCDHEC for the final walkdown.

The waste site inspectors are to be trained and certified in Hazardous Waste Operations and Emergency Response (HAZWOPER), RCRA Well Inspections (SGCP-specific training), SGCP RCRA Waste Unit Inspections, Radiological Workers, etc., as applicable for the specific inspection. They will also be trained based on the individual requirements of the regulatory approved closure documents for each waste unit. In addition, the inspectors are to attend yearly refresher courses. Over the years, no single person will conduct all of the inspections or grass cutting operations. This unit-specific LUCIP, including the checklist (Attachment A-3), will be appended to the SRS LUCAP.

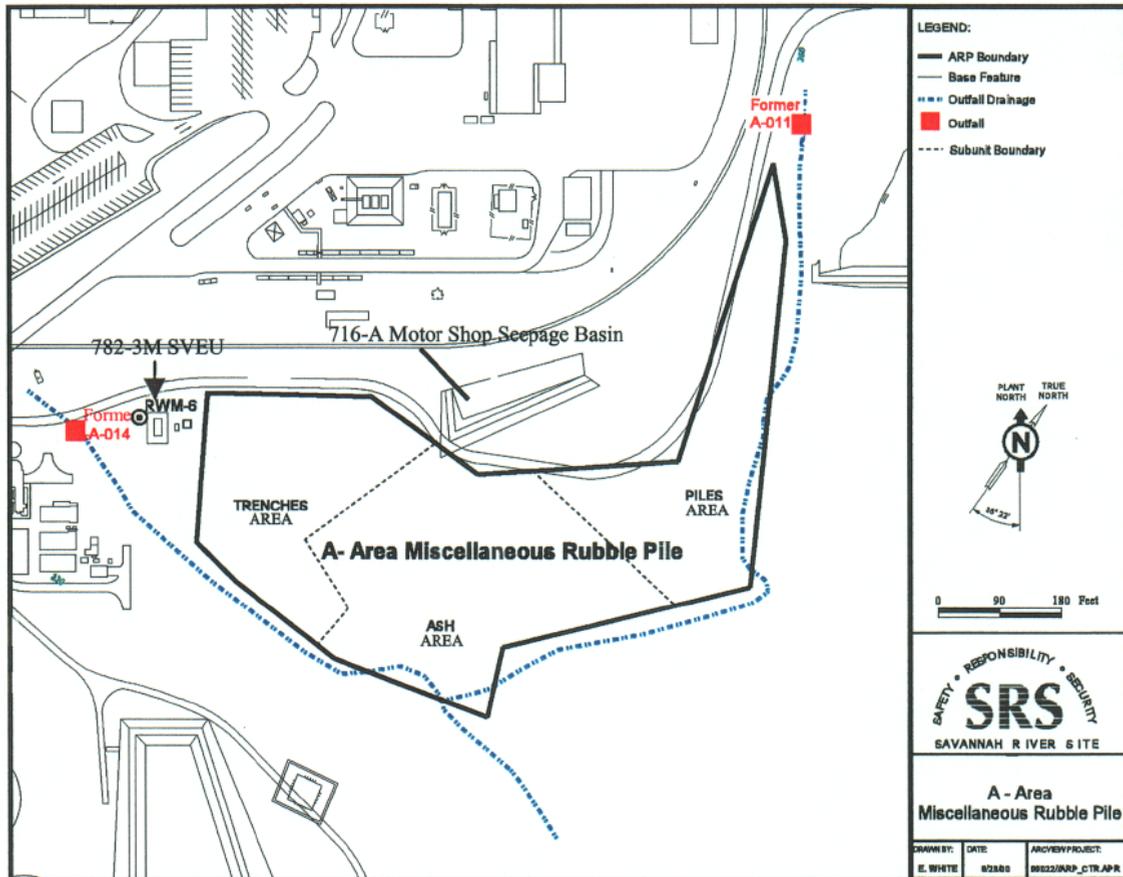
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ATTACHMENT A-1

UNIT MAP OF THE

A-AREA MISCELLANEOUS RUBBLE PILE OPERABLE UNIT (731-6A)

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ATTACHMENT A-2

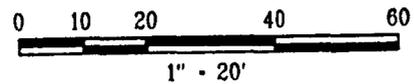
SK-C-53137, LAND USE CONTROL IMPLEMENTATION PLAN

BOUNDARY DRAWING

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AREA SUBJECT TO
LAND USE CONTROL
(INSTITUTIONAL CONTROL)

N 101706
E 50776



N 101673
E 50639

A-AREA MISCELLANEOUS RUBBLE PILE (ARP)
OPERABLE UNIT

LUCIP DRAWING (U)

DRAWING NO. SK-C-53137

ATTACHMENT A-3

SGCP FIELD INSPECTION CHECKLIST

FOR

A-AREA MISCELLANEOUS RUBBLE PILE OPERABLE UNIT (731-6A)

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SGCP FIELD INSPECTION CHECKLIST

for

A-AREA MISCELLANEOUS RUBBLE PILE OPERABLE UNIT (731-6A)

Page 1 of 2

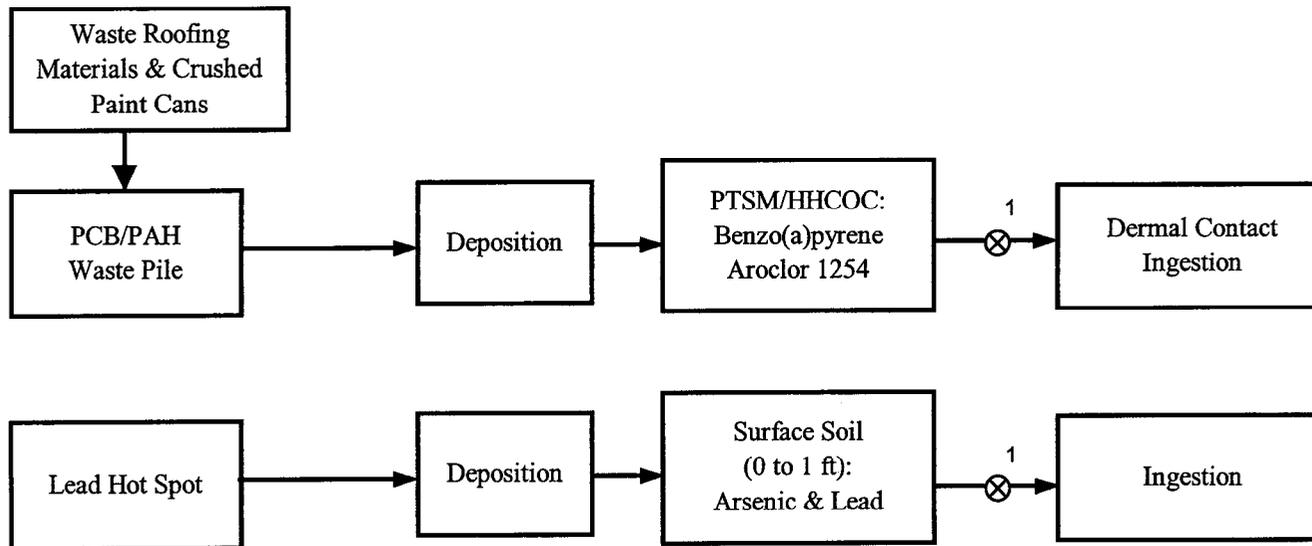
A = Satisfactory X = Unsatisfactory (Comments Required)	A or X	Comments or Corrective Action Taken (See Maintenance Register for Corrected Items)
Verify that there is no excavation, digging, or construction activities on the soil cover.		
Verify that no woody vegetation is growing on the soil cover. Remove or identify as needed.		
Visually check vegetative cover for grass density, with no bare spots more than 3 feet in area. The height of the vegetative cover should not impair the visual inspection of the soil cover. This inspector will determine this.		
Verify that the roads are accessible.		
Check the soil cover for signs of erosion or depressions (subsidence). Backfill as needed.		
Check for signs of burrowing animal holes.		

ATTACHMENT A-4

**CONCEPTUAL SITE MODEL FOR THE A-AREA MISCELLANEOUS RUBBLE PILE
OPERBLE UNIT (731-6A) POST REMEDIAL ACTION**

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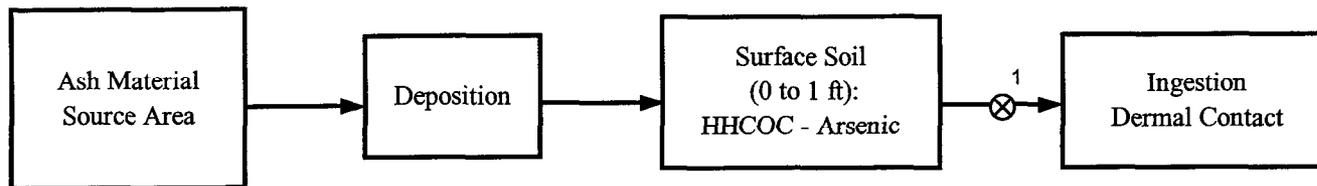
A-Area Miscellaneous Rubble Pile Problem Statement Conceptual Site Model:
Piles Area Exposure Unit



Legend
HHCOG -Human Health Contaminant of Concern
⊗ Pathway break
Remedial Alternative
(1) Removal and Offsite Disposal

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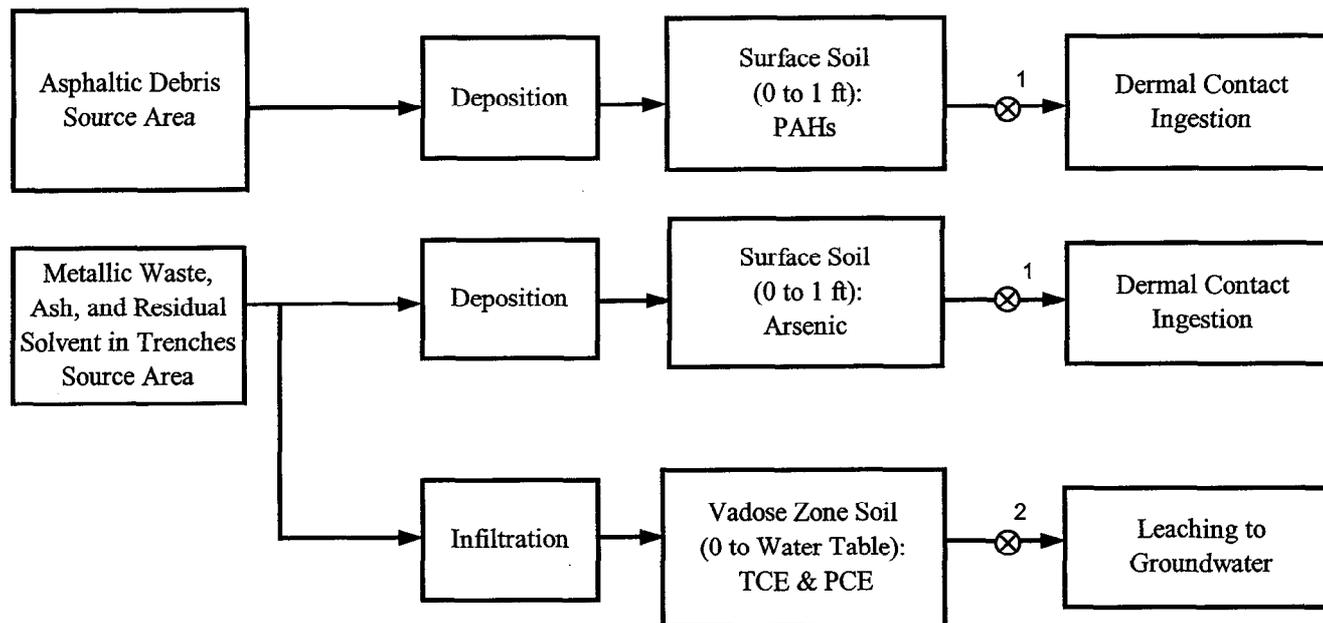
A-Area Miscellaneous Rubble Pile Problem Statement Conceptual Site Model:
Ash Area Exposure Unit



Legend
HHCOC - Human Health Contaminant of Concern
⊗ - Pathway break
Remedial Alternative
(1) Institutional Control

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A-Area Miscellaneous Rubble Pile Problem Statement Conceptual Site Model:
Trenches Area Exposure Unit



Legend
⊗ Pathway break
Remedial Alternatives
(1) Soil Cover and Institutional Control
(2) Soil Vapor Extraction

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LUCIP for the
C-Area Reactor Seepage Basins, 904-66G, -67G, and 68G

Appendix A of Post-Construction Report/Final Remediation Report for C-Area Reactor
Seepage Basins, 904-66G, -67G, and 68G

WSRC-RP-2002-4219, Revision.1, January 2003

NOTE: The Westinghouse Savannah River Company (WSRC) and Department of Energy (DOE) organizations responsible for environmental restoration at the Savannah River Site underwent name changes in 2003, as shown below. The responsibilities as outlined in the following document did not change.

Organization	Previous Name	Current Name
WSRC	Environmental Restoration Division (ERD)	Soils and Groundwater Closure Projects (SGCP)
DOE	Environmental Restoration Division (ERD)	Soil and Groundwater Project (SGP)

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APPENDIX A
LAND USE CONTROL IMPLEMENTATION PLAN
for the
C-AREA REACTOR SEEPAGE BASIN OU
(904-66G, -67G, and -68G)

LAND USE CONTROL IMPLEMENTATION PLAN

This C-Area Reactor Seepage Basin (CRSB) Land Use Control Implementation Plan (LUCIP) will be appended to the Savannah River Site (SRS) Land Use Control Assurance Plan (LUCAP). The United States Department of Energy (USDOE) is responsible for implementing the land use controls (e.g., inspections, maintenance, etc.) outlined in this unit-specific LUCIP.

The selected remedy leaves hazardous substances in place that pose a potential future risk and will require land use restrictions for an indefinite period of time. As negotiated with the United States Environmental Protection Agency (USEPA), and in accordance with USEPA Region IV policy (Johnston 1998), the SRS has developed a LUCAP (WSRC 2002) to ensure that land use restrictions are maintained and periodically verified. This LUCIP provides detailed and specific measures required for the land use controls selected as part of this remedy. The USDOE is responsible for implementing, maintaining, monitoring, reporting upon, and enforcing the land use controls herein. Upon final approval, the LUCIP will be appended to the LUCAP and is considered incorporated by reference into the Post-Construction Report/Final Remediation Report (PCR/FRR), establishing land use controls implementation and maintenance requirements enforceable under the Comprehensive Environmental Response, Compensation, and Recovery Act (CERCLA). The approved LUCIP will establish implementation, monitoring, maintenance, reporting, and enforcement requirements for the unit. The LUCIP will remain in effect until modified as needed to be protective of human health and the environment. LUCIP modification will only occur through another CERCLA document.

1.0 REMEDY SELECTION

1.1 CRSB Operable Unit

Located in C Area in the central portion of the SRS, the CRSB Operable Unit (OU) lies approximately 120 meters (m) (400 feet [ft]) west of C-Area Reactor perimeter fence.

The CRSB OU was constructed in 1957 to receive low-level radioactive wastewater from the C-Reactor (Building 105-C) disassembly basin purges. From 1957 until 1960, and from 1978 until 1986, the CRSB received purge water from the disassembly basin via an underground, polyethylene process sewer line, which measured approximately 245-m (800-ft) in length, with a diameter of 7.6-centimeter (cm) (3-inch [in]).

Three unlined (earthen) basins comprised the CRSBs. Basin 1 (904-66G) was L-shaped and was constructed with approximate outside dimensions of 80 x 10 m (250 x 35 ft) in the north-south direction, 55 x 10 m (180 x 35 ft) in the east-west direction, and with a depth of approximately 2.1 m (7 ft) below land surface (bls). Basin 2 (904-67G) was constructed with approximate outside dimensions of 90 x 20 m (300 x 60 ft), and a depth of 3.6 m (11 ft) bls. Basin 3 (904-68G) was constructed with approximate outside dimensions of 55 x 25 m (180 x 90 ft), and a depth of 3.7 m (12 ft) bls. Prior to remediation, these basins were open and had not been backfilled to grade.

Groundwater contamination above maximum contaminant levels (MCLs) has not been associated with the CRSB OU.

1.2 Nature and Extent of Contamination in CRSB Soils and Pipeline

The CRSB OU consists of a source term. The source term area of concern (AOC) includes the basins and the process sewer line. The following is a brief summary of the principal threat source material (PTSM) as defined in the Plug-in Record of Decision

(ROD) (WSRC 1999) and the Unit-Specific Plug-in ROD Amendment (WSRC 2002a) documents.

- Basin 1 PTSM is composed of cesium-137. The average cesium-137 concentration exceeds the 1×10^{-3} risk and treatment threshold value (TTV) from 0 to 1.8 m (0 to 6 ft) below the basin bottom.
- Basin 2 PTSM is composed of cesium-137. TTVs are exceeded from 0 to 1.2 m (0 to 4 ft) below the basin bottom. An analysis of the activities indicates that the cesium-137 levels associated with Basin 2 soils will decline below the TTV by 2002. This has been interpreted as short-term PTSM, and stabilization/solidification (S/S) is not considered a necessary component of the plug-in remedy for this basin, because current site access/site usage controls will prevent access to the basin as long as the soil is considered PTSM.
- No PTSM was detected in Basin 3. Because of this, no S/S was performed in Basin 3.
- There was no contaminant migration constituent of concern (CMCOC) in the basin soils or in the soil surrounding the process sewer line that will leach to groundwater and exceed MCLs within 1,000 years.
- No PTSM was associated with the process sewer line because radionuclides detected during the sampling did not exceed any of the TTVs.
- The PTSM at CRSB OU is not in direct contact with surface water or groundwater.
- Volatile organic compound (VOC) concentrations, metals, and pesticides in basin soils are below regulatory concern and did not invoke RCRA waste management methods for remediation waste streams. For detailed discussion on the results of characterization sampling and analysis for the CRSB OU refer to Section 3.0 of the Unit-Specific TER (WSRC 2000).

1.3 Remedial Action Overview

The selected remedial action (RA) for the CRSB OU was in situ stabilization of Basin 1, installation of a low-permeability soil cover system over the extent of all three basins, and in situ grouting of the process sewer pipeline. This remedy entailed the following actions:

- Pipeline grouting was used to stabilize and immobilize any potential contamination left inside the pipeline, and prevent access by small animals.
- In situ stabilization of Basin 1 through grouting was used to treat PTSM soil that posed a risk in excess of 1×10^{-3} for future industrial workers.
- Contaminated soil outside the basins exceeding PTSM criteria would have been consolidated. No soil consolidation was required for the CRSB OU.
- A low permeability soil cover system was provided over contaminated soil and the in situ stabilized soil to reduce water infiltration and to provide shielding to potential receptors on the surface.
- Implementation of land use controls, including access control warning signs and a fence, to ensure continued protection of human health or the environment.

The post-remedial action conceptual site model (see Attachment A-3) shows the broken pathways and the remaining residual risk to the future industrial worker.

According to the SRS Future Use Project Report (USDOE 1996) residential use of SRS land should be prohibited.

2.0 LAND USE CONTROLS

Considering the residual risk mentioned above, and in order to ensure the protectiveness of the remedy described above, the CRSB OU land use control objectives are to:

- prevent contact, removal, or excavation of buried waste or pipelines in the OU areas designated in the LUCIP;
- maintain the use of the site for industrial activities only; and
- prevent unauthorized access to the closed CERCLA unit as long as the waste remains a threat to human health or the environment.

Current access controls and a deed notification needed to maintain the future land use controls are described in the following sections of this LUCIP.

2.1 Access Controls

2.1.1 *On-Site Workers*

In accordance with WSRC 1D, *Site Infrastructure and Services Manual* (WSRC 2002g), Procedure 3.02, "Site Real Property Configuration Control," use of all lands and waters on SRS shall be coordinated via the Site Use Program. All employees, contractors, and visitors to the SRS require adherence to the Site Use Program. This program insures that all work performed on the SRS that adds, modifies, or removes features portrayed on the SRS development maps is authorized. No use of land (i.e., excavation or any other land use) shall be undertaken without prior approval documented by a Site Use Permit. This authorization is obtained through the completion of a Site Clearance Request Form. Also, in accordance with Procedure 3.02, all work at SRS that adds to or modifies features or facilities portrayed on SRS development maps (i.e., plot plans of facilities/utilities at SRS) will be authorized by a Site Clearance Permit before any excavation activities are conducted. All site clearance requests will be reviewed to verify

that either an approved Site Use Permit has been obtained or that an existing Site Use Permit has sanctioned the request.

The SRS, specifically the Site Development, Planning, and Mapping Department, is responsible for updating, maintaining, and reviewing site maps, including Federal Facility Agreement (FFA) (FFA 1993) OU identifications. If a site clearance request is made that may impact an FFA OU, the Site Clearance Request Form is sent to the FFA OU reviewer, who is in the Environmental Restoration Division (ERD), for either approval or disapproval. The roles and responsibilities of each individual are detailed in WSRC 1D, Procedure 3.02. Verification of USDOE approval for intended land use must be obtained before issuance of a Site Clearance Permit. The site use and site clearance processes are applicable to all activities and personnel on site (including subcontractors).

The processes are controlled within the SRS Quality Assurance (QA) Program. The SRS QA Program is the governing QA Program for all SRS activities, including those in the ERD. The activities that are performed in the ERD must comply with SRS QA Program procedures as well as ERD-specific procedures.

SRS identifies all buildings and facilities on maps used in the Site Use/Site Clearance Program. This waste unit is identified on these maps as a CERCLA facility.

Any work proposed in these areas will be strictly controlled and workers will be appropriately trained and briefed about health and safety requirements if work is deemed necessary for maintenance. No major change in land use nor excavation at the CRSB OU shall be undertaken without USEPA and South Carolina Department of Health and Environmental Control (SCDHEC) approval. To prevent unknowing entry and to ensure that unrestricted use of the waste unit does not occur while under ownership of the government, identification signs will be posted at the unit.

The access control warning signs for the soil cover will be legible from a distance of at least 25 ft. The soil cover access control warning sign is shown in Figure A-3 (Attachment A-4 to this LUCIP).

The access control warning signs for the underground grouted pipeline will be legible from a distance of at least 25 ft. The underground pipeline access control warning sign is shown in Figure A-4 (Attachment A-4 to this LUCIP).

Custodial responsibilities for maintenance and inspection of the CRSB waste site will be maintained by the Post-Closure Maintenance Group within the ERD.

2.1.2 Trespassers

While under the ownership of USDOE, access control of the entire SRS will continue to be maintained in accordance with the 1992 Resource Conservation and Recovery Act (RCRA) Part B Permit Renewal Application, Volume I, Section F.1. This section describes the 24-hour surveillance system (R.61-79.264.14(b)(1)), artificial or natural barriers (R.61-79.264.14(b)(2)(i)), control entry systems (R.61-79.264.14(b)(2)(ii)), and access control warning signs (R.61-79.264.14(c)) in place at the SRS boundary to comply with the security requirements for a RCRA-permitted facility.

2.2 Deed Notification

In the long term, if the property is ever transferred to non-federal ownership, the US Government will take those actions necessary pursuant to Section 120(h) of CERCLA. Those actions will include a deed notification disclosing former waste management and disposal activities as well as remedial actions taken on the site. The contract for sale and the deed will contain the notification required by CERCLA Section 120(h). The deed notification shall, in perpetuity, notify any potential purchaser that the property has been used for the management and disposal of waste. These requirements are also consistent

with the intent of the RCRA deed notification requirements at final closure of a RCRA facility if contamination will remain at the unit.

The deed shall also include deed restrictions precluding residential use of the property. However, the need for these deed restrictions may be re-evaluated at the time of transfer in the event that exposure assumptions differ and/or the residual contamination no longer poses an unacceptable risk under residential use. Any re-evaluation of the need for the deed restrictions will be done through an amended ROD with USEPA and SCDHEC review and approval.

In addition, if the site is ever transferred to non-federal ownership, a survey plat of the OU will be prepared, certified by a professional land surveyor, and recorded with the appropriate county recording agency.

Per Section 3.6 of the LUCAP, this LUCIP identifies the area under land use restriction via a Survey Plat (see Attachment A-1, Drawing No. SK-C-53122). Note: The line marked "AREA SUBJECT TO LAND USE CONTROLS" on the Survey Plat defines the area subject to land use controls.

2.3 Field Walkdowns and Maintenance for Institutional Controls

After the remediation of the CRSB OU, only maintenance activities will be required per this remedial action. No operations will be required.

The results of any events or actions that indicate some potential compromise of institutional controls will be documented in the FFA Annual Progress Report. All other routine maintenance activities will be documented and maintained in files subject to USEPA and SCDHEC review and audit. A copy of the completed inspection form is maintained in the ERD Administrative Record Files.

The following steps will be implemented to maintain the low permeability soil cover, for as long as it is necessary to prevent contaminant migration above MCL:

- Perform periodic (annual) visual inspections for evidence of damage to the soil cover due to erosion or intrusion by burrowing animals. The inspection will also address upkeep of the vegetative cover and access control barriers (i.e., the fence and access control warning signs). (Attachment A-2 provides a unit-specific inspection checklist for the CRSB waste unit).
- Perform necessary repairs (when required as identified during inspection) to maintain the functional integrity of the soil cover, fence, and access control warning signs.
- Enforce SRS institutional controls through access controls by restricting access to the closed waste unit. Institutional controls will be maintained as long as the waste remains a threat to human health or the environment.
- As required by the National Oil and Hazardous Substance Contingency Plan (NCP), a five-year review of the ROD for the CRSB OU will be performed as long as the waste remains a threat to human health or the environment.

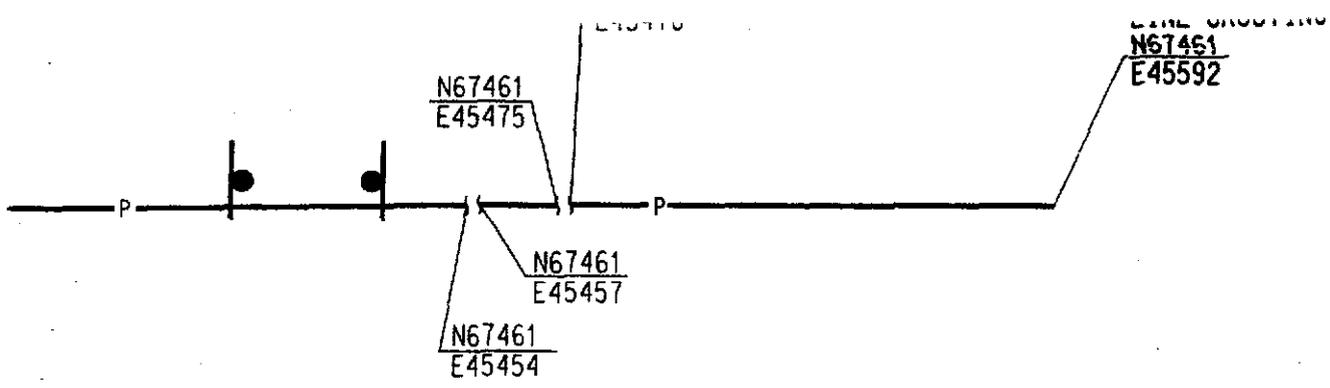
The waste site inspectors are to be trained and certified in Hazardous Waste Operations and Emergency Response (HAZWOPER), RCRA Well Inspections (ERD-specific training), ERD RCRA Waste Unit Inspections, Radiological Worker, etc., as applicable for the specific inspection. They will also be trained based on the individual requirements of the regulatory approved closure documents for each waste unit. In addition, the inspectors are to attend yearly refresher courses. Over the years no single person will conduct all of the inspections or grass cutting operations.

This unit-specific LUCIP, including the checklist (Attachment A-2), will be appended to the SRS LUCAP.

ATTACHMENT A-1

SURVEY PLAT

SK-C-53122, Land Use Control Implementation Plan, Survey Plat (U)



LEGEND:

-  ACCESS WARNING SIGN
-  BOUNDARY MARKER
-  BARBED WIRE FENCE

REMEDIAL ACTION IMPLEMENTATION PLAN FOR THE
 C - REACTOR SEEPAGE BASIN
 (904-66G, 67G & 68G) CLOSURE

 LAND USE CONTROL
 IMPLEMENTATION PLAN
 SURVEY PLAT (U)

 DRAWING NO. SK-C-53122

90

Land Use Control
 Survey Plat (U)
 (SK-C-53122)

ATTACHMENT A-2

ERD FIELD INSPECTION CHECKLIST for CRSB WASTE SITE

ATTACHMENT A-2

ERD FIELD INSPECTION CHECKLIST FOR CRSB WASTE SITE

Page 1 of 3

Waste Site: _____ A = Satisfactory X = Unsatisfactory (Comments required)	A or X	Comments or Corrective Action Taken (See Maintenance Register for Corrected Items)
1. Verify that there is no excavation, digging, or construction activities on the soil cover.		
2. Verify that no woody vegetation is growing on the soil cover. Remove or identify, as needed.		
3. Visually check vegetative cover for grass density, with no bare spots more than 3-feet in area. The height of the vegetative cover should not impair the visual inspection of the soil cover. This will be determined by the inspector.		
4. Verify that the wells and roads are accessible.		
5. Verify that the five (5) waste unit signs, and the six (6) underground piping signs, are in acceptable condition, have correct information, and are legible from a distance of 25 feet.		
6. Verify that the fence is in good condition and that the gate is locked.		

ATTACHMENT A-2 (Continued)

ERD FIELD INSPECTION CHECKLIST FOR CRSB WASTE SITE

Page 2 of 3

Waste Site: __ A = Satisfactory X = Unsatisfactory (Comments required)	A or X	Comments or Corrective Action Taken (See Maintenance Register for Corrected Items)
7. Check the soil cover for signs of erosion or depressions (subsidence).		
8. Check for signs of burrowing animals (holes).		
9. Verify that there is no excavation, digging or construction activities over underground process piping (identified by signs).		
10. Other:		

Inspected By: _____ / _____ Date: _____ Time: _____
 (Print Name) (Signature)

Reviewed By: _____ / _____ Date: _____ Time: _____
 Post-Closure Manager or Designee (Print Name) (Signature)

Note: USEPA and SCDHEC must be notified within 30 days of identification of any area where any breach or compromise of restrictions placed on this institutional control OU has occurred.

ATTACHMENT A-3

**CONCEPTUAL SITE MODEL FOR C-AREA REACTOR SEEPAGE BASIN
POST REMEDIAL ACTION**

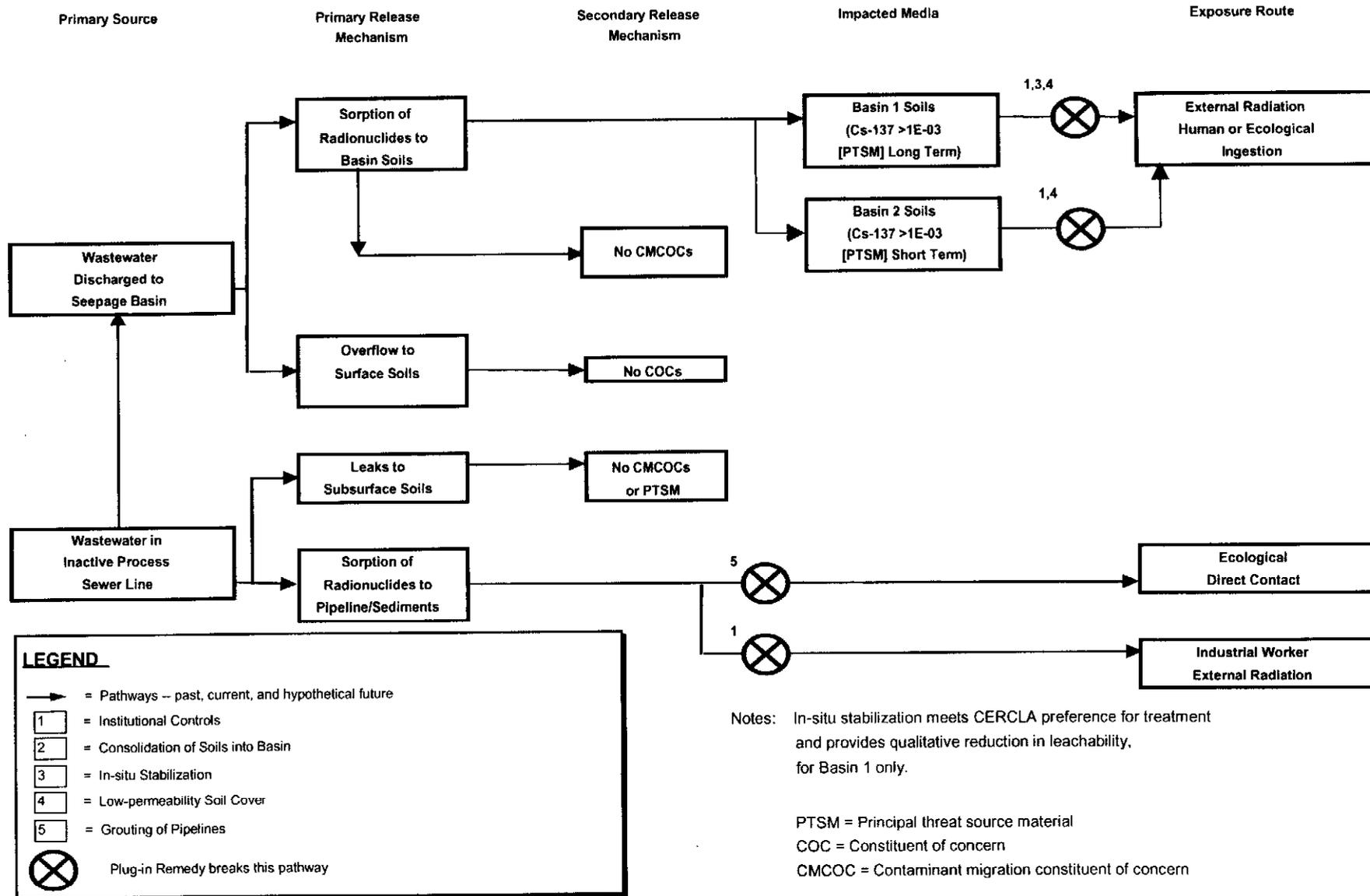


Figure A-1. Conceptual Site Model for C-Area Reactor Seepage Basin Post Remedial Action

ATTACHMENT A-4
ACCESS CONTROL WARNING SIGNS

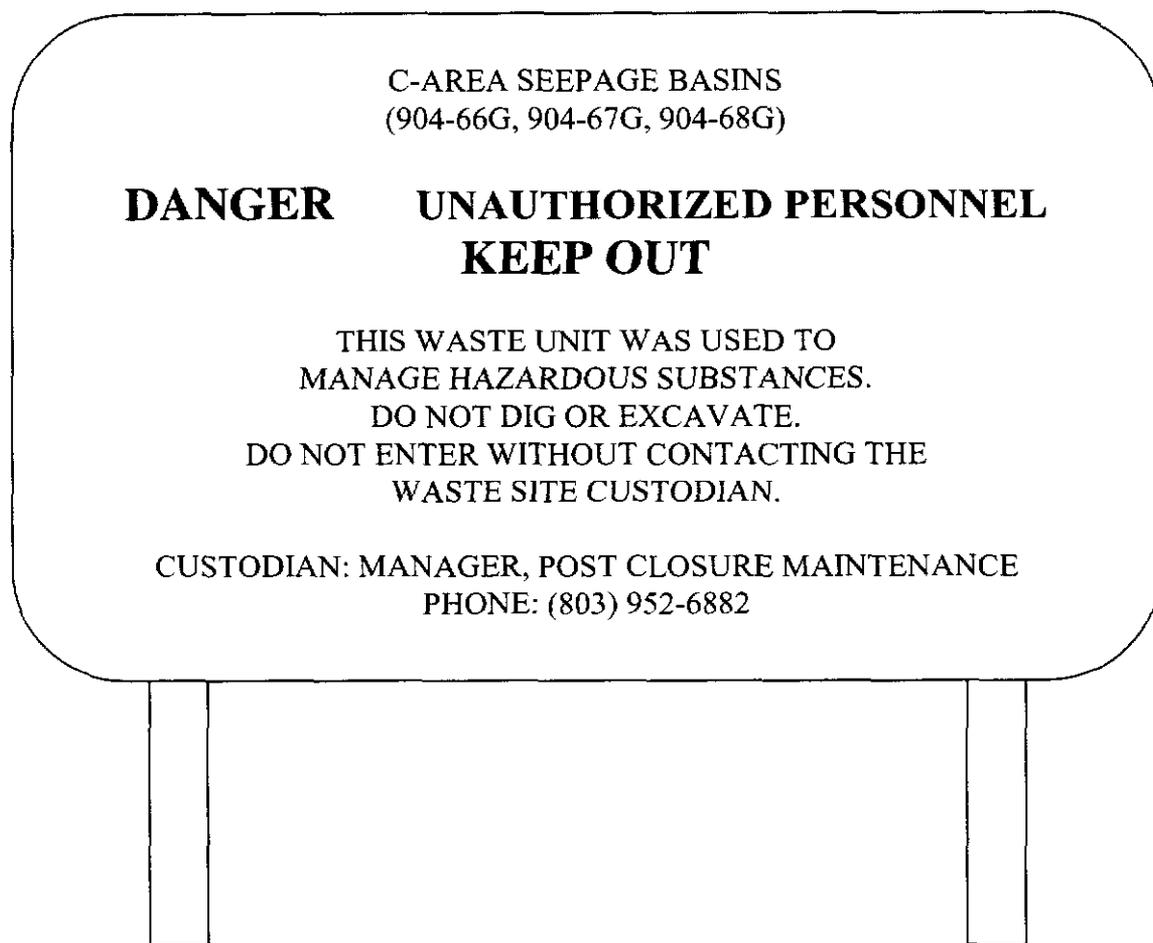


Figure A-2. Soil Cover Access Control Warning Sign

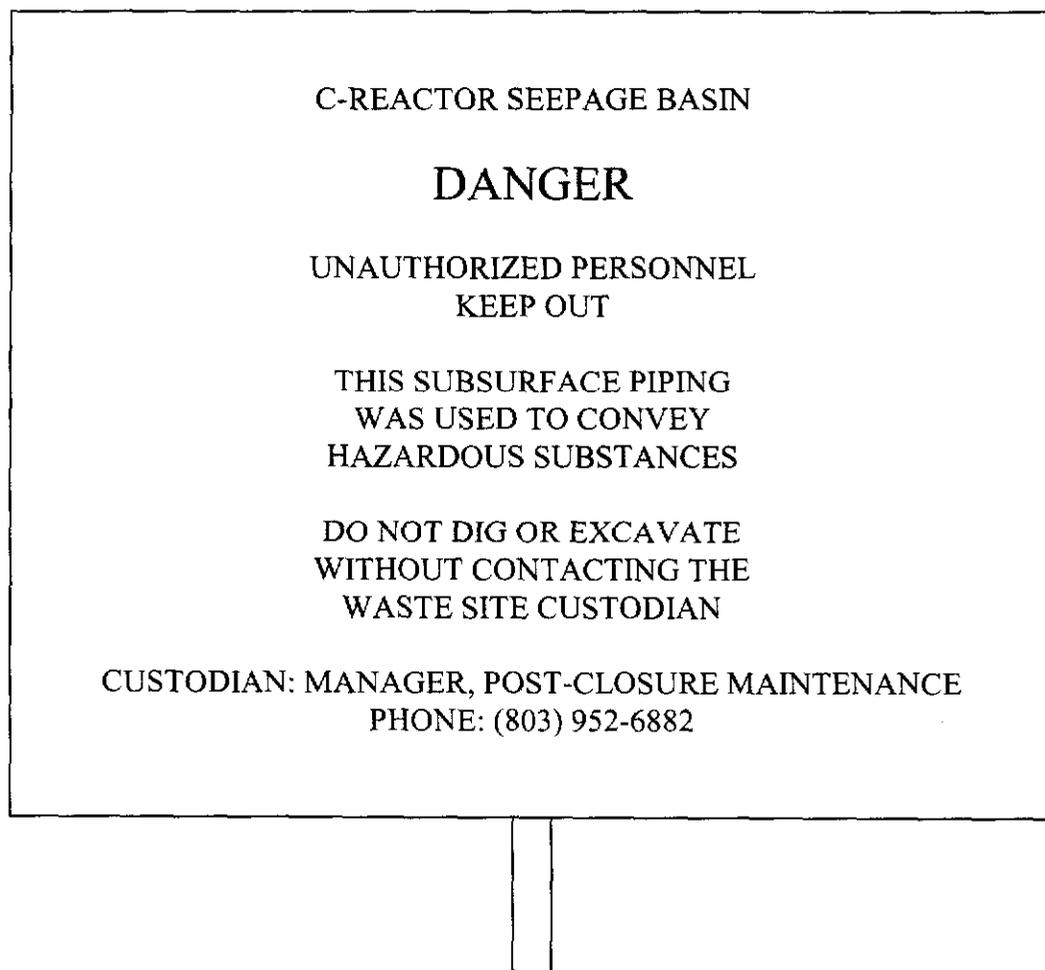


Figure A-3. Underground Piping Access Control Warning Sign

LUCIP for the
Central Shops Burning/Rubble Pits, 631-1G and 631-3G

Appendix A of Corrective Measures Implementation/Remedial Action Implementation
Plan for Central Shops Burning/Rubble Pits, 631-1G and 631-3G

WSRC-RP-2003-4018, Revision.1, August 2003

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APPENDIX B

LAND USE CONTROL IMPLEMENTATION PLAN (LUCIP)
FOR THE
CENTRAL SHOPS BURNING/RUBBLE PITS OPERABLE UNIT

APPENDIX B
LAND USE CONTROL IMPLEMENTATION PLAN (LUCIP)
FOR THE
CENTRAL SHOPS BURNING/RUBBLE PITS OPERABLE UNIT

Land Use Control Implementation Plan

The Central Shops Burning/Rubble Pits Land Use Control Implementation Plan (LUCIP) will be appended to the SRS Land Use Control Assurance Plan (LUCAP).

The selected remedy leaves buried waste in place that pose a potential future risk and will require land use restrictions for an indefinite period of time. As negotiated with the United States Environmental Protection Agency (USEPA) and in accordance with USEPA Region IV policy (Johnston 1998), the Savannah River Site (SRS) has developed a LUCAP (WSRC 2002X) to ensure that land use restrictions are maintained and periodically verified. This LUCIP provides detailed and specific measures required for the land use controls selected as part of this remedy. The United States Department of Energy (USDOE) is responsible for implementing, maintaining, monitoring, reporting upon, and enforcing the land use controls described herein. Upon final approval, the LUCIP will be appended to the LUCAP and is considered incorporated by reference into the Post-Construction Report/Final Remediation Report (PCR/FRR), establishing land use controls implementation and maintenance requirements enforceable under the Comprehensive Environmental Response, Compensation, and Recovery Act (CERCLA). The approved LUCIP will establish implementation, monitoring, maintenance, reporting and enforcement requirements for the unit. The LUCIP will remain in effect until modified as needed to be protective of human health and the environment. LUCIP modification will only occur through another CERCLA document.

1.0 REMEDY SELECTION

1.1 Unit Name

The Central Shops Burning/Rubble Pits Operable Unit (OU) located in N Area in the central portion of the Savannah River Site (SRS), is approximately 10.5 km (6.5 mi) from the nearest site boundary. It is in the northern part of N Area (also known as Central Shops), approximately 0.9 km (0.6 mi) south of the intersection of SRS Roads 5 and C. Figure 1 shows (see Figure 1 in the main text) the location of the Central Shops within SRS and Figures 2 and 3 (see Figures 2 and 3 in the main text) depict the layout of the CSBRP OU and the Active Burning Area (631-2G).

There are two other burning/rubble pits (Pit 631-5G and Pit 631-6G) near Central Shops that are addressed under separate FFA actions. Pit 631-6G is included in the ROD that was completed in 1997. Pit 631-5G was initially a part of the Pits 631-1G and 631-3G OU; however, when a trichloroethylene plume was identified in the groundwater beneath Pit 631-5G, the pit was included in a new OU called the "Heavy Equipment Wash Basin and Central Shops Burning/Rubble (Pit 631-5G) Operable Unit."

Initially, the CSBRP OU was composed of two inactive burning/rubble pits, Pit 631-1G and 631-3G, located along the northern and western sides of the Active Burning Area (631-2G). However, trenching performed during characterization activities identified that Pit 631-3G was composed of two adjacent pits subsequently named 631-3G and 631-3GA. In this CMI/RAIP report, Pits 631-3G and 631-3GA are jointly addressed as Pits 631-3G/3GA.

Prior to 1951, the CSBRP OU area was farmland, an area of moderate relief. The pits are located in cleared areas adjacent to wooded lands. Drainage ditches and the flow paths of stormwater runoff have changed over time. During the disposal activities, each pit had at least one drainage ditch to receive water directly from that pit. The current surface water

drainage system and surface water flow pattern associated with CSBRP OU are presented in Figure 2 (included in the main text).

Pit 631-1G and Pits 631-3G/3GA primarily received asbestos and empty paint cans along with ash, paper, and glass at various times from the 1950s to the mid-1980s. Pits 631-1G and 631-3G/3GA are located along the northern and western sides of the Active Burning Area as shown in Figure 2 (included in the main text).

Pit 631-1G

Waste disposal activities at Pit 631-1G are estimated to have begun in late 1951. Historically, the pit had dimensions of approximately 61 by 9.1 by 1.8 m (200 by 30 by 6 ft). Records suggest that the pit was not excavated. Evidently, the debris was dumped into a ditch next to an access road in the Central Shops area.

During the Phase II investigation, trenching and ground penetrating radar (GPR) activities conducted at Pit 631-1G indicated a pit approximately 79.2 m (260 ft) long and 9.1 m (30 ft) wide. This pit contained debris from 0.6 to 2.7 m (2 to 9 ft) below land surface (bls), with an average waste thickness of 1.2 m (4 ft). The waste consisted of burned trash, including wood, glass, and stainless steel shavings. Overlying the debris was clay fill that varied in thickness from 0.6 to 1.2 m (2 to 4 ft). The clay fill, which was added in the 1980s, was overlain by approximately 0.3 m (1 ft) of topsoil (WSRC 1998) (for references see Section 6.0 in the main text).

At Pit 631-1G, combustible wastes reportedly were also deposited in the pit and periodically burned. The combustible wastes may have included oils, rags, paper, cardboard, plastics, degreasers, wood, rubber, and drummed organic solvents. Occasionally, the pit may have received only burned material and debris.

In 1973, the periodic burning of waste ceased, and a layer of soil was placed over the ashes. The pit then received only inert rubble consisting of paper, cans, lumber, and

empty galvanized steel barrels (see Figure 4 in the main text). The pit remained open until about 1985.

The actual volume of waste disposed of in the pit was not recorded. However, estimates from the Phase II characterization indicate approximately 884 m³ (31,200 ft³) of waste was disposed of in the pit.

Pits 631-3G/3GA

Historically, Pit 631-3G had dimensions of 122 by 15.2 by 2.1 m (400 by 50 by 7 ft). The pit began receiving waste some time after 1975.

In 1998, boreholes drilled through Pit 631-3G determined the depth to be at least 8.2 m (27 ft) bls with the trash rising to within 2.4 m (8 ft) bls and overlain by clay fill (WSRC 1998) (for references see Section 6.0 in the main text). The pit was used to dispose of dry inert rubble. As is evident from Figure 5 (included in the main text) it may have received asbestos, empty paint cans, fluorescent light fixtures, paper, cans, lumber, barrels, metal pipes, metal shavings, and electrical switch gear. The Phase II investigation of trenching activities within Pit 631-3G identified abundant stainless steel metal shavings, sheet metal, burned wood, and one crushed 208-L (55-gal) drum. Burning operations are not known to have occurred at Pit 631-3G. In 1983, dumping ceased and the pit was covered with 2.1 to 3 m (7 to 10 ft) of soil, creating a mounded profile. Historically, the volume of waste in the pit was unknown. However, estimates from the Phase II characterization activities indicate that the volume of the waste in Pit 631-3G is approximately 10,224 m³ (361,000 ft³).

Subsequent activities performed during Phase II characterization revealed that Pit 631-3G is actually divided into two separate pits, designated as Pit 631-3G and a southern Pit 631-3GA. During the Phase II investigation, trenching conducted across Pit 631-3GA revealed unburned materials including metal, large concrete slabs, and transite. In addition, burned materials identified in the pit included sheet metal, stainless steel

shavings, wire, glass, and wood (see Figure 6 in the main text). Boreholes drilled through Pit 631-3GA indicated the depth to be at least 4.6 m (15 ft) bls, with the top of the trash varying from 1.1 to 2.4 m (3.5 to 8 ft) bls and overlain by clay fill (WSRC 1998) (for references see Section 6.0 in the main text). The estimated volume of trash in Pit 631-3GA is 1,487 m³ (52,000 ft³).

To characterize the CSBRP OU, the OU was divided into four subunits including Pit 631-1G; Pits 631-3G/3GA; Poned Area (includes surface water impoundment area and adjacent wetland); and Intermittent Stream as shown in Figures 2 and 3 (included in the main text). Additionally, groundwater associated with CSBRP OU was considered as a separate subunit. Activities were performed for characterizing each of the five subunits. The total area characterized was approximately 8 acres. The results of the characterization and the subsequent risk assessments for each of the five subunits have been summarized in the *RCRA Facility Investigation/Remedial Investigation with Baseline Risk Assessment (RFI/RI/BRA) for the Central Shops Burning/Rubble Pits (631-1G and 631-3G) (U), Rev. 1.2* (WSRC 2001a) (for references see Section 6.0 in the main text).

1.2 Nature and Extent of Contamination in CSBRP OU

Based on the conclusions of the RFI/RI/BRA investigation there are no refined COCs present into any subunit of the CSBRP OU, including groundwater. Hence, no problems warranting action are associated with the CSBRP OU.

There are no PTSM at the CSBRP OU; however, it has been determined that perched/trapped water associated with existing drainage conditions requires mitigation to reduce the uncertainty of future contaminant migration. Therefore, an action is required to maintain restricted (industrial) land use at the CSBRP OU to ensure protection of human health and the environment. Hence, the institutional controls (in conjunction with improved stormwater management) has been identified as the selected remedy.

1.3 Remedial Action Overview

The selected remedy will include the following:

- Institutional controls in accordance with the Land Use Control Assurance Plan (LUCAP) for the SRS. Controls will include erecting warning signs to mitigate the impact of the ongoing operations at the Active Burning Area (631-2G), periodic field inspections, monitoring perched/trapped water levels at Pits 631-3G/3GA.
- Improved stormwater management including:
 - Implementing surface water runoff controls such as reconfiguration of the pit surface areas and the surrounding areas
 - Routing the surface water flow away from the pits to minimize infiltration into Pit 631-1G and Pits 631-3G/3GA
 - Covering the pit surface area with vegetative cover
- Developing a Land Use Control Implementation Plan (LUCIP)
- Monitoring the effectiveness of the above improvements during periodic site inspections included under institutional controls. Pit 631-1G does not require monitoring since the perched water is temporal and discharges out of the pit to the adjacent wetland at the lower end of the pit as shown in Figure 7 (included in the main text). Six pressure measuring transducers will be embedded in Pits 631-3G/3GA and pore pressure will be monitored periodically for changes in the water pressure that will indicate the presence or absence of trapped water. The monitoring will be performed until the trapped water is significantly reduced or eliminated.

Since there are no refined COCs associated with CSBRP OU and the remedial action does not involve any treatment or physical action and there is no exposure pathway to be broken, the conceptual site model (CSM) is not included.

Monitoring of the water condition in Pit 631-3G/3GA will be performed weekly on data recorders. Data will be retrieved from the data recorders at least once a year and evaluated by a hydrogeologist to determine if the pit surface area improvements are reducing the infiltration as designed. The monitoring will be discontinued only when the water level shows declining trend for three consecutive years.

Additionally, 5-year remedy reviews will be performed to ensure that the remedy continues to provide adequate protection to the human health and the environment.

The selected remedy is protective of both human health and the environment, is effective in meeting remedial action objectives (RAOs), and is a permanent solution. The selected remedy will comply with applicable or relevant and appropriate requirements (ARARs) and will not pose any short-term risks to remedial workers, the community, or the environment.

According to the Savannah River Site Future Use Project Report (USDOE 1996) (for references see Section 6.0 in the main text), residential use of SRS land should be prohibited.

Time to complete construction is estimated to be six months.

2.0 LAND-USE CONTROLS

Considering the residual risks mentioned above, the land-use control objectives are to:

- maintain the use of the OU for industrial activities only,

- prevent unauthorized access to the closed CSBRP OU as long as the waste remains a threat to human health and environment, and
- preserve the cover and prevent disturbance of the soil in the pits.

Current access controls and a deed notification needed to maintain the future land use controls are described in the following sections of this LUCIP. The area subject to land use control is identified in Sketch SK-C-53169 (for reference see Attachment A attached to the main text).

2.1 Access Controls

2.1.1 On-Site Workers

In accordance with WSRC 1D, *Site Infrastructure and Services Manual*, Procedure 3.02, "Site Real Property Configuration Control" use of all lands and waters on SRS shall be coordinated via the Site Use Program. All employees, contractors, and visitors to SRS require adherence to the Site Use Program. This program ensures that all work performed on the SRS that adds, modifies, or removes features portrayed on the SRS development maps is authorized. No use of land (i.e., excavation or any other land use) shall be undertaken without prior approval documented by a Site Use Permit. This authorization is obtained through the completion of a Site Clearance Request Form. Also, in accordance with WSRC 1D, Procedure 3.02, all work at SRS that adds to or modifies features or facilities portrayed on SRS development maps (i.e., plot plans of facilities/utilities at SRS) will be authorized by a Site Clearance Permit before any excavation activities are conducted. All site clearance requests will be reviewed to verify that either an approved Site Use Permit has been obtained or that an existing Site Use Permit has sanctioned the request.

SRS, specifically the Site Development, Planning, and Mapping Department, is responsible for updating, maintaining, and reviewing site maps, including Federal Facility

Agreement (FFA) (1993) operable unit (OU) identifications. If a site clearance request is made that may impact an FFA OU, the Site Clearance Request Form is sent to the FFA OU reviewer, who is in the Soil and Groundwater Closure Projects (SGCP), for either approval or disapproval. The roles and responsibilities of each individual are detailed in WSRC 1D, Procedure 3.02, Verification of USDOE approval for intended land use must be obtained before issuance of a Site Clearance Permit. The site use clearance processes are applicable to all activities and personnel on site (including subcontractors).

The processes are controlled within the SRS Quality Assurance (QA) Program. The SRS QA program is the governing QA program for all SRS activities, including those in SGCP. The activities that are performed in SGCP must comply with SRS QA Program procedures as well as with SGCP-specific procedures.

SRS identifies all buildings and facilities on maps used in the Site Use/Site Clearance Program. This waste unit is identified on these maps as a CERCLA facility.

Any work proposed in these areas will be strictly controlled and workers will be appropriately trained and briefed about health and safety requirements if work is deemed necessary for maintenance. No major change in land use nor excavation at the Central Shops Burning/Rubble Pits (CSBRP) (631-1G and 631-3G) OU shall be undertaken without USEPA and South Carolina Department of Health and Environmental Control (SCDHEC) approval.

To prevent unknowing entry and to ensure that unrestricted use of the waste unit does not occur while under ownership of the government, identification signs will be posted at the unit. The signs will be legible from a distance of at least 25 feet. The signs will read similar to as follows:

Central Shops Burning/Rubble Pits (631-1G and 631-3G/3GA) Operable Unit

“Danger – Unauthorized Personnel Keep Out. This unit contains buried waste. Do not dig or excavate. Do not enter without contacting the waste unit custodian.”

Custodian: Manager, Post-Closure Maintenance

Phone: (803) 952-6882

2.1.2 Trespassers

While under the ownership of USDOE, access control of the entire SRS will continue to be maintained in accordance with the 1992 RCRA Part B Permit Renewal Application, Volume I, Section F.1. This section describes the 24-hour surveillance system (R.61-79.264.14(b)(1)), artificial or natural barriers (R.61-79.264.14(b)(2)(i)), control entry systems (R.61-79.264.14(b)(2)(ii)), and warning signs (R.61-79.264.14(c)) in place at the SRS boundary to comply with the security requirements for a RCRA-permitted facility.

2.2 LUCIP Deed Notification

In the long term, if the property is ever transferred to nonfederal ownership, the U.S. Government will take those actions necessary pursuant to Section 120(h) of CERCLA. Those actions will include a deed notification disclosing former waste management and disposal activities as well as remedial actions taken on the site. The contract for sale and the deed will contain the notification required by CERCLA Section 120(h).

The deed notification shall, in perpetuity, notify any potential purchaser that the property has been used for the management and disposal of waste. These requirements are also consistent with the intent of the RCRA deed notification requirements at final closure of a RCRA facility if contamination will remain at the unit.

The deed shall also include deed restrictions precluding residential use of the property. However, the need for these deed restrictions may be reevaluated at the time of transfer in the event that exposure assumptions differ and/or the residual contamination no longer poses an unacceptable risk under residential use. Any reevaluation of the need for the deed restrictions will be done through an amended ROD with USEPA and SCDHEC review and approval.

In addition, if the site is ever transferred to non-federal ownership, a survey plat of the area will be prepared by a certified professional land surveyor and recorded with the county recording agency. The CSBRP OU is located in Aiken County.

Per Section 3.6 of the LUCIP, the post construction revision of this LUCIP will identify two separate areas (one for Pit 631-1G and the other for Pit 631-3G/3GA) under land use restriction via two survey plats each certified separately by a professional land surveyor.

2.3 Field Inspections and Maintenance for Institutional Controls

After the remediation of the CSBRP, only maintenance activities will be required per this remedial action. No operations will be required.

USEPA and SCDHEC will be notified of the results of any events and or actions that indicate some potential compromise of institutional controls within 30 days of identification and will be documented in the FFA Annual Progress Report. All other routine maintenance activities will be documented and maintained in files subject to USEPA and SCDHEC review and audit. A copy of the completed inspection form is maintained in the Soil and Groundwater Closure Projects Division Administrative Record Files. The land-use controls will be implemented as long as the waste remains a threat to human health or the environment.

The following steps will be implemented to maintain the soil covers for as long as it is necessary to prevent unacceptable exposure to future industrial workers:

- Perform periodic (semi-annual) visual inspections for evidence of damage to the vegetative covers due to subsidence, erosion or intrusion by burrowing animals. The inspection will also address upkeep of the vegetative cover and access control barriers (e.g., the warning signs). The inspection checklist for CSBRP OU is provided as an attachment (Attachment B-1).

- Perform necessary repairs (when required as identified during inspection) to maintain the functional integrity of the covers and the warning signs.
- Enforce SRS institutional controls through access controls by restricting access to the closed waste unit. Institutional controls will be maintained as long as the waste remains a threat to human health or the environment.
- As required by the National Oil and Hazardous Substance Contingency Plan (NCP), a five-year review of the selected remedy will be performed as long as the waste buried in the pits remains a threat to human health or the environment.

The waste site inspectors are to be trained in Hazardous Waste Operations and Emergency Response (i.e., HAZWOPER), RCRA Well Inspections (SGCP-specific training), SGCP RCRA Waste Unit Inspections, Radiological Workers, etc., as applicable for the specific inspection. They will also be trained based on the individual requirements of the regulatory approved closure documents for each waste unit. In addition, the inspectors are to attend yearly refresher courses. Over the years, different personnel will conduct the inspections and grass cutting operations.

The unit-specific LUCIP, including the inspection checklist (Attachment B-1), will be revised as needed (e.g., after completion and construction activities and in response to the result of five-year reviews of the remedy) and appended to the SRS LUCAP.

ATTACHMENT B-1

SGCP FIELD INSPECTION CHECKLIST FOR THE CENTRAL SHOPS
 BURNING/RUBBLE PITS (631-1G and 631-3G) OPERABLE UNIT

Scheduled Unscheduled

Page 1 of 2

A = Satisfactory X = Unsatisfactory (Comments required)	A or X	Observation or corrective action taken.
1. Verify the roads are accessible.		
2. Verify that the waste unit signs are in acceptable condition, have the correct information, and are legible from a distance of 25 ft.		
3. Verify that the electronic water pressure measuring devices (transducers) are accessible and not damaged		
4. Verify that there are no excavation, digging, or construction activities on the soil cover.		
5. Check the integrity of vegetative covers and drainage ditches for presence of excessive erosion, sediment buildup, and any debris restricting water flow.		

CAUTION: The inspector shall notify the PCM and ECA **IMMEDIATELY** if there has been a breach or compromise of the institutional controls of this waste unit. Refer to post-closure inspection procedures.

PCM – Post Closure Manager, Manager responsible for port closure care of the unit.

ECA – Environmental Compliance Authority, A professional responsible for providing regulatory support and interface between the project team and the regulatory agencies.

ATTACHMENT B-1 (Continued)

**SGCP FIELD INSPECTION CHECKLIST FOR THE CENTRAL SHOPS
 BURNING/RUBBLE PITS (631-1G and 631-3G) OPERABLE UNIT**

Scheduled Unscheduled

Page 2 of 2

A = Satisfactory X = Unsatisfactory (Comments required)	A or X	Observation or corrective action taken.
6. Verify that no woody vegetation is growing on the soil cover. Remove or identify as needed.		
7. Visually check the vegetative cover for grass density, with no bare spots more than 3-ft by 3-ft in area. The height of the vegetative cover should not impair the visual inspection of the soil cover. This will be determined by the inspector.		
8. Check the soil cover for signs of erosion or depressions (subsidence).		
9. Check for signs of burrowing animals.		
Other:		

Inspected By _____ / _____ Date _____
 (Print Name) (Signature)

Reviewed By _____ / _____ Date _____
 Post Closure Manager (Print Name) (Signature)

LUCIP for the
D-Area Oil Seepage Basin, 631-G

Appendix B of Corrective Measures Implementation/Remedial Design/Remedial Design
Report/Remedial Action Workplan for the D-Area Oil Seepage Basin, 631-G

WSRC-RP-99-4006, Revision.1, August 1999

NOTE: The Westinghouse Savannah River Company (WSRC) and Department of Energy (DOE) organizations responsible for environmental restoration at the Savannah River Site underwent name changes in 2003, as shown below. The responsibilities as outlined in the following document did not change.

Organization	Previous Name	Current Name
WSRC	Environmental Restoration Division (ERD)	Soils and Groundwater Closure Projects (SGCP)
DOE	Environmental Restoration Division (ERD)	Soil and Groundwater Project (SGP)

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APPENDIX B LAND USE CONTROL IMPLEMENTATION PLAN (LUCIP)

LAND USE CONTROL IMPLEMENTATION PLAN (LUCIP)

The D-Area Oil Seepage Basin (D-Area OSB) LUCIP will be appended to the Savannah River Site (SRS) Land Use Control Assurance Plan (LUCAP).

Remedy Selection

The D-Area OSB was constructed in 1952 as a series of unlined trenches for disposal of waste oil products, from D Area and other areas at SRS, which were unacceptable for incineration in the 400-D powerhouse boilers. As the trenches filled, the waste oils along with general office and cafeteria waste, were occasionally ignited. The practice of open burning was a common practice at SRS until 1973 when it was stopped site-wide. In 1975 the basin was removed from service and was backfilled with soil.

The basin remained inactive and covered with natural vegetation, including bushes and grasses, until 1996, when an interim remedial action (IRA) was implemented. During the IRA, the trench area was excavated and drums and debris were removed along with any obviously contaminated soils. The surface soils were carefully removed and stockpiled so that these clean soils could be replaced on the surface at the end of the remedial action. Soil removed from the trenches that were not obviously contaminated was returned to the excavation, with the soil removed from the bottom of the trenches replaced first, and the remaining soils replaced as close to their original location as possible.

At the close of the IRA, the contractor installed two horizontally oriented, perforated pipes along the length of the former waste unit for technology testing (bioventing) purposes. These pipes were used to force fresh air, nutrients, and tracers into the soils at a depth of about 2.4 m (8 ft) in order to volatilize the constituents in the soil, enhance

the aerobic degradation of the constituents in the soil, and monitor the effectiveness of the treatment program (WSRC 1997b, c, d, e).

The selected remedy for shallow soil, surface water, and sediment is no action because no constituents of concern (COCs) in those media were identified in the RCRA Facility Investigation/Remedial Investigation (RFI/RI) Report and Baseline Risk Assessment. The selected remedy for the D-Area OSB deep soils is no further action since Remedial Action Objectives (RAOs) have been achieved by the IRA and biovent testing.

The selected remedy for D-Area OSB groundwater is Natural Attenuation/Groundwater Mixing Zone (GWMZ) with Institutional Controls. Under this alternative, natural attenuation mechanisms such as biodegradation, flushing, volatilization, adsorption, and hydrolysis would continue to reduce contaminant concentrations in the groundwater to acceptable levels. Results from the bioventing study, conducted as part of the IRA, indicate that the source of contaminated soils at the D-Area OSB has been removed and the soil will no longer contribute to any additional groundwater contamination. Evidence indicating that natural attenuation processes are occurring in the D-Area OSB groundwater was presented in the RFI/RI Report and Baseline Risk Assessment and included: (1) decreased dissolved oxygen levels in the groundwater, which indicates that microorganisms are utilizing a combination of the contaminants as carbon source and oxygen within the groundwater as an oxygen source to produce energy, (2) elevated chemical oxygen demand, chloride, and sulfate levels downgradient, (3) depressed pH levels in contaminated areas, and (4) presence of breakdown products.

The D-Area OSB is in an industrial use zone, as identified in Figure 3.3 of the SRS Federal Facility Agreement (FFA) Implementation Plan (WSRC 1996a), for both current and anticipated future land use. The D-Area OSB currently meets unrestricted land use criteria for soils, sediment, and surface water. Groundwater beneath the unit

exceeds the maximum contaminant levels (MCLs). Although institutional controls are included in all of the alternatives (except no-action alternative), the Department of Energy (US DOE) has recommended that residential use of SRS land in the vicinity of D Area be prohibited (US DOE 1996); therefore, future residential use and potential residential water usage in this area is unlikely. Modeling of groundwater transport processes as part of the evaluation of the remedial alternatives indicates that MCLs for the contaminants of concern will be achieved in all areas of the D-Area OSB groundwater after approximately 10 years. Once remediation is complete, institutional controls will no longer be needed.

Land Use Controls

Implementation of this alternative will require near-term institutional control measures. For D-Area OSB, the land use control (LUC) objective necessary to ensure protectiveness of the preferred alternative is to prevent unauthorized access to the D-Area OSB contaminated groundwater plume.

The institutional controls required to prevent unauthorized exposure to the contaminated groundwater at the D-Area OSB include the following:

- Controlled access to the D-Area OSB through existing SRS security gates and SRS perimeter fences and the site use/site clearance programs
- Site control of installation of groundwater wells through existing site procedures

This action is expected to remediate groundwater to below MCLs within 10 years. SRS does not expect any land transfer at this location prior to achievement of the RGOs. Consistent with the No Action and No Further Action decisions for the source unit, a certified survey plat of the source unit and deed restriction will not be required because the source unit meets unrestricted land use requirements, and there is no waste

left in place. A certified survey plat of the groundwater mixing zone boundary has been prepared by a registered land surveyor and is included in this document as Attachment B

If the D-Area OSB is transferred to non-federal ownership prior to remediation of the groundwater to the MCLs for the COCs, reevaluation of the need for deed restriction would be performed through an amended Record of Decision (ROD) with the U. S. Environmental Protection Agency (US EPA) and the South Carolina Department of Health and Environmental Control (SCDHEC) approval. These actions will also be evaluated to ensure compliance with CERCLA 120(h).

In the event that the D-Area OSB is transferred to non-Federal ownership after remediation of the groundwater to meet the MCLs for the COCs, deed notification requirements pursuant to CERCLA 120(h) will be completed. These actions will include a deed notification disclosing former waste management and disposal activities, as well as any remedial actions taken at the waste unit.

Deed Notification

A deed notification shall be filed in the appropriate county records in accordance with CERCLA 120(h), which requires the government to create a deed when land on which any hazardous substance was stored, released, or disposed is transferred to non-federal ownership. The transference of the D-Area OSB prior to the achievement of MCLs is unlikely. In the event the property is transferred prior to completion of the remedial action, a deed notification will be filed with Aiken County. Per CERCLA 120(h)(3)(A), the deed shall contain, to the extent practical, such information as is available based on the complete search of agency files, including the following:

- A notice of the type and quantity of such hazardous substances;

- Notice of the time at which such storage, release, or disposal took place;
- A description of the remedial action taken, if any.

Per CERCLA 120(h)(3)(B), the deed shall also contain a covenant warranting that:

- All remedial action necessary to protect human health and the environment with respect to any such substance remaining on the property has been taken before the date of such transfer;
- Any additional remedial action found to be necessary after the date of such transfer shall be conducted by the United States Government;
- A clause granting the United States Government access to the property in any case in which remedial action or corrective action is found to be necessary after the date of such transfer.

Access Controls

On-Site Workers

In accordance with WSRC 1D, *Site Infrastructure and Services Manual*, Procedure 3.02, *Site Real Property Configuration Control* (WSRC 1996b), use of all lands and waters on the SRS shall be coordinated via the Site Use Program. No use of land (i.e., excavation or any other land use) shall be undertaken without prior approval documented by a Site Use Permit. Also, in accordance with Procedure 3.02, all work at SRS that adds to or modifies features or facilities portrayed on the SRS development maps (i.e., plot plans of facilities/utilities at SRS) is authorized by a Site Clearance Permit before any excavation activities. All Site Clearance requests are reviewed to verify that either an approved Site Use Permit has been obtained or that an existing Site

Use Permit has sanctioned the request. Verification of US DOE approval for intended land use must be obtained before issuance of a Site Clearance Permit. The Site Use and Site Clearance processes are applicable to all activities and personnel on site (including subcontractors). The processes are controlled within the SRS Quality Assurance Program.

Trespassers

Additionally, while under the ownership of the US DOE, access control of the entire SRS will continue to be maintained in accordance with the 1992 RCRA Part B Permit Renewal Application, Volume I, Section F.1. This section describes the 24-hour surveillance system (R.61-79.264.14(b)(1)), artificial or natural barriers (R.61-79.264.14(b)(2)(i)), control entry systems (R.61-79.264.14(b)(2)(ii)), and warning signs (R.61-79.264.14(c)) in place at the SRS boundary to comply with the security requirements for a RCRA-permitted facility.

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LUCIP for the
F-Area Retention Basin, 281-3F

Appendix A of Corrective Measures Implementation/Post-Construction Report/Final
Remediation Report for the F-Area Retention Basin, 281-3F

WSRC-RP-2001-4049, Revision.1, September 2001

NOTE: The Westinghouse Savannah River Company (WSRC) and Department of Energy (DOE) organizations responsible for environmental restoration at the Savannah River Site underwent name changes in 2003, as shown below. The responsibilities as outlined in the following document did not change.

Organization	Previous Name	Current Name
WSRC	Environmental Restoration Division (ERD)	Soils and Groundwater Closure Projects (SGCP)
DOE	Environmental Restoration Division (ERD)	Soil and Groundwater Project (SGP)

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APPENDIX A

Unit Specific LUCIP for

F-Area Retention Basin (Bldg. 281-3F) (U)

APPENDIX A

LUCIP F-Area Retention Basin (Bldg. 281-3F) (U)

LAND USE CONTROL IMPLEMENTATION PLAN (LUCIP)

The F-Area Retention Basin (Bldg. 281-3F) Land Use Control Implementation Plan (LUCIP) will be appended to the Savannah River Site (SRS) Land Use Control Assurance Plan (LUCAP), which has been approved by the USDOE, USEPA, and SCDHEC. SRS is responsible for implementing the land use controls (LUCs) (e.g., inspections, maintenance, etc.) outlined in this unit specific LUCIP.

1.0 REMEDY SELECTION

The F-Area Retention Basin (FRB) is a Resource Conservation Recovery Act (RCRA)/Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) unit located within SRS. The FRB is designated as Building 281-3F and is located outside and south of the F-Area perimeter fence, approximately 1,035 m (3,397 ft) north of Fourmile Branch.

The FRB became operational in 1955, remained active until 1972, and was closed in December 1978. At the time of closure, soil sampling was performed at the basin, and approximately 0.6 m (2 ft) of soil was excavated from the bottom of the basin. A total of 970 m³ (34,209 ft³) of contaminated soil was removed from the basin and transported to Building 643-G for disposal. The basin was backfilled with clean soil and the area was seeded with grass.

The FRB covers an area of approximately 2,400 m³ (0.6 acre). The basin is approximately 61 m (200 ft) long, 36.6 m (129 ft) wide, and 2.1 m (6.9 ft) deep. Prior to implementation of this remedial action, the FRB was an inactive basin,

filled with clean soil and covered with grass, lying at an elevation of approximately 275 ft above mean sea level. Surface water drains from the southeast to Fourmile Branch via an unnamed drainage ditch (tributary) and overland flow. The basin was designed and operated as an unlined, temporary container for potentially contaminated cooling water from the F-Area Canyon Facility and stormwater drainage from the F-Area Tank Farm.

Water was conveyed to the basin by a process sewer line [approximately 168 M (550 ft) of 61-cm (24-inch) diameter and approximately 212 m (700 ft) of 91-cm (36-inch) diameter] that discharged into the north side of the basin. The depth to the top of the process sewer line ranges from less than 1 m (3 ft) to 4.6 m (15 ft).

The FRB RCRA Facility Investigation/Remedial Investigation/Baseline Risk Assessment (RFI/RI/BRA) (WSRC1997a) reports that the primary constituents of concern (COCs) are located at depth in FRB soils and consist of elevated levels of cesium-137 (Cs-137), strontium-90 (Sr-90), and radium-226 (Ra-226).

On March 2, 1999, the combined Corrective Measures Implementation (CMI)/Remedial Design Report (RDR)/Remedial Action Work Plan (RAWP) for the FRB (281-3F) (WSRC 1999c), which provides the design details of the remedial action for the FRB, was approved by USEPA and SCDHEC. The selected remedy specified in the Record of Decision (ROD) is source control. The key elements of the selected remedial action and associated design, as identified in the CMI/RDR/RAWP, for the FRB soils and process sewer line sediment are as follows:

- Placement of all contaminated soils inside the basin (contaminated soil from the basin side walls and from hot spots surrounding the process sewer line)

- In situ stabilization/solidification (S/S) of contaminated soil at the bottom of the basin and contaminated soils placed in the basin from the basin side walls and process sewer line
- In situ grouting of contaminated sediments contained within the process sewer line
- Construction and placement of an engineered low-permeability soil cover (hydraulic conductivity of 1×10^{-5} or less) over the S/S soil mass
- Implementation of institutional controls to limit access to the site and associated pipelines and to restrict future use of this site to industrial applications

The CMI/RDR/RAWP provides the design details for the remedial action at the FRB per the remedy specified in the ROD. The FRB remedial action was performed in accordance with the applicable and relevant federal, state, and local environmental laws and statutes. The technology of choice for this remediation was soil S/S using grouting materials and admixtures in conjunction with a low-permeability soil cover.

1.1 Groundwater Monitoring and Reporting

The selected remedial action includes groundwater monitoring to confirm that the source remediation has achieved the required stabilization of contaminants; to relieve any uncertainty in the analytical data; and to verify that there exists no upgradient source contributing any contamination to the FRB OU groundwater. The existing monitoring wells (FRB-01, -02, -03, and -04) will continue to be used to collect samples semi-annually.

These FRB monitoring wells were used in the remedial investigation process to determine impact from the basin to the groundwater and should be sufficient for the above-stated purposes. Sketches showing the location relative to the basin can be found in the Remedial Design Work Plan (Figure 1) or the ROD (Figure 18).

The analytes being monitored include Cs-137, Sr-90, Ra-226, trichloroethylene (TCE), gross alpha, and non-volatile beta as well as normal field measurements. Cs-137, Sr-90, and Ra-226 will be monitored to confirm the stabilization. Minor detection results (below maximum contaminant levels (MCLs)) of TCE were found during the remedial investigation. Since this constituent is not associated with the basin, the possibility of an upgradient source exists. Should the levels increase, TCE will be monitored for trigger action. If monitoring detects contamination above MCLs (or risk-based concentration (RBCs) without MCLs) for those constituents attributable to the FRB OU or an unknown upgradient source, for two consecutive monitoring periods, the regulators will be informed within 30 days. A plan for evaluating the data and developing further action will be submitted within 90 days for regulatory approval. The results of the monitoring activities will be reported annually.

2.0 LAND USE CONTROL

For the FRB, the following land use control (LUC) objective is necessary to ensure protectiveness of the remedy:

- Controlled access to the FRB unit in accordance with the current site use/site clearance programs, including access controls to the sewer line by grouting the sewer pipeline, manholes, and associated structures and posting signs in the area to indicate that the sewer line and soil beneath the unit has been contaminated with radionuclides.

The elements of the institutional control corrective action, which consists of land restrictions without any engineering controls, are composed of deed notifications when the parcel is transferred from federal ownership (Section 2.1) and access controls including posting identification signs (Section 2.2) and field walkdowns for general site conditions (Section 2.3). These LUCs will be implemented for perpetuity.

Each element of the institutional controls corrective action is discussed below.

2.1 Deed Notification

A deed notification shall be filed in the appropriate county records in accordance with CERCLA 120(h), which requires the government to create a deed when land on which any hazardous substance was stored, released, or disposed of is transferred to non-federal ownership. In the event the property is transferred, a deed notification will be filed with Aiken County. Per CERCLA 120(h)(3)(A), the deed shall contain, to the extent practical, such information as is available based on the complete search of agency files, including the following:

- A notice of the type and quantity of such hazardous substances
- Notice of the time at which such storage, release, or disposal took place
- A description of the remedial action taken, if any

Per CERCLA 120(h)(3)(B), the deed shall also contain a covenant warranting that

- all remedial action necessary to protect human health and the environment with respect to any such substance remaining on the property has been taken before the date of such transfer; and

- any additional remedial action found to be necessary after the date of such transfer would be conducted by the United States Government.

2.2 Access Controls

2.2.1 On-Site Workers

In accordance with WSRC ID, *Site Infrastructure and Services Manual*, Procedure 3.02, "Site Real Property Configuration Control," use of all lands and waters at SRS shall be coordinated via the Site Use Program. No use of land (i.e., excavation or any other land use) shall be undertaken without prior approval documented by a Site Use Permit. Also, in accordance with Procedure 3.02, all work at SRS that adds to or modifies features or facilities portrayed on SRS development maps (i.e., plot plans of facilities/utilities at SRS) will be authorized by a Site Clearance Permit before excavation activities take place. All Site Clearance Requests are reviewed to verify that either an approved Site Use Permit has been obtained or that an existing Site Use Permit has sanctioned the request. Verification of USDOE approval for intended land use must be obtained before a Site Clearance Permit is issued. The site use and site clearance processes are applicable to all activities and personnel on site (including subcontractors). The processes are controlled within the SRS Quality Assurance Program.

SRS identifies all buildings and facilities on maps used in the Site Use/Site Clearance Program and requires a 200-foot buffer zone around each facility. This waste unit is identified on these maps as a CERCLA facility.

Any work proposed in these areas will be strictly controlled, and workers will be appropriately trained and briefed about health and safety requirements if work is deemed necessary for maintenance. Any changes in the use or disturbance of the FRB will be cleared with USEPA and SCDHEC before any disturbance occurs.

To prevent unknowing entry and to ensure that unrestricted use of the waste unit does not occur while under government ownership, identification signs have been posted at the unit. The signs are legible from a distance of 25 feet and located approximately every 100 feet along the process sewer line, at each manhole, and at each side of the basin as shown in Figure 7, sheet 1 and 2. The signs read as follows:

F-Area Retention Basin

"DANGER"
UNAUTHORIZED PERSONNEL
KEEP OUT.
THIS UNIT WAS USED TO
MANAGE HAZARDOUS
SUBSTANCES. DO NOT DIG OR
EXCAVATE. DO NOT ENTER
WITHOUT CONTACTING THE
WASTE SITE CUSTODIAN.

CUSTODIAN: MANAGER, POST-
CLOSURE MAINTENANCE
PHONE: (803) 952-6882

F-Area Process Piping

"DANGER"
UNAUTHORIZED PERSONNEL
KEEP OUT.
THIS SUBSURFACE PIPING
SYSTEM WAS USED TO CONVEY
HAZARDOUS SUBSTANCES. DO
NOT DIG OR EXCAVATE
WITHOUT CONTACTING THE
WASTE SITE CUSTODIAN.

CUSTODIAN: MANAGER POST-
CLOSURE MAINTENANCE
PHONE: (803) 952-6882

Additionally, while under the ownership of USDOE, access control of the entire SRS will continue to be maintained in accordance with the 1992 RCRA Part B Permit Renewal Application, Volume I, Section F.1. To comply with the security requirements for a RCRA-permitted facility, this section describes the 24-hour surveillance system (R.61-79.264.14(b)(1)), artificial or natural barriers (R.61-79.264.14(b)(2)(i)), control entry systems (R.61-79.264.14(b)(2)(ii)), and warning signs (R.61-79.264.14(c)) in place at the SRS boundary.

2.3 Field Walkdowns and Maintenance for Institutional Controls

Monitoring will be performed to verify that LUCIP requirements have been met. Semi-annual monitoring of the FRB OU, 281-3F, will be conducted for accuracy and legibility of signs, visible subsidence or erosion of the waste unit, proper

vegetative growth, burrowing animals, proper access to the facility, mowing, etc. Subsidence or erosion will be corrected by backfilling the affected area with clean soil and seeding the area to prevent further erosion. USEPA and SCDHEC will be notified of the results of any inspection, event, and/or action that indicates a potential compromise of institutional controls within 30 days of identification. The notification and the reason for the notification will be documented in the Federal Facility Agreement Annual Progress Report. All other routine maintenance activities (i.e., mowing, etc.) will be documented, and the documentation will be maintained in files that are subject to USEPA and SCDHEC review and audit. A copy of the completed inspection form will be maintained in Environmental Restoration Division administrative record files.

Inspections at the FRB will be performed to ensure that institutional controls remain protective and consistent with all remedial action objectives. Monthly inspections will be performed for the first 2 years and until permanent vegetation is established. After that time, inspections will be performed semi-annually per the inspection checklist.

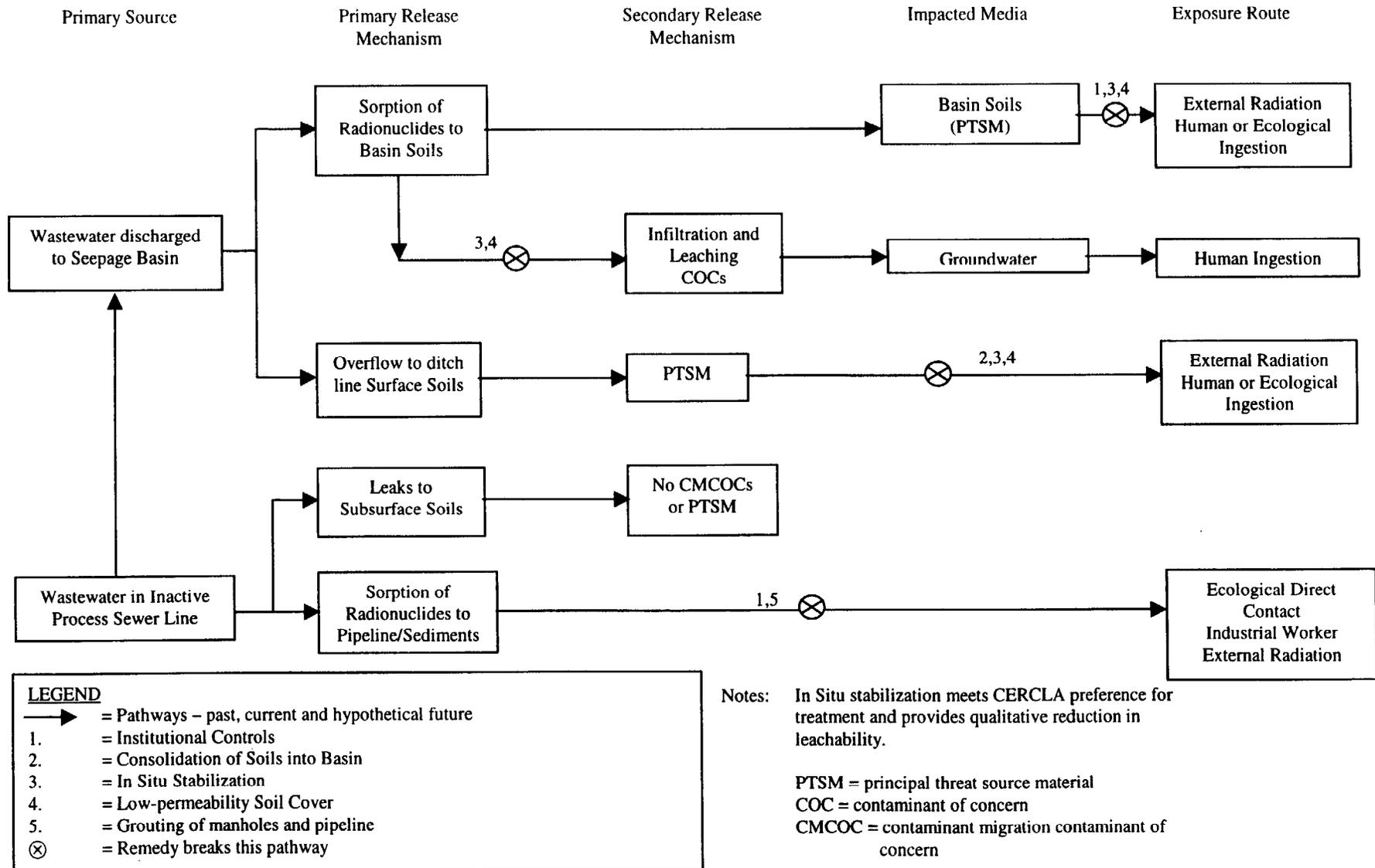


Figure A-1. Conceptual Site Model (CSM) for the F-Area Retention Basin Post Remedial Action

**APPENDIX B ER INSPECTION CHECKLIST FOR F-AREA RETENTION
 BASIN**

Waste Site: _____ A = Satisfactory X = Unsatisfactory (Comments required)	A or X	<u>Comments or Corrective Action Taken (See Maintenance Register for Corrected Items)</u>
Check to see if the site needs mowing.		
Verify that the basin and roads are accessible.		
Check for potential encroachments. (Ensure that there is no building on the site.)		
Verify all signs are intact, in good condition, and legible from a distance of at least 25 feet.		
Visually check vegetative cover for grass density. There should be no woody vegetation or shrubs growing on the cover. The height of the vegetative growth should not impair the visual inspection of the site.		
Check the integrity of drainage ditches (if any) for presence of excessive erosion, sediment buildup, and any debris restricting water flow.		
Visually inspect the concrete markers at four corners of the basin to ensure their integrity. The concrete should be visible and free of damage.		
Visually check the basin cover for signs of erosion subsidence and/or depressions.		
Verify that conditions of the roads to the well sites are adequate.		
Inspect the grounds surrounding well sites for vegetation overgrowth, debris, and existence and/or development of erosion features.		

**APPENDIX B ER INSPECTION CHECKLIST FOR F-AREA RETENTION
 BASIN (Cont'd.)**

Waste Site: _____ A = Satisfactory X = Unsatisfactory (Comments required)	A or X	<u>Comments or Corrective Action Taken (See Maintenance Register for Corrected Items)</u>
Verify that the well posts and protective covers are in place.		
Verify the well is properly identified per R.61-71.6H (South Carolina well standards and regulations).		
Verify the wells' casings are properly locked per R.61-71.11.C.6 (South Carolina well standards and regulations).		
Verify that the previous "Quarterly Monitoring Well Inspection Summary Report" has been sent to ERD Records Interim Storage. This report can be obtained from ERD Waste Treatment.		
Other		
Comments:		

Inspected By: _____ / _____ Date: _____ Time: _____
 (Print Name) (Signature)

Reviewed By: _____ / _____ Date: _____ Time: _____
 PM or Designee (Print Name) (Signature)

Note: USEPA and SCDHEC must be notified within 30 days of identification of any area where any breach or compromise of restrictions placed on this institutional control operable unit has occurred.

LUCIP for the
Ford Building Seepage Basin, 904-91G

Appendix A of Post-Construction Report/Corrective Measures Implementation
Report/Final Remediation Report for the Ford Building Seepage Basin, 904-91G

WSRC-RP-2003-4038, Revision.1, October 2003

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APPENDIX A
LAND USE CONTROL IMPLEMENTATION PLAN (LUCIP)
FOR THE
FORD BUILDING SEEPAGE BASIN OPERABLE UNIT

APPENDIX A

LAND USE CONTROL IMPLEMENTATION PLAN (LUCIP)

FOR THE

FORD BUILDING SEEPAGE BASIN OPERABLE UNIT

LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) for the Ford Building Seepage Basin will be appended to the SRS Land Use Control Assurance Plan (LUCAP).

Remedy Selection

Located in N Area in the central portion of the Savannah River Site (SRS), the Ford Building Seepage Basin (FBSB) Operable Unit (OU) lies approximately 610 m (2,000 ft) northwest of the intersection of Roads C and 6 (see Figure 1 in the main text). The FBSB and its associated components were constructed in 1964 to receive wastewater from the Ford Building. At the Ford Building, wastewater was generated during the reconfiguration, repair, and scrapping of reactor heat exchangers and the process equipment. The seepage basin operated until 1984. The retention tank, pumping station, and process piping line were removed in 1998. As a result of the removal action of 1998, approximately 2.1 m³ (2.8 yd³) of radiologically contaminated soil was containerized in two B-12 boxes and one 55-gal drum. The containerized soil is included in the remedial action for the FBSB OU.

The FBSB OU (as shown in Figures 3 and 4 included in the main text) included the following eight components:

- a 5-cm (2 in) diameter, 18.3-m (60-ft) long, steel underground pipeline (Ford Building process sewer line) that carried wastewater from the Ford Building to the underground retention tank (removed in 1998)

- a 22,710 L (6,000 gal), underground, steel retention tank containing sludge and wastewater (removed in 1998)
- a 5-cm (2 in) diameter, 32.9-m (108 ft) long, steel underground pipeline (Ford Building process sewer line removed in 1998) that carried wastewater from the underground retention tank to the seepage basin
- a pumping station (removed in 1998) to remove fluids from the retention tank
- an unlined, 568,000-L (150,000 gal) seepage basin (approximately 37 by 24 m [120 by 80 ft] at ground level and approximately 18 by 7.8 [60 by 25 ft] at the floor level and approximately 3 m [10 ft] deep)
- a delisted National Pollutant Discharge Elimination System (NPDES) outfall CS-008 and associated riprap-lined earthen drainage ditch
- an underground 20-cm (8 in) diameter, abandoned fire hydrant line that was cut during construction of the seepage basin
- groundwater associated with the unit (the groundwater flow direction is indicated in Figure 4)

There is no record that the basin ever overflowed.

The RFI/RI/BRA report (WSRC 2000) (see Section 6.0 in the main test for references) contains the detailed information and analytical data for all the investigations conducted and samples taken during the media assessment of the FBSB OU. For the purpose of remedial investigation and risk assessment, the eight FBSB OU components were grouped into the following five subunits:

- FBSB and its surrounding area (Seepage Basin Area)

- Tank/Process Sewer Line Area
- Fire Hydrant Line
- NPDES Ditch
- Groundwater

Based on the results of the RFI/RI/BRA report, only soils associated with two of the five subunits needed remedial action namely, Seepage Basin Area (surface soil 0 to 0.3 m [0 to 1 ft] below land surface (bls) and subsurface soils (0.3 to 2.1 m [1 to 7 ft bls]; and Tank/Process Sewer Line Area (soil limited to 1.3-m [4-ft] depth).

Five refined COCs were identified for the Seepage Basin Area subunit. The refined COCs included arsenic, aroclor-1254, cesium-137, cobalt-60, and europium-154. Out of five refined COCs, four were human health COCs (arsenic, cesium-137, cobalt-60, and europium-154) and were identified for the future industrial workers exposed to surface and subsurface soils. One refined COC (aroclor-1254) was identified as an ecological COC for the Seepage Basin Area surface soil.

Only two human health refined COCs (cesium-137 and cobalt-60) were identified for the Tank/Process Sewer Line Area soil limited to 1.3-m (4-ft) depth.

There was no principal threat source material (PTSM) at the FBSB OU.

The selected remedy for the FBSB OU was excavation, dispositioning, backfilling, vegetative cover, and institutional controls. This selected remedial action entailed excavating the contaminated soil at the Tank/Process Sewer Line Area and dispositioning the excavated soil into the basin along with the vegetation existing in the basin; removing the containerized soil and dispositioning the soil into the seepage basin; backfilling the remaining volume of the seepage basin and the excavated area of the Tank/Process Sewer Area with clean soil from an SRS borrow pit; and covering the backfilled area with

vegetative covers. Additionally, implementing the institutional controls and five-year remedy reviews are included.

Time to complete construction was estimated to be six months.

The selected remedy is protective of both human health and the environment, is effective in meeting remedial action objectives (RAOs), and is a permanent solution. The selected remedy will comply with applicable or relevant and appropriate requirements (ARARs) and will not pose short-term risks to remedial workers, the community, or the environment.

A post-remedial action conceptual site model (CSM) (Figure B-1) illustrates how implementation of the remedial action breaks the exposure pathways.

According to the Savannah River Site Future Use Project Report (USDOE 1996); (see Section 6.0 in the main text for reference), residential use of SRS land should be prohibited.

Land Use Controls

Considering the residual risks mentioned above, the land-use control objectives are to:

- maintain the use of the OU for industrial activities only,
- prevent unauthorized access to the closed FBSB OU as long as the waste remains a threat to human health and environment, and
- preserve the cover and prevent disturbance of the dispositioned soil.

Current access controls and a deed notification needed to maintain the future land use controls are described in the following sections of this LUCIP. The area subject to land use control is identified in Drawing C-CG-G-2660 in Appendix F.

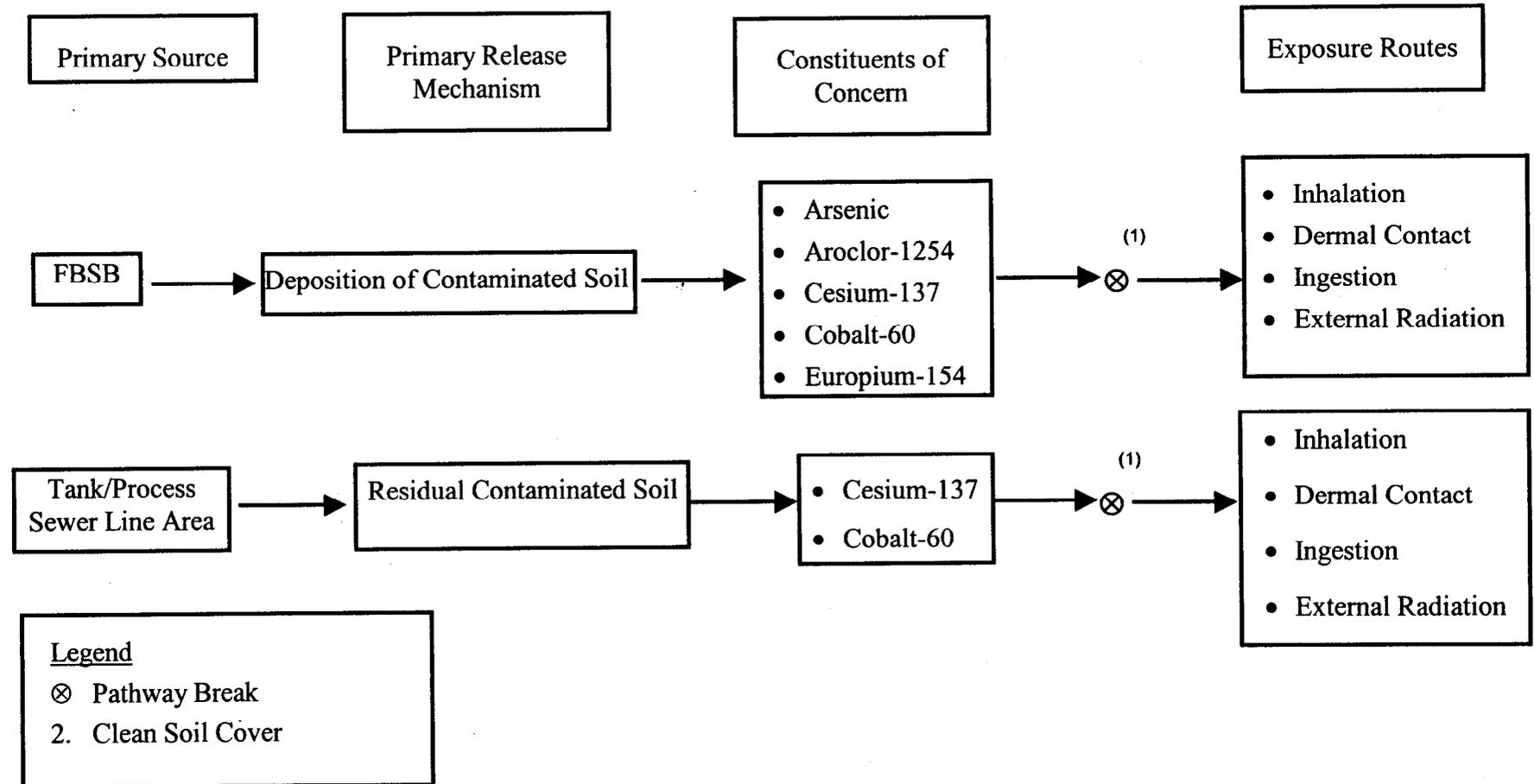


Figure A-1 Conceptual Site Model for FBSB OU with Selected Remedy Applied

Deed Notification

In the long term, if the property is ever transferred to nonfederal ownership, the U.S. Government will take those actions necessary pursuant to Section 120(h) of CERCLA. Those actions will include a deed notification disclosing former waste management and disposal activities as well as remedial actions taken on the site. The deed notification shall, in perpetuity, notify any potential purchaser that the property has been used for the management and disposal of waste. These requirements are also consistent with the intent of the RCRA deed notification requirements at final closure of a RCRA facility if contamination will remain at the unit.

The deed shall also include deed restrictions precluding residential use of the property. However, the need for these deed restrictions may be reevaluated at the time of transfer in the event that exposure assumptions differ and/or the residual contamination no longer poses an unacceptable risk under residential use. Any reevaluation of the need for the deed restrictions will be done through an amended ROD with USEPA and SCDHEC review and approval.

In addition, if the OU is ever transferred to non-federal ownership, a survey plat of the area will be prepared by a certified professional land surveyor and recorded with the county recording agency. The FBSB OU is located in Barnwell County.

Access Controls

On-Site Workers

In accordance with procedures in place and maintained at SRS (WSRC 1D, *Site Infrastructure and Services Manual*, Procedure 3.02, Site Real Property Configuration Control) use of all lands and waters on SRS shall be coordinated via the Site Use Program. No major change in use of land (i.e., excavation or disturbance) shall be undertaken without prior approval from USEPA and SCDHEC.

To prevent unknowing entry and to ensure that unrestricted use of the waste unit does not occur while under ownership of the government, identification signs are posted at the unit. The signs are legible from a distance of at least 25 feet. The signs read as follows:

Ford Building Seepage Basin (904-91G)

“Danger – Unauthorized Personnel Keep Out. This unit contains hazardous substances. Do not dig or excavate. Do not enter without contacting the waste unit custodian.”

Custodian: Manager, Post-Closure Maintenance

Phone: (803) 952-6882

Trespassers

While under the ownership of US DOE, access control of the entire SRS will continue to be maintained in accordance with the 1992 RCRA Part B Permit Renewal Application, Volume I, Section F.1. This section describes the 24-hour surveillance system (R.61-79.264.14(b)(1)), artificial or natural barriers (R.61-79.264.14(b)(2)(i)), control entry systems (R.61-79.264.14(b)(2)(ii)), and warning signs (R.61-79.264.14(c)) in place at the SRS boundary to comply with the security requirements for a RCRA-permitted facility.

Field Walkdowns and Maintenance for Institutional Controls

After the remediation of the FBSB, only maintenance activities will be required per this remedial action. No operations will be required.

The results of any events and or actions that indicate some potential compromise of institutional controls will be documented in the FFA Annual Progress Report. All other routine maintenance activities will be documented and maintained in files subject to USEPA and SCDHEC review and audit. A copy of the completed inspection form is maintained in the Soil and Groundwater Closure Projects (SGCP) Administrative Record

Files. The land-use controls will be implemented as long as the waste remains a threat to human health or the environment.

The following steps will be implemented to maintain the soil covers for as long as it is necessary to prevent unacceptable exposure to future industrial workers:

- Perform periodic (semi-annual) visual inspections for evidence of damage to the soil cover due to subsidence, erosion or intrusion by burrowing animals. The inspection will also address upkeep of the vegetative cover and access control barriers (e.g., the warning signs). The field inspection checklist for FBSB OU is provided as an attachment (Attachment A-1).
- Perform necessary repairs (when required as identified during inspection) to maintain the functional integrity of the soil cover and the warning signs.
- Enforce SRS institutional controls through access controls by restricting access to the closed waste unit. Institutional controls will be maintained as long as the waste remains a threat to human health or the environment.
- As required by the National Oil and Hazardous Substance Contingency Plan (NCP), a five-year review of the ROD for the FBSB OU unit will be performed as long as the waste remains a threat to human health or the environment.

The unit-specific LUCIP, including the inspection data sheet, will be revised as needed (e.g., after completion and construction activities and in response to the result of five-year reviews of the remedy) and appended to the SRS LUCAP.

Per Section 3.6 of the LUCAP, the post-construction revision of the LUCIP identifies the area under land-use restriction via a survey plat certified by a professional land surveyor.

ATTACHMENT A-1

**FIELD INSPECTION CHECKLIST FOR THE FORD BUILDING SEEPAGE BASIN
 OPERABLE UNIT**

A = Satisfactory X = Unsatisfactory (Explanation required)	A or X	Observation or Corrective Action Taken
1. Verify that there is no excavation, digging, or construction activities on the soil cover		
2. Verify that no woody vegetation is growing on the soil cover. Remove or identify, as needed.		
3. Visually check vegetative cover for grass density, with no bare spots more than 3 feet by 3 feet in area. The height of the vegetative cover should not impair the visual inspection of the soil cover. This will be determined by the inspector.		
4. Verify that the roads are accessible.		
5. Verify that the waste unit signs, (4) are in acceptable condition, have correct information, and are legible from a distance of 25 feet.		
6. Check the soil cover for signs of erosion or depressions (subsidence).		
7. Check for signs of burrowing animals (holes)		
8. Other:		

CAUTION: The Inspector shall notify the Post-Closure Manager (PCM) and Environmental Compliance Authority (ECA) **IMMEDIATELY** if there has been a breach or compromise of the institutional controls of this waste unit. Refer to the post-closure inspection procedure SOP-019.

NOTE: All monitoring wells associated with this waste unit are inspected using SGCP Monitoring Well Inspection Procedure in compliance with South Carolina Hazardous Waste Management Regulation R.61-79, Subpart F, Groundwater Monitoring.

Inspected By: _____ / _____ Date: _____
 (Print Name) (Signature)

Post-Closure Manager: _____ / _____ Date: _____
 (Print Name) (Signature)

LUCIP for the
General Separations Area Consolidation Unit

Consisting of:

- Old Radioactive Waste Burial Ground (Including Solvent Tanks) (643-E)
- HP-52 Ponds
- H-Area Retention Basin (281-3H) and Spill on 05/01/1956 of Unknown of Retention Basin Pipe Leak (NBN)
- Warner's Pond (685-23G) and Spill on 03/08/1978 of Unknown of Seepage Basin Pile Leak in
- H-Area Seepage Basin (NBN) and Spill on 02/08/78 of Unknown of H-Area Process Sewer Line Cave-In, NBN

Appendix A of Corrective Measures Implementation/Remedial Action Implementation Plan (CMI/RAIP) for the General Separations Area Consolidation Unit

WSRC-RP-2003-4053, Revision.1.1, November 2003

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APPENDIX A

**LAND USE CONTROL IMPLEMENTATION PLAN
FOR THE
GENERAL SEPARATIONS AREA CONSOLIDATION UNIT**

LAND USE CONTROL IMPLEMENTATION PLAN

The General Separations Area Consolidation Unit (GSACU) Land Use Control Implementation Plan (LUCIP) will be appended to the Savannah River Site (SRS) Land Use Control Assurance Plan (LUCAP).

The selected remedy leaves hazardous substances in place that pose a potential future risk and will require land use restrictions for an indefinite period of time. As negotiated with the United States Environmental Protection Agency (USEPA) and in accordance with USEPA Region IV policy (Johnston 1998), the Savannah River Site (SRS) has developed a LUCAP (WSRC 2002b) to ensure that land use restrictions are maintained and periodically verified. This LUCIP provides detailed and specific measures required for the land use controls selected as part of this remedy. The United States Department of Energy (USDOE) is responsible for implementing, maintaining, monitoring, reporting upon, and enforcing the land use controls described herein. Upon final approval, the LUCIP will be appended to the LUCAP and is considered incorporated by reference into the Post-Construction Report/Corrective Measures Implementation Report (PCR/CMIR), establishing land use controls implementation and maintenance requirements enforceable under the Comprehensive Environmental Response, Compensation, and Recovery Act (CERCLA). The approved LUCIP will establish implementation, monitoring, maintenance, reporting and enforcement requirements for the unit. The LUCIP will remain in effect until modified as needed to be protective of human health and the environment. LUCIP modification will only occur through another CERCLA document.

1.0 REMEDY SELECTION

1.1 General Separations Area Consolidation Unit

The SRS occupies approximately 310 square miles of land adjacent to the Savannah River, principally in Aiken and Barnwell counties of South Carolina. The GSACU is located near the center of SRS adjacent to E Road and south of H-Area, and includes the following waste units:

- H-Area Retention Basin (HRB) (281-3H).
- Warner's Pond (685-23G), including a portion of the H-Area Inactive Process Sewer Line (HIPSL).
- HP-52 Ponds.
- Old Radioactive Waste Burial Ground (ORWBG) (643-E), including 22 underground solvent tanks known as OSTs.

Collectively, these waste units are identified as a single operable unit (OU) because of their proximity to each other and similar health and environmental threats.

The Federal Facility Agreement (FFA 1993) for SRS lists the GSACU as a Resource Conservation and Recovery Act (RCRA) Solid Waste Management Unit/Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) unit requiring further evaluation. The GSACU required further evaluation through an investigation process that integrates and combines the RCRA Facility Investigation (RFI) process with the CERCLA Remedial Investigation (RI) process to determine the actual or potential impact to human

health and the environment of releases of hazardous substances, pollutants or contaminants to the environment.

1.1.1 H-Area Retention Basin

HRB (281-3H) is a single open inactive retention basin surrounded by a berm. HRB is approximately 60 m (200 ft) long by 37 m (120 ft) wide by 2 m (7 ft) deep. From 1955 to 1972, it received non-hazardous, radioactively-contaminated wastewater from chemical separations facilities and from the H-Area Tank Farm. Wastewater flowed through an underground process sewer line to a diversion box that directed the waste stream to either HRB or a former retention basin (281-7H) that was located to the west side of HRB. The process sewer line from the diversion box to HRB is no longer in service and is part of the HRB unit. This segment is a 1-m (3-ft) diameter concrete pipe approximately 23 m (75 ft) long. Drainage from HRB was via a 1-m (3-ft) diameter concrete pipe approximately 30 m (100 ft) long on the south side of the basin. The pipe discharged to a concrete spillway along an existing active effluent stream that flows from H-Area to Fourmile Branch.

In May 1956, an undetermined volume of material leaked from the discharge gate on the south side of HRB. SRS constructed a temporary holding pond (approximately 15 x 15 m [45 x 45 ft]) to contain the material. This area was identified as a site evaluation area (SEA) called "Spill on 05/01/1956 of Unknown Amount of Retention Basin Pipe Leak" and subsequently has been included in the HRB unit.

There is a soil pile on the western side of the basin. The soil pile is approximately 50 m (160 ft) long by 18 m (60 ft) wide by 5 m (15 ft) high. The soil is the excavated remains of a former basin (281-7H) which was adjacent to HRB site.

Trees and other vegetation were removed from HRB in 1996. HRB is now primarily covered with grasses and scattered small shrubs. Standing rainwater is normally present in HRB. The amount varies seasonally, depending on the amount of rainfall and the evaporation rate.

1.1.2 Warner's Pond

Warner's Pond (685-23G) is approximately 4-acre in size centered on an area that was formerly occupied by a pond approximately 1-acre in size. The pond was constructed in 1956 as an emergency holding pond to receive contaminated cooling water from the 221-H (H Canyon) building that flowed into an effluent stream. Contaminated cooling water was discharged to Warner's Pond on three occasions: 1956 (cooling coil leak), 1960 (source not determined), and 1965 (cooling coil leak which released approximately 300 curies [Ci] of activity). Contaminated water from all three events entered the pond via the effluent stream leading from H Area and was diverted or pumped to HRB or to the H-Area Seepage Basins. In 1966, Warner's Pond was drained, backfilled with clean soil, and paved with asphalt.

There are several inactive pipelines that run through the Warner's Pond area and are part of the unit. One is a RCRA regulated pipeline known as the H-Area Inactive Process Sewer Line (HIPSL). The RCRA-HIPSL is an 46-centimeter (cm) (18-inch) diameter vitrified clay pipe through which liquid waste was transported from the H-Area Separations Facilities to the H-Area Seepage Basins. Facility records indicate the sewer line operated from 1955 to 1982. This effluent was characterized as hazardous due to mercury and chromium concentrations and low pH. No listed wastes were managed at the RCRA-HIPSL. There are approximately 380 m (1,250 ft) of RCRA-HIPSL, several manholes, and a diversion box inside the Warner's Pond OU boundary.

The other two inactive process sewer lines (IPSLs) in the Warner's Pond waste unit are within the berms and are subject to CERCLA remedial action in accordance with the SRS Federal Facilities Agreement (FFA 1993), as opposed to corrective action under the SRS RCRA Permit. One section of the CERCLA-IPSL is approximately 105 m (350 ft) of reinforced concrete pipe, and the other section is approximately 70 m (230 ft) of polyethylene pipe. These pipelines adjoin the RCRA-HIPSL from a network of sewer lines (now inactive) that carried effluent to several non-RCRA regulated units.

In 1978, two spills (overflows) from a diversion box along the then-active vitrified clay HIPSL contaminated soils in the vicinity of the diversion box over an area at least 8 x 75m (25 by 250 ft). This area was identified as a SEA called "Spill on 03/08/1978 of Unknown Seepage Basin Pipe Leak in H-Area Seepage Basin (NBN)" and subsequently has been included in the Warner's Pond unit.

There are also reports that 12 m (40 ft) of the HIPSL collapsed in 1978 just north of the railroad line at the northern part Warner's Pond. A parallel bypass line was installed adjacent to the broken section, which was abandoned in place. This area was identified as a SEA called "Spill on 02/08/1978 of H-Area Process Sewer Line Cave-In (NBN)" and subsequently has been included in the Warner's Pond unit.

In 1978, radiological survey data and sampling data identified elevated beta-gamma activity at Warner's Pond that warranted corrective measures. Soils exceeding 2,000 counts per minute (approximately 765 m³ [1,000 yd³]) were removed from the former pond area and sent to the Burial Ground Complex for disposal. The area was then treated with herbicide, graded with fresh soil, topped with a clay overburden, and re-paved with asphalt. The effluent stream that fed the former pond has been re-directed around the contaminated area.

Trees and other vegetation were removed from the fenced Warner's Pond in 1996. Warner's Pond is primarily covered with asphalt that is in generally good condition with few cracks. The area between the south side of the Warner's Pond fence and E Road, which contains woody vegetation and soils with surficial contamination, has been included in this remediation project.

1.1.3 HP-52 Ponds

The HP-52 Ponds waste unit (no building number) is a site approximately 1.1 acre in size centered on an area that was formerly occupied by two small holding ponds. In 1967, during a transfer of high level waste at the H-Area Tank Farm, some spilled material flowed into a nearby storm sewer and reached the HP-52 outfall. Two small holding ponds referred to as the "HP-52 Cesium Ponds" or "HP-52 Ponds" were constructed to contain the contaminated water. Contaminated soil from the spill containing approximately 1,200 Ci of radioactivity was removed and shipped to the ORWBG. The stream banks below the HP-52 outfall were paved with asphalt to minimize contaminant migration from the soil to the stream.

A smaller spill occurred in 1969 when an H-Area Tank Farm waste transfer line ruptured and released high level waste to the storm sewer and outfall. Following this event, the pond areas were filled with contaminated soil excavated from the stream banks, and covered with clean backfill. Stream flow was diverted from the original effluent ditch and re-directed around the former ponds area.

There is no historical evidence to document the exact locations of the former ponds at HP-52 Ponds. The former ponds area was inferred from the field locations of, and information associated with, two concrete waste site markers. Several soil piles are present at HP-52 Ponds. The piles are the result of

movement of soil at the unit to fill the pond areas, to backfill ditches, and to redirect the active regulated effluent ditch.

Trees and other vegetation were removed from HP-52 Ponds in 1996. The HP-52 Ponds unit is now primarily covered with grasses and scattered small shrubs.

1.1.4 Old Radioactive Waste Burial Ground

The ORWBG (643-E) is located in E-Area directly south of the Low-Level Radioactive Waste Disposal Facility (LLRWDF) (643-7E) and the Mixed Waste Management Facility (MWMF) (643-28E). The ORWBG is bordered by SRS E Road on the south and F-Area on the west. The ORWBG is part of the central disposal area for solid radioactive waste at SRS known as the Burial Ground Complex (BGC). Waste was disposed of at the ORWBG from 1952 until 1974, when the site was essentially filled and the majority of waste disposal operations shifted to other facilities in the BGC.

The ORWBG is a 76-acre disposal area for solid radioactive waste produced at SRS, as well as for shipments from other USDOE and Department of Defense facilities. During its operational history, approximately 200,000 m³ (7,125,000 ft³) of radioactive wastes, including radioactively contaminated hazardous substances, were buried at depth within the ORWBG. Most wastes disposed of in the ORWBG were placed in drums, cans, cardboard boxes, plastic bags, and metal containers and then buried in earthen trenches approximately 6 m (20 ft) deep. Most waste was disposed of at the ORWBG from 1952 until 1972. In addition, small quantities of radioactive waste (contaminated primarily with transuranic isotopes) were disposed of in 1973 and 1974. At the time of burial, approximately 5.1 million Ci of radioactivity was placed in the ORWBG. Much of the short-lived radioactivity has decayed, but a large inventory of radioactive and hazardous substances remain buried at depth in the ORWBG.

In 1996, USDOE issued an Interim Record of Decision (Irod) (WSRC 1996) to place a soil cover on the ORWBG. The interim action installed a minimum 0.6 m (2 ft) thick compacted low permeability native soil layer underlying a 15 cm (6 inch) vegetative layer with proper slopes and associated drainage network to minimize infiltration and leaching of the buried waste. This interim action was completed in May 1998.

A second interim action was started in 2001 (WSRC 2000) to stabilize residual contamination remaining in the old solvent tanks (OSTs) within the ORWBG. The 22 OSTs, including the residual materials in the tanks, have been grouted in place. The physical work for this interim action was completed in March 2003.

1.2 Nature and Extent of Contamination at GSACU Waste Units

The constituents of concern (COCs) pertinent to the GSACU, as presented in the ROD (WSRC 2002), include the source units (e.g., contamination in soil) for the waste units. Groundwater in the aquifer under HRB, Warner's Pond, and HP-52 Ponds is not included in the scope of this CMI/RAIP because it is being addressed separately under the GSA Eastern Groundwater OU. The ORWBG is being addressed by the corrective action program in the SRS RCRA Part B permit for the Mixed Waste Management Facility (MWMF) (WSRC 1995) in accordance with Settlement Agreement 87-52-SW.

Principle threat source material (PTSM) is a COC that has been determined to present a risk of 1×10^{-3} , or greater, to human health. Contaminant migration constituents of concern (CMCOCs) are COCs that have been determined to present a risk of leaching to the groundwater at concentrations above the maximum contaminant level (MCL) within 1,000 years.

1.2.1 HRB

The unit investigation determined that soils in the basin bottom/sidewalls, in the basin berm, in the soil pile, and in the sewer line and discharge area are contaminated with radionuclides and arsenic. PTSM is present, primarily as cesium-137. CMCOCs are also present, primarily as strontium-90. Along the process sewer line, the contamination is at and below the pipe elevation. The discharge area has the deepest detected contamination. At the soil pile, the contamination is limited to the soil pile itself and does not extend below the asphalt layer beneath the soil pile. Available data suggest that the hardpan provides a natural limit to the downward migration of contaminants at HRB, although this is not a certainty.

1.2.2 Warner's Pond

The investigations determined that soils in the former pond area, in the berms, and along the HIPSL are contaminated with radionuclides. PTSM is present as cesium-137. Radionuclide CMCOC contaminants were primarily strontium-90. An additional CMCOC, mercury, was present in some soils in the former pond area. The extent of contamination, including any remnant left after excavation, and depth of the hardpan layer, was refined during post-ROD field activities.

1.2.3 HP-52 Ponds

The investigations determined that soils and sediments in the former ponds area, the old effluent ditch, the soil piles, and the historic drainage channel near the former beaver pond are contaminated with radionuclides. PTSM is present as cesium-137. There are no CMCOCs at HP-52 Ponds. The extent of contamination, including any remnant left after excavation, and depth of the hardpan, was refined during post-ROD field activities.

1.2.4 ORWBG

Traditional characterization (i.e., intrusive sampling) was not performed at the ORWBG to avoid disturbing material under the interim soil cover. Characterization was accomplished through a detailed literature review; evaluation of aerial photographs, construction drawings, health physics burial maps, and the computerized burial record analysis database, evaluation of past studies, review of process history, interviews with SRS staff, and non-intrusive investigations. This investigation is documented in *Source Term for the Old Radioactive Waste Burial Ground (ORWBG), Savannah River Site (WSRC 1997a)*. The data provided sufficient information to understand the hazards associated with the ORWBG and to select a remedial alternative.

1.3 Remedial Action Overview

The selected remedial action established in the ROD is based on an evaluation of potential alternatives performed in accordance with the National Oil and Hazardous Substance Contingency Plan (NCP) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (as amended). As stated in the ROD (WSRC 2002), the selected RA for the GSACU includes the following elements:

1. Excavate materials constituting industrial PTSM and soil containing CMCOCs above RGs at HRB, Warner's Pond, and HP-52 Ponds to the extent practicable. The excavation will not breach the integrity of the hardpan. Soil RGs for CMCOCs are established to prevent leaching of constituents to groundwater at concentrations above the maximum concentration level (MCL) within 1,000 years.

2. Manage standing surface water (in HRB, Warner's Pond, and HP-52 Ponds) and water which accumulates during excavation by solidification and consolidation with the excavated soil and/or by another means.
3. Consolidate the excavated soil and material by transferring it to the areas of the ORWBG that have not yet been covered by the native soil cover (e.g., over the OSTs).
4. When inactive pipelines are encountered during removal of soil, excavate those sections of the pipelines with the soil. At Warner's Pond, this will include the inactive CERCLA pipelines within the berms, the diversion box, and the RCRA-regulated HIPSL. Characterization data show that soil around the HIPSL is non-hazardous. Sections of the HIPSL and any contents will be sampled and analyzed during the characterization of Warner's Pond to determine if they are hazardous in accordance with South Carolina Hazardous Waste Management Regulation R.61-79.261. If the HIPSL pipeline or its contents are hazardous, these materials will not be consolidated into the ORWBG. A RCRA Closure Plan will be developed to document the disposition of the RCRA pipeline.

For remaining intact portions of inactive pipelines, including portions that are not in contact with PTSM or cannot be readily removed (such as the section of the HIPSL under the railroad track), plug the ends of the pipelines and grout in place. If a pipeline is not intact, cannot be reliably grouted in place, and is non-hazardous, remove it and consolidate it with the soil transferred to the ORWBG. Risks posed by remnant contamination in soil after excavation will be determined prior to backfilling.

5. Consolidate any vegetation in contact with PTSM by removing it and transferring it to the ORWBG. Vegetation will be shredded, chipped, or

spatially distributed and incorporated into the excavated soil. Placement of this material at ORWBG will be engineered in a manner that minimizes subsidence.

6. Evaluate the risk of remnant material after excavation at HRB, Warner's Pond, and HP-52 Ponds. Contaminant migration risk from the potential source to the groundwater beneath each unit will be evaluated.
7. Mitigate residual risk at HRB, Warner's Pond, and HP-52 Ponds by backfilling and placing clean soil over open excavations that may contain residual contamination exceeding RGs. A soil cover will be used to minimize infiltration so that (1) no unit-related contaminants will cause MCL exceedances in the groundwater beneath each unit, and (2) the accumulation of perched water atop the hardpan is minimized.

Note: at HRB and Warner's Pond, a low permeability geosynthetic cover will be installed, as stated in the CMI/RAIP, Section 1.5.2, RAIP Scoping Meeting, Item No. 5.

8. Restore surface water drainage at Warner's Pond to a natural state by removing the berms that cause ponding of water.
9. Prepare a post-construction report for HRB, Warner's Pond, and HP-52 Ponds to summarize the remediation activities and summarize how residual risks are addressed.
10. Implement institutional controls at HRB, Warner's Pond, and HP-52 Ponds. Institutional controls will consist of site maintenance (site inspections, mowing, general housekeeping, repair of erosion damage, and other routine maintenance as needed) and access controls (warning signs and land use

restrictions). Institutional controls will include continued use of SRS's Site Use and Site Clearance.

11. Construct a low-permeability geosynthetic cover system (with a soil hydraulic conductivity of $\leq 1 \times 10^{-7}$ cm/sec) over the ORWBG; including the areas where consolidated materials from HRB, Warner's Pond, and HP-52 Ponds shall be placed. A hydraulic conductivity of $\leq 1 \times 10^{-7}$ cm/sec is selected because it provides infiltration control that sufficiently manages uncertainties related to residual contamination without further investigation, and it is consistent with low permeability caps placed over similar facilities at SRS.
12. Implement institutional controls at the ORWBG. Institutional controls will consist of site maintenance (site inspections, mowing, general housekeeping, repair of erosion damage, other routine maintenance as needed, and periodic maintenance of the infiltration control system) and access controls (security fences, warning signs, and land use restrictions). Institutional controls will include continued use of SRS's Site Use and Site Clearance.
13. Before institutional controls are terminated at the ORWBG, install intruder barriers over the long-lived persistent radioactive hot spots to deter inadvertent human intrusion. The likely configuration of the intruder barrier is heavy rip-rap. The barrier will be installed above the low permeability cap but beneath a soil cover. Covering the rip rap will minimize development of an undesirable habitat (e.g., a habitat among rip-rap favorable for deep-rooting plants and burrowing animals that could degrade the low permeability cap). Placement of the barrier will not interfere with the long-term integrity of the cap. A reasonable estimated timeframe for installing the intruder barrier is 100 years. The barrier will be installed before institutional controls are terminated; the USDOE expects to maintain institutional controls at the

Burial Ground Complex for at least 100 years. Installation of these intruder barriers are not part of this remedial action.

Note: The final intruder barriers over the long-lived persistent radioactive hot spots at the ORWBG will not be required until the USDOE relinquishes institutional control of the BGC. The estimated time frame of 100 years for installing these barriers is based on the assumed time frame for continued USDOE ownership.

The post-remedial action conceptual site model (see Attachment A-3 to this LUCIP) shows the broken pathways and the remaining residual risk to the future industrial worker.

According to the Savannah River Site future Use Project Report (USDOE 1996), residential use of SRS land should be prohibited.

2.0 LAND-USE CONTROLS

Considering the residual risk mentioned above, and in order to insure the protectiveness of the remedy described above, the GSACU land use control objectives are to:

- prevent contact, removal, or excavation of buried waste or pipelines in the OU areas designated in this LUCIP;
- maintain the use of the site for industrial activities only;
- prevent unauthorized access to the closed CERCLA unit as long as the waste remains a threat to human health or the environment; and
- prevent unauthorized residential or agricultural access to groundwater.

Current access controls and deed notification needed to maintain the future land use are described in the following sections of this LUCIP.

2.1 Access Controls

2.1.1 On-Site Workers

In accordance with WSRC 1D, *Site Infrastructure and Services Manual*, Procedure 3.02, "Site Real Property Configuration Control," use of all lands and waters on SRS shall be coordinated via the Site Use Program. All employees, contractors, and visitors to the SRS require adherence to the Site Use Program. This program ensures that all work performed on the SRS that adds, modifies, or removes features portrayed on the SRS development maps is authorized. No use of land (i.e., excavation or any other land use) shall be undertaken without prior approval documented by a Site Use Permit. This authorization is obtained through the completion of a Site Clearance Request Form. Also, in accordance with Procedure 3.02, all work at SRS that adds to or modifies features or facilities portrayed on SRS development maps (i.e., plot plans of facilities/utilities at SRS) will be authorized by a Site Clearance Permit before any excavation activities are conducted. All site clearance requests will be reviewed to verify that either an approved Site Use Permit has been obtained or that an existing Site Use Permit has sanctioned the request.

SRS, specifically the Site Development, Planning, and Mapping Department, is responsible for updating, maintaining, and reviewing site maps, including Federal Facility Agreement (FFA) (FFA 1993) operable unit (OU) identifications. If a site clearance request is made that may impact an FFA OU, the Site Clearance Request Form is sent to the FFA OU reviewer, who is in the Soil and Groundwater Closure Projects (SGCP), for either approval or disapproval. The roles and responsibilities of each individual are detailed in WSRC 1D, Procedure

3.02. Verification of USDOE approval for intended land use must be obtained before issuance of a Site Clearance Permit. The Site Use and Site Clearance processes are applicable to all activities and personnel on site (including subcontractors).

The processes are controlled within the SRS Quality Assurance (QA) Program. The SRS QA program is the governing QA program for all SRS activities, including those in SGCP. The activities that are performed in SGCP must comply with SRS QA Program procedures as well as with SGCP-specific procedures.

SRS identifies all buildings and facilities on maps used in the Site Use/Site Clearance Program. This waste unit is identified on these maps as a CERCLA facility.

Any work proposed in these areas will be strictly controlled and workers will be appropriately trained and briefed about health and safety requirements if work is deemed necessary for maintenance. No major change in land use nor excavation at the GSACU OU shall be undertaken without USEPA and South Carolina Department of Health and Environmental Control (SCDHEC) approval. To prevent unknowing entry and to ensure that unrestricted use of the waste unit does not occur while under ownership of the government, identification signs will be posted at the unit.

The access control warning signs for the soil covers will be legible for a distance of at least 25 feet. The soil cover access control warning sign is shown in Figure A-5 (Attachment A-4 to this LUCIP).

The access control warning signs for the underground grouted pipeline (Warner's Pond only) will be legible from a distance of at least 25 ft. The underground pipeline access control warning sign is shown in Figure A-6 (Attachment A-4 to this LUCIP).

Custodial responsibilities for maintenance and inspection of the GSACU waste units will be maintained by the Post-Closure Maintenance Group within SGCP.

2.1.2 Trespassers

While under the ownership of USDOE, access control of the entire SRS will be maintained in accordance with the 1992 RCRA Part B Permit Renewal Application, Volume I, Section F.1. This section describes the 24-hour surveillance system (R.61-79.264.14(b)(1)), artificial or natural barriers (R.61-79.264.14(b)(2)(I)), control entry systems (R.61-79.264.14(b)(2)(ii)), and access control warning signs (R.61-79.264.14(c)) in place at the SRS boundary to comply with the security requirements for a RCRA-permitted facility.

2.2 LUCIP Deed Notification

In the long term, if the property is ever transferred to non-federal ownership, the US Government will take those actions necessary pursuant to Section 120(h) of CERCLA. Those actions will include a deed notification disclosing former waste management and disposal activities as well as remedial actions taken on the site. The contract for sale and the deed will contain the notification required by CERCLA Section 120(h).

The deed notification shall, in perpetuity, notify any potential purchaser that the property has been used for the management and disposal of waste. These requirements are also consistent with the intent of RCRA deed notification requirements at final closure of a RCRA facility if contamination will remain at the unit.

The deed shall also include deed restrictions precluding residential use of the property. However, the need for these deed restrictions may be re-evaluated at the time of transfer in the event that exposure assumptions differ and/or the residual

contamination no longer poses an unacceptable risk under residential use. Any re-evaluation of the need for the deed restrictions will be done through an amended ROD with USEPA and SCDHEC review and approval.

In addition, if the site is ever transferred to non-federal ownership, a survey plat of the OU will be prepared, certified by a professional land surveyor, and recorded with the appropriate county recording agency.

Per Section 3.6 of the LUCAP, the post-construction revision of this LUCIP will identify the area under land use restriction via a survey plat certified by a professional land surveyor.

2.3 Field Walkdown and Maintenance for Institutional Controls

After the remediation of the GSACU, only maintenance activities will be required per this remedial action. No operations other than groundwater monitoring (at the monitoring wells) and effluent stream monitoring (at the monitoring stations) will be required.

The results of any events and or actions that indicate some potential compromise of institutional controls will be documented in the FFA Annual Progress Report. All other routine maintenance activities will be documented and maintained in files subject to US EPA and SCDHEC review and audit. A copy of the complete inspection form is maintained in the Soil and Groundwater Closure Projects Administrative Record Files. The land-use controls will be implemented as long as the waste remains a threat to human health or the environment.

The following steps will be implemented to maintain the geosynthetic soil covers for as long as is necessary to prevent contaminant migration above MCL:

- Perform periodic (quarterly at the ORWBG, and annually at HRB, Warner's Pond, and HP-52 Ponds) visual inspections for evidence of damage to the soil cover due to erosion or intrusion by burrowing animals. The inspection will also address upkeep of the vegetative cover and access control barriers (e.g., the access control warning signs). (Attachment A-2 provides a unit-specific inspection checklist for the GSACU waste units).
- Perform necessary repairs (when required as identified during inspection) to maintain the functional integrity of the soil cover, fence (ORWBG only), and access control warning signs.
- Enforce SRS institutional controls through access controls by restricting access to the closed waste unit. Institutional controls will be maintained as long as the waste remains a threat to human health or the environment.
- As required by the National Oil and Hazardous Substance Contingency Plan (NCP), a five-year review of the ROD for the GSACU will be performed as long as the waste remains a threat to human health or the environment.

The waste unit inspectors are to be trained in Hazardous Waste Operations and Emergency Response (HAZWOPER), RCRA Well Inspections (SGCP-specific training), SGCP RCRA Waste Unit Inspections, Radiological Workers, etc., as applicable for the specific inspection. They will also be trained based on the individual requirements of the regulatory approved closure documents for each waste unit. In addition, the inspectors are to attend yearly refresher courses. Over the years, different personnel will conduct the inspections and grass cutting operations.

This unit-specific LUCIP, including the checklist (Attachment A-2), will be appended to the SRS LUCAP.

ATTACHMENT A-1
SURVEY PLAT (Later)

The applicable Survey Plats for the GSACU waste units will be provided in the PCR/CMIR documentation with as-built information for the waste unit closures.
(See Section 2.2 of the LUCIP.)

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ATTACHMENT A-2

**SGCP FIELD INSPECTION CHECKLIST
for the
GENERAL SEPARATIONS AREA CONSOLIDATION UNIT**

SGCP FIELD INSPECTION CHECKLIST
for the
GENERAL SEPARATIONS AREA CONSOLIDATION UNIT

**This includes H-Area Retention Basin (HRB), Warner's Pond, HP-52 Ponds, and
 the Old Radioactive Waste Burial Ground (ORWBG) waste units**

GSACU Waste unit Inspected: _____

A= Satisfactory X= Unsatisfactory (Explanation required)	A or X	Observation or Corrective Action Taken
1. Verify that the roads are accessible. (HRB, Warner's Pond, HP-52)		
2. Verify that the waste unit warning signs are in acceptable condition, have the correct information, and are legible from a distance of 25 feet. (All sites)		
3. Verify that the fence is in good condition and that the gates are locked. (ORWBG only)		
4. Verify that there are no excavation, digging, or construction activities on the soil cover. (All sites)		
5. Check the integrity of drainage ditches for the presence of excessive erosion, sediment buildup, and any debris restricting water flow. (HRB, Warner's Pond, HP-52)		
6. Verify that no woody vegetation is growing on the soil cover. Remove or identify as needed. (All sites)		

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ATTACHMENT A-3

CONCEPTUAL SITE MODEL
for the
GENERAL SEPARATIONS AREA CONSOLIDATION UNIT
POST-REMEDIAL ACTION

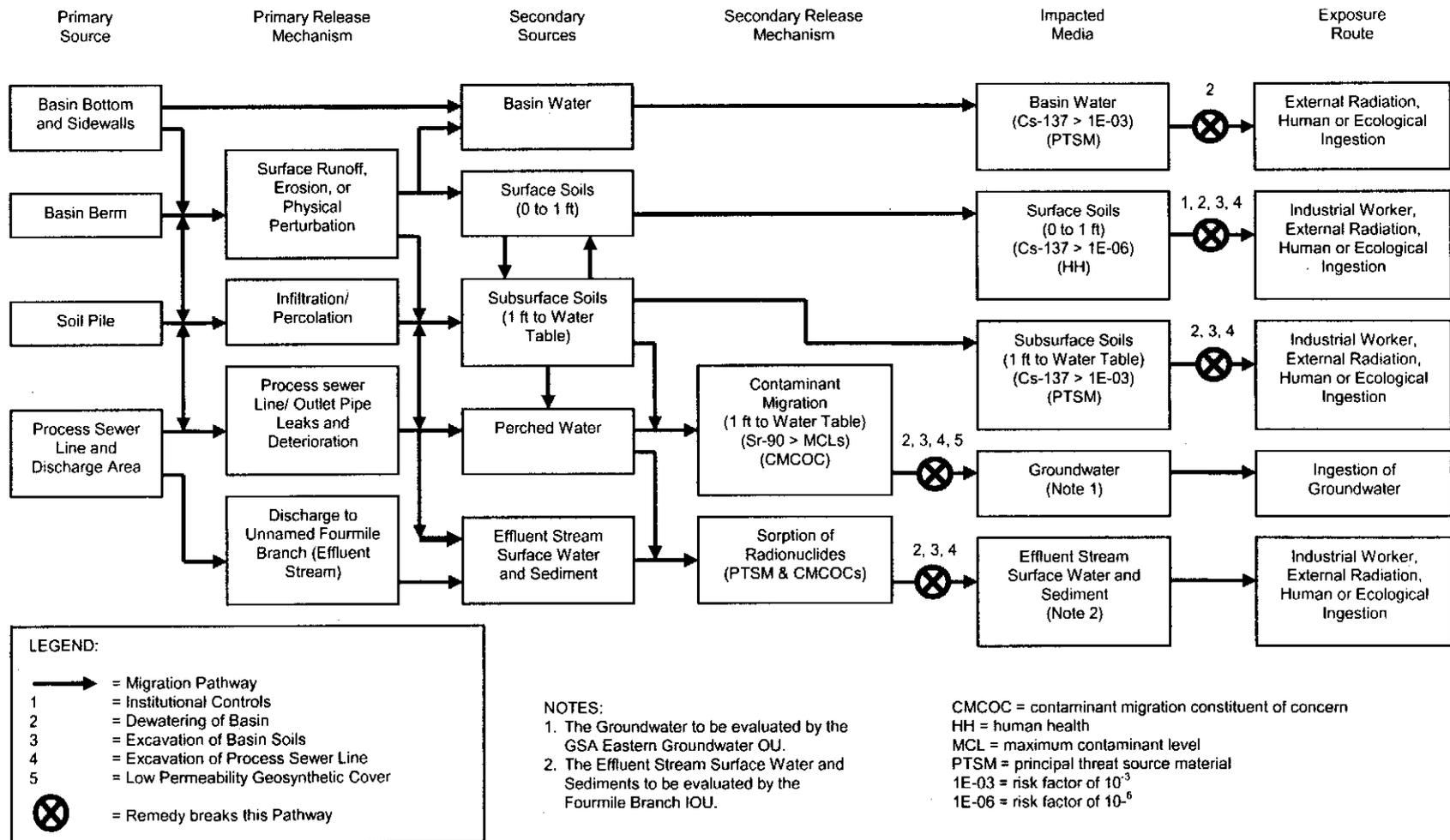


Figure A-1. Conceptual Site Model for HRB Post-Remedial Action

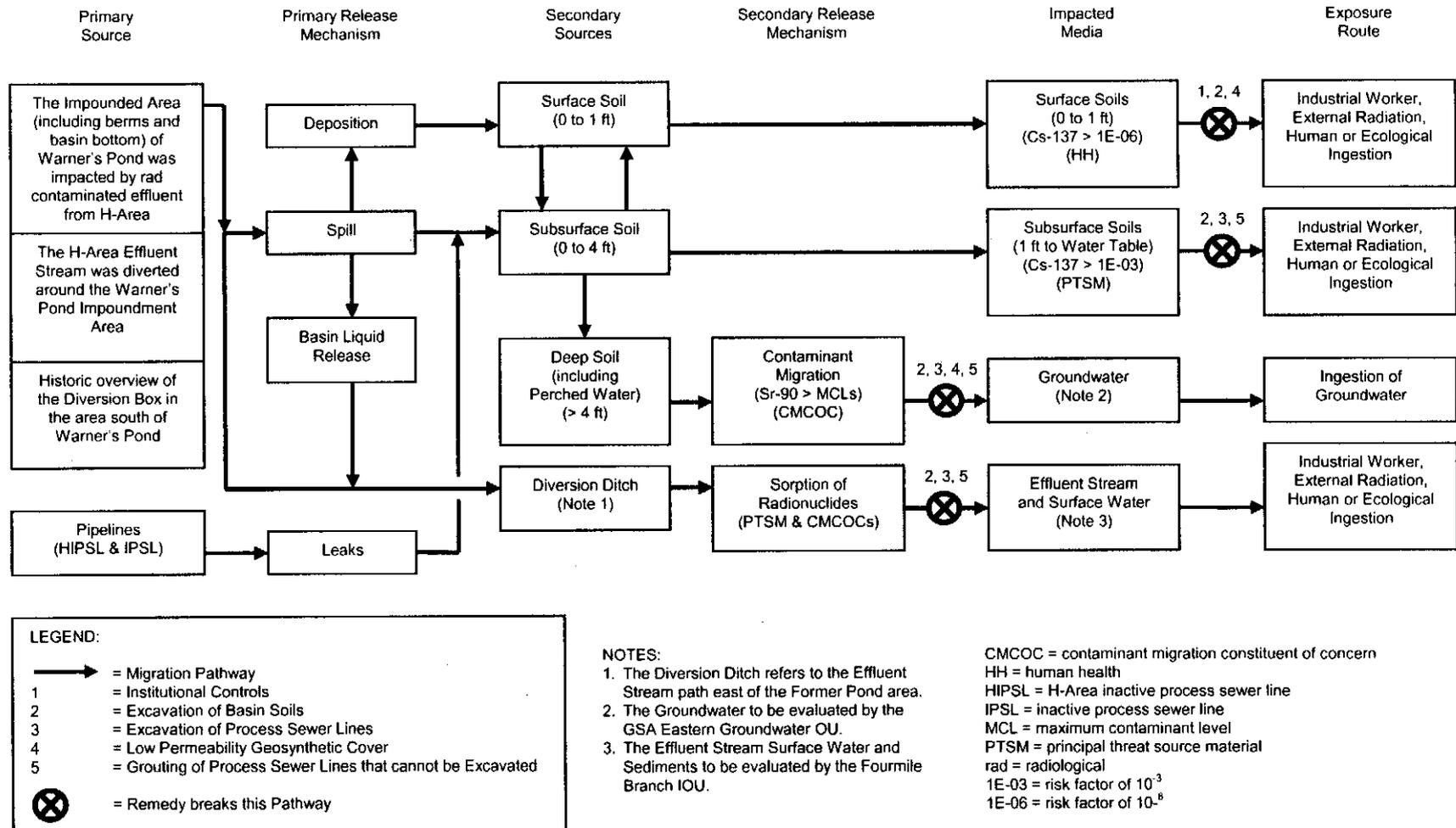


Figure A-2. Conceptual Site Model for Warner's Pond Post-Remedial Action

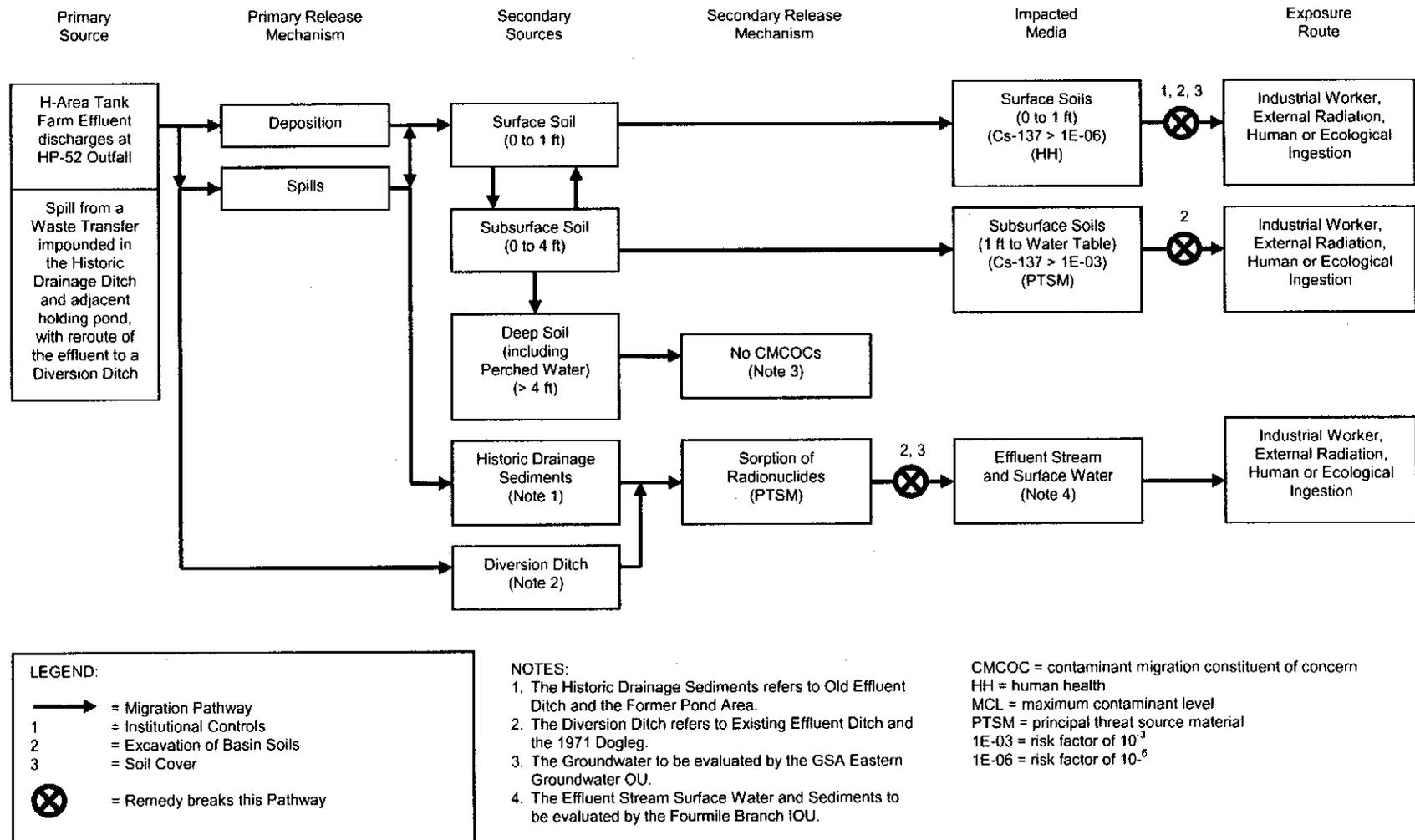


Figure A-3. Conceptual Site Model for HP-52 Ponds Post-Remedial Action

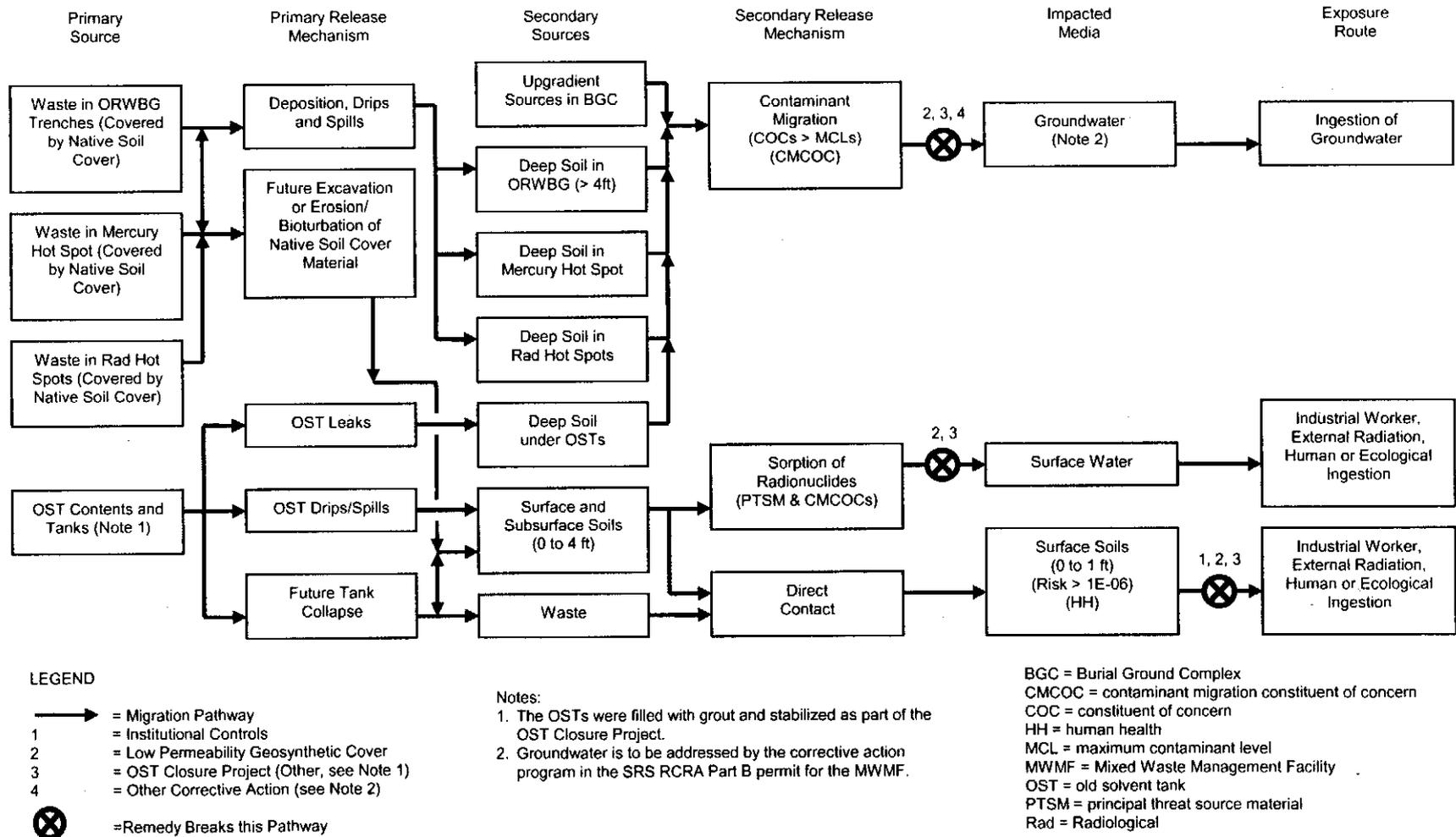
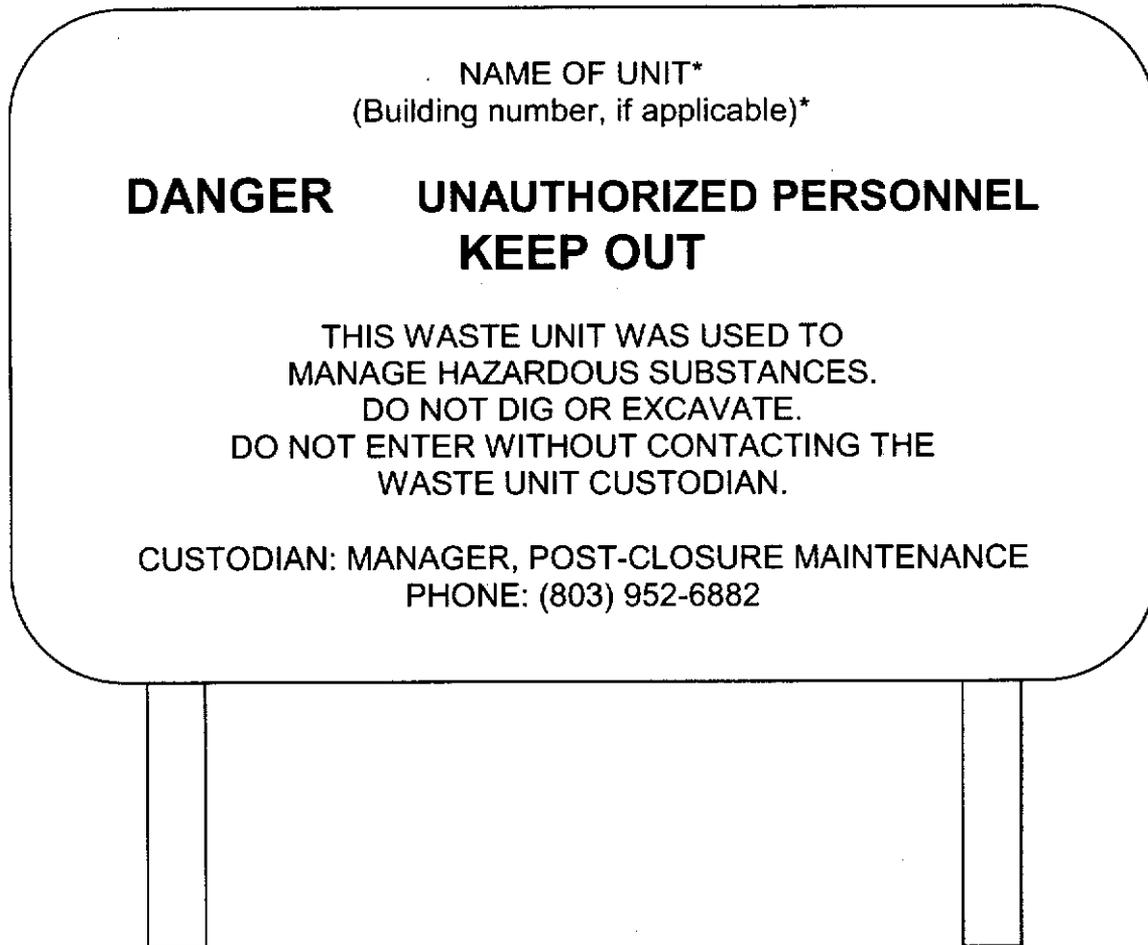


Figure A-4. Conceptual Site Model for the ORWBG Post-Remedial Action

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ATTACHMENT A-4

ACCESS CONTROL WARNING SIGNS



* Name of waste unit and building identification will inserted as applicable.

Figure A-5. Soil Cover Access Control Warning Sign

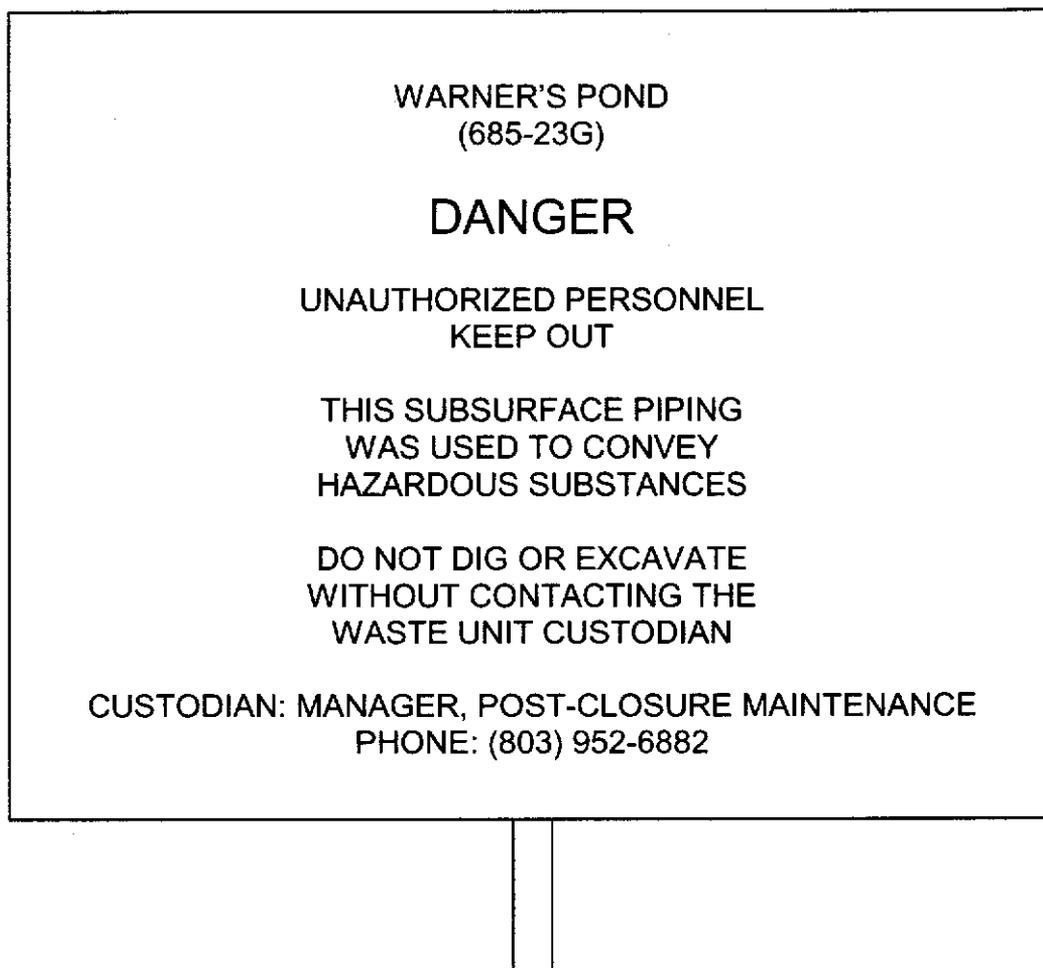


Figure A-6. Underground Piping Access Control Warning Sign

LUCIP for the
K-Area Bingham Pump Outage Pit, 643-1G

Section 2 of Final Remediation Report for the
K-Area Bingham Pump Outage Pit, 643-1G

WSRC-RP-98-4003, Revision.1, August 1998

NOTE: The Westinghouse Savannah River Company (WSRC) and Department of Energy (DOE) organizations responsible for environmental restoration at the Savannah River Site underwent name changes in 2003, as shown below. The responsibilities as outlined in the following document did not change.

Organization	Previous Name	Current Name
WSRC	Environmental Restoration Division (ERD)	Soils and Groundwater Closure Projects (SGCP)
DOE	Environmental Restoration Division (ERD)	Soil and Groundwater Project (SGP)

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2.0 LAND USE CONTROL IMPLEMENTATION PLAN

The K BPOP Land Use Control Implementation Plan will be appended to the SRS Land Use Control Assurance Plan (LUCAP) once the SRS LUCAP is approved.

Remedy Selection

The miscellaneous construction debris (i.e., pipes, cables, ladders, etc.) with fixed contamination (primary source) has been buried in the K BPOP since 1958. The presence of the debris plays a primary role in the remedy selection. There was no indication from the characterization data that the contamination present on the debris has moved and the level of radioactivity has diminished over the years. The degree of exposure toxicity to the waste is considered minimal and the potential for exposure is also considered to be minimal.

The K BPOP is located in an industrial zone as recommended by the Citizens Advisory Board and delineated on the SRS Future Land Use Map in the Federal Facility Agreement Implementation Plan. Under the current land use scenario, the possible receptor includes the known on-unit worker. Possible receptors under the future land use scenario include the on-unit industrial worker and on-unit resident (adult and child). Based on the risks identified for the K BPOP in the Remedial Investigation Report with Baseline Risk Assessment (RI/BRA) (WSRC, 1997b), the K BPOP poses minimal risk to human health. However, to manage any risk uncertainty and to ensure that the potential for exposure remains minimal, institutional controls are appropriate for the K BPOP operable unit. The No Action alternative would provide adequate protection of human health and the environment only for the near future. However, long-term protection for the duration of U.S. Government control of the SRS will be assured through institutional controls; and if the land is transferred to non-federal ownership via deed restrictions, in perpetuity, if deed restrictions are determined to be necessary.

For the K BPOP operable unit, institutional controls meet the remedial action objectives of risk reduction to human health and achievement of remedial goals for soil by precluding future on-site residential use of the area, buried waste contact, removal, or excavation. In addition, there is no need for remediation of the K BPOP from an ecological standpoint. Further, K BPOP is not impacting groundwater. Constituents are not observed to have migrated horizontally and clayey zones underneath the base of the pit will limit vertical migration potential.

Land Use Controls

Institutional controls are intended to be permanent and effective in the near- and long-term. It is considered to be the least cost option, which is still protective of human health and the environment. Implementation of this alternative will require both near- and long-term actions. For the near term, signs will be posted at the waste unit to indicate that this area was used to manage hazardous materials. In addition, existing SRS access controls will be used to maintain this site for nonresidential use.

Based on the conclusions of the K BPOP RI/BRA Report, groundwater does not pose a threat to human health and restrictions are not required. Therefore, groundwater land use control (LUC) objectives have not been established. However, to prevent the disturbance of soil in the LUC area the following LUC objectives for soil at K BPOP have been established.

For the K BPOP operable unit, the LUC objectives are to:

- Prevent contact, removal or excavation of buried waste in the area and
- Preclude residential use of the area

The general means to achieve the objectives include:

- Continuation of the SRS access controls (i.e., security guards, security systems, badging, etc.) to preclude access to the SRS and the K BPOP by the general public,
- Continuation of the SRS Site Use/Site Clearance program to preclude work in the waste unit
- Installation of warning signs at the most probable access points that instruct personnel to contact the waste unit custodian prior to entry,
- Maintenance of the waste unit signs and visible markers to identify the waste unit to site workers,
- General maintenance of the waste unit (i.e. mowing, ensuring road accessibility, erosion and subsidence control, etc.), and
- Evaluation of the need for deed notifications/restrictions if the property is ever transferred to non-federal ownership, as required per CERCLA Section 120(h)

A survey plat, completed by professional land surveyors delineates the land subject to land use controls. (Figure 4).

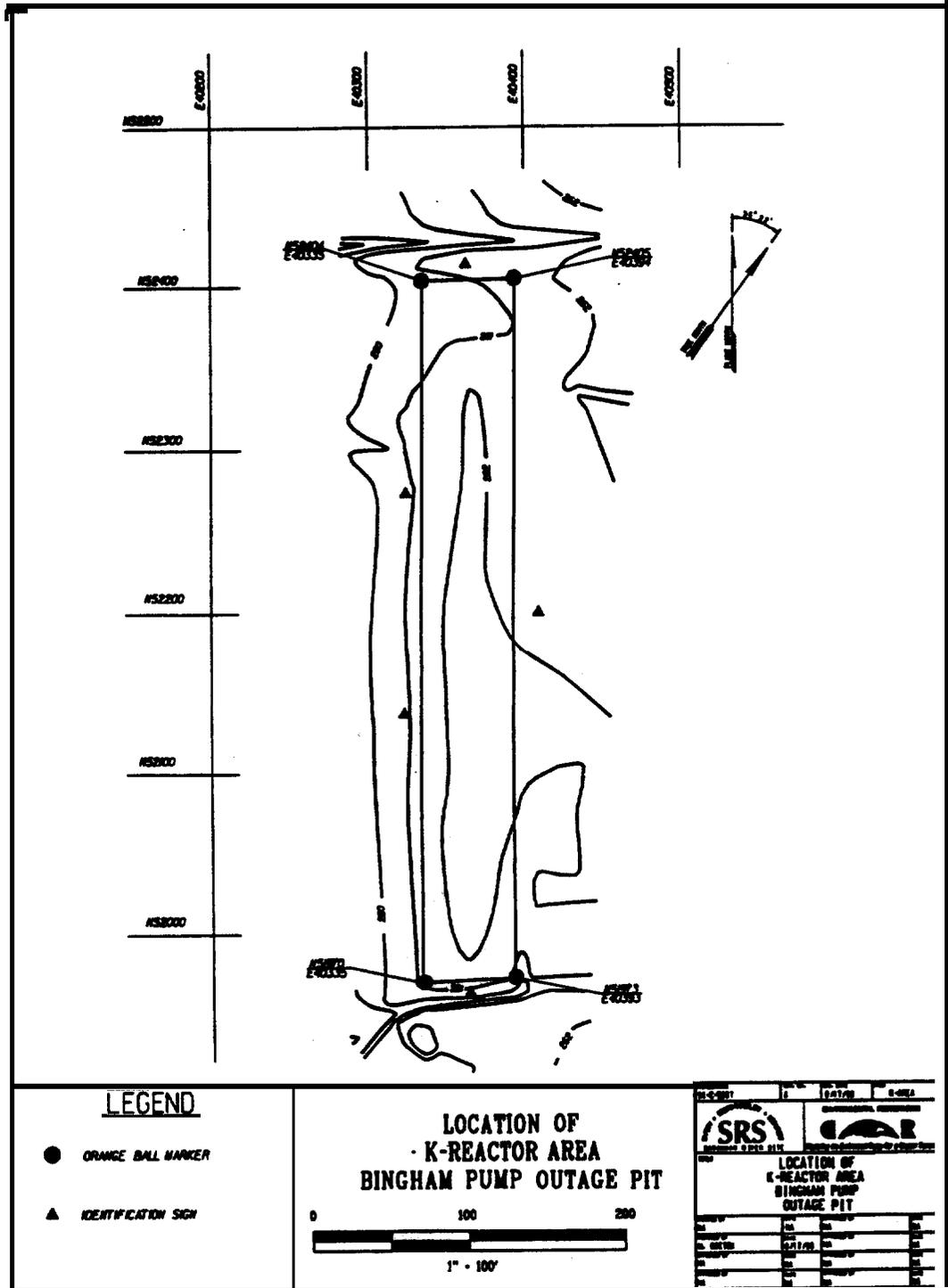
In the long term, if the property is ever transferred to non-federal ownership, the U.S. Government will take those actions necessary pursuant to CERCLA 120(h). These actions will include a deed notification disclosing former waste management and disposal activities, as well as any remedial actions taken at the waste unit. The deed notification will, in perpetuity, notify any potential purchaser that the property has been used for the management and disposal of construction debris and other materials, including hazardous substances. RCRA deed notification requirements are not required for this waste unit since it is not listed as a RCRA facility in the SRS Federal Facility Agreement, Appendix C. The deed will also include restrictions precluding residential use of the property. However, the need for modifications to the LUCs shall be reevaluated at the time of transfer in the event that exposure assumptions differ and/or contamination no longer poses an unacceptable risk under residential use. The Environmental Protection Agency (EPA) and the South Carolina Department of Health and Environmental Control (SCDHEC) will be given advanced notification of plans for property transfer in order to ensure adoption of such additional measures as may be needed to assure continued compliance with LUCs on the transferred property. In addition, if the property is ever transferred to non-federal ownership, a survey plat of the area will be prepared, certified by a professional land surveyor, and recorded with the appropriate county recording agency.

This proposal is consistent with EPA guidance and is an effective use of risk management principles.

The elements of the institutional controls corrective action, which consists of land restriction without any engineering controls, are comprised of deed notifications, access controls that include posting of identification signs, and field walkdowns for general site conditions.

Each element of the institutional controls corrective action is discussed below.

Figure 4. Locations of the K-Area Bingham Pump Outage Pit Identification Signs



2.1 Deed Notification

A deed notification shall be filed in the appropriate county records in accordance with CERCLA 120(h), which requires the government to create a deed when land on which any hazardous substance was stored, released, or disposed is transferred to non-federal ownership. Per CERCLA 120(h)(3)(A), the deed shall contain, to the extent practical, such information as is available based on the complete search of agency files, to include

- a notice of the type and quantity of such hazardous substances;
- notice of the time at which such storage, release, or disposal took place;
- a description of the remedial action taken, if any.

Per CERCLA 120(h)(3)(B), the deed shall also contain a covenant warranting that

- all remedial action necessary to protect human health and the environment with respect to any such substance remaining on the property has been taken before the date of such transfer;
- any additional remedial action found to be necessary after the date of such transfer shall be conducted by the United States Government;
- a clause granting the United States Government access to the property in any case in which remedial action or corrective action is found to be necessary after the date of such transfer.

RCRA permit requirements are not applicable for this waste unit per the SRS Federal Facility Agreement, Appendix C.

2.2 Access Controls

2.2.1 On-Site Workers

In accordance with WSRC 1D, *Site Infrastructure and Services Manual*, Procedure 3.02, *Site Real Property Configuration Control* (WSRC, 1996), use of all lands and waters on the SRS shall be coordinated via the Site Use Program. No use of land (i.e., excavation or any other land use) shall be undertaken without prior approval documented by a Site Use Permit. Also, in accordance with Procedure 3.02, all work at SRS that adds to or modifies features or facilities portrayed on the SRS development maps (i.e., plot plans of facilities/utilities at SRS) is authorized by a Site Clearance Permit before execution. All Site Clearance requests are reviewed to verify that either an approved Site Use Permit has been obtained, or that an existing Site Use Permit has sanctioned the request. Verification of the Department of Energy approval for intended land use must be obtained before issuance of a Site Clearance Permit. The Site Use and Site Clearance processes are applicable to all activities and personnel on site (including subcontractors). The processes are controlled within the SRS Quality Assurance Program.

The SRS identifies all buildings and facilities on maps used in the Site Use/Site Clearance Program and includes a 200-foot buffer zone around each facility. This waste unit is identified on these maps as a CERCLA facility.

Any work proposed in these areas will be strictly controlled and workers will be appropriately trained and briefed about health and safety requirements if work is deemed necessary for maintenance. Any changes in the use or disturbance of the K BPOP will be cleared with the EPA and SCDHEC before the disturbance occurs. To prevent unknowing entry and to ensure that unrestricted use of the waste unit does not occur while under ownership of the government, identification signs will be posted at the waste unit access points (Figure 4). The signs will be legible from a distance of at least 25 feet. The signs will read:

K-Area Bingham Pump Outage Pit, 643-1G
"Danger - Unauthorized Personnel Keep Out.
This waste unit was used to manage hazardous substances.
Do not dig or excavate. Do not enter without contacting the
waste site custodian."
Custodian: Manager, Post Closure Maintenance
Phone: (803) 952-6882

Site-specific access controls (i. e., fences) are not required for the K BPOP since exposure to the casual worker or trespasser as calculated in the Baseline Risk Assessment does not warrant this level of protection.

2.2.2 *Trespassers*

Additionally, while under the ownership of the Department of Energy, access control of the entire SRS will continue to be maintained in accordance with the 1992 RCRA Part B Permit Renewal Application, Volume I, Section F.1. This section describes the 24-hour surveillance system (R.61-79.264.14(b)(1)), artificial or natural barriers (R.61-79.264.14(b)(2)(i)), control entry systems (R.61-79.264.14(b)(2)(ii)), and warning signs (R.61-79.264.14(c)) in place at the SRS boundary to comply with the security requirements for a RCRA-permitted facility.

2.3 *Field Walkdowns and Maintenance*

"Monitoring" will be performed to verify that LUC Implementation Plan requirements as specified in Section 2.0 of this document are met. Semi-annual monitoring of the K BPOP, 643-1G, will be conducted for items such as accuracy and legibility of identification signs, visible subsidence or erosion of the waste unit, proper vegetation growth, mowing, etc. Subsidence or erosion will be corrected by backfilling the affected area with clean soil and seeding the area to prevent direct exposure of the waste or creation of an exposure pathway. The results of any events and/or actions that could indicate some potential compromise of institutional controls will be documented in the Federal Facility Agreement Annual Progress Report. All other routine maintenance activities (i.e., mowing, etc.) will be documented and maintained in files that are subject to EPA and SCDHEC review and audit. Currently, K BPOP is located outside of the K-Area reactor security fence in an area of no planned future activity and existing SRS access controls and Site Use/Site Clearance programs support the LUC objectives. Also, no erosion or subsidence has been detected during current semi-annual inspections in recent years, and vegetation will not cover signs in a six-month period. Therefore, semi-annual, rather than quarterly, monitoring of the K BPOP will be required to ensure that LUC objectives are met. The typical field inspection checklist to be used to perform monitoring activities at K BPOP is included in this document as Attachment A.

"Inspections" at K BPOP will be performed to ensure that Institutional Controls remains protective and consistent with all remedial action objectives. Annual inspections of the K BPOP will be conducted. The results of the inspections will be reported in the annual certification.

2.4 *Certification Mechanism*

The U.S. Department of Energy Site Manager shall certify on an annual basis that the K BPOP is currently being restricted per the institutional controls corrective action described in the approved *Record of Decision Remedial Alternative Selection for the K-Area Bingham Pump Outage Pit (643-1G) (U)*, WSRC-RP-97-178, Revision 1, October 1997 (WSRC, 1997a). This certification shall be included in the Federal Facility Agreement Annual Progress Report.

2.5 Groundwater Monitoring and Reporting

Based on the conclusions of the RI/BRA, the K BPOP is not impacting groundwater. Constituents are not observed to have migrated horizontally and clayey zones underneath the base of the pit will limit vertical migration potential. No groundwater land use control objectives have been established. Therefore, groundwater monitoring and reporting is not required for the K BPOP.

3.0 SCHEDULE

The remedial actions to be implemented at the K BPOP include the installation of five identification signs. The installation of the identification signs, as described in Section 2.2.1, will occur during 1 QFY99. Semi-annual site monitoring activities will also begin with 1QFY99. The monitoring activities will include those items necessary to annually certify that the K BPOP is being restricted per the approved corrective action. Installation of the signs and site monitoring activities will commence within two months of regulatory approval of this FRR.

4.0 REFERENCES

WSRC, 1996. "Procedure 3.02, Site Real Property Configuration Control" located in WSRC 1D, *Site Infrastructure and Services Manual*, Westinghouse Savannah River Company, Aiken, SC (latest revision).

WSRC, 1997a. *Record of Decision Remedial Alternative Selection for the K-Area Bingham Pump Outage Pit (643-1G) (U)*, WSRC-RP-97-178, Rev. 1, Westinghouse Savannah River Company, Aiken, SC (October).

WSRC, 1997b. *Remedial Investigation Report with Baseline Risk Assessment for the K-Area Bingham Pump Outage Pit (U)*, WSRC-RP-95-1555, Rev. 1.2, Westinghouse Savannah River Company, Aiken, SC (March).

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Final Remediation Report for the K-Area Bingham Pump Outage Pit (643-1G) (U)
Savannah River Site
August 1998

WSRC-RP-98-4003
Revision 1
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ATTACHMENT A
FIELD INSPECTION CHECKLIST

TYPICAL

ER INSPECTION DATA SHEET FOR WASTE SITES

Page 1 of 3

Waste Site: _____ A = Satisfactory X = Unsatisfactory (Comments required)	A or X	Comments or Corrective Action Taken (See Maintenance Register for Corrected Items)
Check for potential encroachments (Ensure that there is no building on the site).		
Does the site have brush or woody vegetation that needs cutting and disposal?		
Does the site need grass cut?		
Verify that the wells and roads are accessible.		
Are the wells properly locked per R.61-71.11.C.6?		

TYPICAL

ER INSPECTION DATA SHEET FOR WASTE SITES

Page 2 of 3

Waste Site: _____ A = Satisfactory X = Unsatisfactory (Comments required)	A or X	Comments or Corrective Action Taken (See Maintenance Register for Corrected Items)
Is the concrete pad cracked or broken? Is the pad undercut or silted over?		
Is the well properly identified per R.61-71.6.H?		
Verify that the wells' posts and protective covers are in place.		
Verify that the waste units' signs have the correct and legible information.		
Does the site show signs of erosion or subsidence? Are there any signs of burrowing animals (holes)?		
Verify that the orange ball markers are in place.		

- TYPICAL

ER INSPECTION DATA SHEET FOR WASTE SITES
 Page 3 of 3

Waste Site: _____ A = Satisfactory X = Unsatisfactory (Comments required)	A or X	Comments or Corrective Action Taken (See Maintenance Register for Corrected Items)
Verify that the fence is locked and in good condition (if applicable).		
Check the integrity of drainage ditches (if any) for presence of excessive erosion, sediment buildup, and any debris restricting water flow.		
Does the site need general clean up (housekeeping)?		
Comments:		

Inspected By: _____ / _____ Date: _____ Time: _____
 (Print Name) (Signature)

Reviewed By: _____ / _____ Date: _____ Time: _____
 Post Closure Manager or Designee (Print Name) (Signature)

Note: EPA and SCDHEC must be notified within 30 days of identification of any area where any breach or compromise or compromise of restrictions placed on this institutional control operable unit has occurred.

LUCIP for the
K-Area Burning/Rubble Pit, 131-K and K-Area Rubble Pile, 631-20G

Appendix D of Post-Construction Report for the K-Area Burning/Rubble Pit, 131-K and
K-Area Rubble Pile, 631-20G

WSRC-RP-2002-4095, Revision.1, October 2002

NOTE: The Westinghouse Savannah River Company (WSRC) and Department of Energy (DOE) organizations responsible for environmental restoration at the Savannah River Site underwent name changes in 2003, as shown below. The responsibilities as outlined in the following document did not change.

Organization	Previous Name	Current Name
WSRC	Environmental Restoration Division (ERD)	Soils and Groundwater Closure Projects (SGCP)
DOE	Environmental Restoration Division (ERD)	Soil and Groundwater Project (SGP)

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APPENDIX D
LAND USE CONTROL IMPLEMENTATION PLAN

K-AREA BURNING/RUBBLE PIT (131-K)

AND

K- AREA RUBBLE PILE (631-20G) OPERABLE UNIT (KBRP/KRP)

LAND USE CONTROL IMPLEMENTATION PLAN

This KBRP/KRP Land Use Control Implementation Plan (LUCIP) will be appended to the Savannah River Site (SRS) Land Use Control Assurance Plan (LUCAP). The United States Department of Energy (USDOE) is responsible for implementing the land use controls (LUCs) (e.g., inspections, maintenance, etc.) outlined in this unit-specific LUCIP.

The selected remedy leaves hazardous substances in place that pose a potential future risk and will require land use restrictions for an indefinite period of time. As negotiated with the United States Environmental Protection Agency (USEPA), and in accordance with USEPA Region IV policy (Johnston 1998), the SRS has developed a LUCAP (WSRC 2002b) to ensure that land use restrictions are maintained and periodically verified. This LUCIP provides detailed and specific measures required for the land use controls selected as part of this remedy. The USDOE is responsible for implementing, maintaining, monitoring, reporting upon, and enforcing the land use controls herein. Upon final approval, the LUCIP will be appended to the LUCAP and is considered incorporated by reference into the Post Construction Report (PCR), establishing land use controls implementation and maintenance requirements enforceable under the Comprehensive Environmental Response, Compensation, and Recovery Act (CERCLA). The approved LUCIP will establish implementation, monitoring, maintenance, reporting, and enforcement requirements for the unit. The LUCIP will remain in effect until modified as needed to be protective of human health and the environment. LUCIP modification will only occur through another CERCLA document.

1.0 REMEDY SELECTION

1.1 KBRP/RP Operable Unit

Located in K Area in the south-central portion of SRS, the KBRP/KRP operable unit (OU) lies approximately 4.5 km (5.9 miles) east of the nearest site boundary and 0.65 km (0.4 miles) east of K-Reactor Area (Figure 1 in the PCR).

Historical photographs of K-Area indicate that the K-Area Burning/Rubble Pit (KBRP) was constructed between 1955 and 1956. Used for waste burning and burial, the pit was a shallow, unlined excavation measuring approximately 9 m (30 ft) wide, 73 m (240 ft) long, and approximately 2.4 m (8 ft) deep. Based on its dimensions, the total pit volume is approximately 1,640 m³ (2,140 yd³) and encompasses an area of approximately 0.07 ha (0.17 acres).

During operation, organic liquids of unknown use and origin, waste oils, paper, plastics, and rubber were disposed of in the pit and burned periodically (WSRC 1998a). Disposal records, including composition, origin, and use of materials disposed, were not kept for this unit during its operation. The use of the KBRP for disposal of combustible wastes was discontinued in 1973. When the pit became full, it was backfilled with soil to grade level.

Historical photographs of K Area indicate that the K-Area Rubble Pile (KRP) was constructed sometime between 1956 and 1961. The KRP consists of a general disposal area, semicircular in shape, measuring approximately 91 m (300 ft) long and 16 to 41 m (50 to 135 ft) wide, with an area of approximately 0.6 ha (1.5 acres). Individual rubble piles within the area are 1.2 to 1.8 m (4 to 6 ft) high. The total estimated waste volume is 2,140 m³ (2,800 yd³). The KRP is composed primarily of soil matter, with some broken asphalt, broken concrete pieces, and gravel-sized coal. The coal and asphalt materials exist in a wide range of particle sizes and are dispersed in a highly heterogeneous manner throughout the piles. As with the KBRP, disposal records were not kept for this unit

during its period of operation. The Resource Conservation and Recovery Act (RCRA) Facility Investigation/Remedial Investigation (RFI/RI) included collecting soil samples from individual rubble piles as part of the pit and pile area evaluation (WSRC 1998a).

According to the Savannah River Site Future Use Project Report (USDOE 1996), residential use of SRS land should be prohibited.

1.2 Nature and Extent of Contamination

The KBRP/KRP OU consists of a source term and groundwater. The following is a brief summary of final constituents of concern (COCs) as defined in the Record of Decision (ROD) document. There is no principal threat source material (PTSM).

Under the future industrial worker scenario, the Baseline Risk Assessment (BRA) identified final COCs for the KBRP (polycyclic aromatic hydrocarbon (PAHs)), for the KRP (PAHs and arsenic) and for the groundwater (tetrachloroethylene (PCE) and trichloroethylene (TCE)). The following COCs and associated risks were identified for the KBRP based on the future industrial worker: benzo(a)anthracene (3.70×10^{-5}), benzo(a)pyrene (3.70×10^{-4}), benzo(b)fluoranthene (5.00×10^{-5}), benzo(k)fluoranthene (2.50×10^{-6}), dibenzo(a,h)anthracene (5.40×10^{-5}), and indeno(1,2,3-c,d)pyrene (2.14×10^{-5}). The following COCs and associated risks were identified for the KRP based on the future industrial worker: benzo(a)anthracene (1.81×10^{-5}), benzo(a)pyrene (1.45×10^{-4}), benzo(b)fluoranthene (2.30×10^{-5}), indeno(1,2,3-c,d)pyrene (8.70×10^{-6}), and arsenic (3.35×10^{-5}). The following COCs and associated risks were identified for KBRP and KRP groundwater based on the future industrial worker: PCE (1.6×10^{-6}) and TCE (1.10×10^{-7}).

1.3 Remedial Action Overview

The remedy selected and installed for the OU is:

KBRP/KRP Soil cover with Institutional Controls

K-Area Groundwater Monitored Natural Attenuation (MNA)

This remedy included the following actions:

- Installation of a soil cover system,
- Installation of monitoring wells, and
- Implementation of land-use controls, including warning signs, to ensure continued protection of human health or the environment.

Per the ROD, MNA would be implemented pursuant to the groundwater mixing zone application (GMZA) (WSRC 1999b). The ROD deferred to the GMZA for details establishing the long-term groundwater monitoring program to ensure maximum mixing zone concentration limits (MZCL) are not exceeded. Therefore hereafter MNA is referred to as GMZA.

The post-remedial action conceptual site model, Attachment A, shows the broken pathways and the remaining residual risk to the future industrial worker.

2.0 LAND USE CONTROLS

In order to ensure the protectiveness of the remedy described above, the KBRP/KRP OU land use control objective is to:

- Prevent contact, removal, or excavation of buried waste in the OU areas designated in the LUCIP and preclude future residential or agricultural use of the area, and
- Prevent unauthorized access to groundwater.

Current access controls and a deed notification needed to maintain the LUCs are described in the following sections of this LUCIP.

2.1 Access Controls

2.1.1 *On-Site Workers*

In accordance with WSRC 1D, *Site Infrastructure and Services Manual*, Procedure 3.02, "Site Real Property Configuration Control," use of all lands and waters on SRS shall be coordinated via the Site Use Program. All employees, contractors, and visitors to the SRS require adherence to the Site Use Program. This program ensures that all work performed on the SRS that adds, modifies, or removes features portrayed on the SRS development maps is authorized. No use of land (i.e., excavation or any other land use) shall be undertaken without prior approval documented by a Site Use Permit. This authorization is obtained through the completion of a Site Clearance Request Form. Also, in accordance with Procedure 3.02, all work at SRS that adds to or modifies features or facilities portrayed on SRS development maps (i.e., plot plans of facilities/utilities at SRS) will be authorized by a Site Clearance Permit before any excavation activities are conducted. All site clearance requests will be reviewed to verify that either an approved Site Use Permit has been obtained or that an existing Site Use Permit has sanctioned the request.

The SRS, specifically the Site Development, Planning, and Mapping Department, is responsible for updating, maintaining, and reviewing site maps, including Federal Facility Agreement (FFA) OU identifications. If a site clearance request is made that may impact

a FFA OU, the Site Clearance Request Form is sent to the FFA OU reviewer, who is in the Environmental Restoration Division (ERD), for either approval or disapproval. The roles and responsibilities of each individual are detailed in WSRC 1D, Procedure 3.02. Verification of USDOE approval for intended land use must be obtained before issuance of a Site Clearance Permit. The site use and site clearance processes are applicable to all activities and personnel on site (including subcontractors).

The processes are controlled within the SRS Quality Assurance (QA) Program. The SRS QA Program is the governing QA Program for all SRS activities, including those in the ERD. The activities that are performed in the ERD must comply with SRS QA Program procedures as well as ERD-specific procedures.

SRS identifies all buildings and facilities on maps used in the Site Use/Site Clearance Program. This waste unit is identified on these maps as a CERCLA facility.

Any work proposed in these areas will be strictly controlled and workers will be appropriately trained and briefed about health and safety requirements if work is deemed necessary for maintenance. No major change in land use nor excavation at the KBRP/KRP OU shall be undertaken without United States Environmental Protection Agency (USEPA) and South Carolina Department of Health and Environmental Control (SCDHEC) approval. To prevent unknowing entry and to ensure that unrestricted use of the waste unit does not occur while under ownership of the government, identification signs will be posted at the unit.

Custodial responsibilities for maintenance and inspection of the KBRP/KRP waste site will be maintained by the Post-Closure Maintenance group within the ERD.

The warning signs for the soil cover will be legible from a distance of at least 25 feet. The soil cover signs will read as follows:

K-Area Burning/Rubble Pit (131-K) and Rubble Pile (631-20G)

“Danger – Unauthorized Personnel Keep Out. This unit contains hazardous substances. Do not dig or excavate. Do not enter without contacting the waste site custodian.”

Custodian: Manager, Post-Closure Monitoring and Maintenance

Phone: (803) 952-6882

2.1.2 Trespassers

While under the ownership of USDOE, access control of the entire SRS will continue to be maintained in accordance with the 1992 Resource Conservation and Recovery Act (RCRA) Part B Permit Renewal Application, Volume I, Section F.1. This section describes the 24-hour surveillance system (R.61-79.264.14(b)(1)), artificial or natural barriers (R.61-79.264.14(b)(2)(i)), control entry systems (R.61-79.264.14(b)(2)(ii)), and warning signs (R.61-79.264.14(c)) in place at the SRS boundary to comply with the security requirements for a RCRA-permitted facility.

2.2 LUCIP Deed Notification

In the long term, if the property is ever transferred to non-federal ownership, the US Government will take those actions necessary pursuant to Section 120(h) of CERCLA. Those actions will include a deed notification disclosing former waste management and disposal activities as well as remedial actions taken on the site. The contract for sale and the deed will contain the notification required by CERCLA Section 120(h). The deed notification shall, in perpetuity, notify any potential purchaser that the property has been used for the management and disposal of waste. These requirements are also consistent with the intent of the RCRA deed notification requirements at final closure of a RCRA facility if contamination will remain at the unit.

The deed shall also include deed restrictions precluding residential use of the property. However, the need for these deed restrictions may be re-evaluated at the time of transfer in the event that exposure assumptions differ and/or the residual contamination no longer poses an unacceptable risk under residential use. Any re-evaluation of the need for the deed restrictions will be done through an amended ROD with USEPA and SCDHEC review and approval.

In addition, if the site is ever transferred to non-federal ownership, a survey plat of the OU will be prepared, certified by a professional land surveyor, and recorded with the appropriate county recording agency.

Note: Survey Plat (Attachment B, SK-C-5373), and the line marked "AREA SUBJECT TO LAND USE CONTROLS" define the area subject to Land Use Controls.

2.3 Field Walkdown and Maintenance for Institutional Controls

After the remediation of the KBRP/KRP OU, only maintenance activities will be required per this remedial action. No operations other than GMZA monitoring (WSRC 1999b) will be required.

The results of any events or actions that indicate some potential compromise of institutional controls will be documented in the FFA Annual Progress Report. All other routine maintenance activities will be documented and maintained in files subject to USEPA and SCDHEC review and audit. A copy of the completed inspection form is maintained in the ERD Administrative Record Files.

The following steps will be implemented to maintain the soil cover for as long as the waste remains a threat to human health or the environment:

- Perform periodic (annual) visual inspections for evidence of damage to the soil cover due to erosion or intrusion by burrowing animals. The inspection will also

address upkeep of the vegetative cover and access control barriers (i.e., the warning signs). (Attachment C provides a unit-specific inspection data sheet for the KBRP/KRP waste unit).

- Perform necessary repairs (when required as identified during inspection) to maintain the functional integrity of the soil cover and the warning signs.
- Enforce SRS institutional controls through access controls by restricting access to the closed waste unit. Institutional controls will be maintained as long as the waste remains a threat to human health or the environment.
- As required by the National Oil and Hazardous Substance Contingency Plan (NCP), a five-year review of the ROD for the KBRP/KRP unit will be performed as long as the waste remains a threat to human health or the environment.

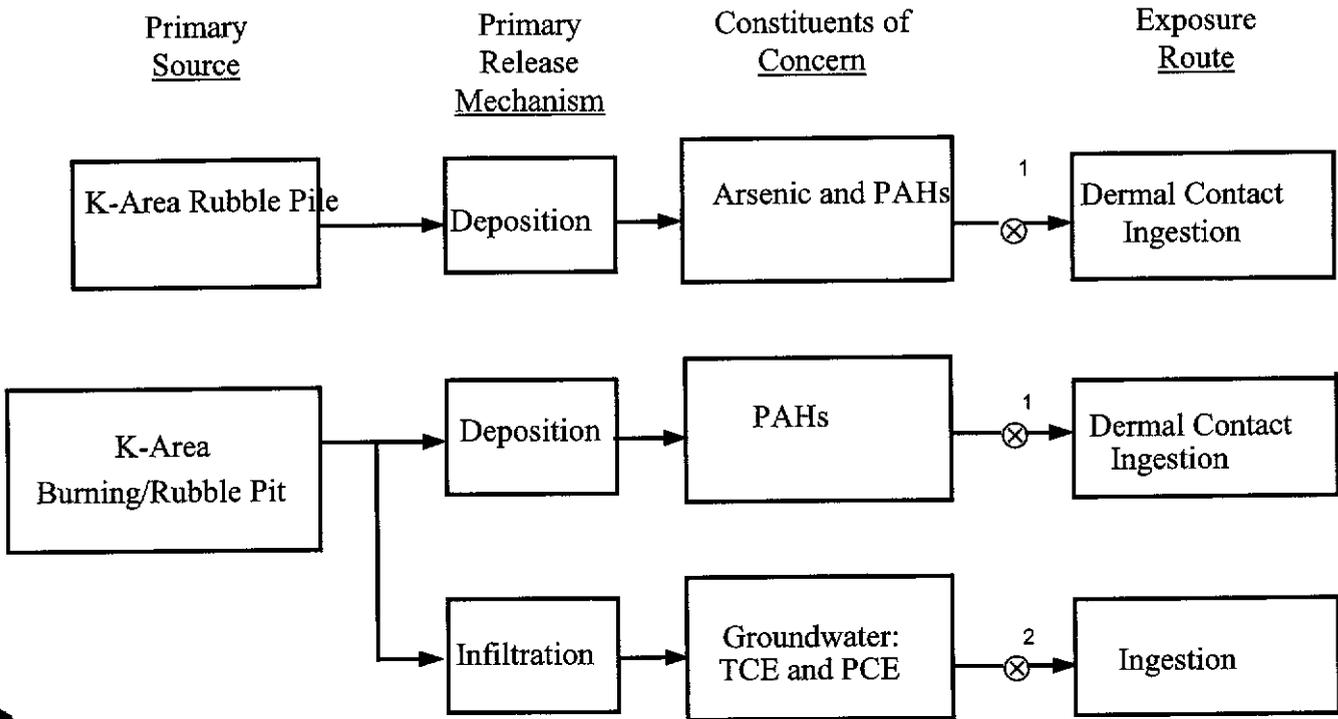
The waste site inspectors are to be trained and certified as Hazardous Waste Operations and Emergency Response (HAZWOPER), RCRA Well Inspectors (ERD specific training), ERD RCRA Waste Unit Inspectors, Radiological Workers, etc., as applicable for the specific inspection. They will also be trained based on the individual requirements of the regulatory approved closure documents for each waste unit. In addition, the inspectors are to attend yearly refresher courses. Over the years no single person will conduct all of the inspections or grass cutting operations.

This unit-specific LUCIP, including the checklist, will be appended to the SRS LUCAP.

Per Section 3.6 of the LUCAP, this LUCIP identifies the area under land-use restriction via a survey plat (see Attachment B). If the OU is ever transferred to non-federal ownership, a survey plat of the area, prepared by a certified professional land surveyor, will be recorded with the county recording agency.

ATTACHMENT A

**K-AREA BURNING RUBBLE PIT AND RUBBLE PILE
POST-REMEDIAL ACTION CONCEPTUAL SITE MODEL**



Legend
 ⊗ Pathway break
 Remedial Alternatives:
 (1) Soil Cover
 (2) GMZA

ATTACHMENT B

**LAND USE CONTROL IMPLEMENTATION PLAN SURVEY PLAT
(SK-C-5373)**

BURNING/RUBBLE PIT (131-K) &
PILES (631-20G)

KRP-4

N54368
E42590

N54354
E42730

N 54348
E 42746

N 54347
E 42647

N54379
E42645

N54325
E42707

N 54306
E 42710

N54249
E42533

N 54218
E 42547

4 TYP
SK-C-5370

UNITED STATES DEPARTMENT OF ENERGY

SAVANNAH RIVER SITE

AS-BUILT OF K-AREA BURNING/RUBBLE PIT (131-K) AND
RUBBLE PILES (631-20G)

LAND USE CONTROL IMPLEMENTATION PLAN
SURVEY PLAT (U)

SCALE

AS NOTED

DWG. NUMBER IS

SK-C-5373

SHEET NO.

1 OF 1

LATEST REVISION

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LUCIP for the
K-Area Reactor Seepage Basin, 904-65G

Appendix A of Post-Construction Report/Final Remediation Report for the K-Area
Reactor Seepage Basin, 904-65G

WSRC-RP-2002-4030, Revision.1, July 2002

NOTE: The Westinghouse Savannah River Company (WSRC) and Department of Energy (DOE) organizations responsible for environmental restoration at the Savannah River Site underwent name changes in 2003, as shown below. The responsibilities as outlined in the following document did not change.

Organization	Previous Name	Current Name
WSRC	Environmental Restoration Division (ERD)	Soils and Groundwater Closure Projects (SGCP)
DOE	Environmental Restoration Division (ERD)	Soil and Groundwater Project (SGP)

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APPENDIX A LUCIP

for

K-AREA REACTOR SEEPAGE BASIN

LAND USE CONTROL IMPLEMENTATION PLAN

This K-Area Reactor Seepage Basin (KRSB) Land Use Control Implementation Plan (LUCIP) will be appended to the Savannah River Site (SRS) Land Use Control Assurance Plan (LUCAP). SRS is responsible for implementing the land use controls (LUCs) (e.g., inspections, maintenance, etc.) outlined in this unit-specific LUCIP.

The selected remedy leaves hazardous substances in place that pose a potential future risk and will require land use restrictions for an indefinite period of time. As negotiated with the United States Environmental Protection Agency (USEPA), and in accordance with USEPA Region IV policy (Johnston 1998), the Savannah River Site (SRS) has developed a LUCAP (WSRC 2002b) to ensure that land use restrictions are maintained and periodically verified. This LUCIP provides detailed and specific measures required for the land use controls selected as part of this remedy. The United States Department of Energy (USDOE) is responsible for implementing, maintaining, monitoring, reporting upon, and enforcing the land use controls herein. Upon final approval, the LUCIP will be appended to the LUCAP and is considered incorporated by reference into the PCR/FRR, establishing land use controls implementation and maintenance requirements enforceable under the Comprehensive Environmental Response, Compensation, and Recovery Act (CERCLA). The approved LUCIP will establish implementation, monitoring, maintenance, reporting, and enforcement requirements for the unit. The LUCIP will remain in effect until modified as needed to be protective of human health and the environment. LUCIP modification will only occur through another CERCLA document.

1.0 REMEDY SELECTION

1.1 KRSB Operable Unit

Located in K Area in the south-central portion of SRS, the KRSB Operable Unit (OU) lies approximately 100 feet west of K Reactor (Building 105-K).

The KRSB was constructed in 1957 to receive low-level radioactive wastewater from disassembly basin purges from K Reactor (Building 105-K). The basin dimensions are approximately 40 x 20 meters (135 x 70 feet), with an average depth of 2.1 meters (7 feet) below land surface (bls). From 1957 until 1960, the KRSB received low-level radioactive purge water from the K-Area Disassembly Basin via a 183-meter (600-foot) long, 7.6-centimeter (3-inch) diameter polyethylene pipe buried approximately 0.6 to 1.2 meter (2 to 4 feet) bls.

Groundwater contamination above maximum contaminant levels (MCLs) has not been associated with the KRSB Operable Unit.

According to the Savannah River Site Future Use Project Report (USDOE 1996), residential use of SRS land should be prohibited.

1.2 Nature and Extent of Contamination in KRSB Soils and Pipeline

The KRSB OU consists of a source term. The source term area of contamination (AOC) includes a 40 m long x 20 m wide x 2.1 m deep (131 ft long x 66 ft wide x 7 ft deep) basin and a 183 m (600 ft) long polyethylene process sewer line. The following is a brief summary of radionuclides including the principal threat source material (PTSM) as defined in the Plug-in Record of Decision (ROD) document.

- KRSB is radiologically contaminated. Five radionuclides have been identified as human health constituents of concern (COCs) in the seepage basin soils: cesium-137, strontium-90, plutonium-239/240, americium-241, and cobalt-60. Radionuclides in

soils around the perimeter of the seepage basin were determined not to be a human health risk. Carbon-14 and strontium-90 were retained as final contaminant migration constituents of concern (CMCOCs) in basin soil only. Only radionuclides were identified as COCs.

- KRSB contains principal threat source material (PTSM). For the plug-in remedy, PTSM has been defined as highly contaminated basin soils and any other unit-related soils that pose a radiological risk equal to or greater than 1×10^{-3} to the future industrial worker. The KRSB OU characterization data indicate that a maximum cumulative risk of 1.3×10^{-2} may result from exposure of a future industrial worker to basin soils that exceed the PTSM threshold. Cesium-137 is the predominant risk driver under this scenario.

1.3 Remedial Action Overview

The selected remedial action (RA) for the KRSB OU was in situ stabilization of the basin with a low-permeability soil cover system, and in situ grouting of the process pipeline. This remedy entails the following actions:

- Pipeline grouting was used to stabilize any potential contamination left inside the pipeline and prevent access by small animals.
- In situ stabilization through grouting was used to treat PTSM soil in the basin which poses a risk in excess of 1×10^{-3} for future industrial workers.
- Consolidation of contaminated soil outside the basin exceeding PTSM criteria. Consolidated PTSM soil was stabilized with the rest of the soil in the basin.
- A low permeability soil cover system was provided over the in situ stabilized soil to reduce water infiltration and to provide shielding to potential receptors on the surface.

- Implementation of LUCs, including warning signs, to ensure continued protection of human health or the environment.

The post-remedial action conceptual site model, Figure A-1, shows the broken pathways and the remaining residual risk to the future industrial worker.

2.0 LAND USE CONTROLS

In order to ensure the protectiveness of the remedy described above, the KRSB OU land use control objective is to:

- Prevent contact, removal, or excavation of buried waste or pipelines in the OU areas designated in the LUCIP and preclude future residential or agricultural use of the area.

Current access controls and a deed notification needed to maintain the LUCs are described in the following sections of this LUCIP.

2.1 Access Controls

2.1.1 On-Site Workers

In accordance with WSRC 1D, *Site Infrastructure and Services Manual*, Procedure 3.02, "Site Real Property Configuration Control," use of all lands and waters on SRS shall be coordinated via the Site Use Program. All employees, contractors, and visitors to the SRS require adherence to the Site Use Program. This Program ensures that all work performed on the SRS that adds, modifies, or removes features portrayed on the SRS development maps is authorized. No use of land (i.e., excavation or any other land use) shall be undertaken without prior approval documented by a Site Use Permit. This authorization is obtained through the completion of a Site Clearance Request Form. Also, in accordance with Procedure 3.02, all work at SRS that adds to or modifies features or facilities portrayed on SRS development maps (i.e., plot plans of facilities/utilities at SRS) will be authorized by a Site Clearance Permit before any excavation activities are conducted. All site clearance requests will be reviewed to verify that either an approved

Site Use Permit has been obtained or that an existing Site Use Permit has sanctioned the request.

The SRS, specifically the Site Development, Planning, and Mapping Department, is responsible for updating, maintaining, and reviewing site maps, including Federal Facility Agreement (FFA) OU identifications. If a site clearance request is made that may impact a FFA OU, the Site Clearance Request Form is sent to the FFA OU reviewer, who is in the ERD, for either approval or disapproval. The roles and responsibilities of each individual are detailed in WSRC 1D, Procedure 3.02. Verification of USDOE approval for intended land use must be obtained before issuance of a Site Clearance Permit. The site use and site clearance processes are applicable to all activities and personnel on site (including subcontractors).

The processes are controlled within the SRS Quality Assurance (QA) Program. The SRS QA Program is the governing QA Program for all SRS activities, including those in the ERD. The activities that are performed in the ERD must comply with SRS QA Program procedures as well as ERD-specific procedures.

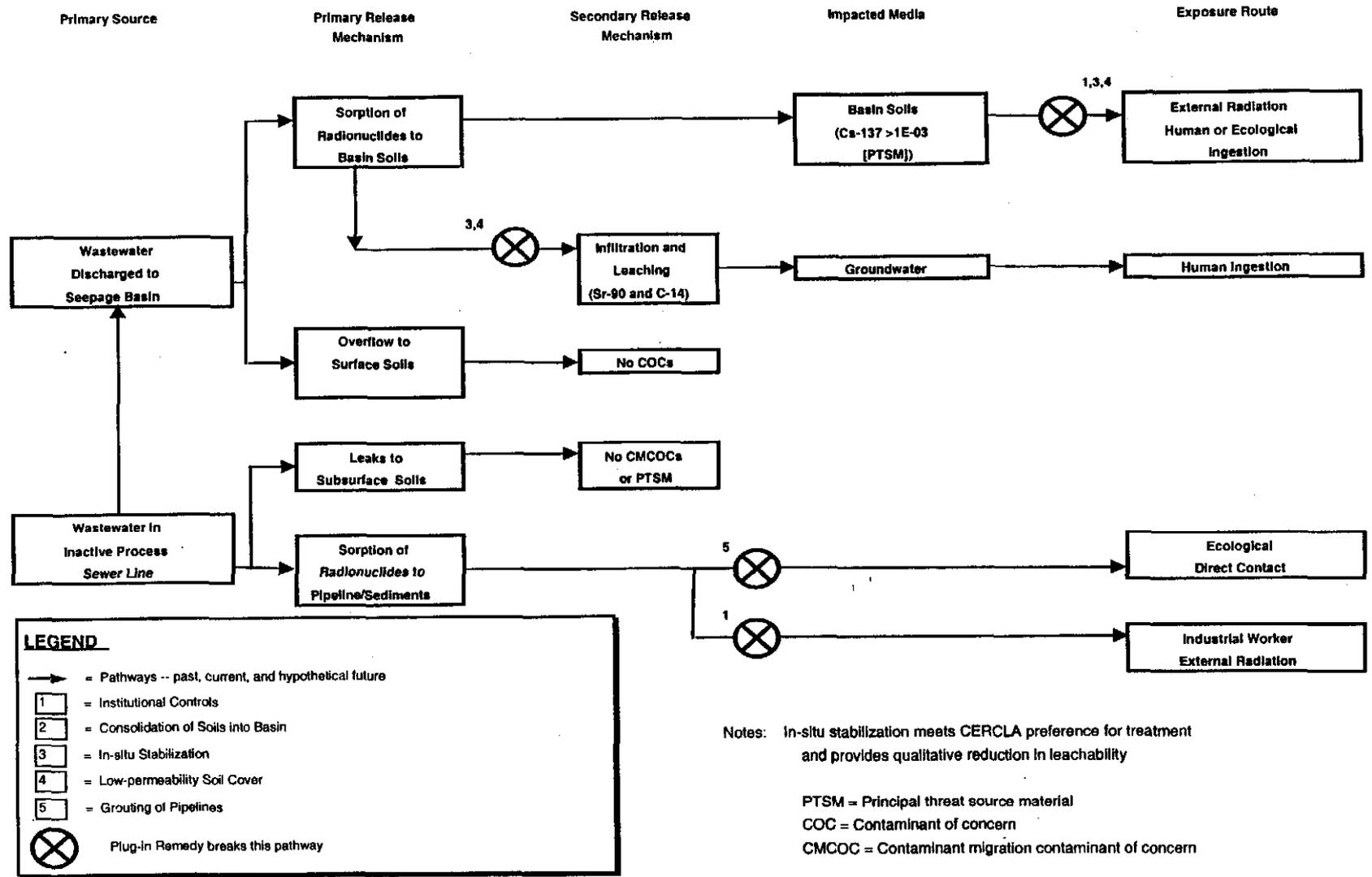


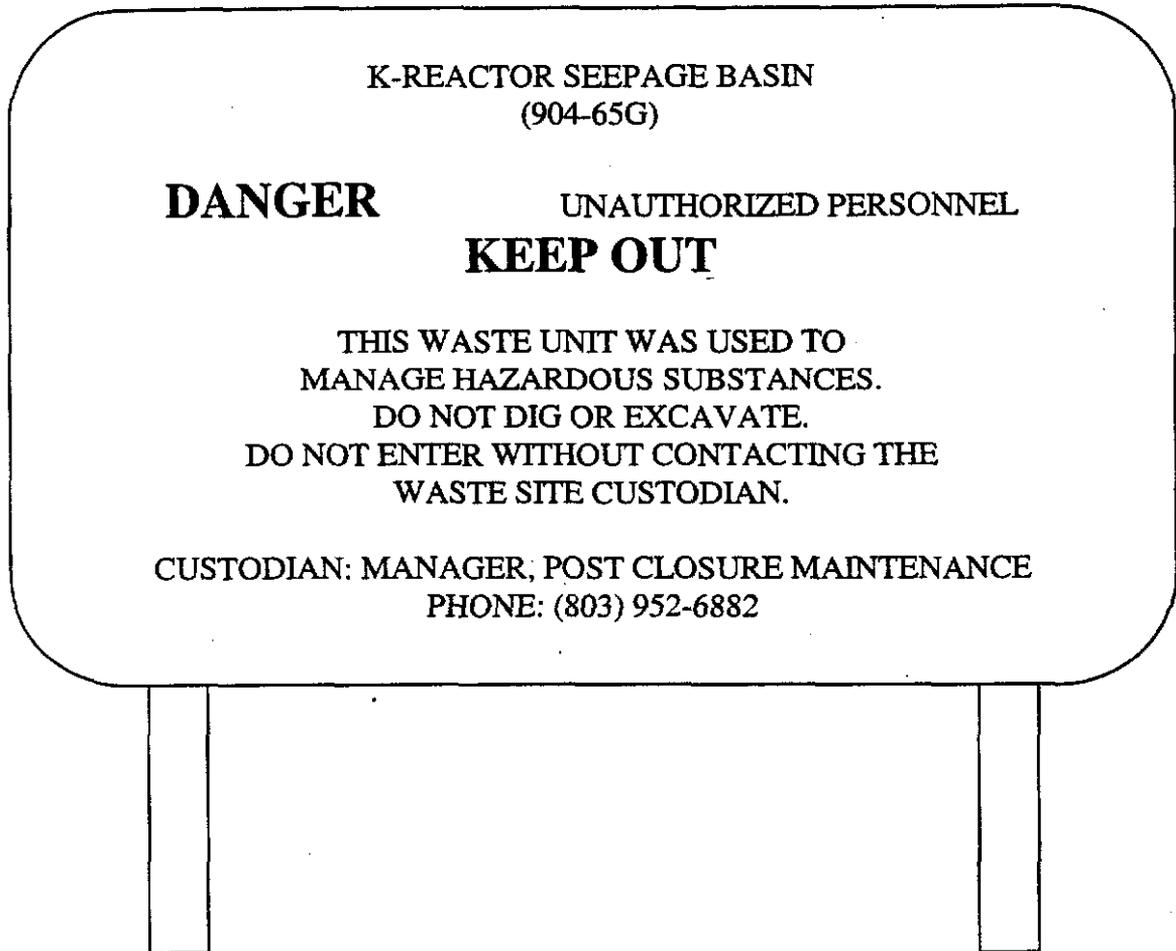
Figure A-1. Conceptual Site Model for K-Area Reactor Seepage Basin Post Remedial Action

SRS identifies all buildings and facilities on maps used in the Site Use/Site Clearance Program. This waste unit is identified on these maps as a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) facility.

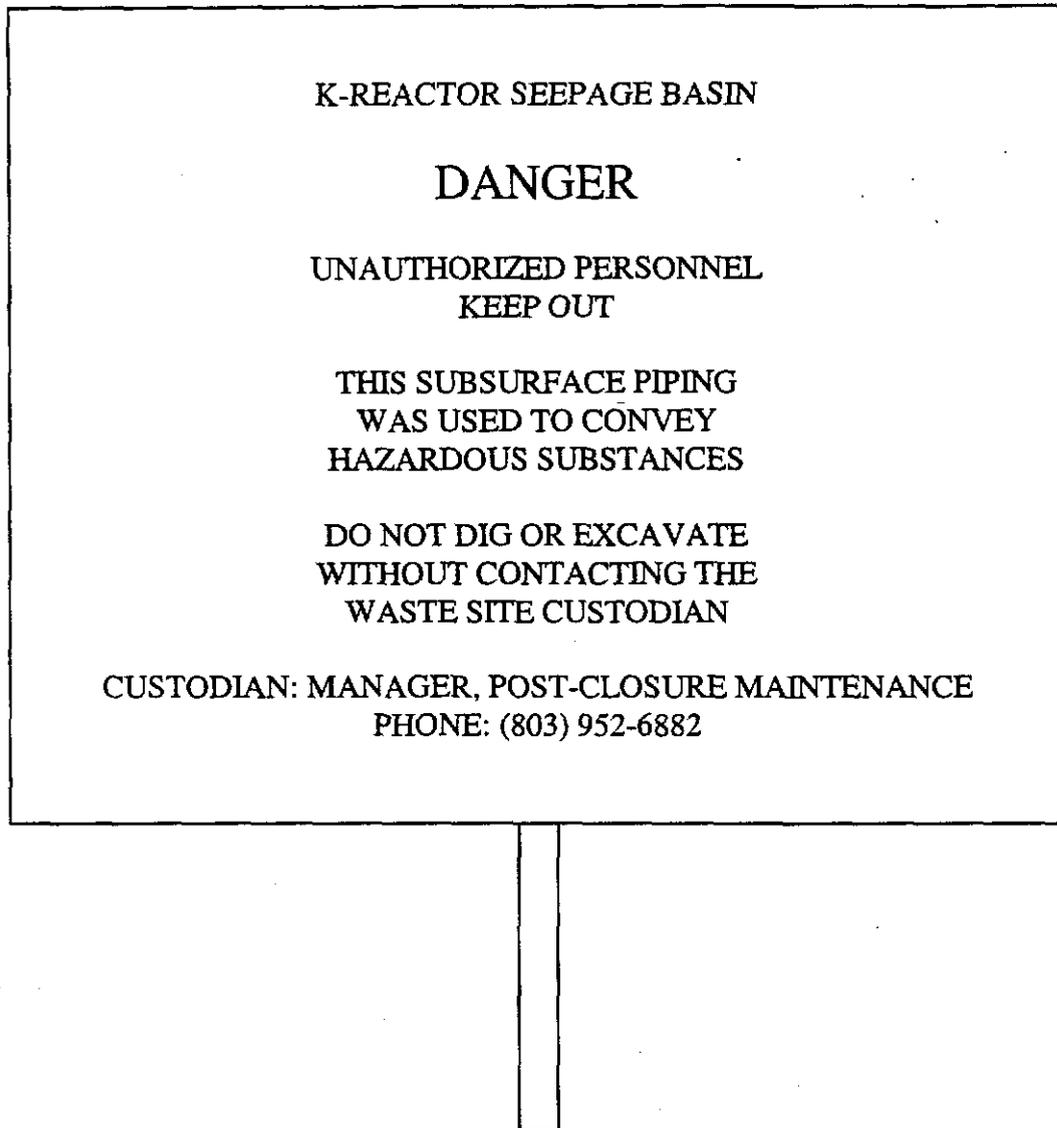
Any work proposed in these areas will be strictly controlled and workers will be appropriately trained and briefed about health and safety requirements if work is deemed necessary for maintenance. No major change in land use nor excavation at the KRSB OU shall be undertaken without United States Environmental Protection Agency (USEPA) and South Carolina Department of Health and Environmental Control (SCDHEC) approval. To prevent unknowing entry and to ensure that unrestricted use of the waste unit does not occur while under ownership of the government, identification signs will be posted at the unit.

Custodial responsibilities for maintenance and inspection of the KRSB waste site will be maintained by the Post-Closure Maintenance group within the ERD.

The warning signs for the soil cover will be legible from a distance of at least 25 feet.
The soil cover signs will read as follows:



The warning signs for the underground grouted pipeline will be legible from a distance of at least 25 feet. The underground pipeline signs will read as follows:



2.1.2 *Trespassers*

While under the ownership of USDOE, access control of the entire SRS will continue to be maintained in accordance with the 1992 Resource Conservation and Recovery Act (RCRA) Part B Permit Renewal Application, Volume I, Section F.1. This section

describes the 24-hour surveillance system (R.61-79.264.14(b)(1)), artificial or natural barriers (R.61-79.264.14(b)(2)(i)), control entry systems (R.61-79.264.14(b)(2)(ii)), and warning signs (R.61-79.264.14(c)) in place at the SRS boundary to comply with the security requirements for a RCRA-permitted facility.

2.2 Deed Notification

In the long term, a deed notification will be filed in the appropriate county records in accordance with CERCLA 120(h), which requires the government to create a deed when land on which any hazardous substance was stored, released, or disposed of is transferred to non-federal ownership. In the event the property is transferred, a deed notification will be filed with Aiken County. Per CERCLA 120(h)(3)(A), the deed shall contain, to the extent practical, such information as is available based on the complete search of agency files, including the following:

- A notice of the type and quantity of such hazardous substances
- Notice of the time at which such storage, release, or disposal took place
- A description of the remedial action taken

Although the above information is known and documented, for federal land, a deed is not applicable. If or when this parcel of land is sold to a private entity, a deed will be filed with the appropriate county and the conditions of CERCLA 120(h)(3)(A) will be satisfied.

Per CERCLA 120(h)(3)(B), the deed shall also contain a covenant warranting that

- All remedial action necessary to protect human health and the environment with respect to any such substance remaining on the property has been taken before the date of such transfer.

- Any additional remedial action found to be necessary after the date of such transfer should be conducted by the United States Government.
- A clause granting the United States Government access to the property in any case in which remedial action or corrective action is found to be necessary after the date of such transfer.

The deed notification shall, in perpetuity, notify any potential purchaser that the property has been used for management and disposal of radioactive oil and chemical wastewater. The deed shall also include restrictions precluding residential use of property. However, the need for these deed restrictions may be re-evaluated at the time of transfer in the event that contamination no longer poses an unacceptable risk under residential use. In addition, if the site is ever transferred to non-federal ownership, a survey plat of the area will be prepared by a certified professional land surveyor and recorded with the county recording agency.

2.3 Field Walkdowns and Maintenance for Institutional Controls

After the remediation of the KRSB, only maintenance activities will be required per this remedial action. No operations will be required.

The results of any events or actions that indicate some potential compromise of institutional controls will be documented in the Federal Facility Agreement (FFA) Annual Progress Report. All other routine maintenance activities will be documented and maintained in files subject to USEPA and SCDHEC review and audit. A copy of the completed inspection form is maintained in the Environmental Restoration Division Administrative Record Files.

The following steps will be implemented to maintain the low permeability soil cover, for as long as it is necessary to prevent contaminant migration above MCL:

- Perform periodic (annual) visual inspections for evidence of damage to the soil cover due to erosion or intrusion by burrowing animals. The inspection will also address upkeep of the vegetative cover and access control barriers (i.e., the warning signs). (Attachment 2 provides a unit-specific inspection data sheet for the KRSB waste unit).
- Perform necessary repairs (when required as identified during inspection) to maintain the functional integrity of the soil cover and the warning signs.
- Enforce SRS institutional controls through access controls by restricting access to the closed waste unit. Institutional controls will be maintained as long as the waste remains a threat to human health or the environment.
- As required by the National Oil and Hazardous Substance Contingency Plan (NCP), a five-year review of the ROD for the KRSB unit will be performed as long as the waste remains a threat to human health or the environment.

The waste site inspectors are to be trained and certified as Hazardous Waste Operators (HAZWOPER), RCRA Well Inspectors (Environmental Restoration Division [ERD] specific training), ERD RCRA Waste Unit Inspectors, Radiological Workers, etc., as applicable for the specific inspection. They will also be trained based on the individual requirements of the regulatory approved closure documents for each waste unit. In addition, the inspectors are to attend yearly refresher courses. Over the years no single person will conduct all of the inspections or grass cutting operations.

This unit-specific LUCIP, including the checklist, will be appended to the SRS LUCAP.

Per Section 3.6 of the LUCAP, this LUCIP identifies the area under land-use restriction via a survey plat (see Attachment 1). If the OU is ever transferred to non-federal ownership, a survey plat of the area, prepared by a certified professional land surveyor, will be recorded with the county recording agency.

ATTACHMENT 1

SURVEY PLAT

SK-C-53105, Rev. 2, Land Use Control Implementation Plan, Survey Plat (U)

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REFERENCE: PCR/FRR # WSRC-RP-2002-4030

K - REACTOR SEEPAGE BASIN (904-65G) CLOSURE
LAND USE CONTROL IMPLEMENTATION PLAN
SURVEY PLAT (U)

DRAWING NO. SK-C-53105, REV. 2

3344444444455555555556666
89012345678901234567890123

PSC-
PLOT DATE

DRAWN BY (ORIG):
TIME

LAST CADD REV. BY: T.HICKMAN
DATE:

Survey Plat (U)

(SK-C-53105)

ATTACHMENT 2

ER INSPECTION DATA SHEET FOR KRSB WASTE SITE

Page 1 of 2

Waste Site: _____ A = Satisfactory X = Unsatisfactory (Comments required)	A or X	Comments or Corrective Action Taken (See Maintenance Register for Corrected Items)
1. Verify that there is no excavation, digging, or construction activities on the soil cover.		
2. Verify that no woody vegetation is growing on the soil cover. Remove or identify, as needed.		
3. Visually check vegetative cover for grass density, with no bare spots more than 3-feet in area. The height of the vegetative cover should not impair the visual inspection of the soil cover. This will be determined by the inspector.		
4. Verify that the roads are accessible.		
5. Verify that the four (4) waste unit signs, and the four (4) underground piping signs, are in acceptable condition, have correct information, and are legible from a distance of 25 feet.		
6. Check the soil cover for signs of erosion or depressions (subsidence).		

ATTACHMENT 2 (Cont.)

ER INSPECTION DATA SHEET FOR KRSB WASTE SITE

Page 2 of 2

Waste Site: _____ A = Satisfactory X = Unsatisfactory (Comments required)	A or X	Comments or Corrective Action Taken (See Maintenance Register for Corrected Items)
7. Check for signs of burrowing animals (holes).		
8. Verify that there is no excavation, digging or construction activities over underground process piping (identified by signs).		
9. Other:		

Inspected By: _____ / _____ Date: _____ Time: _____
 (Print Name) (Signature)

Reviewed By: _____ / _____ Date: _____ Time: _____
 Post-Closure Manager or Designee (Print Name) (Signature)

Note: USEPA and SCDHEC must be notified within 30 days of identification of any area where any breach or compromise of restrictions placed on this institutional control OU has occurred.

LUCIP for the
L- and P-Area Bingham Pump Outage Pits, 643-3G and 643-4G

Section 2.0 of Final Remediation Report for the L- and P-Area Bingham Pump Outage
Pits, 643-3G and 643-4G

WSRC-RP-2000-4030, Revision.0, March 2000

NOTE: The Westinghouse Savannah River Company (WSRC) and Department of Energy (DOE) organizations responsible for environmental restoration at the Savannah River Site underwent name changes in 2003, as shown below. The responsibilities as outlined in the following document did not change.

Organization	Previous Name	Current Name
WSRC	Environmental Restoration Division (ERD)	Soils and Groundwater Closure Projects (SGCP)
DOE	Environmental Restoration Division (ERD)	Soil and Groundwater Project (SGP)

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The contact person (title, address, and phone number) for the L and P BOPs is as follows:

Westinghouse Savannah River Company
Manager, Post-Closure Maintenance
Building 730-2B
Aiken, SC 29808
(803) 952-6882

2.0 LAND USE CONTROL IMPLEMENTATION PLAN (LUCIP)

The L and P BOPs Land Use Control Implementation Plan (LUCIP) will be appended to the SRS Land Use Control Assurance Plan (LUCAP) once it is approved.

Remedy Selection

The miscellaneous construction debris (i.e., pipes, cables, ladders, etc.) with fixed contamination (primary source) has been buried in the L and P BOPs since 1958. The presence of the debris plays a primary role in the remedy selection. There was no indication from the characterization data that the contamination present on the debris has moved, and the level of radioactivity has diminished over the years. The degree of exposure toxicity to the waste is considered minimal and the potential for exposure is also considered to be minimal.

The L and P BOPs are located in a potential residential zone, close to but outside of the industrial zone boundaries as identified on the Proposed SRS Future Land Use Map of the SRS FFA Implementation Plan. The location of the L and P BOPs adjacent to the heavy industrial (nuclear) zones, and the presence of buried debris, make the units unsuitable for residential use (US DOE 1996). Although the units are located outside of the defined industrial zones, it is anticipated that the units will be limited use areas with restrictions similar to an industrial-use zone.

Based on the *Approved Standardized Corrective Action Design (ASCAD™ Combined Document for the L- and P-Area Bingham Pump Outage Pits* (U) (WSRC 1999a), no human health or ecological final COCs were identified for any land use/receptor scenario at the L BPOPs, indicating that surface soil and subsurface soil and groundwater do not pose unacceptable risks to human or environmental receptors under current or future conditions. Furthermore, no final Contaminant Migration Constituents of Concern (CM COC) were identified; therefore, leaching does not pose a threat to groundwater. Land Use Controls (LUCs) will provide adequate protection against exposure to waste left in place by prohibiting unauthorized excavation through access controls and deed restrictions.

Based on the *Approved Standardized Corrective Action Design (ASCAD™ Combined Document for the L- and P-Area Bingham Pump Outage Pits* (U) (WSRC 1999a), no ecological final COCs or final CM COCs were identified at the P BPOP; therefore, the unit does not pose unacceptable risks to ecological receptors and does not pose a future threat to groundwater. For the hypothetical on-unit resident and the future industrial worker scenarios, human health final COCs in the subsurface soil included polyaromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs). No human health final COCs were identified for the current land use scenario. LUCs will provide adequate protection against exposure to waste left in place by prohibiting unauthorized excavation through access controls and deed restrictions.

The selected remedy for L and P BPOPs groundwater is No Action as neither unit poses a future threat to groundwater. The L and P BPOPs soils pose minimal risk to human health. To manage any risk uncertainty and to ensure that the potential for exposure remains minimal, Institutional Control as the selected remedy for soils is appropriate for the L and P BPOPs operable unit (OU). LUCs will restrict the L and P BPOPs to future industrial use and will prohibit residential use of the

areas. Unauthorized excavation will also be prohibited and the waste units will remain undisturbed. LUCs will be maintained until such time as they are deemed unnecessary.

The proposed actions for both the L and P BPOPs Operable Unit (OU) are final actions because they each meet the final remedial action objectives (RAOs) and final remedial goals (RGs) established in the Record of Decision (ROD) (WSRC 1999b).

A post-construction conceptual site model (CSM) for the L and P BPOPs, which illustrates the broken pathways after implementation of the remedy, are included as Figure 4.

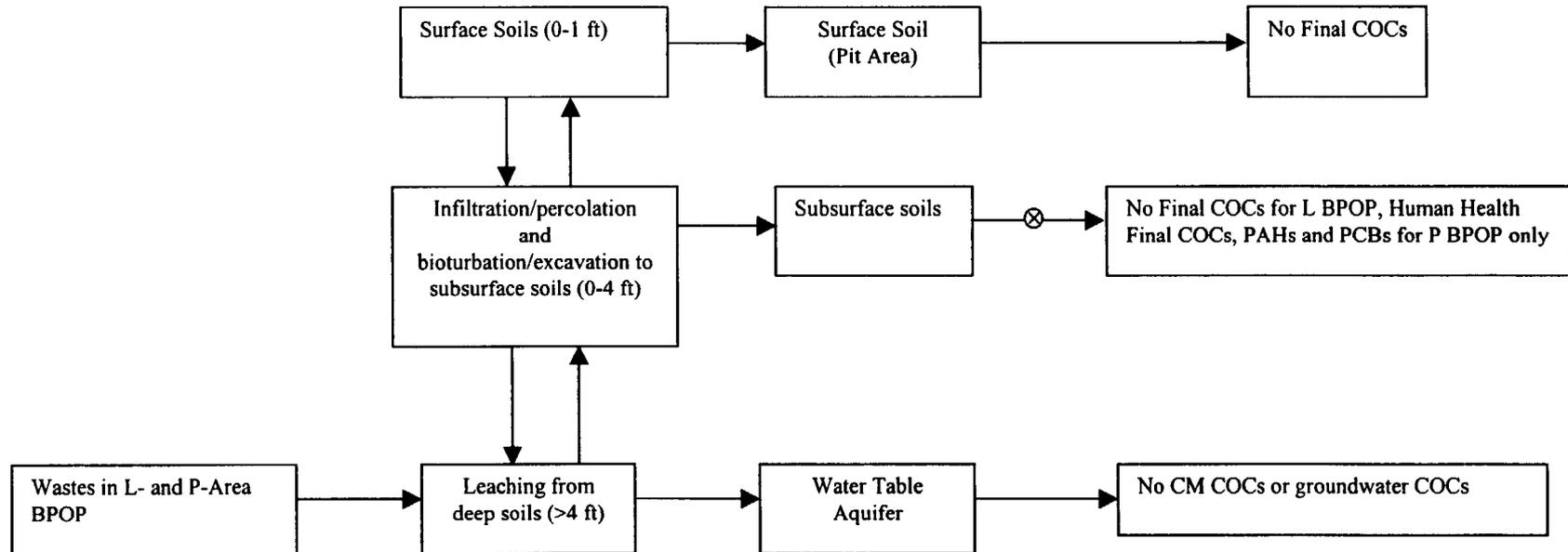
Land Use Controls

Based on the conclusions of the L and P BPOPs remedial investigation/baseline risk assessment (RI/BRA), groundwater does not pose a threat to human health and restrictions are not required. Therefore, groundwater LUC objectives have not been established. Soils do pose a threat to human health and restrictions are required. Soil LUC objectives are detailed below.

Institutional controls is the remedial alternative selected for this site and is intended to be permanent and effective in the near-and long-term. Implementation of this alternative will require both near- and long-term actions.

The LUC objectives necessary to ensure the protectiveness of the preferred alternative are:

- Prevent contact, removal, or excavation of buried waste in the area
- Preclude residential use of the area



Notes for Remedial Actions:
 Land Use Controls

Other Notes:
 ⊗ = pathway break for remedial considerations

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Figure 4. Simplified Conceptual Site Model for the L and P BPOPs

The LUCs required to prevent unauthorized exposure to the contaminated media at the L and P BPOPs include the following:

- Survey plats have been completed by professional land surveyors delineating the land subject to LUCs (Figures 5 and 6). Figures 5 and 6 are reductions of full size survey plats.
- installation of warning signs at the most probable access points to indicate that the areas were used for the disposal of waste materials/hazardous substances (radioactively contaminated construction materials) and to advise that the waste unit custodian must be contacted prior to entry
- use of existing SRS access controls (including security gates, guards, and the site use/site clearance program) to maintain the use of each site consistent with its intended land use
- periodic inspections and general maintenance (primarily mowing and subsidence repairs, and minor drainage modifications as needed to prevent ponding and to promote surface water runoff)
- evaluation of the need for deed notifications/restrictions if the property were ever transferred to non-federal ownership, as required under CERCLA Section 120(h)

In the long term, if the L and P BPOPs are transferred to non-federal ownership, the need for deed restriction will be evaluated and performed through an amended ROD with the United States Environmental Protection Agency (US EPA) and South Carolina Department of Health and Environmental Control (SCDHEC)

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**FRR for the L- and P-Area Bingham Pump
 Outage Pits (643-2G, 643-3G, and 643-4G) (U)
 Savannah River Site
 March 2000**

**WSRC-RP-2000-4030
 Rev. 0
 Page 12 of 19**

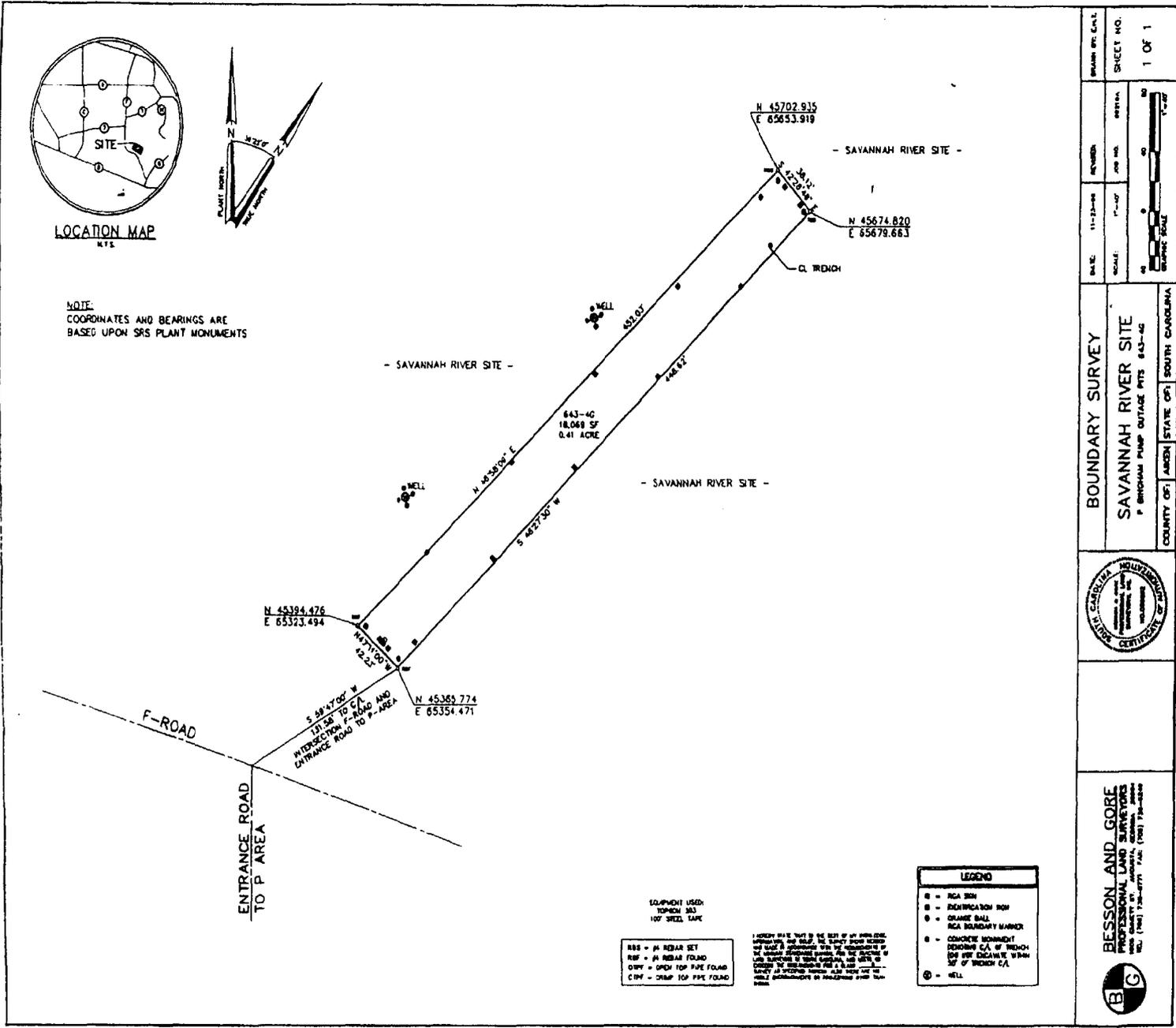


Figure 6. P Bingham Pump Outage Pit Survey Plat

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approval and actions taken pursuant to CERCLA Section 120(h). The actions will include a deed notification disclosing former waste management and disposal activities, as well as any remedial actions taken at the waste unit. The deed notification will, in perpetuity, notify any potential purchaser that the property has been used for the management and disposal of construction debris, waste and other materials, including hazardous substances. RCRA deed notification requirements are not required for this waste unit since it is not listed as a RCRA facility in the SRS FFA, Appendix C. The deed would include restrictions precluding residential use of the property. The need for deed restrictions and/or LUCs will require US EPA and SCDHEC review and approval. The survey plat will be reviewed and updated, as necessary, at the time the site is transferred and will be recorded with the Barnwell County recording agency. This proposal is consistent with US EPA guidance and is an effective use of risk management principles.

The elements of the institutional control corrective action, which consists of land restrictions without any engineering controls, are composed of deed notifications when the parcel is transferred from United States Department of Energy (US DOE) ownership, access controls that include posting of identification signs, and field walkdowns for general site conditions. These LUCs will be implemented in perpetuity for this OU. Each element of the institutional controls corrective action is discussed below.

2.1 Deed Notification

A deed notification shall be filed with the Barnwell County recording agency in accordance with CERCLA Section 120(h), which requires the government to create a deed when land on which any hazardous substance was stored, released, or disposed is transferred to non-federal ownership. The transference of the L and

P BPOPs OU is unlikely. Per CERCLA Section 120(h)(3)(A), the deed shall contain, to the extent practical, such information as is available based on the complete search of agency files, including the following:

- a notice of the type and quantity of such hazardous substances
- notice of the time at which such storage, release, or disposal took place
- a description of the remedial action taken, if any

Per CERCLA Section 120(h)(3)(B), the deed shall also contain a covenant warranting that

- all remedial action necessary to protect human health and the environment with respect to any such substance remaining on the property has been taken before the date of such transfer
- any additional remedial action found to be necessary after the date of such transfer shall be conducted by the United States Government
- a clause granting the United States Government access to the property in any case in which remedial action or corrective action is found to be necessary after the date of such transfer

RCRA permit requirements are not applicable for this waste unit per the SRS FFA, Appendix C.

2.2 Access Controls

2.2.1 On-Site Workers

In accordance with WSRC 1D, *Site Infrastructure and Services Manual*, Procedure 3.02, *Site Real Property Configuration Control* (WSRC, 1996), use of all lands and waters on the SRS shall be coordinated via the Site Use Program. No use of land (i.e., excavation or any other land use) shall be undertaken without prior approval documented by a Site Use Permit. Also, in accordance with Procedure 3.02, all work at SRS that adds to or modifies features or facilities portrayed on the SRS development maps (i.e., plot plans of facilities/utilities at SRS) is authorized by a Site Clearance Permit before execution. All Site Clearance requests are reviewed to verify that either an approved Site Use Permit has been obtained, or that an existing Site Use Permit has sanctioned the request. Verification of the US DOE approval for intended land use must be obtained before issuance of a Site Clearance Permit. The Site Use and Site Clearance processes are applicable to all activities and personnel on site (including subcontractors). The processes are controlled within the SRS Quality Assurance Program.

SRS identifies all buildings and facilities on maps used in the Site Use/Site Clearance Program and includes a 200-ft buffer zone around each facility. This waste unit is identified on these maps as a CERCLA facility.

Any work proposed in these areas will be strictly controlled and workers will be appropriately trained and briefed about health and safety requirements if work is deemed necessary for maintenance. Any changes in the use or disturbance of the L and P BPOPs will be cleared with the US EPA and SCDHEC before the disturbance occurs. To prevent unknowing entry and to ensure that unrestricted use of the waste unit does not occur while under ownership of the government,

identification signs will be posted at the waste unit roadway access points (Figures 2 and 3). The signs will be legible from a distance of at least 25 ft. The signs will read:

L-Area Bingham Pump Outage Pits, 643-2G and 643-3G

“Danger – Unauthorized Personnel Keep Out. This waste unit was used to manage waste materials/hazardous substances (radioactively contaminated construction material). Do not dig or excavate. Do not enter without contacting the waste site custodian.”

Custodian: Manager, Post-Closure Maintenance

Phone: (803) 952-6882

P-Area Bingham Pump Outage Pit, 643-4G

“Danger – Unauthorized Personnel Keep Out. This waste unit was used to manage waste materials/hazardous substances (radioactively contaminated construction material). Do not dig or excavate. Do not enter without contacting the waste site custodian.”

Custodian: Manager, Post-Closure Maintenance

Phone: (803) 952-6882

Site-specific access controls (i.e., fences) are not required for the L and P BPOPs since exposure to the casual worker or trespasser as calculated in the Baseline Risk Assessment does not warrant this level of protection.

2.2.2 Trespassers

Additionally, while under the ownership of the US DOE, access control of the entire SRS will continue to be maintained in accordance with the 1992 RCRA Part B Permit Renewal Application, Volume I, Section F.1. This section describes the 24-hour surveillance system (R.61-79.264.14(b)(1)), artificial or natural barriers (R.61-79.264.14(b)(2)(i)), control entry systems (R.61-79.264.14(b)(2)(ii)), and warning signs (R.61-79.264.14(c)) in place at the SRS boundary to comply with the security requirements for a RCRA-permitted facility.

2.3 Field Walkdowns and Maintenance

Monitoring will be performed to verify that LUCIP requirements are met. Semi-annual monitoring of the L and P BPOPs, 643-2G, 3G, and 4G will be conducted for items such as accuracy and legibility of identification signs, visible subsidence or erosion of the waste unit, proper vegetation growth, mowing, etc. Subsidence or erosion will be corrected by backfilling the affected area with clean soil and seeding the area to prevent further erosion. The results of any events and/or actions that could indicate some potential compromise of institutional controls will be documented in the FFA Annual Progress Report. All other routine maintenance activities (i.e., mowing, etc.) will be documented and maintained in files that are subject to US EPA and SCDHEC review and audit. The typical field inspection checklist to be used to perform monitoring activities at the L and P BPOPs are included in this document as Attachment A-1. A copy of the completed inspection form is maintained in the Environmental Restoration Division Administrative Record Files.

Inspections at the L and P BPOPs will be performed to ensure that institutional controls remain protective and consistent with all remedial action objectives. Semi-annual inspections of the L and P BPOPs will be conducted. The results of the inspections will be reported in the annual certification.

2.4 Certification Mechanism

The US DOE Site Manager shall certify on an annual basis that the L and P BPOPs are currently being restricted per the institutional controls corrective action described in the approved *Record of Decision Remedial Alternative Selection for the L- and P-Area Bingham Pump Outage Pits (643-2G, 3G and 4G) (U)*, WRSC-RP-98-4105, Revision 1, September 1999 (WSRC 1999b). This certification shall be included in the FFA Annual Progress Report.

2.5 Groundwater Monitoring and Reporting (as necessary)

Based on the conclusions of the RI/BRA, the L and P BPOPs are not impacting groundwater. Constituents are not observed to have migrated horizontally and clayey zones underneath the base of the pit will limit vertical migration potential. No groundwater land use control objectives have been established. Therefore, groundwater monitoring and reporting is not required for the L and P BPOPs.

3.0 SCHEDULE

The remedial actions to be implemented at the L and P BPOPs include the installation of two identification signs. The installation of the identification signs, as described in Section 2.2.1, will occur during 4Q00. Semi-annual site monitoring activities will also begin with 4Q00. The monitoring activities will include those items necessary to annually certify that the L and P BPOPs are being restricted per the approved corrective action. Installation of the signs and site monitoring activities will commence within two months of regulatory approval of this FRR.

4.0 REFERENCES

US DOE 1996. *Savannah River Site: Future Use Project Report*, Stakeholder Recommendations for SRS Land and Facilities. January 1996. Cover letter: Fiori, Mario P., "SRS Future Use Project Report (Reference: Transmittal of Final Draft "Forging the Missing Link: A Resource Document for Identifying Future Use Options," Grumbly/Pearlman letter, 1-12-94)", US DOE Letter EB-96-015, Savannah River Site, Aiken, South Carolina, January 29, 1996.

US EPA 1991. *A Guide to Principal Threat and Low Level Threat Wastes*, Superfund Publication 9380.3-06FS, United States Environmental protection Agency, Office of Solid Waste and Emergency Response, November 1991.

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LUCIP for the
L-Area Hot Shop, 717-G (Including the CML-003 Sandblast Area) Operable Unit
Appendix A of Corrective Measures Implementation/Remedial Action Implementation
Plan (CMI/RAIP) for the L-Area Hot Shop, 717-G (Including the CML-003 Sandblast
Area) Operable Unit

WSRC-RP-2003-4021, Revision.1, June 2003

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APPENDIX A

LAND USE CONTROL IMPLEMENTATION PLAN

FOR THE

L-AREA HOT SHOP (INCLUDING THE CML-003 SANDBLAST AREA)

OPERABLE UNIT

LAND USE CONTROL IMPLEMENTATION PLAN

FOR THE

L-AREA HOT SHOP (INCLUDING CML-003 SANDBLAST AREA)
OPERABLE UNIT

The L-Area Hot Shop (Including CML-003 Sandblast Area) Operable Unit Land Use Control Implementation Plan (LUCIP) will be appended to the Savannah River Site (SRS) Land Use Control Assurance Plan (LUCAP).

The selected remedy leaves hazardous substances in place that pose a potential future risk and will require land use restrictions for an indefinite period of time. As negotiated with the United States Environmental Protection Agency (USEPA) and in accordance with USEPA Region IV policy (Johnston 1998), SRS has developed a LUCAP to ensure that land use restrictions are maintained and periodically verified. This LUCIP provides detailed and specific measures required for the land use controls selected as part of this remedy. The United States Department of Energy (USDOE) is responsible for implementing, maintaining, monitoring, reporting upon, and enforcing the land use controls described herein. Upon final approval, the LUCIP will be appended to the LUCAP and is considered incorporated by reference into the Post-Construction Report (PCR)/Final Remediation Report (FRR), establishing land use controls implementation and maintenance requirements enforceable under the Comprehensive Environmental Response, Compensation, and Recovery Act (CERCLA). The approved LUCIP will establish implementation, monitoring, maintenance, reporting and enforcement requirements for the unit. The LUCIP will remain in effect until modified as needed to be protective of human health and the environment. LUCIP modification will only occur through another CERCLA document.

1.0 REMEDY SELECTION

1.1 The L Area Hot Shop (LAHS) (Including CML-003 Sandblast Area) Operable Unit

The L-Area Hot Shop (LAHS) (including CML-003 Sandblast Area) operable unit (OU) is listed as a Resource Conservation and Recovery Act (RCRA) 3004(u) Solid Waste Management Unit/CERCLA unit in Appendix C of the Federal Facility Agreement (FFA) for the SRS. The media associated with this OU includes concrete, inactive process (IP) drainlines and soils.

L Area is located in the south-central portion of SRS at the intersection of SRS Roads C and B. L Area lies north of L-Lake and is separated from it by SRS Road B. The LAHS OU is located at the southeast corner of the L-Reactor Area and consists of the following:

- A concrete slab with associated IP drainlines on which three interconnected buildings (former Buildings 712-G, 717-G, and 707-G) and a former storage area (former Building 080-1G) were constructed.
- A concrete slab (former Building 080-2G) located outside the eastern perimeter fence used as a temporary drum storage area.
- The CML-003 Sandblast Area, reportedly used during operation of L-Reactor for sandblasting non-radioactive equipment and metals. LAHS concrete slabs are contained within the footprint of the CML-003 Sandblast Area.

All three buildings (former Buildings 712-G, 717-G, and 707-G) were constructed in the 1960s in the footprint of temporary buildings removed in the 1950s. These buildings were used extensively during the L-Area Restart Program to repair equipment. Between June and September 1993, the three buildings were demolished. A fence controls access to the area. The area inside the fence is approximately 5,825 m² (62,700 ft²).

Two manholes with associated underground pipelines, one located inside and one outside of the LAHS perimeter fence, were also investigated. These underground pipelines were used for transporting sanitary wastewater.

Two IP drainlines, one 6-inch cast iron pipe located in the concrete slab/decontamination area (former Building 712-G) and one 2-inch pipe located in the concrete slab/hot shop (former Building 717-G), were also observed during the investigations. Both the 2-inch and the 6-inch IP drainlines were removed except for 9 m (30 ft) extending out from the slab, as shown in Figure 2 (dotted line). The length of the 2-inch IP drainline is estimated to be 120 ft (approximately 90 ft under slab). The length of the 6-inch IP drainline is estimated to be 50 ft (approximately 20 ft under the slab).

The *Site Evaluation Report for the L Area Sandblast Areas (CML-001, CML-002, and CML-003) NBN (U)* (WSRC 1996a) revealed that the boundaries of the LAHS and the CML-003 Sandblast Area overlap (see Figure 2). The waste unit database indicates that the boundaries for the LAHS OU and Sandblast Area are the same. However, the site evaluation report identified the northeast corner of the Sandblast Area as being 26.2 m (86 ft) north of the LAHS northeast corner. Thus the fence surrounding the LAHS defines the eastern, western, and southern boundaries of the CML-003 Sandblast Area, while the northern boundary of CML-003 is approximately 26.2 m (86 ft) north of the LAHS fence. During operation of L-Reactor, the CML-003 Sandblast Area reportedly was used for sandblasting non-radioactive equipment and metals. However, there is no documentation on the frequency of sandblasting, and there are no records of radioactive materials or hazardous material ever disposed of or used at the CML-003 Sandblast Area.

1.2 Nature and Extent of Contamination in the L Area Hot Shop (LAHS) (Including CML-003 Sandblast Area) Operable Unit

No refined COCs are identified associated with three of the five subunits of the LAHS OU (LAHS Soils, LAHS Manholes and Associated Sanitary Wastewater Pipelines, and

LAHS Surface Drainage Ditch). Unrestricted land use was assumed for risk calculations and the calculated risk levels were below the USEPA target risk range upper limit of 1×10^{-6} . However, radiological contamination has been identified at two of the LAHS subunits (LAHS Inactive Process Drainlines and LAHS Concrete Slab). The LAHS OU is not a "source control" unit (i.e., the unit does not contain contaminated soil that may act as a source of future contamination to the groundwater through leaching).

Therefore, there are no problems warranting action associated with human health analysis, ecological analysis, or contaminant migration analysis. The LAHS Inactive Process Drainlines and LAHS Concrete Slab are considered Primary Threat Source Material (PTSM). There may be transferable radiological contamination present on the surface of the concrete slab. Radiological surveys conducted after the three buildings (former Buildings 712-G, 717-G, and 707-G) were demolished, identified fixed beta-gamma contamination above SRS background levels on the concrete slab. The contamination on the slab surface was fixed in place by sealing the surfaces of the slab with paint. The post-remedial action conceptual site model (see Attachment A-2 to this LUCIP) shows the broken pathways and the remaining residual risk to the future industrial worker.

According to the *Savannah River Site future Use Project Report* (USDOE 1996), residential use of SRS land should be prohibited.

1.3 Remedial Action Overview

The LAHS OU future land use will be industrial usage. Unrestricted land use is inappropriate due to the proximity of the LAHS OU to the heavy industrial (nuclear) area. The remedial action objective for the LAHS OU is to protect future industrial workers and the ecology from exposure to radionuclides present in the LAHS OU concrete slab and to prevent spread of transferable radionuclide contamination present in the LAHS OU concrete slab and IP drainlines.

The selected remedy for the LAHS OU is Alternative 5, Decontamination, Removal (All of LAHS concrete slab and the Inactive Process Drainlines), Disposal (PRSB #3) and institutional controls.

The selected alternative entails the following:

- Removal of the concrete slab (former 707-G, 712-G, 717-G, and 080-1G) by saw cutting or breaking up.
- Remove the grouted 6-inch cast iron IP drainline (approximately 50 ft long [approximately 30-ft coming out of the slab and 20-ft suspected to be underneath the slab of former Building 712-G]). Contaminated soils will be excavated in until the surface soils in the excavated areas are field screened/sampled to the threshold values of 20 pCi/g for gross alpha and 50 pCi/g for non-volatile beta and gamma spectroscopy.
- Remove the grouted 2-inch cast iron IP drainline (approximately 120-ft in length [approximately 30-ft coming out of the slab and 90-ft suspected to be beneath the slab in former Building 717-G]). Contaminated soils will be excavated in until the surface soils in the excavated areas are field screened/sampled to the threshold values of 20 pCi/g for gross alpha and 50 pCi/g for non-volatile beta and gamma spectroscopy.
- Cut both IP drainlines (6-inch and 2-inch) into smaller pieces suitable for transportation and disposal.
- Transport the contaminated concrete debris resulting from concrete slab removal operations (approximately 2,000 ft³) and the cut pieces of both IP drainlines to P-Area Reactor Seepage Basin #3 for final disposal. Contaminated soils will be excavated in until the surface soils in the excavated areas are field

screened/sampled to the threshold values of 20 pCi/g for gross alpha and 50 pCi/g for non-volatile beta and gamma spectroscopy.

The LAHS IP drainlines and LAHS concrete slab are considered Principal Threat Source Material (PTSM) based upon a 2×10^{-3} risk to the future industrial worker. The preference for treatment to address principal threats at the LAHS will be achieved by disposing of the contaminated concrete debris resulting from removal operations and the pieces of both drainlines to P-Area Reactor Seepage Basin #3 for final disposal.

The RCRA Facility Investigation/Remedial Investigation (RFI/RI) Work Package Addendum has concluded that there are no ARARs for the LAHS OU. The LAHS Inactive Process Drainlines and the LAHS Concrete Slab potentially contain transferable radiological contamination that needs to be addressed in this remedial action. The estimated human health risk from the radiological contamination (IP Drainlines and Concrete Slab) is approximately 2.3×10^{-3} which exceeds the threshold of 2×10^{-3} identification as PTSM. Therefore, remedial action objectives (RAOs) were established for the Inactive Process Drainlines and the Concrete Slab.

Based on the ROD, the following two RAOs has been established for the LAHS OU.

The remedial objective for the LAHS OU is twofold:

1. Protect future industrial workers against unacceptable exposures by implementing institutional controls; and
2. Prevent the transfer of radionuclide contamination present in the concrete slab and drainlines by removal and offsite disposal of these sources.

The post-remedial action conceptual site model (see Attachment A-2 to this LUCIP) shows the broken pathways and the remaining residual risk to the future industrial worker.

2.0 LAND-USE CONTROLS

Considering the residual risk mentioned above, the land-use control objectives for the LAHS OU are to:

- Maintain the use of the site for industrial activities only and
- Prevent unauthorized access to the closed CERCLA unit as long as the waste remains a threat to human health or the environment.

Current access controls and deed notification needed to maintain the future land use are described in the following sections of this LUCIP.

2.1 Access Controls

2.1.1 On-Site Workers

In accordance with WSRC 1D, *Site Infrastructure and Services Manual*, Procedure 3.02, "Site Real Property Configuration Control," use of all lands and waters on SRS will be coordinated via the Site Use Program. All employees, contractors, and visitors to the SRS require adherence to the Site Use Program. This program ensures that all work performed on the SRS that adds, modifies, or removes features portrayed on the SRS development maps is authorized. No use of land (i.e., excavation or any other land use) will be undertaken without prior approval documented by a Site Use Permit. This authorization is obtained through the completion of a Site Clearance Request Form. Also, in accordance with WSRC Manual 1D, Procedure 3.02, all work at SRS that adds to or modifies features or facilities portrayed on SRS development maps (i.e., plot plans of facilities/utilities at SRS) will be authorized by a Site Clearance Permit before any excavation activities are conducted. All site clearance requests will be reviewed to verify that either an approved Site Use Permit has been obtained or that an existing Site Use Permit has sanctioned the request.

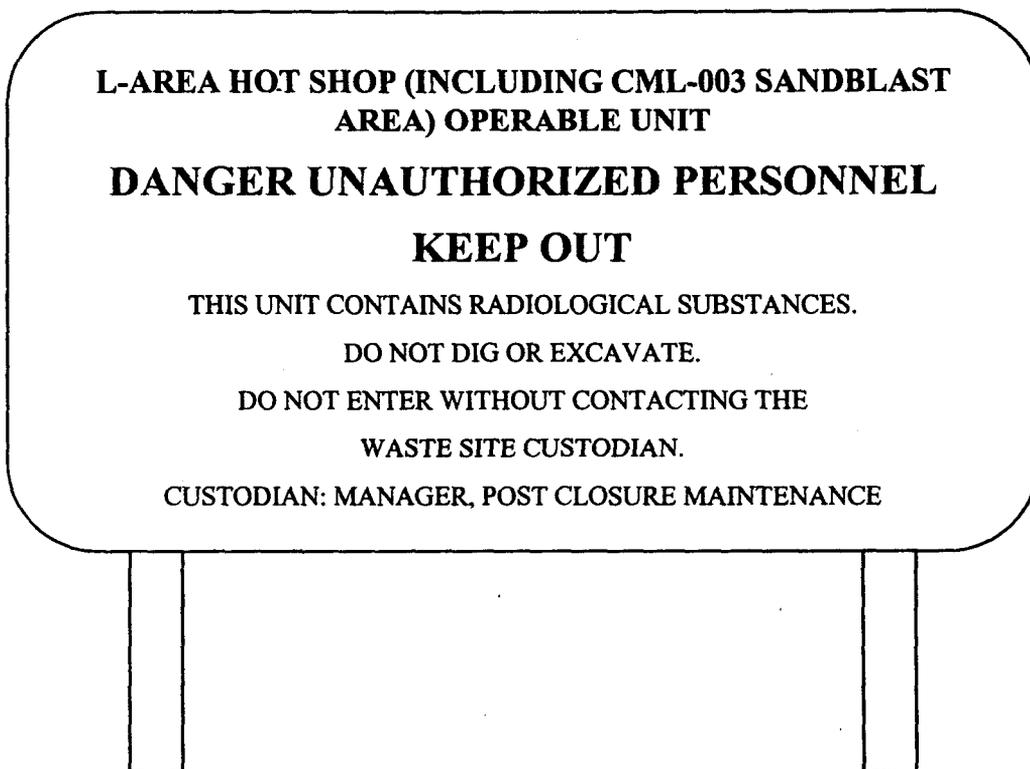
SRS, specifically the Site Development, Planning, and Mapping Department, is responsible for updating, maintaining, and reviewing site maps, including Federal Facility Agreement (FFA) (1993) operable unit (OU) identifications. If a site clearance request is made that may impact an FFA OU, the Site Clearance Request Form is sent to the FFA OU reviewer, who is in the Soil and Groundwater Closure Projects (SGCP), for either approval or disapproval. The roles and responsibilities of each individual are detailed in WSRC 1D, Procedure 3.02, Verification of USDOE approval for intended land use must be obtained before issuance of a Site Clearance Permit. The site use and site clearance processes are applicable to all activities and personnel on site (including subcontractors).

The processes are controlled within the SRS Quality Assurance (QA) Program. The SRS QA program is the governing QA program for all SRS activities, including those in

SGCP. The activities that are performed in SGCP must comply with SRS QA Program procedures as well as with SGCP-specific procedures.

SRS identifies all buildings and facilities on maps used in the Site Use/Site Clearance Program. This waste unit is identified on these maps as a CERCLA facility.

Any work proposed in these areas will be strictly controlled and workers will be appropriately trained and briefed about health and safety requirements if work is deemed necessary for maintenance. No major change in land use nor excavation at the LAHS OU will be undertaken without United States Environmental Protection Agency (USEPA) and South Carolina Department of Health and Environmental Control (SCDHEC) approval. To prevent unknowing entry and to ensure that unrestricted use of the waste unit does not occur while under ownership of the government, identification signs will be posted at the unit. The signs will be legible for a distance of at least 25 feet. The signs will read as follows:



Custodial responsibilities for maintenance and inspection of the LAHS OU will be maintained by the Post-Closure Maintenance Group within WSRC SGCP.

2.1.2 Trespassers

While under the ownership of USDOE, access control of the entire SRS will be maintained in accordance with the 1992 RCRA Part B Permit Renewal Application, Volume I, Section F.1. This section describes the 24-hour surveillance system (R.61-79.264.14(b)(1)), artificial or natural barriers (R.61-79.264.14(b)(2)(I)), control entry systems (R.61-79.264.14(b)(2)(ii)), and access control warning signs (R.61-79.264.14(c)) in place at the SRS boundary to comply with the security requirements for a RCRA-permitted facility.

2.2 LUCIP Deed Notification

The deed notification will, in perpetuity, notify any potential purchaser that the property has been used for the management and disposal of waste. These requirements are also consistent with the intent of RCRA deed notification requirements at final closure of a RCRA facility if contamination will remain at the unit.

The deed will also include deed restrictions precluding residential use of the property. However, the need for these deed restrictions may be re-evaluated at the time of transfer in the event that exposure assumptions differ and/or the residual contamination no longer poses an unacceptable risk under residential use. Any re-evaluation of the need for the deed restrictions will be done through an amended ROD with USEPA and SCDHEC review and approval.

Per Section 3.6 of the LUCIP, the post-construction revision of the LUCIP will identify the area under land use restriction via a survey plat certified by a professional land surveyor.

2.3 Field Walkdown and Maintenance for Institutional Controls

“Monitoring” will be performed to verify that the LUCIP requirements are met. Semi-annual monitoring of the LAHS OU will be conducted for items such as accuracy and legibility of signs, visible subsidence or erosion of the waste unit, proper vegetative growth, mowing, etc. Subsidence or erosion will be corrected by backfilling the affected area with clean soil and seeding the area to prevent further erosion. After the remediation of the LAHS OU, only maintenance activities will be required per this remedial action. The results of any events and/or actions that indicate some potential compromise of institutional controls will be documented in the FFA Annual Progress Report. All other routine maintenance activities will be documented and maintained in the files subject to USEPA and SCDHEC review and audit. A copy of the complete inspection form is maintained in the Soil and Groundwater Closure Projects (SGCP) Document Control.

Per Section 3.6, of the LUCAP, the post construction revision of this LUCIP will identify the area under land use restriction via a survey plat certified by a professional land surveyor. In addition, if the site is ever transferred to non-federal ownership, a survey plat of the OU will be recorded with the appropriate county recording agency.

A unit-specific field inspection checklist is provided in Attachment A-1 of this LUCIP. The waste site inspectors are to be trained in Hazardous Waste Operations and Emergency Response (i.e., HAZWOPER), RCRA Well Inspections (SGCP-specific training), SGCP RCRA Waste Unit Inspections, Radiological Worker, etc., as applicable for the specific inspection. They will also be trained based on the individual requirements of the regulatory approved closure documents for each waste unit. In addition, the inspectors are to attend yearly refresher courses. Over the years, different personnel will conduct the inspections and grass cutting operations. This unit-specific LUCIP, including the checklist (Attachment A-1), will be appended to the SRS LUCAP.

ATTACHMENT A-1

**ERD FIELD INSPECTION CHECKLIST FOR L-AREA HOT SHOP (INCLUDING
CML-003 SANDBLAST AREA) OPERABLE UNIT**

**SGCP INSPECTION DATA SHEET FOR L-AREA HOT SHOP
OPERABLE UNIT**

A= Satisfactory X= Unsatisfactory (Explanation required)	A or X	Observation or Corrective Action Taken
1. Verify that the roads are accessible.		
2. Verify that the waste unit signs (specify the number) are in acceptable condition, have the correct information and are legible from a distance of 25 feet.		
3. Does the site show signs of erosion or subsidence? Are there any signs of burrowing animals (holes)?		

Inspected by: _____ / _____ Date: _____ Time: _____
(Print Name) (Signature)

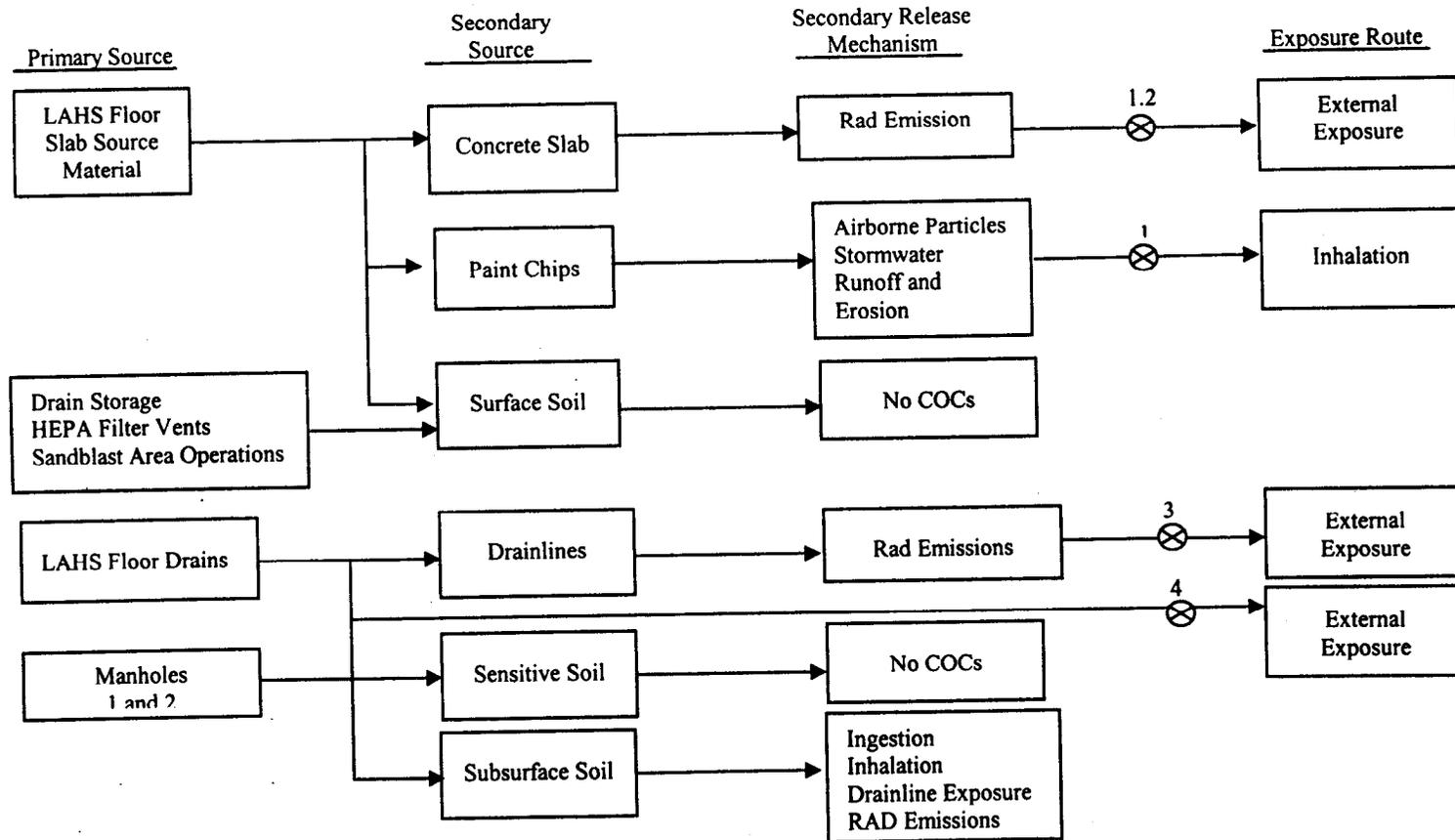
Reviewed by: _____ / _____ Date: _____ Time: _____
Post-Closure Manager or Designee

Note: USEPA and SCDHEC must be notified within 30 days of identification of any area where any breach or compromise of restrictions placed on this institutional control OU has occurred.

ATTACHMENT A-2

**CONCEPTUAL SITE MODEL FOR THE L-AREA HOT SHOP (INCLUDING CML-003
SANDBLAST AREA) OPERABLE UNIT**

POST-REMEDIAL ACTION



LEGEND

- = Pathways – past, current and hypothetical future
- 5. = Institutional Controls
- 6. = Removal of Concrete Pads
- 7. = Excavation/Removal of Inactive Process (IP) Drainlines
- 8. = Excavation/Removal of Contaminated Soils from Around IP Drainlines
- ⊗ = Remedy breaks this pathway

Notes:

PTSM = principal threat source material
 COC = constituent of concern
 CMCO = contaminant migration constituent of concern

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LUCIP for the
L-Area Oil and Chemical Basin, 904-83G

Appendix A Post-Construction Report/Final Remediation Report
for the L-Area Oil and Chemical Basin, 904-83G

WSRC-RP-2001-4078, Revision.1, September 2001

NOTE: The Westinghouse Savannah River Company (WSRC) and Department of Energy (DOE) organizations responsible for environmental restoration at the Savannah River Site underwent name changes in 2003, as shown below. The responsibilities as outlined in the following document did not change.

Organization	Previous Name	Current Name
WSRC	Environmental Restoration Division (ERD)	Soils and Groundwater Closure Projects (SGCP)
DOE	Environmental Restoration Division (ERD)	Soil and Groundwater Project (SGP)

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APPENDIX A

LUCIP for L-Area Oil and Chemical Basin (Bldg. 904-83G) (U)

LAND USE CONTROL IMPLEMENTATION PLAN (LUCIP)

The L-Area Oil and Chemical Basin (LAOCB) LUCIP will be appended to the Savannah River Site (SRS) Land Use Control Assurance Plan (LUCAP), which has been approved by the United States Department of Energy (USDOE), United States Environmental Protection Agency (USEPA), and South Carolina Department of Health and Environmental Control (SCDHEC). SRS will be responsible for the implementation of the LUCIP.

1.0 REMEDY SELECTION

1.1 LAOCB Operable Unit

The LAOCB and L-Area Acid/Caustic Basin (LAACB) source operable unit (OU) is listed as a Resource Conservation and Recovery Act (RCRA) 3004(u) Solid Waste Management Unit/Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) unit in Appendix C of the Federal Facility Agreement (FFA).

The selected remedial alternative was developed in accordance with CERCLA, as amended, RCRA, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The decision in the Record of Decision (ROD) document is based on the Administrative Record File for this specific RCRA/CERCLA unit.

Based on the LAOCB/LAACB RCRA Facility Investigation/Remedial Investigation (RFI/RI) Report and the Baseline Risk Assessment (BRA), the LAOCB source OU posed significant risk to human health and the environment.

Therefore, a determination has been made that the combination of in situ solidification/stabilization (S/S) of the pipeline, excavation and placement of the pipeline in the LAOCB, and in situ S/S and capping of the LAOCB is protective of human health and the environment for the contamination remaining in the LAOCB pipeline and soil.

Based on the LAOCB/LAACB RFI/RI Report and the BRA, the LAOCB source OU poses no significant risk to human health and the environment. Therefore, a determination has been made that a No Action alternative is appropriate for the LAOCB. The No Action alternative will be protective of human health and the environment.

As stated in the ROD, the groundwater has been identified as a separate OU and is therefore considered outside the scope of LAOCB remedial action.

1.2 General Description of LAOCB

The LAOCB is located within the SRS, approximately 300 feet south of the L-Area perimeter fence and 1,250 feet north of L Lake. The area lies at an elevation of approximately 235 feet above mean sea level and 45 feet above the elevation of L Lake. Surface water runoff in L Area drains southward to L Lake via overland flow and small intermittent stream channels and drainage ditches. The water table is approximately 25 feet below ground surface in the area of the LAOCB.

The LAOCB measured approximately 182 feet long by 108 feet wide at the berm, with an average depth of 12 feet. The berm diverted overland flow away from the basin. The LAOCB previously contained water from direct precipitation and low-lying vegetation indigenous to the area. It was surrounded by a chain link fence and was posted as a radiological soil contamination area (SCA).

The LAOCB was constructed in 1961 as an unlined seepage basin. Prior to its construction, approximately 750 feet of 6-inch diameter steel pipeline was originally installed from the maintenance hot shop (Building 717-G) to the L-Area Seepage Basin. After the LAOCB was constructed, wastewater was diverted to the LAOCB through a portion of the 6-inch pipeline between the hot shop and the LAOCB; the remainder of the pipeline was plugged off and taken out of use. A second 2-inch diameter steel pipeline, approximately 450 feet long and located just south of the 6-inch pipeline, was also used between the hot shop and the LAOCB. Wastewater from other areas of SRS was transported in drums and tanker trucks and was disposed in the basin via a bermed concrete drainage pad, located outside and upgradient at the north side of the basin. The basin was put in operation in 1961 and remained active until 1979.

The LAOCB is no longer a radiological facility. The pipelines were buried in areas designated as underground radiological material areas (URMA).

1.3 Nature and Extent of Contamination in LAOCB Soils and Pipelines

LAOCB soils presented the greatest risk at the unit. Significant carcinogenic risks to the potential future worker or resident were driven by potential exposure from direct radiation, ingestion of soil, and ingestion of produce grown in the LAOCB soils, which were contaminated with radionuclides (primarily cobalt-60 and cesium-137) to a depth of less than two feet. Noncarcinogenic risks were driven primarily by ingestion of basin soils contaminated with chromium and lead. The vegetation within the LAOCB security fence was contaminated with radionuclides from the basin. The concrete drainage pad and associated piping within the staging area at the north end of the LAOCB were contaminated with fixed and/or transferable radioactive contamination. Four existing monitoring wells (LCOs 1, 2, 3, 4) potentially provided a conduit for the migration of unit constituents of concern (COCs) to the water table aquifer in the vicinity of the basin.

No manmade radionuclide contamination of soils existed outside and adjacent to the LAOCB security fence; the detected radionuclides outside the LAOCB fence were strictly naturally occurring.

Results of investigation on the LAOCB pipelines indicated that soils surrounding the pipelines had not been significantly impacted by unit operation. Carcinogenic and noncarcinogenic risks posed by the pipeline soils were due to naturally occurring metals and radionuclides that are typical of SRS soils. However, relatively high levels of radioactive contamination were detected on the internal surface of the LAOCB pipelines. Future deterioration of the pipeline's steel walls could have created an unacceptable risk to the environment.

Table 3 of the ROD summarizes the on-unit risks posed by LAOCB.

1.4 Remedial Action Overview

1.4.1 *The LAOCB Remedial Action*

The remedial action was applicable to the LAOCB soils and pipelines (associated pipelines between the hot shop and the western limit of the proposed LAOCB cover).

The selected remedial action for the LAOCB soils and pipelines included the following key elements (WSRC 1997b):

- in situ stabilization of the LAOCB pipelines' interior and excavation of the stabilized pipelines, including the surrounding contaminated soils (if any), and their placement in the LAOCB for stabilization and solidification;
- in situ S/S of LAOCB soils and pipelines, followed by capping of the LAOCB with a low permeability (hydraulic conductivity of 1×10^{-5} cm/sec or less) engineered soil cover, and

- maintenance and institutional control of the capped LAOCB as long as the waste remains a threat to human health and the environment.

The objectives of the LAOCB remedial action were to eliminate risks posed by direct external exposure to radiation, ingestion, and inhalation of radionuclides and to prevent or mitigate the leaching and migration of COCs to the groundwater (WSRC 1997b, WSRC 1997c). The post-remedial action Conceptual Site Model in Figure A-1 of this LUCIP illustrates how the selected remedy achieves the remedial action objectives.

2.0 LAND USE CONTROL

For the LAOCB, the following land use control (LUC) objective is necessary to ensure protectiveness of the remedy:

- Control access to the LAOCB unit in accordance with the current site use/site clearance programs, including access control signs in the area to indicate that the stabilized soil beneath the unit is contaminated with radionuclides.
- Prevent unauthorized access to the groundwater.

The elements of the institutional control corrective action, which consists of land restrictions without any engineering controls, are composed of deed notifications when the parcel is transferred from federal ownership (Section 2.1), access controls such as posting identification signs (Section 2.2), and field walkdowns to inspect general site conditions and maintenance (Section 2.3). These land use controls will remain in place as long as the waste remains a threat to human health and the environment.

2.1 Deed Notification

A deed notification shall be filed in the appropriate county records in accordance with CERCLA 120(h), which requires the government to create a deed when land on which a hazardous substance was stored, released, or disposed of is transferred to non-federal ownership. In the event the property is transferred, a deed notification will be filed with Aiken County. Per CERCLA 120(h)(3)(A), the deed shall contain, to the extent practical, such information as is available based on the complete search of agency files, including the following:

- A notice of the type and quantity of such hazardous substances
- Notice of the time at which such storage, release, or disposal took place
- A description of the remedial action taken, if any

Per CERCLA 120(h)(3)(B), the deed shall also contain a covenant warranting that

- All remedial action necessary to protect human health and the environment with respect to any such substance remaining on the property has been taken before the date of such transfer.
- Any additional remedial action found to be necessary after the date of such transfer would be conducted by the United States Government.

2.2 Access Controls

2.2.1 On-Site Workers

In accordance with WSRC ID, *Site Infrastructure and Services Manual*, Procedure 3.02, "Site Real Property Configuration Control," use of all lands and waters at SRS shall be coordinated via the Site Use Program. No use of land (i.e.,

excavation or any other land use) shall be undertaken without prior approval documented by a Site Use Permit. Also, in accordance with Procedure 3.02, all work at SRS that adds to or modifies features or facilities portrayed on SRS development maps (i.e., plot plans of facilities/utilities at SRS) will be authorized by a Site Clearance Permit before excavation activities take place. All Site Clearance Requests are reviewed to verify that either an approved Site Use Permit has been obtained or that an existing Site Use Permit has sanctioned the request. Verification of USDOE approval for intended land use must be obtained before a Site Clearance Permit is issued. The site use and site clearance processes are applicable to all activities and personnel on site (including subcontractors). The processes are controlled under the SRS Quality Assurance Program.

SRS identifies all buildings and facilities on maps used in the Site Use/Site Clearance Program and requires a 200-foot buffer zone around each facility. This waste unit is identified on these maps as a CERCLA facility.

All work in these areas will be strictly controlled, and workers will be appropriately trained and briefed about health and safety requirements if work is deemed necessary for maintenance. Any changes in the use or disturbance of the LAOCB will be cleared with the USEPA and SCDHEC before disturbance occurs. To prevent unknowing entry and to ensure that unrestricted use of the waste unit does not occur while under ownership of the government, identification signs have been posted at the unit. The signs are legible from a distance of 25 feet. The sign reads as follows:

L-Area Oil and Chemical Basin

"DANGER"
UNAUTHORIZED PERSONNEL KEEP OUT.
THIS UNIT WAS USED TO MANAGE HAZARDOUS
SUBSTANCES. DO NOT DIG OR EXCAVATE. DO
NOT ENTER WITHOUT CONTACTING THE WASTE
SITE CUSTODIAN.
CUSTODIAN: MANAGER, POST CLOSURE
MAINTENANCE
PHONE: (Contact Phone Number)

2.2.2 Trespassers

Additionally, while under the ownership of USDOE, access control of the entire SRS will continue to be maintained in accordance with the 1992 RCRA Part B Permit Renewal Application, Volume I, Section F.1. To comply with the security requirements for a RCRA-permitted facility, this section describes the 24-hour surveillance system (R.61-79.264.14(b)(1)), artificial or natural barriers (R.61-79.264.14(b)(2)(i)), control entry systems (R.61-79.264.14(b)(2)(ii)), and warning signs (R.61-79.264.14(c)) in place at the SRS boundary.

2.3 Field Walkdowns and Maintenance for Institutional Controls

Monitoring will be performed to verify that LUCIP requirements have been met. Semi-annual monitoring of the LAOCB OU, 904-83G, will be conducted for accuracy and legibility of signs, visible subsidence or erosion of the waste unit, proper vegetative growth, burrowing animals, proper access to the facility, mowing, etc. Subsidence or erosion will be corrected by backfilling the affected area with clean soil and seeding the area to prevent further erosion. USEPA and SCDHEC will be notified of the results of any inspection, event, and/or action that indicates a potential compromise of institutional controls within 30 days of identification. The notification and the reason for the notification will be documented in the Federal Facility Agreement Annual Progress Report. All other routine maintenance activities (i.e., mowing, etc.) will be documented, and the documentation will be maintained in files that are subject to USEPA and SCDHEC review and audit. A copy of the completed inspection form will be maintained in Environmental Restoration Division Administrative Record Files.

Inspections at the LAOCB will be performed to ensure that institutional controls remain protective and consistent with all remedial action objectives. Monthly inspections will be performed for the first 2 years and until permanent vegetation is established. After that time, inspections will be performed semi-annually per the attached inspection checklist

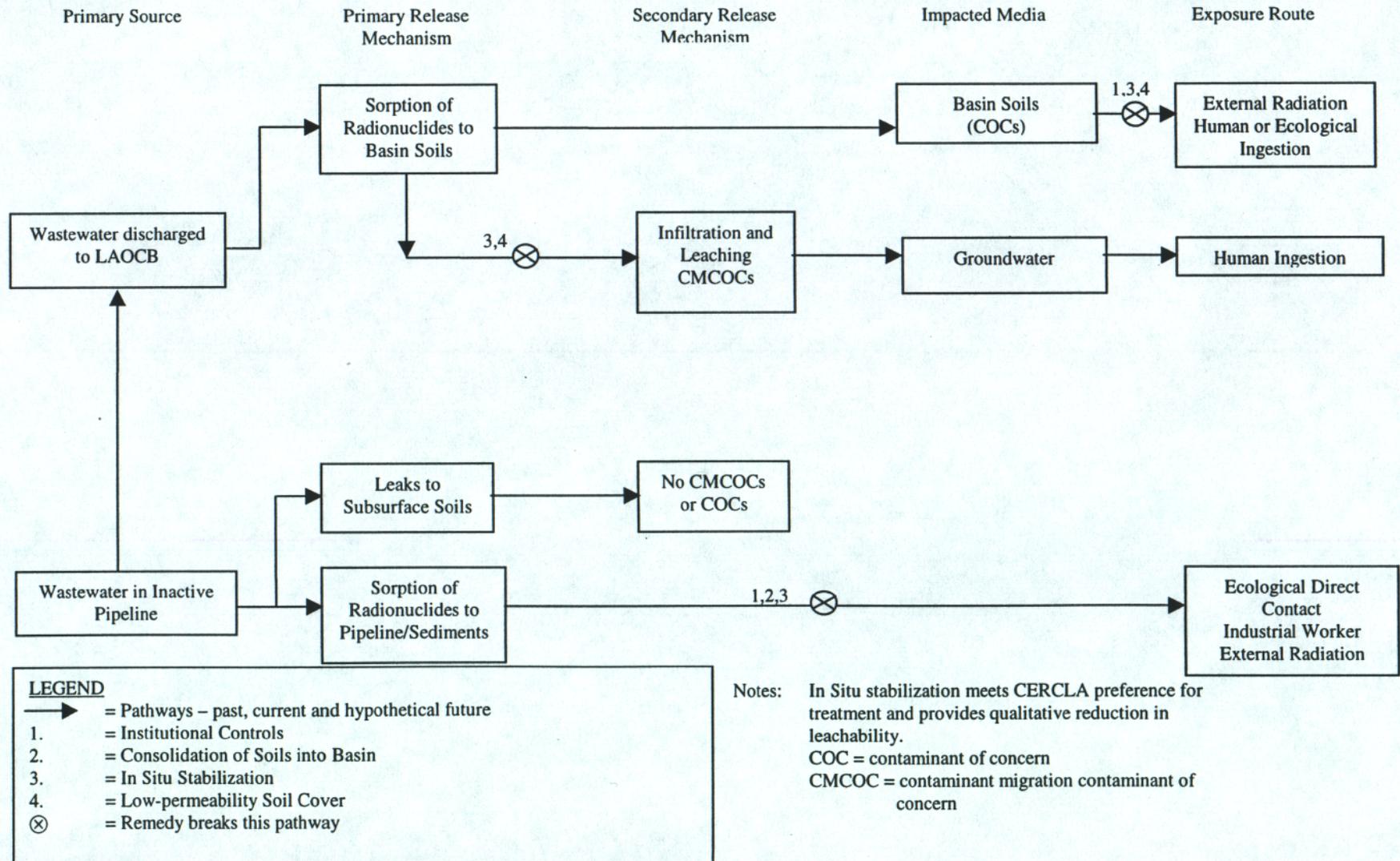


Figure A-1. Conceptual Site Model for the L-Area Oil and Chemical Basin Post Remedial Action

ATTACHMENT TO LUCIP

ER INSPECTION CHECKLIST FOR L-AREA OIL AND CHEMICAL BASIN

Waste Site: _____ A = Satisfactory X = Unsatisfactory (Comments required)	A or X	<u>Comments or Corrective Action Taken (See Maintenance Register for Corrected Items)</u>
Check to see if the site needs mowing.		
Verify that the basin and roads are accessible.		
Check for potential encroachments. (Ensure that there is no building on the site.)		
Verify all signs are intact, in good condition, and legible from a distance of at least 25 feet.		
Visually check vegetative cover for grass density. There should be no woody vegetation or shrubs growing on the cover. The height of the vegetative growth should not impair the visual inspection of the site.		
Check the integrity of drainage ditches (if any) for presence of excessive erosion, sediment buildup, and any debris restricting water flow.		
Visually inspect the concrete markers at four corners of the basin to ensure their integrity. The concrete should be visible and free of damage.		
Visually check the basin cover for signs of erosion subsidence and/or depressions.		
Verify that conditions of the roads to the well sites are adequate.		
Inspect the grounds surrounding well sites for vegetation overgrowth, debris, and existence and/or development of erosion features.		

ATTACHMENT TO LUCIP

ER INSPECTION CHECKLIST FOR L-AREA OIL AND CHEMICAL BASIN
 (Cont'd.)

Waste Site: _____ A = Satisfactory X = Unsatisfactory (Comments required)	A or X	<u>Comments or Corrective Action Taken (See Maintenance Register for Corrected Items)</u>
Verify that the well posts and protective covers are in place.		
Verify the well is properly identified per R.61-71.6H (South Carolina well standards and regulations).		
Verify the wells' casings are properly locked per R.61-71.11.C.6 (South Carolina well standards and regulations).		
Verify that the previous "Quarterly Monitoring Well Inspection Summary Report" has been sent to ERD Records Interim Storage. This report can be obtained from ERD Waste Treatment.		
Other		
Comments:		

Inspected By: _____ / _____ Date: _____ Time: _____
 (Print Name) (Signature)

Reviewed By: _____ / _____ Date: _____ Time: _____
 PM or Designee (Print Name) (Signature)

Note: USEPA and SCDHEC must be notified within 30 days of identification of any area where any breach or compromise of restrictions placed on this institutional control operable unit has occurred.

LUCIP FOR
L-Area Reactor Seepage Basin, 904-064G

Appendix A of Post-Construction Report/Final Remediation Report for the L-Area
Reactor Seepage Basin

WSRC-RP-2003-4118, Revision.1, February 2004

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Appendix A

Land Use Control Implementation Plan (LUCIP)

For

L-Area Reactor Seepage Basin

This L-Area Reactor Seepage Basin (LRSB) Land Use Control Implementation Plan (LUCIP) will be appended to the Savannah River Site (SRS) Land Use Control Assurance Plan (LUCAP). SRS is responsible for implementing the land use controls (LUCs) (e.g., inspections and maintenance) outlined in this unit-specific LUCIP.

The selected remedy leaves hazardous substances in place that pose a potential future risk and will require land use restrictions for an indefinite period of time. As negotiated with the United States Environmental Protection Agency (USEPA), and in accordance with USEPA Region IV policy, SRS has developed a LUCAP to ensure that land use restrictions are maintained and periodically verified. This LUCIP provides detailed and specific measures required for the LUCs selected as part of this remedy. The United States Department of Energy (USDOE) is responsible for implementing, maintaining, monitoring, reporting upon, and enforcing the LUCs herein. Upon final approval, the LUCIP will be appended to the LUCAP. It is considered incorporated by reference into the Post-Construction Report/Final Remediation Report (PCR/FRR), establishing land use controls implementation and maintenance requirements enforceable under the Comprehensive Environmental Response, Compensation, and Recovery Act (CERCLA). The approved LUCIP will establish implementation, monitoring, maintenance, reporting, and enforcement requirements for the unit. The plan will remain in effect until modified as needed to be protective of human health and the environment. LUCIP modification will only occur through another CERCLA document.

SRS will maintain institutional controls in accordance with the LUCAP (WSRC-2003). The LUCAP states that the land use for the LRSB operable unit (OU) will be maintained

for industrial land use only. Institutional controls will be in place as long as the risk is greater than 1×10^{-6} and the threat to the environment extends beyond 2006.

The additional institution control, fencing, will be required through the year 2006, at which point the risk from potential threat source material (PTSM) (1×10^{-3}) will no longer be present due to radioactive decay.

1.0 REMEDY SELECTION

1.1 LRSB Operable Unit

The LRSB OU is located in the central portion of SRS, southeast of the L-Reactor facility. The basin was in an open area with sparse vegetative cover. It was posted as a Soil Contamination Area (SCA) and is currently posted as an underground radioactive material area. The ground slopes to the south toward L-Lake, which is approximately 1,220 ft away. The LRSB is located in an industrial zone identified in the proposed SRS future land use map. The basin was adjacent to a nuclear facility and has been selected to remain an industrial use area. According to the *Savannah River Site Future Use Project Report* (USDOE 1996), residential use of SRS land near nuclear facilities should be prohibited.

1.2 Nature and Extent of Contamination in LRSB

The LRSB was an L-shaped unlined (earthen) basin with dimensions of 200 ft in length for each leg of the L-shape, 36 ft in width, and 7 ft in depth. The basin has been filled, covered, vegetated and is currently closed. The basin area was 0.29 acres. The area inside the LRSB OU fence is 1.34 acres.

In 1958, the process sewer line began conveying low-level radioactive purge water from the L-Area Reactor disassembly basin to the seepage basin. The LRSB received purge water from 1958 to 1968 and from 1985 to 1988. From 1985 to 1988, mixed-bed

deionizers and sand filters intercepted the purge water before it was discharged to the LRSB. In 1988, L-Reactor was placed on warm standby; in 1993, it was shut down. It has not been restarted.

The process sewer line is a 3-inch diameter high density polyethylene (HDPE) pipe that is approximately 450 ft long and extended from the disassembly basin within the L-Reactor facility to the discharge point at the north end of the basin. In addition to the process sewer line, a concrete pad (18 x 18 ft) with metal handles sat adjacent to the basin. This pad was most likely used as an off-loading area. Liquid waste was transferred from tanker trucks at the off-loading pad into the basin via a flexible pipe. The pipe extends from the pad to the north end of the basin.

The LRSB contains PTSM composed of cobalt-60 and is limited to 1 ft below the bottom of the basin. No PTSM is associated with the process sewer lines or the concrete pad.

Strontium-90 was predicted to leach to the groundwater from the seepage basins and buffer area in less than 1,000 years at concentrations above the MCL.

A portion of the L-Area Oil and Chemical Basin (LAOCB) 6-inch pipeline (steel) used to extend between the west end of the LAOCB cap and the east end of the LRSB. Although many radionuclides were discharged to LRSB, most of the radioactivity was attributable to tritium. Other radionuclides include strontium-90, cesium-137, cobalt-60, and promethium-147.

1.3 Remedial Action Overview

The remedy selected for the LRSB OU is a low-permeability soil cover system with institutional controls. According to the *Savannah River Site Future Use Project Report Stakeholder Recommendations for SRS Land and Facilities* (USDOE 1996) residential use of SRS land should be prohibited. This remedy entails the following actions:

- The 6-inch carbon steel pipe was grouted in place, excavated and disposed of in the basin. The 3-inch HDPE pipe was grouted and left in place. The portion of the 1.5-inch abandoned domestic water line inside the LRSB fence line was excavated and disposed of in the basin, and the end of the pipe was capped. Any contaminated soil (i.e., exceeding 20 pCi/g of gross alpha or 50 pCi/g non-volatile beta) surrounding the pipelines was disposed of in the basin.
- The concrete pad, associated piping, and handrails was removed and disposed of in the basin. A minimum 1 ft of soil from beneath the previous concrete pad location was excavated and disposed of in the basin. Any contaminated soil (i.e., exceeding 20 pCi/g gross alpha or 50 pCi/g nonvolatile beta) surrounding the concrete pad was disposed in the basin.
- A low-permeability soil cover system with a perimeter fence was installed to reduce water infiltration, and to protect human health and the environment.
- Institutional controls were implemented to ensure continued protection of human health or the environment.

The post-remedial action (RA) conceptual site model shows the broken pathways and the remaining residual risk to the future industrial worker (Attachment C).

2.0 LAND USE CONTROLS

The following LUC objectives have been developed for the LRSB OU to ensure the protectiveness of the RA:

- Prevent contact, removal, or excavation of buried waste or pipelines in the OU areas designated in the LUCIP and preclude future residential or agricultural use of the area.
- Maintain the use of the site for industrial activities only.

Current access controls and a deed notification needed to maintain the future LUCs are described in the following sections of this LUCIP.

2.1 Access Controls

2.1.1 On-Site Workers

In accordance with WSRC 1D, *Site Infrastructure and Services Manual*, Procedure 3.02, "Site Real Property Configuration Control," use of all lands and waters on SRS shall be coordinated via the Site Use Program. No use of land (i.e., excavation or any other land use) shall be undertaken without prior approval documented by a Site Use Permit. In accordance with Procedure 3.02, all work at SRS that adds to or modifies features or facilities portrayed on SRS development maps (i.e., plot plans of facilities/utilities at SRS) will be authorized by a Site Clearance Permit before excavation activities are conducted. All Site Clearance Requests will be reviewed to verify that either an approved Site Use Permit has been obtained or that an existing Site Use Permit has sanctioned the request.

The Site Development, Planning, and Mapping Department at SRS is responsible for updating, maintaining, and reviewing site maps, including Federal Facility Agreement (FFA) OU identifications. If a Site Clearance Request is made that may impact an FFA OU, the Site Clearance Request form is sent to the FFA OU reviewer, who is in the Soil and Groundwater Closure Projects (SGCP), for either approval or disapproval. The roles and responsibilities of each individual are detailed in WSRC 1D, Procedure 3.02. Verification of USDOE approval for intended land use must be obtained before issuance of a Site Clearance Permit. The Site Use and Site Clearance processes are applicable to all activities and personnel on site (including subcontractors).

The processes are controlled within the SRS Quality Assurance (QA) Program. The SRS QA Program is the governing QA Program for all SRS activities, including those in the

SGCP. The activities that are performed in the SGCP must comply with SRS QA Program procedures as well as SGCP-specific procedures.

SRS identifies all buildings and facilities on maps used in the Site Use/Site Clearance Program. This waste unit is identified on these maps as a CERCLA facility.

Any work proposed in these areas will be strictly controlled, and workers will be appropriately trained and briefed about health and safety requirements if work is deemed necessary for maintenance. No major change in land use or excavation at the LRSB OU shall be undertaken without USEPA and South Carolina Department of Health and Environmental Control (SCDHEC) approval. To prevent unknowing entry and to ensure that unrestricted use of the waste unit does not occur while it is under ownership of the government, identification signs will be posted at the unit.

Custodial responsibilities for maintenance and inspection of the LRSB OU will be maintained by the Post-Closure Maintenance group within the SGCP.

The warning signs for the soil cover will be legible from a distance of at least 25 ft. The soil cover signs will read as shown in the photograph below:



The warning signs for the underground grouted pipeline will be legible from a distance of at least 25 ft. The underground pipeline signs will read as shown in the photograph below:



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2.1.2 Trespassers

While under the ownership of USDOE, access control of the entire SRS will continue to be maintained in accordance with the 1992 Resource Conservation Recovery Act (RCRA) Part B Permit Renewal Application, Volume I, Section F.1. This section describes the 24-hour surveillance system (R.61-79.264.14(b)(1)), artificial or natural barriers (R.61-79.264.14(b)(2)(i)), control entry systems (R.61-79.264.14(b)(2)(ii)), and warning signs (R.61-79.264.14(c)) in place at the SRS boundary to comply with the security requirements for a RCRA-permitted facility.

2.2 Deed Notification

In the long-term, if the property is ever transferred to non-federal ownership, the U.S. Government will take those actions necessary pursuant to Section 120(b) of CERCLA. Those actions will include a deed notification disclosing former waste management and disposal activities as well as RAs taken on the site. The contract for sale and the deed will contain the notification required by CERCLA Section 120(h). The deed notification shall, in perpetuity, notify any potential purchaser that the property has been used for the management and disposal of waste. These requirements are also consistent with the intent of the RCRA deed notification requirements at final closure of a RCRA facility if contamination will remain at the unit.

The deed shall also include deed restrictions that preclude residential use of the property. However, the need for these deed restrictions may be re-evaluated at the time of transfer in the event that exposure assumptions differ and/or the residual contamination no longer poses an unacceptable risk under residential use. Any re-evaluation of the need for the deed restrictions will be done through an amended ROD with USEPA and SCDHEC review and approval.

Pursuant to the approved ROD Amendment (WSRC 2002a) and RAIP (WSRC 2002b), if the site is ever transferred to non-federal ownership, a survey plat of the OU will be prepared, certified by a professional land surveyor, and recorded with the appropriate county recording agency.

Note: The "AREA SUBJECT TO LAND USE CONTROLS" are shown on SK-C-53110, Rev. 1.

2.3 Field Walk downs and Maintenance for Institutional Controls

After the remediation of the LRSB, only maintenance activities will be required per this RA. No operations activities will be required.

The results of any events and or actions that indicate some potential compromise of institutional controls will be documented in the FFA Annual Progress Report. All other routine maintenance activities will be documented and maintained in files subject to USEPA and SCDHEC review and audit. A copy of the completed inspection form is maintained in the SGCP Administrative Record Files.

The following steps will be implemented to maintain the low-permeability soil cover:

- Perform periodic (at a minimum annual) visual inspections for evidence of damage to the soil cover due to erosion or intrusion by burrowing animals. The inspection will also address upkeep of the vegetative cover and access control barriers (e.g., the fences and warning signs). (Attachment B provides a unit-specific field inspection checklist for the LRSB OU).
- Perform necessary repairs (when required as identified during inspection) to maintain the functional integrity of the soil cover and the warning signs.

- Enforce SRS institutional controls by restricting access to the closed waste unit. Institutional controls will be maintained as long as the waste remains a threat to human health or the environment.
- As required by the National Oil and Hazardous Substance Contingency Plan (NCP), a five-year review of the Record of Decision (ROD) for the LRSB unit will be performed as long as the waste remains a threat to human health or the environment.

The waste site inspectors are to be trained and certified in Hazardous Waste Operations (HAZWOPER), RCRA well inspectors (SGCP-specific training), SGCP RCRA waste unit inspectors, radiological workers, etc., as applicable for the specific inspection. They will also be trained based on the individual requirements of the regulatory approved closure documents for each waste unit. In addition, the inspectors are to attend yearly refresher courses. Over the years no single person will conduct all of the inspections or grass cutting operations.

This unit-specific LUCIP, including the checklist, will be appended to the SRS LUCAP.

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Appendix A

Attachment A

**SK-C-53110, Rev. 1, L-Area Reactor Seepage Basin (904-64G) Closure (U)
Land Use Control Implementation Plan As-Built**

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010742

PCR# WSRC-RP-2003-4118

L - AREA REACTOR SEEPAGE BASIN
(904-64G) CLOSURE (U)
AS-BUILT
LAND USE CONTROL IMPLEMENTATION PLAN

DRAWING NO. SK-C-53110 , REV. 1

90

33344444444455555555556666
789012345678901234567890123

PSC =
PLOT DATE

DRAWN BY (ORIG):
TIME

LAST CADD REV. BY:
DATE:

Scale shown on this drawing is only applicable
when plotted at 30"x42" (actual drawing size)

Appendix A

Attachment B

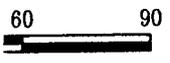
SGCP Inspection Checklist For L-Area Reactor Seepage Basin

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4	232.32
5	232.83
	233.01
	233.82

PCR# WSRC-RP-2003-4118

L - AREA REACTOR SEEPAGE BASIN
 (904-64G) CLOSURE (U)
 AS-BUILT
 SAMPLE LOCATIONS
 DRAWING NO. SK-C-53111 , REV. 1



333344444444455555555556666
 6789012345678901234567890123

PSC=
 PLOT DATE

DRAWN BY (ORIG): T.HICKMAN
 TIME

LAST CADD REV. BY:
 DATE:

Scale shown on this drawing is only applicable
 when plotted at 30"x42" (actual drawing size)

N 45300

FENCE

N 45200

LEGEND	
	AREA SUBJECT TO LAND USE CONTROLS
	EXISTING MINOR CONTOUR
	EXISTING MAJOR CONTOUR
	ABANDONED PIPELINE
	BASIN PERIMETER FENCE
	ACCESS WARNING SIGN
	ABANDONED PIPELINE WARNING SIGN
	BOUNDARY MARKER

PCR # WSRC-RP-2003-4118

L - AREA REACTOR SEEPAGE BASIN
(904-64G) CLOSURE (U)

AS-BUILT GRADING PLAN

DRAWING NO. SK-C-53112 , REV. 1



010744

PCR # WSRC-RP-2003-4118

L - AREA REACTOR SEEPAGE BASIN
(904-64G) CLOSURE (U)

SECTIONS

DRAWING NO. SK-C-53113 , REV. 1

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789012345678901234567890123

PSC=
PLOT DATE

DRAWN BY (ORIG): T.HICKMAN
TIME

LAST CADD REV. BY:
DATE:

Scale shown on this drawing is only applicable
when plotted at 30"x42" (actual drawing size)

**FIELD INSPECTION CHECKLIST
 L-AREA REACTOR SEEPAGE BASIN**

SCHEDULED

UNSCHEDULED

A= Satisfactory X= Unsatisfactory (Explanation Required)	A or X	Observations/Corrective Action Taken
1. Verify that the roads are accessible.		
2. Verify that the waste unit signs are in acceptable condition, have the correct information, and are legible from a distance of 25 ft.		
3. Verify that there are no excavation, digging, or construction activities on the soil cover or the underground process piping (identified by signs).		
4. Check the integrity of vegetative covers and drainage ditches for presence of excessive erosion, sediment buildup, and any debris restricting flow.		
5. Verify that no woody vegetation is growing on the soil cover. Remove or identify, as needed.		
6. Visually check vegetative cover for grass density, with no bare spots more that 3 ft by 3 ft in area. The height of the vegetative cover should not impair the visual inspection of the soil cover. This will be determined by the inspector.		
7. Check the soil cover for signs of erosion or depressions (subsidence).		
8. Check for signs of burrowing animals (holes).		
9. Verify that the fence is in good condition and that the gate is locked.		

Inspected by:

_____/_____
 (Print Name) (Signature) Date: _____

Post-Closure Manager:

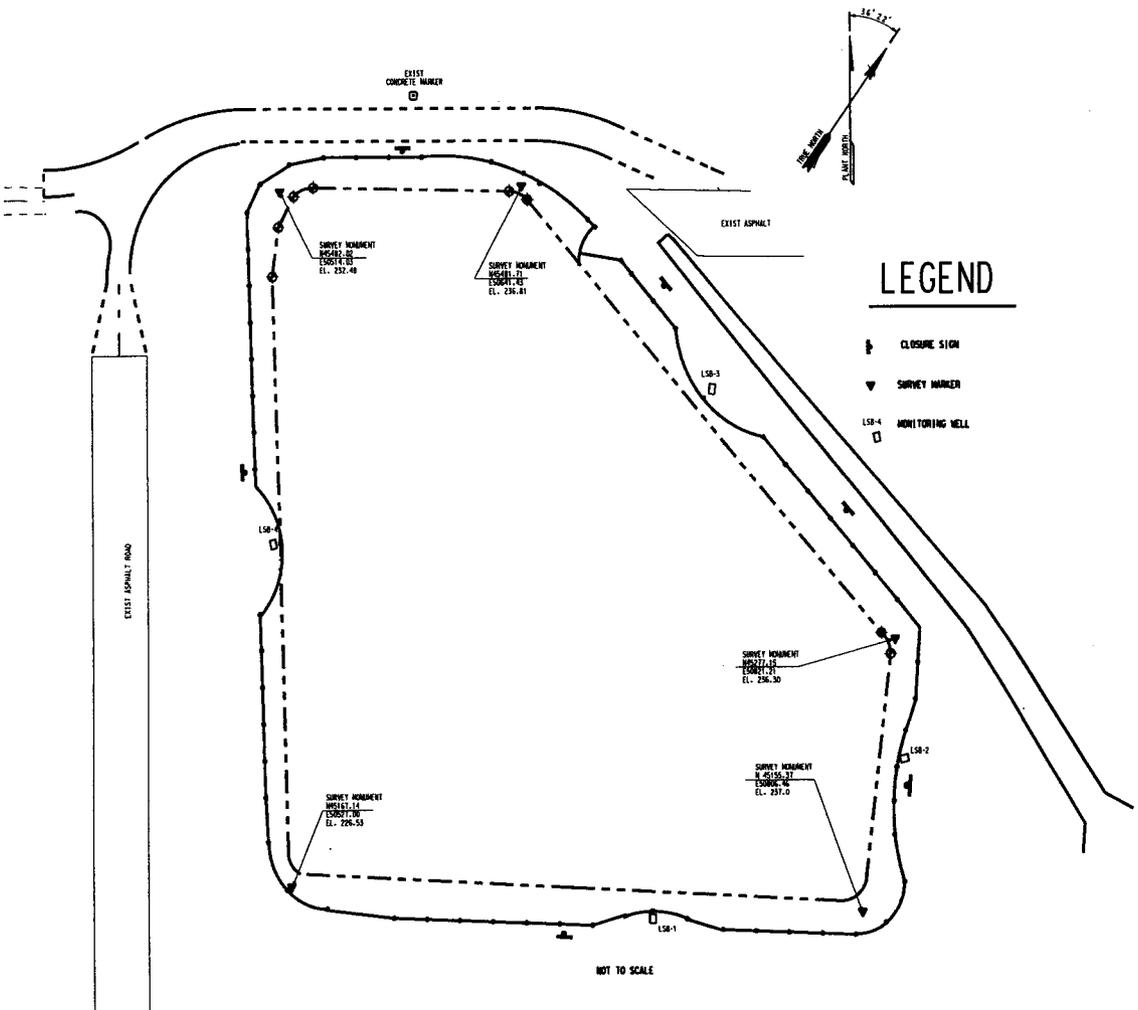
_____/_____
 (Print Name) (Signature) Date: _____

CAUTION:

The Inspector shall notify the Post Closure Manager (PCM) and the Environmental Compliance Authority (ECA) IMMEDIATELY if there has been a breach or compromise of this waste unit. Refer to Post Closure Procedures.

NOTE: Monitoring wells associated with this waste unit are maintained in accordance with SGCP Monitoring Well Procedures. See attached map of the LRSB OU.

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Map L-Area Reactor Seepage Basin (904 - 64G)

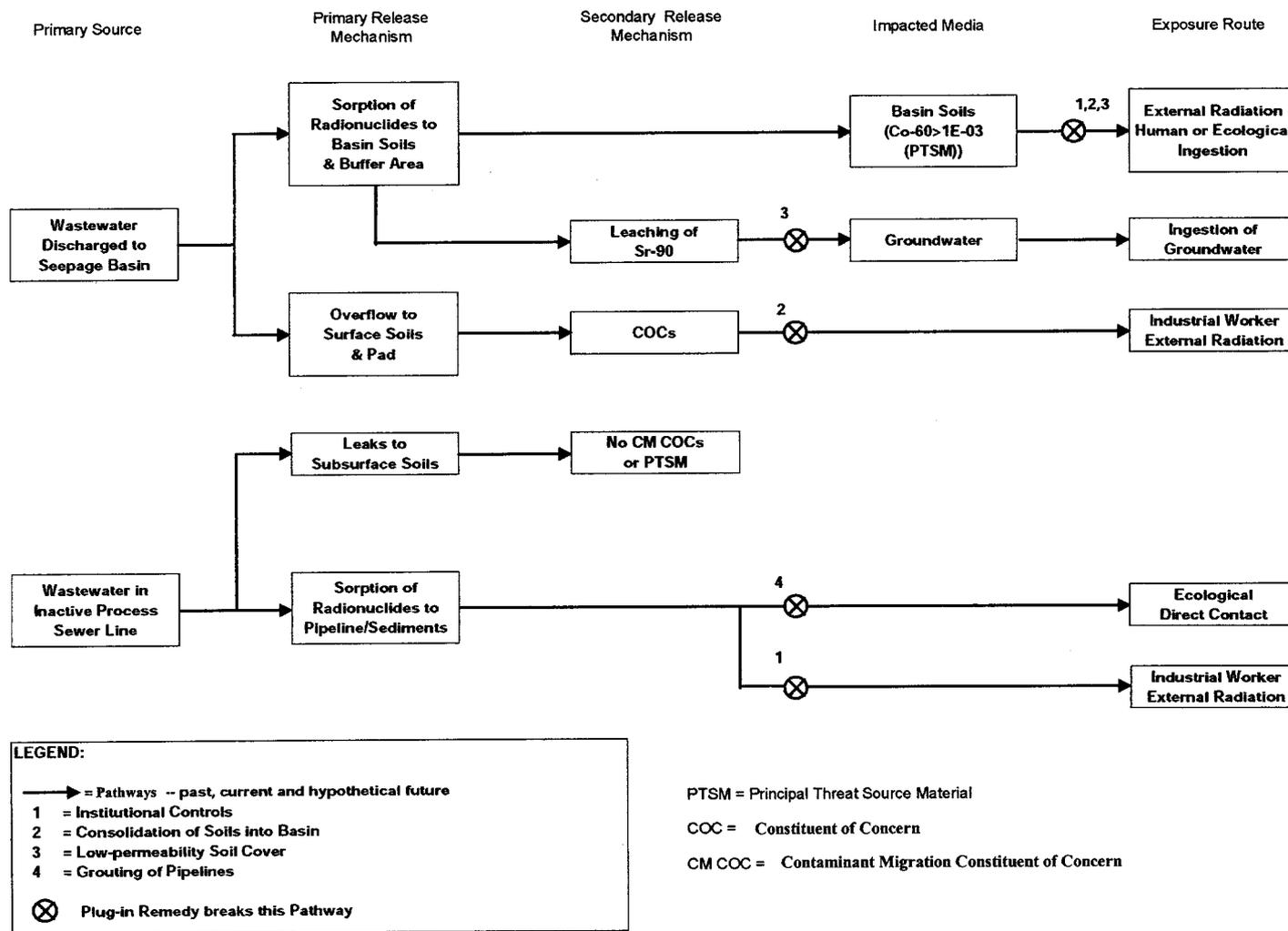
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Appendix A

Attachment C

**Post-Remedial Action Conceptual Site Model For L-Area Reactor Seepage
Basin With Plug-In Remedy Applied**

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Post-Remedial Action Conceptual Site Model For L-Area Reactor Seepage Basin With Plug-In Rod

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LUCIP for the
L-Area Rubble Pile (131-3L) and Groundwater Plume Operable Unit

Appendix A of Post-Construction Report for the L-Area Burning/Rubble Pit (131-L), Gas
Cylinder Disposal Facility (131-2L) and L-Area Rubble Pit (131-3L)

WSRC-RP-2003-4126, Revision.1, February 2004

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APPENDIX A
LAND USE CONTROL IMPLEMENTATION PLAN (LUCIP)
FOR THE
GROUNDWATER PLUME

**LAND USE CONTROL IMPLEMENTATION PLAN (LUCIP)
FOR THE
GROUNDWATER PLUME**

This groundwater plume Land Use Control Implementation Plan (LUCIP) will be appended to the Savannah River Site (SRS) Land Use Control Assurance Plan (LUCAP). SRS is responsible for implementing the land use controls (LUCs) (e.g., inspections, maintenance, etc.) outlined in this unit-specific LUCIP.

The selected remedy temporarily leaves groundwater contaminated with carbon tetrachloride above the MCL. This poses a potential future risk that will require LUCs for a finite period of time. As negotiated with the United States Environmental Protection Agency (USEPA), and in accordance with USEPA Region IV policy, SRS has developed a LUCAP to ensure that land use restrictions are maintained and periodically verified. This LUCIP provides detailed and specific measures required for the LUCs selected as part of this remedy. The United States Department of Energy (USDOE) is responsible for implementing, maintaining, monitoring, reporting on, and enforcing the LUCs herein. (Upon final approval, the LUCIP will be appended to the LUCAP and thus will be considered incorporated by reference into the post-construction report/final remediation report (PCR/FRR), establishing LUCs, implementation, and maintenance requirements enforceable under the Comprehensive Environmental Response, Compensation, and Recovery Act (CERCLA)). The approved LUCIP will establish implementation, monitoring, maintenance, reporting, and enforcement requirements for the unit. The LUCIP will remain in effect until modified as needed to be protective of human health and the environment. LUCIP modification will only occur through another CERCLA document.

1.0 Remedy Selection

1.1 L-Area Rubble Pile

The Record of Decision states, "Institutional control will be contingent on confirmatory sampling results. If no contamination above anticipated (residential) RGs remains at the LRP, unit-specific LUCs will not be implemented (Table 5). If soil contamination above anticipated (residential) RGs does remain, institutional controls will be implemented."

The removal and disposal action performed at the LRP has achieved the residential RGs and no institutional controls are required. As such, this LUCIP will address the temporary controls necessary to support the groundwater remedy only.

1.2 Groundwater Plume

There is a small diffuse groundwater plume of carbon tetrachloride located southwest of the LRP. The source of this plume is depleted.

The groundwater plume will be treated in situ by natural processes in accordance with the approved groundwater mixing zone (GMZA).

1.2.1 Nature and Extent of Contamination at Groundwater Plume

Groundwater Plume

Carbon tetrachloride above its water quality standard was identified in a small diffuse plume of about 2 acres that is located to the southwest of the LRP. This plume is moving away from the LRP. See Figure 1. The source term of this plume is depleted and may or may not have been associated with past disposal actions at the LRP.

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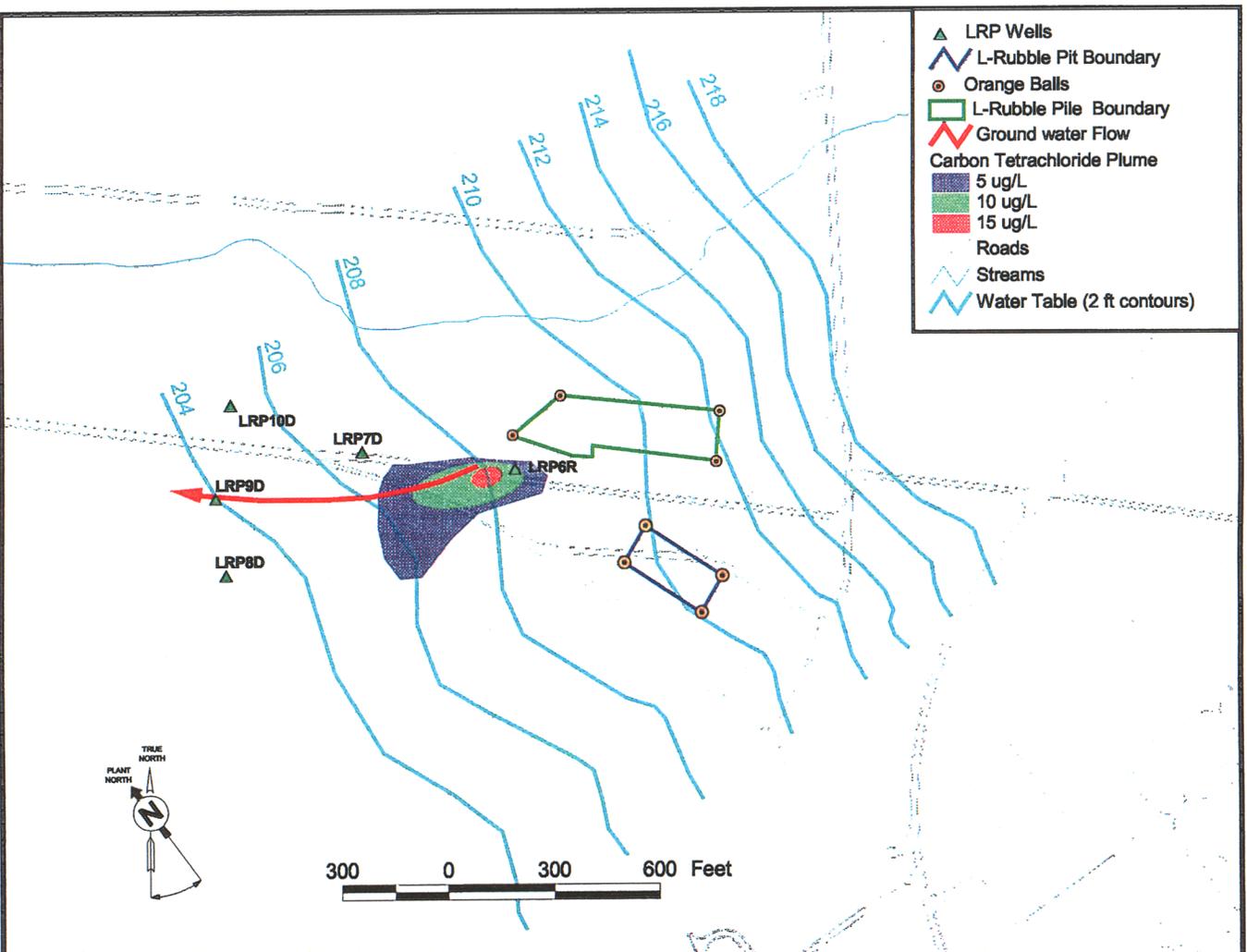


Figure 1. Current Estimated Area of Groundwater Plume Subject to Land Use Controls

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1.3 Remedial Action Overview

1.3.1 Groundwater: Groundwater Mixing Zone, with Institutional Controls until the Maximum Contaminant Level is Attained

The Remedial Action Objectives (RAOs) for groundwater are

- prevent human exposure to carbon tetrachloride in groundwater above the water quality standard.
- Prevent or limit discharge of carbon tetrachloride from groundwater to surface water at levels above the water quality standard.
- Reduce carbon tetrachloride concentrations in groundwater by treating in situ through natural processes to below the water quality standards in accordance with GMZA.

The groundwater plume is being treated in situ by natural processes. Groundwater modeling (WSRC 1999) indicates that natural processes of advection and dispersion will reduce contaminant concentrations below the MCL for carbon tetrachloride.

Monitoring is being performed to confirm that groundwater concentrations are decreasing consistent with the model predictions and the cleanup objectives. Monitoring consists of sampling of the GMZA wells and surface water. Groundwater sampling is being done quarterly for the first year, then semi-annually thereafter until the plume has been demonstrated to be less than MCL. Surface water sampling is performed annually. Details of the compliance monitoring strategy are described in the GMZA (WSRC 2000b), which was approved by SCDHEC. All samples will be analyzed for carbon tetrachloride, chloroform, methylene chloride, and chloromethane.

Institutional controls for the groundwater plume will be implemented as long as groundwater concentration of carbon tetrachloride exceeds the MCL. Figure 2 provides a post-construction groundwater conceptual site model (CSM) that shows the broken exposure pathway.

Institutional controls will be implemented by:

- preventing unauthorized exposure to the contaminated groundwater by off-site workers via the Site Use Program/Site Clearance Program
- protecting authorized monitoring well workers via worker training, work control procedures
- providing access controls against trespassers via the 1992 RCRA Part B Permit Renewal Application which describes the security procedures and equipment, 24-hour surveillance system, artificial or natural barriers, control entry systems, and access control warning signs in place at the SRS boundary

The Five-Year Review Requirement, a CERCLA remedy review, will be conducted every five years to determine whether the groundwater remedy is meeting RAOs.

2.0 Land Use Controls

Land-use controls will be maintained as long as the groundwater plume exceeds the MCL for carbon tetrachloride.

2.1 Access Controls

Access controls are discussed in the institutional controls section above.

2.2 Deed Notification

If the land associated with the contaminated groundwater plume is transferred to non-federal ownership, a deed restriction that precludes the use of the groundwater for drinking water purposes shall be prepared. A survey plat of the land transferred will be prepared by a professional land surveyor, and recorded with appropriate county recording agency to identify the area under land use restriction. If the MCL for carbon tetrachloride is achieved prior to transfer of the land to non-federal ownership, no deed restrictions due to management of waste at the LBRP (131-L), GCDF (131-2L), and LRP (131-3L) will be required.

The contaminated groundwater associated with the remediated LBRP (131-L), GCDF (131-2L), and LRP (131-3L) OUs are managed by a South Carolina approved groundwater mixing zone application, which requires monitoring, reporting and institutional controls until the MCL for carbon tetrachloride is achieved. If the MCL for carbon tetrachloride is achieved prior to transfer of the land to non-federal ownership, no deed restrictions due to management of waste at the LBRP/GCDF/LRP OUs will be required. If the land associated with the contaminated groundwater plume is transferred to non-Federal ownership, a deed restriction that precludes the use of the groundwater for drinking water purposes shall be prepared. At the time of transfer, a survey plat of the transferred land will be prepared by a professional land surveyor, and recorded with the appropriate county recording agency to identify the groundwater plume area under land use restriction.

Figure 1 of the LUCIP shows the current estimated location of the groundwater plume subject to land use controls. The sole basis for land use restrictions for this OU is contaminated groundwater, which is subject to movement and natural attenuation. Hence, information set forth in a survey plat at this time would not be relevant to transfer of land at an undetermined time in the future. Preparation of a survey plat should be deferred until such time as the site is transferred to non-Federal ownership. Preparing the survey

plat coincident with the land transfer will maximize the accuracy of the description of the area under restrictive covenant. The deferred survey plat will be appended to this PCR when it is completed.

Any re-evaluation of the need for the deed restrictions will be done through an amended Record of Decision (ROD) with USEPA and SCDHEC review and approval.

2.3 Field Walkdowns and Surveillance

2.3.1 Maintenance for Institutional Controls

Groundwater plume maintenance will include periodic well inspections (see below) with maintenance as needed. The results of any events and or actions that indicate some potential compromise of institutional controls will be documented in the Federal Facility Agreement (FFA) Annual Progress Report. All other routine maintenance activities will be documented and maintained in files subject to USEPA and SCDHEC review and audit. A copy of the completed inspection form is maintained in SGCP Document Control. The LUCs will be implemented as long as the groundwater remains a threat to human health or the environment.

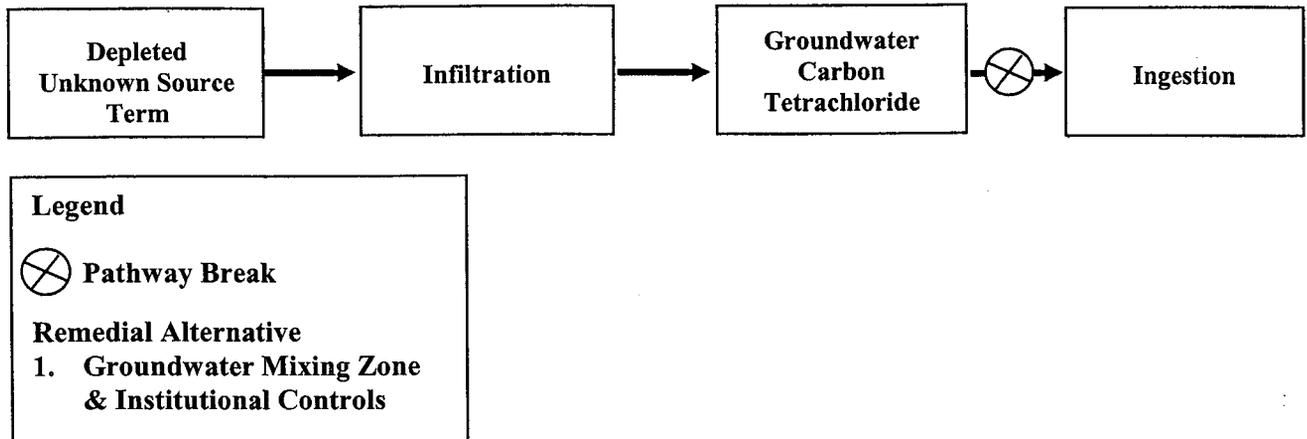


Figure 2. Groundwater Plume POST-Remedial Action Conceptual Site Model

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The following steps will be implemented to maintain the groundwater OU for as long as it is necessary to prevent exposure to the groundwater as long as it is contaminated above the carbon tetrachloride MCL.

- Institutional controls will be maintained as long as the groundwater remains a threat to human health or the environment.
- As required by the National Oil and Hazardous Substance Contingency Plan (NCP), a five-year review of the remedy for the groundwater plume unit must be performed as long as the groundwater remains a threat to human health or the environment.
- The GMZA monitoring wells are maintained in accordance with SRS Monitoring Well Procedures.

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LUCIP for the
Miscellaneous Chemical Basin/Metals Burning Pit, 731-4A and 731-5A

Appendix A of Interim Post-Construction Report for the Miscellaneous Chemical
Basin/Metals Burning Pit, 731-4A and 731-5A

WSRC-RP-2002-4038, Revision.1.1, December 2002

NOTE: The Westinghouse Savannah River Company (WSRC) and Department of Energy (DOE) organizations responsible for environmental restoration at the Savannah River Site underwent name changes in 2003, as shown below. The responsibilities as outlined in the following document did not change.

Organization	Previous Name	Current Name
WSRC	Environmental Restoration Division (ERD)	Soils and Groundwater Closure Projects (SGCP)
DOE	Environmental Restoration Division (ERD)	Soil and Groundwater Project (SGP)

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Appendix A

**Unit-Specific Land Use Control Implementation Plan
for the Miscellaneous Chemical Basin/Metals Burning Pit (731-4A/5A)**

UNIT-SPECIFIC LAND USE CONTROL IMPLEMENTATION PLAN FOR THE MISCELLANEOUS CHEMICAL BASIN/METALS BURNING PIT

The Miscellaneous Chemical Basin/Metals Burning Pit (MCB/MBP) Land Use Control Implementation Plan (LUCIP) will be appended to the Savannah River Site (SRS) Land Use Control Assurance Plan (LUCAP). SRS is responsible for implementing the land use controls (LUCs) (e.g., inspections, maintenance, etc.) outlined in this unit-specific LUCIP.

1.0 REMEDY SELECTION

The MCB received liquid chemical wastes and is located in an old borrow pit. It was approximately 6 m (20 ft) wide by 6 m (20 ft) long and approximately 0.3 m (1 ft) deep, although exact basin boundaries have not been determined. No construction records exist for the borrow pit. No records of specific materials disposed were kept although its presumed use was for the disposal of waste solvent and used oil.

The MBP is irregular in shape with approximate dimensions of 122 by 122 m (400 by 400 ft). Waste materials were piled 0.9 to 2.7 m (3 to 6 ft) high within the MBP. A review of file material does not indicate the existence of an excavation as the word "pit" implies. The MBP is actually a cleared area that was used for burning lithium-aluminum alloys, scrap, and cuttings from A&M Area operations. Unit photographs show what is thought to be typical disposal of metal shavings, pieces of aluminum, plastic pipe, metal drums, and other miscellaneous scrap. Wastes were primarily contained in two discrete areas, one large pile and a series of small piles oriented in a semi-circular arc. The pit was reportedly placed in service in 1960 and taken out of service in 1974. At that time, the waste piles were regraded and the area was allowed to revegetate. Weeds, grasses, and pine trees currently grow at the unit. The western half of the unit has a slope of approximately 6 percent, and the eastern half of the unit has a slope of approximately 2.5 percent.

The Interim Action Proposed Plan (IAPP) was submitted in accordance with the Federal Facility Agreement (FFA) and the approved implementation schedule and was approved by the United States Environmental Protection Agency (USEPA) on January 14, 1999, and the South Carolina Department of Health and Environmental Control (SCDHEC) on January 18, 1999. The IROD documented the selected remedial action and was approved by USEPA on January 6, 2000, and SCDHEC on November 18, 1999.

In summary, the MBP surface and subsurface soils contaminated with aluminum and the MCB surface soils contaminated with polychlorinated biphenyls (PCBs) will be excavated and disposed of in an appropriate Offsite Rule compliant facility. Soil vapor extraction (SVE) will be performed in the MCB vadose zone, while the groundwater at that unit will be treated by in situ air stripping. The combination of alternatives for soil removal, vadose zone remediation via active/passive SVE, groundwater remediation, and institutional controls is intended to be an interim action for the MCB/MBP operable unit (OU) as a whole to reduce risk to human health and the environment. However, the selected alternatives for the soils and vadose zone represent final actions because they will meet the final remedial action objectives (RAOs) and final remedial goals (RGs) established in the IROD. An interim action for this OU was chosen because of the uncertainty of the groundwater remediation within the overall unit remediation strategy. The uncertainty in the groundwater remediation strategy is based on two volatile organic compounds (VOCs) groundwater plumes located upgradient from the MCB/MBP. The groundwater plumes are associated with the M-Area Hazardous Waste Management Facility (a facility closed under RCRA and undergoing corrective action for the contaminated groundwater associated with that unit) and the A-Area Burning/Rubble Pits and Rubble Pit (ABRP) (a Resource Conservation and Recovery Act (RCRA)/Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) unit). Since these plumes are moving in the general direction of the MCB/MBP, it is not clear whether these plumes may represent a future VOC source relative to the MCB/MBP groundwater. An interim action at the MCB/MBP OU will allow an early start for remedial activities and will generate additional data on the nature and extent of the

groundwater interactions between the MCB/MBP, the ABRP, and A&M Area. These data will allow development of the final groundwater RGs. The rationale for the proposed groundwater interim action is centered on 1) controlling the source of groundwater contamination, i.e. vadose zone contamination; and 2) remediating the "hot spot" portions of the groundwater plume.

The MCB/MBP OU is in an area that has been recommended for multiple land uses, with the specific exclusion of residential land use. Although the remediation decisions for this unit were based on the industrial use scenario, the groundwater remedy is anticipated to achieve the more protective residential use scenario based on modeling results. The MBP will meet unrestricted land use criteria for soils, sediment, and surface water following the excavation detailed in the Interim Corrective Measures Implementation/Remedial Action Implementation Plan (ICMI/RAIP). The MCB will not meet unrestricted land use criteria for soils. Groundwater beneath both units exceeds the maximum contaminant levels (MCLs). Although institutional controls are included in all of the alternatives, the United States Department of Energy (USDOE) has recommended that residential use of SRS land in the vicinity of MCB/MBP be controlled; therefore, prohibition of future residential use and potential residential water usage and other controls will be taken to ensure long-term protectiveness in this area.

A post-construction conceptual site model (CSM) for the MCB, which illustrates the broken pathways after implementation of the remedy, is included as Figure A-1. A post-construction CSM for the MBP is included as Figure A-2.

2.0 LAND USE CONTROLS

Institutional controls are intended to be an alternative that maintains control of the area and that is protective of human health and the environment. Implementation of this alternative will require some near-term actions.

For the MCB, the following LUC objectives are necessary to ensure protectiveness of the preferred alternative:

- Prevent direct contact with PCB- and octachlorodibenzo-p-dioxin (OCDD)-contaminated surface/subsurface soils such that the constituents of concern (COCs) are not a continued significant risk to human health. Contaminated soils remain at the MCB to an estimated depth of 4 ft.
- Prevent direct contact with the vadose zone and groundwater during the groundwater interim remedial action.

For the MBP, the following LUC objective is necessary to ensure protectiveness of the preferred alternative:

- Prevent direct contact with the vadose zone and groundwater during the groundwater interim remedial action. Note that no contaminated soils remain at the MBP that are a continued significant risk to human health or the environment.

The following institutional controls are required to prevent unauthorized exposure to the contaminated media at the MCB/MBP:

- Controlled access to the MCB/MBP through existing SRS security gates and perimeter fences and the site use/site clearance programs.

- Signs posted in the area to indicate that waste remains in the vicinity of the MCB above levels allowing for unrestricted land use and to contact the waste unit custodian prior to entry.
- Notification of residual hazardous waste to any future landowner through deed notification, as required under CERCLA Section 120(h).

Figure A-3 shows the location of the MCB/MBP OU and the SRS coordinates of the MCB/MBP OU.

In the long term, if the MCB/MBP OU is transferred to non-federal ownership, the need for deed restriction will be evaluated and performed through an amended ROD with USEPA and SCDHEC approval and actions taken pursuant to CERCLA 120(h). The actions will include a deed notification disclosing former waste management and disposal activities, as well as any remedial actions taken at the waste unit. The deed notification will, in perpetuity, notify any potential purchaser that the property has been used for the management and disposal of waste and other materials, including hazardous substances. At this time, RCRA deed notification requirements are not required for this waste unit since this is an interim action. The deed, if necessary, would include restrictions precluding residential use of the property. The need for deed restrictions may be re-evaluated at the time of transfer in the event exposure assumptions differ and/or contamination no longer poses an unacceptable risk under residential use. Proposed changes in deed restrictions will require USEPA and SCDHEC review and approval. The survey plat will be reviewed and updated, as necessary, at the time the site is transferred and will be recorded with the Aiken County recording agency. This proposal is consistent with USEPA guidance and is an effective use of risk management principles.

The elements of the institutional control corrective action, which consists of land restrictions without any engineering controls, are composed of deed notifications when the parcel is transferred from USDOE ownership, access controls that include posting of identification signs, and field walkdowns for general site conditions. These land use controls will be implemented in perpetuity for this OU.

Each element of the institutional controls corrective action is discussed below.

2.1 Deed Notification

A deed notification shall be filed in the appropriate county records in accordance with CERCLA 120(h), which requires the government to create a deed when land on which any hazardous substance was stored, released, or disposed of is transferred to non-federal ownership. The transference of the MCB/MBP OU is unlikely. In the event the property is transferred, a deed notification will be filed with Aiken County. Per CERCLA 120(h)(3)(A), the deed shall contain, to the extent practical, such information as is available based on the complete search of agency files, including the following:

- A notice of the type and quantity of such hazardous substances;
- Notice of the time at which such storage, release, or disposal took place; and
- A description of the remedial action taken, if any.

Per CERCLA 120(h)(3)(B), the deed shall also contain a covenant warranting that

- All remedial action necessary to protect human health and the environment with respect to any such substance remaining on the property has been taken before the date of such transfer;
- Any additional remedial action found to be necessary after the date of such transfer shall be conducted by the United States Government; and

- A clause granting the United States Government access to the property in any case in which remedial action or corrective action is found to be necessary after the date of such transfer.

At this time, RCRA permit requirements are not applicable for this waste unit since this is an interim action.

2.2 Access Controls

2.2.1 On-Site Workers

In accordance with WSRC 1D, *Site Infrastructure and Services Manual*, Procedure 3.02, *Site Real Property Configuration Control*, use of all lands and waters on the SRS shall be coordinated via the Site Use Program. No use of land (i.e., excavation or any other land use) shall be undertaken without prior approval documented by a Site Use Permit. Also, in accordance with Procedure 3.02, all work at SRS that adds to or modifies features or facilities portrayed on the SRS development maps (i.e. plot plans of facilities/utilities at SRS) is authorized by a Site Clearance Permit before any excavation activities. All Site Clearance requests are reviewed to verify that either an approved Site Use Permit has been obtained or that an existing Site Use Permit has sanctioned the request. Verification of USDOE approval for intended land use must be obtained before issuance of a Site Clearance Permit. The Site Use and Site Clearance processes are applicable to all activities and personnel on site (including subcontractors). The processes are controlled within the SRS Quality Assurance Program.

The SRS identifies all buildings and facilities on maps used in the Site Use/Site Clearance Program and includes a 200-foot buffer zone around each facility. This waste unit is identified on these maps as a CERCLA facility.

Any work proposed in these areas will be strictly controlled and workers will be appropriately trained and briefed about health and safety requirements if work is deemed necessary for maintenance. Any changes in the use or disturbance of the MCB/MBP will be cleared with the USEPA and SCDHEC before disturbance occurs. To prevent unknowing entry and to ensure that unrestricted use of the waste unit does not occur while under ownership of the government, identification signs will be posted. The signs will be legible from a distance of at least 25 feet and are located at the MCB/MBP as shown on the Miscellaneous Chemical Basin and Metals Burning Pit Soil and Groundwater Remediation Soil Removal and Replacement Plan and Detail (U) (C-CT-A-0027, Attachment 2 of this LUCIP).

The signs at the MCB read:

Miscellaneous Chemical Basin (731-4A)

“Danger – Unauthorized Personnel Keep Out. This unit contains hazardous substances. Do not dig or excavate. Do not enter without contacting the waste site custodian.”

Custodian: Manager, Post-Closure Maintenance

Phone: (803) 952-6882

The signs at the MBP read:

Metals Burning Pit (731-5A)

“Danger – Unauthorized Personnel Keep Out. This unit contains hazardous substances. Do not dig or excavate. Do not enter without contacting the waste site custodian.”

Custodian: Manager, Post-Closure Maintenance

Phone: (803) 952-6882

Site-specific controls (i.e., fences) are not required for MCB/MBP OU since the exposure to the casual worker or trespasser does not warrant this level of protection.

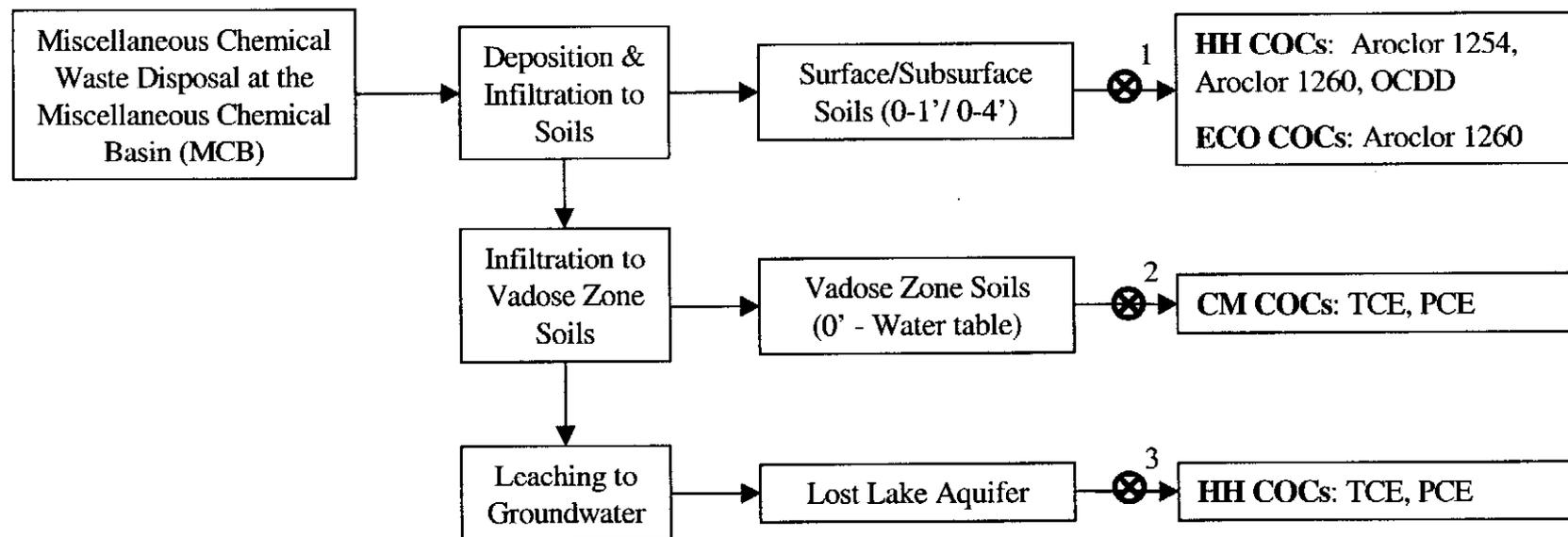
2.2.2 *Trespassers*

Additionally, while under the ownership of the USDOE, access control of the entire SRS will continue to be maintained in accordance with the 1992 RCRA Part B Permit Renewal Application, Volume I, Section F.1. This section describes the 24-hour surveillance system (R.61-79.264.14(b)(1)), artificial or natural barriers (R.61-79.264.14(b)(2)(i)), control entry systems (R.61-79.264.14(b)(2)(ii)), and warning signs (R.61-79.264.14(c)) in place at the SRS boundary to comply with the security requirements for a RCRA-permitted facility.

2.3 **Field Walkdowns and Maintenance for Institutional Controls**

"Monitoring" will be performed to verify that LUCIP requirements are met. Semi-annual monitoring of the MCB/MBP OU, 731-4A/5A, will be conducted for items such as accuracy and legibility of signs, visible subsidence or erosion of the waste unit, proper vegetative growth, condition of fence, mowing, etc. Subsidence or erosion will be corrected by backfilling the affected area with clean soil and seeding the area to prevent further erosion. The results of any events and/or action that could indicate some potential compromise of institutional controls will be documented in the Federal Facility Agreement Annual Progress Report. All other routine maintenance activities (i.e., mowing, etc.) will be documented and maintained in files that are subject to USEPA and SCDHEC review and audit. A copy of the completed inspection form is maintained in the Environmental Restoration Division administrative record files.

Inspections at the MCB/MBP will be performed to ensure that institutional controls remain protective and consistent with all RAOs. Semi-annual inspections will be conducted. The MCB/MBP (731-4A/5A) Inspection Sheet is included as Attachment 1 of this LUCIP.

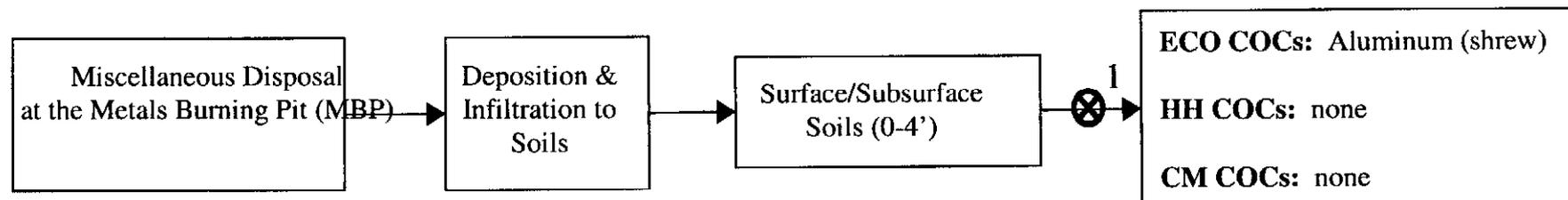


Abbreviations:
 COC = constituent of concern
 CM COC = contaminant migration COC
 ECO COC = ecological COC
 HH COCs = human health COC
 OCDD = chlorinated dioxin
 PCE = tetrachloroethene
 TCE = trichloroethene

Notes for Interim Remedial Actions:
 (1) Soil Excavation, Removal, and Institutional Controls
 (2) Soil Vapor Extraction (Active & Passive)
 (3) Vertical Recirculation Wells
 ⊗ = pathway break for remedial considerations

Figure A-1. Conceptual Site Model for MCB

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Abbreviations:
COC = constituent of concern
CM COC = contaminant migration COC
ECO COC = ecological COC
HH COC = human health COC

Notes for Interim Remedial Actions:
(1) Soil Excavation & Offsite Disposal

⊗ = pathway break for remedial considerations

Figure A-2. Conceptual Site Model for MBP

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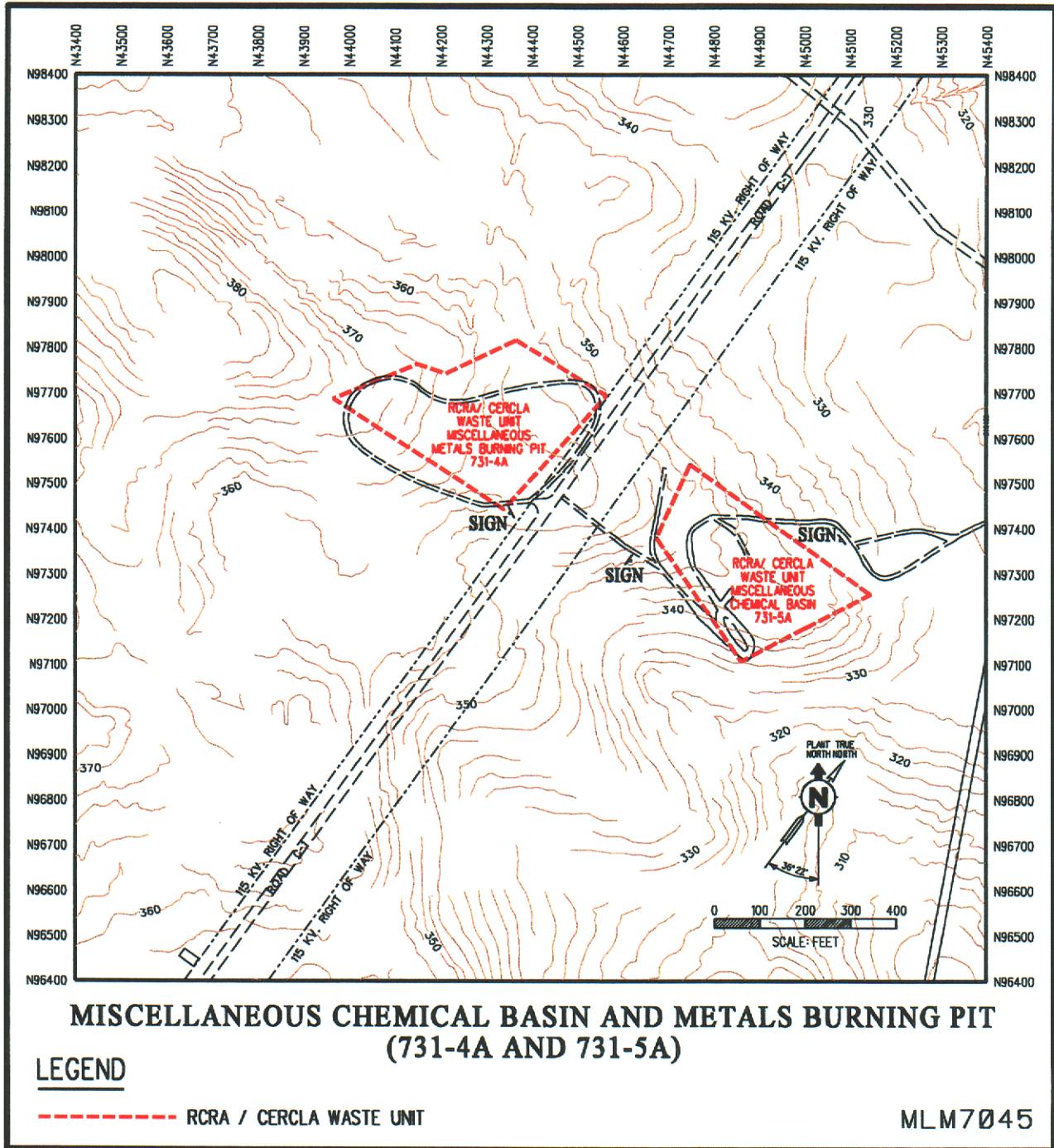


Figure A-3. Miscellaneous Chemical Basin/Metals Burning Pit Operable Unit

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ATTACHMENT 1

MCB/MBP (731-4A/5A) INSPECTION SHEET

A = Satisfactory X = Unsatisfactory (Comments Required)	A or X	Comments or Corrective Action Taken (See Maintenance Register for Corrected Items)
Check for potential encroachments (Ensure that there is no building on the site)		
Does the site have brush or woody vegetation that needs cutting and disposal?		
Does the site need to have the grass cut?		
Verify that the roads are accessible.		
Does the site show signs of erosion or subsidence? Are there any signs of burrowing animals (holes)?		
Does the site have adequate vegetative cover?		
Verify that the signs (three total) are correct and legible.		
Does the site need general cleanup (housekeeping)?		

Inspected By: _____ / _____ Date/Time: _____ / _____
 (Print Name) (Signature)

Accompanied By: _____ / _____ Date/Time: _____ / _____
 (Print Name) (Signature)

Post Closure Manager: _____ / _____ Date/Time: _____ / _____
 (Print Name) (Signature)

Note: USEPA and SCDHEC must be notified within 30 days of identification of any area where any breach or compromise of restrictions placed on this institutional control operable unit has occurred.

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ATTACHMENT 2

**MISCELLANEOUS CHEMICAL BASIN/METALS BURNING PIT SOIL AND
GROUNDWATER REMEDIATION**

SOIL REMOVAL AND REPLACEMENT PLAN AND DETAIL (U)

(DRAWING NUMBER C-CT-A-0027)

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LUCIP for the
Old F-Area Seepage Basin, 904-49G

Appendix A of Post-Construction Report for the Old F-Area Seepage Basin, 904-49G

WSRC-RP-2000-4100, Revision.1, August 2001

NOTE: The Westinghouse Savannah River Company (WSRC) and Department of Energy (DOE) organizations responsible for environmental restoration at the Savannah River Site underwent name changes in 2003, as shown below. The responsibilities as outlined in the following document did not change.

Organization	Previous Name	Current Name
WSRC	Environmental Restoration Division (ERD)	Soils and Groundwater Closure Projects (SGCP)
DOE	Environmental Restoration Division (ERD)	Soil and Groundwater Project (SGP)

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APPENDIX A

Unit-Specific LUCIP for Old F-Area Seepage Basin (Bldg. 904-40G) (U)

LAND USE CONTROL IMPLEMENTATION PLAN (LUCIP)

The Old F-Area Seepage Basin (OFASB) (Bldg. 904-49G) LUCIP will be appended to the Savannah River Site (SRS) Land Use Control Assurance Plan (LUCAP), which has been approved by the United States Department of Energy (USDOE), United States Environmental Protection Agency (USEPA), and South Carolina Department of Health and Environmental Control (SCDHEC).

1.0 REMEDY SELECTION

The OFASB is a Resource Conservation Recovery Act (RCRA)/Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) unit located within the SRS, approximately 600 feet north of F Area and 1 mile east of Road C. The Upper Three Runs Creek is located to the north of the basin. The water table is approximately 75 feet below ground surface in the area of the OFASB. Surface drainage is to the north toward Upper Three Runs Creek, which is 155 feet below the basin elevation.

The OFASB covers a total of 1.3 acres and is approximately 200 by 300 feet in dimension. An earthen berm in the interior divides the basin into two compartments. This unit also includes one effluent ditch line, which is located to the northwest corner of the basin leading toward Upper Three Runs Creek, and one process sewer line, which fed the basin at the southwest corner. The sewer line has an average depth of 9 to 10 feet below the land surface and is approximately 800 feet in length.

point as described in the approved groundwater mixing zone application. To implement the groundwater mixing zone demonstration, four compliance boundary wells, three intermediate wells, and the three existing MZCL wells have been utilized.

2.0 LAND USE CONTROL

For the OFASB, the following land use control (LUC) objective is necessary to ensure protectiveness of the remedy:

- Controlled access to the OFASB unit in accordance with the current site use/site clearance programs, including access controls to the sewer line by grouting the manholes and posting signs in the area to indicate that the sewer line and soil beneath the unit has been contaminated with radionuclides.

The elements of the institutional control corrective action, which consists of land restrictions without any engineering controls, are composed of deed notifications when the parcel is transferred from federal ownership (Section 2.1) and access controls comprising posting identification signs (Section 2.2) and field walkdowns and maintenance for general site conditions (Section 2.3). These LUCs will be implemented in perpetuity for this operable unit.

Each element of the institutional controls corrective action is discussed below.

2.1 Deed Notification

A deed notification shall be filed in the appropriate county records in accordance with CERCLA 120(h), which requires the government to create a deed when land on which any hazardous substance was stored, released, or disposed of is transferred to non-federal ownership. In the event the property is transferred, a deed notification will be filed with Aiken County. Per CERCLA 120(h)(3)(A),

the deed shall contain, to the extent practical, such information as is available based on the complete search of agency files, including the following:

- A notice of the type and quantity of such hazardous substances
- Notice of the time at which such storage, release, or disposal took place
- A description of the remedial action taken, if any

Per CERCLA 120(h)(3)(B), the deed shall also contain a covenant warranting that

- All remedial action necessary to protect human health and the environment with respect to any such substance remaining on the property has been taken before the date of such transfer.
- Any additional remedial action found to be necessary after the date of such transfer would be conducted by the United States Government.

2.2 Access Controls

2.2.1 On-Site Workers

In accordance with WSRC ID, *Site Infrastructure and Services Manual*, Procedure 3.02, "Site Real Property Configuration Control," use of all lands and waters at SRS shall be coordinated via the Site Use Program. No use of land (i.e., excavation or any other land use) shall be undertaken without prior approval documented by a Site Use Permit. Also, in accordance with Procedure 3.02, all work at SRS that adds to or modifies features or facilities portrayed on SRS development maps (i.e., plot plans of facilities/utilities at SRS) will be authorized by a Site Clearance Permit before excavation activities take place. All Site Clearance Requests are reviewed to verify that either an approved Site Use Permit has been obtained or that an existing Site Use Permit has sanctioned the request.

Verification of US DOE approval for intended land use must be obtained before a Site Clearance Permit is issued. The site use and site clearance processes are applicable to all activities and personnel on site (including subcontractors). The processes are controlled within the SRS Quality Assurance Program.

SRS identifies all buildings and facilities on maps used in the Site Use/Site Clearance Program and requires a 200-foot buffer zone around each facility. This waste unit is identified on these maps as a CERCLA facility.

All work in these areas will be strictly controlled, and workers will be appropriately trained and briefed about health and safety requirements if work is deemed necessary for maintenance. Any changes in the use or disturbance of the OFASB will be cleared with the USEPA and SCDHEC before disturbance occurs. To prevent unknowing entry and to ensure that unrestricted use of the waste unit does not occur while under ownership of the government, identification signs have been posted at the unit. The signs are legible from a distance of 25 feet and located approximately every 100 feet along the process sewer line and at each manhole and each side of the basin in the area as shown in Figure 7, sheet 1 and 2. The signs read as follows:

Old F-Area Seepage Basin

"DANGER"
UNAUTHORIZED PERSONNEL KEEP
OUT.
THIS UNIT WAS USED TO MANAGE
HAZARDOUS SUBSTANCES. DO NOT
DIG OR EXCAVATE. DO NOT ENTER
WITHOUT CONTACTING THE WASTE
SITE CUSTODIAN.
CUSTODIAN: MANAGER, POST-
CLOSURE MAINTENANCE
PHONE: (803) 952-6882

**Old F-Area Seepage Basin
Process Piping**

"DANGER"
UNAUTHORIZED PERSONNEL KEEP
OUT.
THIS SUBSURFACE PIPING SYSTEM
WAS USED TO CONVEY
HAZARDOUS SUBSTANCES. DO
NOT DIG OR EXCAVATE WITHOUT
CONTACTING THE WASTE SITE
CUSTODIAN.
CUSTODIAN: MANAGER POST-
CLOSURE MAINTENANCE
PHONE: (803) 952-6882

2.2.2 Trespassers

Additionally, while under the ownership of USDOE, access control of the entire SRS will continue to be maintained in accordance with the 1992 RCRA Part B Permit Renewal Application, Volume I, Section F.1. To comply with the security requirements for a RCRA-permitted facility, this section describes the 24-hour surveillance system (R.61-79.264.14(b)(1)), artificial or natural barriers (R.61-79.264.14(b)(2)(i)), control entry systems (R.61-79.264.14(b)(2)(ii)), and warning signs (R.61-79.264.14(c)) in place at the SRS boundary.

2.3 Field Walkdowns and Maintenance for Institutional Controls

Monitoring will be performed to verify that LUCIP requirements have been met. Semi-annual monitoring of the OFASB OU, 904-49G, will be conducted for accuracy and legibility of signs, visible subsidence or erosion of the waste unit, proper vegetative growth, burrowing animals, proper access to the facility, mowing, etc. Subsidence or erosion will be corrected by backfilling the affected area with clean soil and seeding the area to prevent further erosion. USEPA and SCDHEC will be notified of the results of any inspection, event, and/or action that indicates a potential compromise of institutional controls within 30 days of identification. The notification and the reason for the notification will be documented in the Federal Facility Agreement Annual Progress Report. All other routine maintenance activities (i.e., mowing, etc.) will be documented, and the documentation will be maintained in files that are subject to USEPA and SCDHEC review and audit. A copy of the completed inspection form will be maintained in Environmental Restoration Division administrative record files.

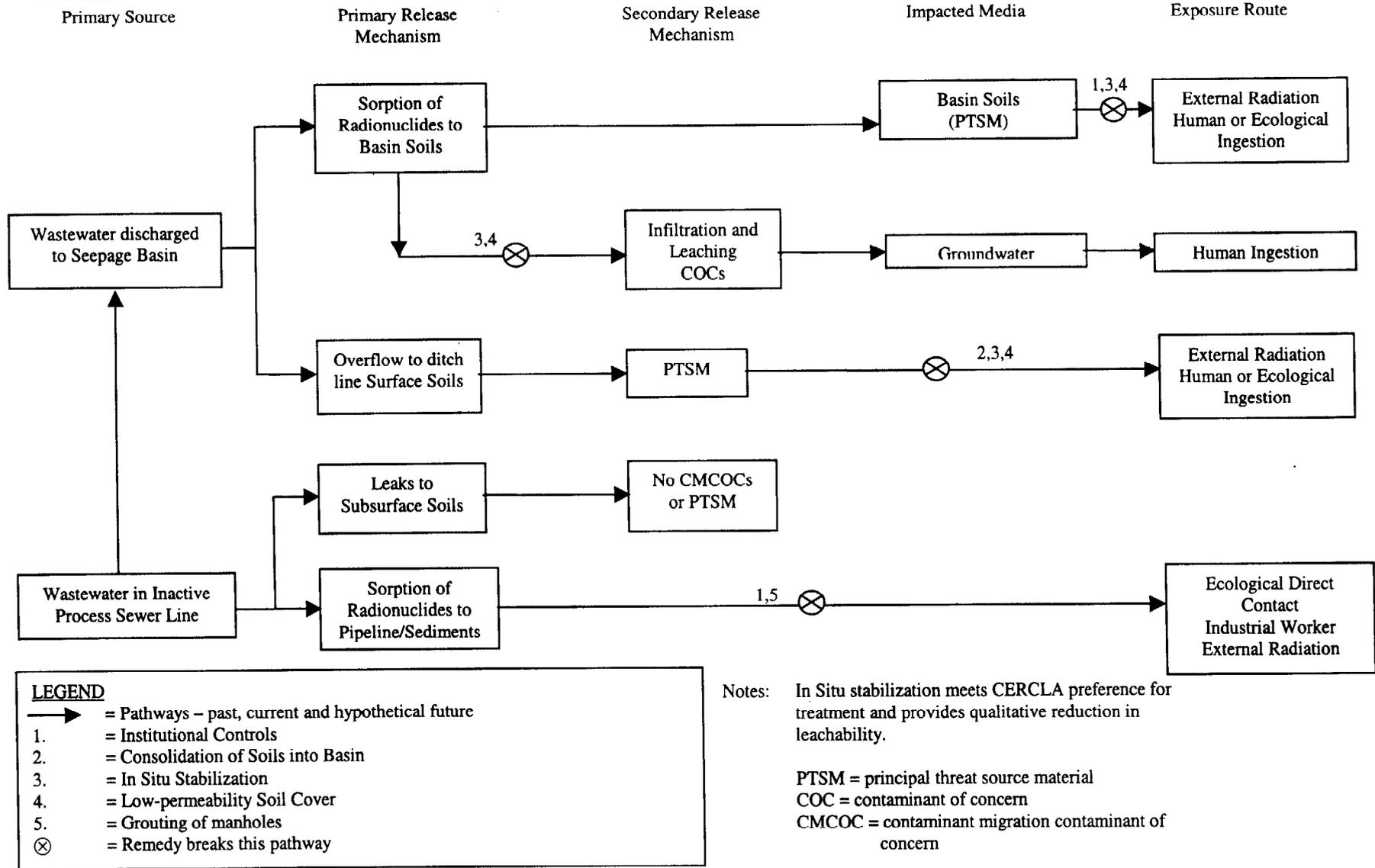


Figure A-1. Conceptual Site Model (CSM) for the Old F-Area Seepage Basin Post Remedial Action

APPENDIX A

ER INSPECTION CHECKLIST FOR OLD F-AREA SEEPAGE BASIN

Waste Site: _____ A = Satisfactory X = Unsatisfactory (Comments required)	A or X	<u>Comments or Corrective Action Taken (See Maintenance Register for Corrected Items)</u>
Check to see if the site needs mowing.		
Verify that the basin and roads are accessible.		
Check for potential encroachments. (Ensure that there is no building on the site.)		
Verify all signs are intact, in good condition, and legible from a distance of at least 25 feet.		
Visually check vegetative cover for grass density. There should be no woody vegetation or shrubs growing on the cover. The height of the vegetative growth should not impair the visual inspection of the site.		
Check the integrity of drainage ditches (if any) for presence of excessive erosion, sediment buildup, and any debris restricting water flow.		
Visually inspect the concrete markers at four corners of the basin to ensure their integrity. The concrete should be visible and free of damage.		
Visually check the basin cover for signs of erosion subsidence and/or depressions.		
Verify that conditions of the roads to the well sites are adequate.		
Inspect the grounds surrounding well sites for vegetation overgrowth, debris, and existence and/or development of erosion features.		

008004

APPENDIX A

ER INSPECTION CHECKLIST FOR OLD F-AREA SEEPAGE BASIN (Cont'd.)

Waste Site: _____ A = Satisfactory X = Unsatisfactory (Comments required)	A or X	<u>Comments or Corrective Action Taken (See Maintenance Register for Corrected Items)</u>
Verify that the well posts and protective covers are in place.		
Verify the well is properly identified per R.61-71.6H (South Carolina well standards and regulations).		
Verify the wells' casings are properly locked per R.61-71.11.C.6 (South Carolina well standards and regulations).		
Verify that the previous "Quarterly Monitoring Well Inspection Summary Report" has been sent to ERD Records Interim Storage. This report can be obtained from ERD Waste Treatment.		
Other		
Comments:		

Inspected By: _____ / _____ Date: _____ Time: _____
 (Print Name) (Signature)

Reviewed By: _____ / _____ Date: _____ Time: _____
 PM or Designee (Print Name) (Signature)

Note: USEPA and SCDHEC must be notified within 30 days of identification of any area where any breach or compromise of restrictions placed on this institutional control operable unit has occurred.

LUCIP for the
P-Area Burning/Rubble Pit, 131-P

Appendix A of Corrective Measures Implementation/Remedial Action Implementation
Plan P-Area Burning/Rubble Pit, 131-P

WSRC-RP-2002-4216, Revision.1, August 2003

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APPENDIX B

LAND USE CONTROL IMPLEMENTATION PLAN

for the

P-AREA BURNING RUBBLE PIT (PBRP)

LAND USE CONTROL IMPLEMENTATION PLAN

for the

P-AREA BURNING RUBBLE PIT (PBRP)

This P-Area Burning Rubble Pit (PBRP) Land Use Control Implementation Plan (LUCIP) will be appended to the Savannah River Site (SRS) Land Use Control Assurance Plan (LUCAP). The United States Department of Energy (USDOE) is responsible for implementing the land use controls (LUCs) (e.g., inspections, maintenance, etc.) outlined in this unit-specific LUCIP.

The selected remedy leaves hazardous substances in place that pose a potential future risk and will require land use restrictions for an indefinite period of time. As negotiated with the United States Environmental Protection Agency (USEPA), and in accordance with USEPA Region IV policy (Johnston 1998), SRS has developed a LUCAP (WSRC 2002c) to ensure that land use restrictions are maintained and periodically verified. This LUCIP provides detailed and specific measures required for the LUCs selected as part of this remedy. USDOE is responsible for implementing, maintaining, monitoring, reporting upon, and enforcing the LUCs herein. Upon final approval, the LUCIP will be appended to the LUCAP and is considered incorporated by reference into the Post-Construction Report/Final Remediation Report (PCR/FRR), establishing LUC implementation and maintenance requirements enforceable under the Comprehensive Environmental Response, Compensation, and Recovery Act (CERCLA). The approved LUCIP will establish implementation, monitoring, maintenance, reporting, and enforcement requirements for the unit. The LUCIP will remain in effect until modified as needed to be protective of human health and the environment. LUCIP modification will only occur through another CERCLA document.

SRS will maintain institutional controls in accordance with the LUCAP (WSRC 2002c). The LUCAP states that the land use for the PBRP OU will be maintained for industrial land use only. Institutional controls will remain in place as long as the risk is greater than 1×10^{-6} and there is a threat to the environment.

1.0 REMEDY SELECTION

1.1 PBRP Operable Unit

The PBRP operable unit (OU) is located in the central portion of SRS, west of the P-Reactor facility. The PBRP is in an open area with sparse vegetative cover. The land surface at PBRP slopes gently to the south. Approximately 45.7 m (150 ft) to the south of the unit is a steep embankment of Steel Creek. The embankment drops 7.6 m (25 ft) in elevation over a lateral distance of 30.5 m (100 ft). The embankment is punctuated by a terrace located 3.0 m (10 ft) above the elevation of Steel Creek. The terrace is 7.6 m (25 ft) wide and contains a seep line. Steel Creek is at the base of the embankment. As outlined in the *Savannah River Site Future Use Project Report* (USDOE 1996b), USDOE has taken steps to prohibit residential use of SRS, including land in the vicinity of the P-Reactor Area, through its plan for current and future use of SRS. Therefore, future residential use of the area is not anticipated.

The RFI/RI/BRA determined that there is no problem (there are no refined constituents of concern [RCOCs]) warranting additional or separate action for the small drainage ditch near PBRP, the seepage line located along an embankment of Steel Creek, or the segment of Steel Creek located adjacent to the PBRP OU; therefore, no subunit-specific action(s) were warranted under the ROD for these three areas. The ditch and seepage line subunits do not appear to have been contaminated. Although Steel Creek as a whole is contaminated, no subunit-specific action was warranted under the ROD for the portion of this surface water within the PBRP OU. This contamination did not originate from PBRP and

contamination in Steel Creek is being addressed separately under the integrator operable unit program. Action was found to be warranted only for the PBRP and the groundwater.

The USDOE, USEPA, and South Carolina Department of Health and Environmental Control (SCDHEC) agree that industrial land use restrictions are appropriate for the PBRP OU. Industrial land use restrictions will include LUCs to ensure protection against unrestricted (residential) uses. The future land use of the PBRP OU is anticipated to be the same as the current land use (industrial use and control by the federal government).

A Remedial Action Fact Sheet summarizing project background, environment concerns, and environmental actions and plans is included as Appendix A of the PBRP Corrective Measures Implementation/Remedial Action Implementation Plan (CMI/RAIP).

1.2 Nature and Extent of Contamination in PBRP

Soil

The PBRP unit investigation confirmed that miscellaneous inert debris remains buried in the pit. Soil contaminants within the pit include inorganics, semi-volatile organic constituents (SVOCs), volatile organic compounds (VOCs), and polychlorinated biphenyls (PCBs). Soils around the perimeter of the pit are generally uncontaminated. However, there are a few places around the perimeter of the pit where low levels of unit-related contamination are present. "The Human Health RCOCs were limited to polycyclic aromatic hydrocarbons (PAHs) (See note on Table 1 for a specific list of PAHs). No Ecological RCOCs were identified within the PBRP investigation." There are no RCRA-listed or characteristic wastes at the unit. The volume of contaminated soil is 3,500 cubic yards.

The contaminant fate and transport modeling indicates that nine constituents at PBRP present a contaminant migration (leachability) threat to groundwater. The contaminant migration RCOCs include antimony, chromium, copper, nickel, zinc, dibenzofuran,

tetrachloroethene, trichloroethene, and PCB-1242. These constituents are predicted to exceed MCLs or RBCs within 1,000 years.

“Table 1 lists the final Contaminant Migration and Human Health RCOCs and risks at the OU (WSRC 2002a).” There is no principal threat source material (PTSM) (highly mobile or highly toxic source materials that require a bias toward treatment alternatives) at PBRP. The contamination is largely isolated by backfill with its exposure limited by land use restrictions; the waste is categorized as a low-level threat.

Groundwater

There is no discernable contaminant plume in the groundwater, and detections above maximum contaminant levels (MCLs) are sporadic and limited to the water table aquifer (i.e., shallow unconfined aquifer). The groundwater RCOCs were 1,1-dichloroethene (DCE) and trichloroethene (TCE). DCE was detected above its MCL of 7 micrograms per liter ($\mu\text{g/L}$) in well PRP-6 in one of four sampling events (9.29 $\mu\text{g/L}$ in January 2001) and in well PRP-7 in one of four sampling events (7.13 $\mu\text{g/L}$ in November 1999). TCE was detected above its MCL of 5 $\mu\text{g/L}$ in well PRP-7 in one of four sampling events (15.9 $\mu\text{g/L}$ in November 1999). SK-C-53135 shows the locations of wells at PBRP and the analytical results for DCE and TCE. The volume of contaminated groundwater cannot be defined; there is no discernable contaminant plume. “Table 1 reports the risks associated with the groundwater RCOCs (i.e., DCE and TCE) (WSRC 2002a). There is no PTSM in groundwater. There is no free product (non-aqueous phase liquids).”

1.3 Remedial Action Overview

Based upon the characterization data and risk assessments in the RCRA Facility Investigation/Remedial Investigation/Baseline Risk Assessment (RFI/RI/BRA) (WSRC 2001a), the RAOs, and the evaluation of alternatives, the ROD (WSRC 2002a) selected remedy for PBRP is Alternative PBRP2 (Engineered Cover System with BaroBallsTM, Natural Biodegradation, and Institutional Controls). The ROD selected remedy for

groundwater is Alternative GW2 (Continued Monitoring and Reporting) (i.e., wells PRP 5, 6 and 7). The conceptual site model (CSM) from the ROD has been revised and is included to illustrate the broken pathways with the OU after implementation of the remedy (Figure 1).

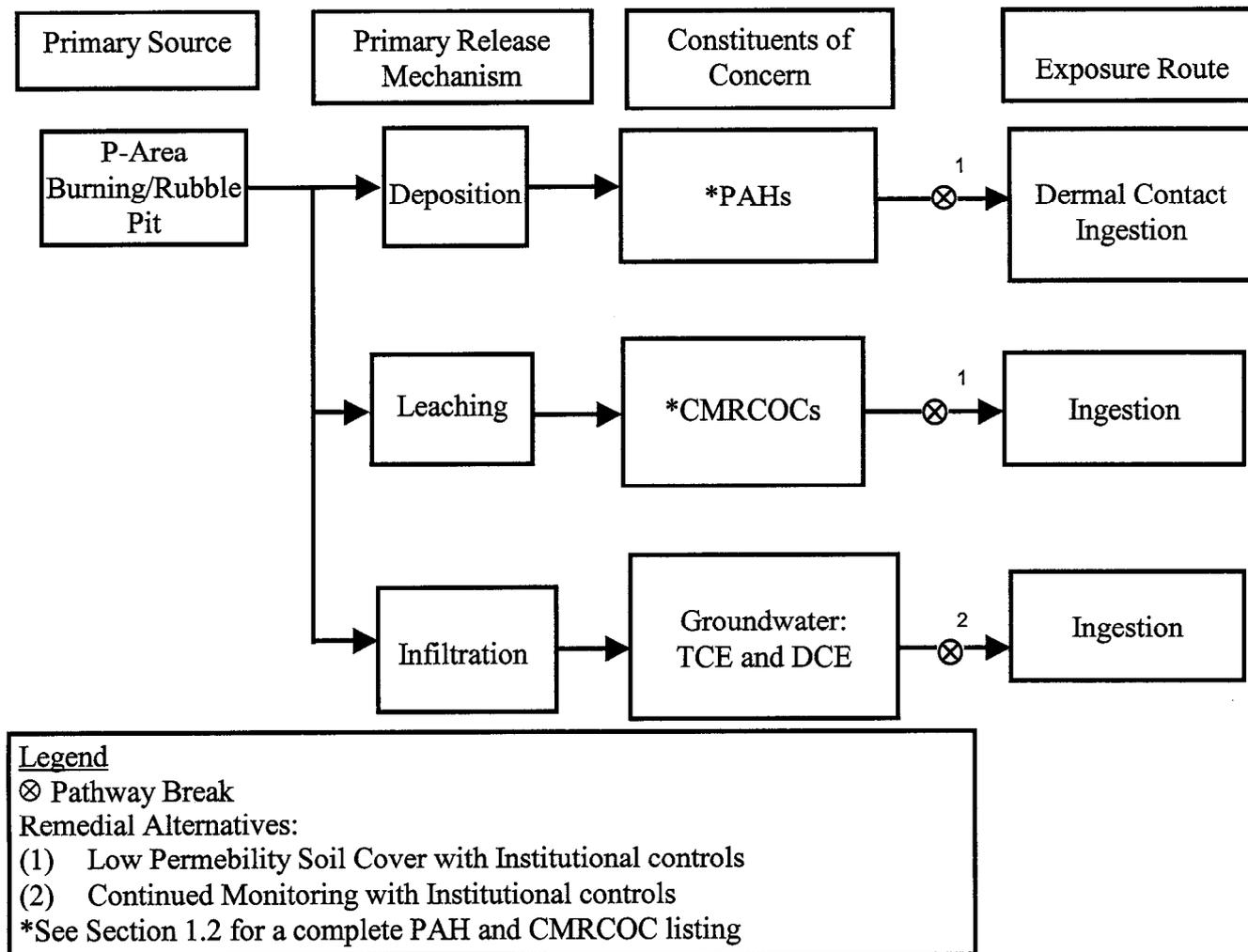


Figure 1. Conceptual Site Model for the PBRP with Remedy Applied

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Table 1. Summary of Risks and Hazards

RCOC	Type of RCOC	Location of Maximum	Depth of Maximum (ft bls)	Summary of Risks
PBRP Soil				
Antimony (Sb)	CM	PBRP-04	6-9	Predicted to exceed MCL in 612 years. Max groundwater concentration (10X MCL) in 800 years
Chromium (Cr)	CM	PBRP-05	6-9	Predicted to exceed MCL in 422 years. Max groundwater concentration (30X MCL) in 830 years
Copper (Cu)	CM	PBRP 05	9-12	Predicted to exceed MCL in 489 years. Max groundwater concentration (5X MCL) in 860 years
Nickel (Ni)	CM	PBRP-01	6-9	Predicted to exceed MCL in 232 years. Max groundwater concentration (3X MCL) in 430 years
Zinc (Zn)	CM	PBRP-01	6-9	Predicted to exceed RBC in 232 years. Max groundwater concentration (4X RBC) in 450 years
Benzo(a)anthracene *	HH _{ind, res}	PBRP-01	0-1	Future Industrial Worker Risk = up to 5×10^{-5} Hypothetical Resident Risk = up to 2×10^{-4}
Benzo(a)pyrene *	HH _{cur, ind, res}	PBRP-01	0-1	Current Worker Risk = up to 1×10^{-6} Future Industrial Worker Risk = up to 5×10^{-4} Hypothetical Resident Risk = up to 2×10^{-3}
Benzo(b)fluoranthene *	HH _{ind, res}	PBRP-01	0-1	Future Industrial Worker Risk = up to 5×10^{-5} Hypothetical Resident Risk = up to 2×10^{-4}
Benzo(k)fluoranthene *	HH _{ind, res}	PBRP-01	0-1	Future Industrial Worker Risk = up to 4×10^{-5} Hypothetical Resident Risk = up to 2×10^{-5}
Chrysene *	HH _{res}	PBRP-01	0-1	Hypothetical Resident Risk = up to 2×10^{-6}
Dibenzo(a,h)anthracene *	HH _{ind, res}	PBRP-01	0-1	Future Industrial Worker Risk = up to 7×10^{-5} Hypothetical Resident Risk = up to 3×10^{-4}
Dibenzofuran	CM	PBRP-01	0-1	Predicted to exceed RBC in 94 years. Max groundwater concentration (19X RBC) in 170 years
Fluoranthene *	HH _{res}	PBRP-01	0-1	Hypothetical Resident Hazard = up to 0.14
Indeno(1,2,3-c,d)pyrene *	HH _{ind, res}	PBRP-01	0-1	Future Industrial Worker Risk = up to 2×10^{-5} Hypothetical Resident Risk = up to 1×10^{-4}
Phenanthrene *	HH _{res}	PBRP-01	0-1	Hypothetical Resident Hazard = up to 0.16
Pyrene *	HH _{res}	PBRP-01	0-1	Hypothetical Resident Hazard = up to 0.16
Tetrachloroethene (PCE)	CM	PBRP-04	15-18	Predicted to exceed MCL in 5 years. Max groundwater concentration (15X MCL) in 6 years
Trichloroethene (TCE)	CM	PBRP-04	15-18	Predicted to exceed MCL in 4 years. Max groundwater concentration (10X MCL) in 4 years
PCB-1242	CM	PBRP-04	12-15	Predicted to exceed MCL in 428 years. Max groundwater concentration (9X MCL) in 500 years
Groundwater				
1,1-Dichloroethene (DCE)	ARAR, HH _{res, ind}	PRP-6	N/A	Exceeds MCL by 1.3X
Trichloroethene (TCE)	ARAR, HH _{res}	PRP-7	N/A	Exceeds MCL by 3X

ARAR = applicable or relevant and appropriate requirement (ARAR) RCOC

CM = Contaminant Migration RCOC

HH_{cur} = Human health RCOC for the current on-unit worker

HH_{ind} = Human health RCOC for the future industrial worker

HH_{res} = Human health RCOC for the future on-unit resident

RBC = Risk Based Concentration

MCL = maximum contaminant level

bls = below land surface

Ecological:

No RCOCs.

PTSM: No PTSM.

* Note: All HH RCOCs listed above are hereafter referred to as polycyclic aromatic hydrocarbons (PAHS)

Site maintenance will consist of repair of erosion damage, maintenance of drainage features, maintenance of wells PRP 5, 6 and 7 and maintenance of the soil cover integrity to maintain the effectiveness of the cover at mitigating infiltration and leaching. Site maintenance will also include maintenance of signs around the unit.

2.0 LAND USE CONTROLS

To ensure the protectiveness of the remedy described above, the PBRP OU land-use control objective is to:

- prevent contact, removal, or excavation of buried waste in the OU areas designated in the LUCIP and preclude future residential or agricultural use of the area.
- maintain the use of the site for industrial activities only.

Current access controls and a deed notification needed to maintain the future LUCs are described in the following sections of this LUCIP.

2.1 Access Controls

2.1.1 *On-Site Workers*

In accordance with WSRC 1D, *Site Infrastructure and Services Manual*, Procedure 3.02, "Site Real Property Configuration Control," use of all lands and waters on SRS shall be coordinated via the Site Use Program. All employees, contractors, and visitors to SRS require adherence to the Site Use Program. This program ensures that all work performed on the SRS that adds, modifies, or removes features portrayed on the SRS development maps is authorized. No use of land (i.e., excavation or any other land use) shall be undertaken without prior approval documented by a Site Use Permit. This authorization is obtained through the completion of a Site Clearance Request Form. Also, in accordance with WSRC 1D, Procedure 3.02, all work at SRS that adds to or modifies

features or facilities portrayed on SRS development maps (i.e., plot plans of facilities/utilities at SRS) will be authorized by a Site Clearance Permit before any excavation activities are conducted. All Site Clearance requests will be reviewed to verify that either an approved Site Use Permit has been obtained or that an existing Site Use Permit has sanctioned the request.

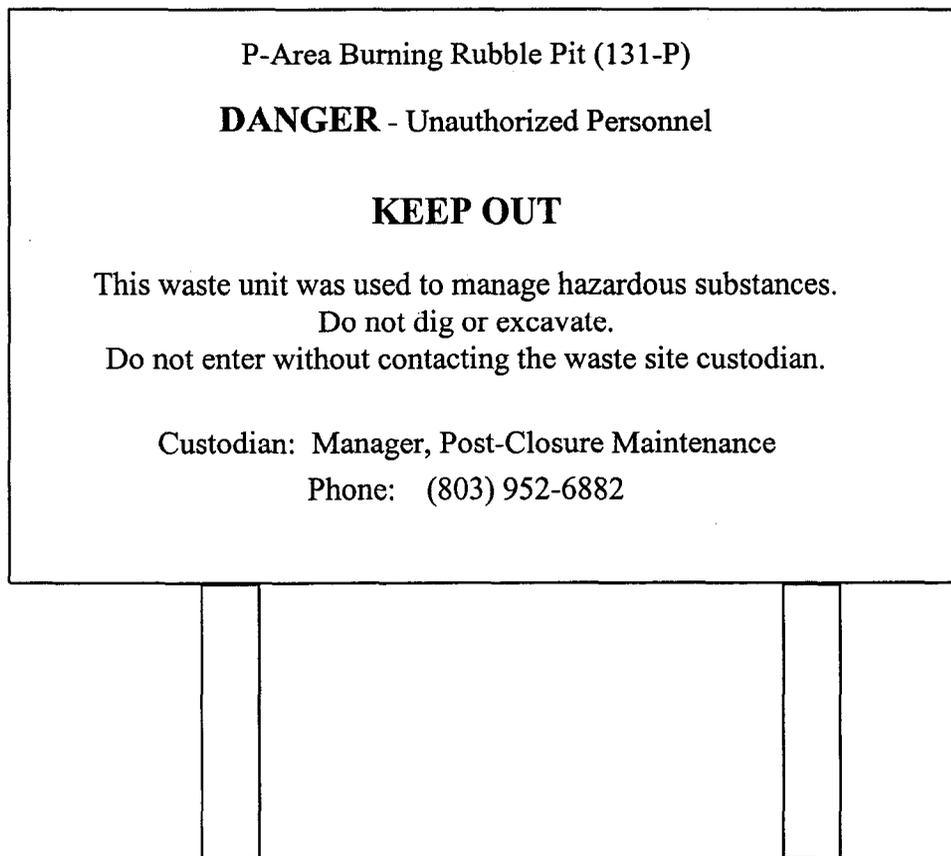
The SRS, specifically the Site Development, Planning, and Mapping Department, is responsible for updating, maintaining, and reviewing site maps, including FFA OU identifications. If a site clearance request is made that may impact an FFA OU, the Site Clearance Request Form is sent to an FFA OU reviewer, who is in the Soil and Groundwater Closure Projects (SGCP), for either approval or disapproval. The roles and responsibilities of each individual are detailed in WSRC 1D, Procedure 3.02. Verification of USDOE approval for intended land use must be obtained before issuance of a Site Clearance Permit. The Site Use and Site Clearance processes are applicable to all activities and personnel on site (including subcontractors).

The processes are controlled within the SRS Quality Assurance (QA) Program. The SRS QA Program is the governing QA Program for all SRS activities, including those in the SGCP. The activities that are performed in the SGCP must comply with SRS QA Program procedures as well as SGCP-specific procedures.

SRS identifies all buildings and facilities on maps used in the Site Use/Site Clearance Program. This waste unit is identified on these maps as a CERCLA facility.

Any work proposed in these areas will be strictly controlled, and workers will be appropriately trained and briefed about health and safety requirements if work is deemed necessary for maintenance. No major change in land use or excavation at the PBRP OU shall be undertaken without USEPA and SCDHEC approval. To prevent unknowing entry and to ensure that unrestricted use of the waste unit does not occur while it is under ownership of the government, access control warning signs will be posted at the unit.

They will be posted at each entrance to the restricted portion of the unit and at other appropriate locations in sufficient numbers to be seen from any approach. Custodial responsibilities for maintenance and inspection of the PBRP OU will be maintained by the Post-Closure Maintenance group within the SGCP. The access control warning signs for the soil cover will be legible from a distance of at least 25 feet. The soil cover signs will read as follows:



2.1.2 Trespassers

While under the ownership of USDOE, access control of the entire SRS will continue to be maintained in accordance with the 1992 Resource Conservation Recovery Act (RCRA) Part B Permit Renewal Application, Volume I, Section F.1. This section

describes the 24-hour surveillance system (R.61-79.264.14(b)(1)), artificial or natural barriers (R.61-79.264.14(b)(2)(i)), control entry systems (R.61-79.264.14(b)(2)(ii)), and warning signs (R.61-79.264.14(c)) in place at the SRS boundary to comply with the security requirements for a RCRA-permitted facility.

2.1.3 Groundwater Institutional Controls

Groundwater institutional controls will be implemented as long as concentrations exceed MCLs. Institutional controls will be implemented by:

- Performing environmental monitoring of wells PRP-5, 6 and 7.
- Providing access controls for on-site workers via the Site Use/Site Clearance Program, work control, worker training, worker briefing of health and safety requirements, and identification.
- The posting of signs at the waste unit access points to provide a visible indication of the presence of hazardous materials.
- Preventing unauthorized groundwater usage via the Site Use/Site Clearance Program land use restrictions.
- Notifying the USEPA and SCDHEC of any changes in use or disturbance of waste observed during site inspections.
- Providing access controls against trespassers per Section 2.1.2.

2.2 Deed Notification

In the long-term, if the property is ever transferred to non-federal ownership, the U.S. Government will take those actions necessary pursuant to Section 120(h) of CERCLA. Those actions will include a deed notification disclosing former waste management and disposal activities as well as remedial actions taken on the site. The contract for sale and the deed will contain the notification required by CERCLA Section 120(h). The deed

notification shall, in perpetuity, notify any potential purchaser that the property has been used for the management and disposal of waste. These requirements are also consistent with the intent of the RCRA deed notification requirements at final closure of a RCRA facility if contamination will remain at the unit.

The deed shall also include deed restrictions precluding residential use of the property. However, the need for these deed restrictions may be re-evaluated at the time of transfer in the event that exposure assumptions differ and/or the residual contamination no longer poses an unacceptable risk under residential use. Any re-evaluation of the need for the deed restrictions will be done through an amended ROD with USEPA and SCDHEC review and approval.

In addition, if the site is ever transferred to non-federal ownership, a survey plat of the OU will be prepared, certified by a professional land surveyor, and recorded with the appropriate county recording agency.

2.3 Field Walkdowns and Maintenance for Institutional Controls

After the remediation of the PBRP, only well monitoring and maintenance activities, outlined in the PBRP ROD (WSRC 2002a), will be required per this remedial action. No operations other than well monitoring will be required.

The results of any events and or actions that indicate some potential compromise of institutional controls will be documented in the FFA Annual Progress Report. All other routine maintenance activities will be documented and maintained in files subject to USEPA and SCDHEC review and audit. A copy of the completed inspection form is maintained in the SGCP Administrative Record Files.

The following steps will be implemented to maintain the low permeability soil cover:

- Perform periodic (annual) visual inspections for evidence of damage to the soil cover due to erosion or intrusion by burrowing animals. The inspection will also address upkeep of the vegetative cover and access control barriers (e.g., the warning signs). (Attachment A provides a unit-specific inspection data sheet for the PBRP OU).
- Perform necessary repairs (when required as identified during inspection) to maintain the functional integrity of the soil cover, selected wells, and the warning signs.
- Enforce SRS institutional controls by restricting access to the closed waste unit. Institutional controls will be maintained as long as the waste remains a threat to human health or the environment.
- As required by the National Oil and Hazardous Substance Contingency Plan (NCP), a five-year review of the remedy for the PBRP unit will be performed as long as the waste remains a threat to human health or the environment.

The waste site inspectors are to be trained in Hazardous Waste Operations and Emergency Response (i.e., HAZWOPER), RCRA Well Inspections, RCRA Waste Unit Inspections, Radiological Workers, etc., as applicable for the specific inspection. They will also be trained based on the individual requirements of the regulatory approved closure documents for each waste unit. In addition, the inspectors are to attend yearly refresher courses. No single person will conduct all of the inspections or grass cutting operations over the years.

This unit-specific LUCIP, including the checklist, will be appended to the SRS LUCAP.

Per Section 3.6 of the LUCAP, this LUCIP identifies the area under land-use restriction via a survey plat. Note: Drawing # SK-C-53135 (Attachment B), includes a line marked "AREA SUBJECT TO LAND USE CONTROLS" to define the area subject to LUCs.

If the OU is ever transferred to non-federal ownership, a survey plat of the area, prepared by a certified professional land surveyor, will be recorded with the county recording agency.

APPENDIX B

ATTACHMENT A

SGCP INSPECTION DATA SHEET FOR P-AREA BURNING RUBBLE PIT

SGCP ANNUAL INSPECTION DATA SHEET

FOR P-AREA BURNING RUBBLE PIT

Page 1 of 2

A = Satisfactory X = Unsatisfactory (Explanation required)	A or X	Comments or Corrective Action Taken (See Maintenance Register for Corrected Items)
Verify there is no unauthorized digging, excavation, or construction activities on the soil cover.		
Remove or verify there is no woody vegetation growing on the soil cover.		
Check the vegetative cover for density. Verify there are no bare spots greater than 9 ft ² in area. The height of the vegetative cover should not impair the visual inspection of the soil cover. This will be determined by the inspector.		
Verify that the wells and roads are accessible.		
Inspect monitoring wells PRP-5, 6 and 7.		

Note: All monitoring wells associated with this waste unit are inspected using Monitoring Well Inspection Procedure SOP-011 in compliance with South Carolina Hazardous Waste Management Regulations R.61-79: Subpart F, Groundwater Monitoring.

SGCP ANNUAL INSPECTION DATA SHEET

FOR P-AREA BURNING RUBBLE PIT (Continued)

Page 2 of 2

A = Satisfactory X = Unsatisfactory (Explanation required)	A or X	Comments or Corrective Action Taken (See Maintenance Register for Corrected Items)
Verify that the waste unit signs have the correct information and they are legible from at least 25 feet and remove vegetation blocking the sign.		
Check the unit for evidence of erosion or subsidence (depressions).		
Check for evidence of burrowing animals (holes).		
Check OU boundary for presence of excessive erosion, carrying material outside the monument marker boundaries.		
Comments:		

Inspected by: _____ / _____ Date: _____ Time: _____
 (Print Name) (Signature)

Reviewed by: _____ / _____ Date: _____ Time: _____
 Post-Closure Manager or Designee

Note: USEPA and SCDHEC must be notified within 30 days of identification of any area where any breach or compromise of restrictions placed on this institutional control OU has occurred.

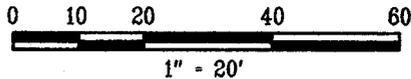
APPENDIX B

ATTACHMENT B

LUCIP DRAWING

SK-C-53135, Rev. 0, Land Use Control Implementation Plan (U)

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P-AREA BURNING RUBBLE PIT
(PBRP) OPERABLE UNIT CLOSURE (131-P)

LAND USE CONTROL
IMPLEMENTATION PLAN DRAWING (U)

SK-C-53135, REV. 0

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456789012345678901234567890123

PSC = 20

DRAWN BY (ORIG): T.HICKMAN

LAST CADD REV. BY: T.HICKMAN

PLOT DATE 01/10/03 TIME

DATE: 01/10/03

ATTACHMENT A

DRAWINGS

SK-C-53133 - PBRP (131-P) Grading Plan (U)

and

SK-C-53134 - PBRP (131-P) Sections and Details (U)

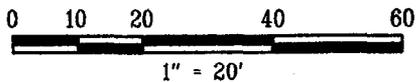
BOUNDARY MARKERS SHALL BE 36 INCHES LONG WITH THE LOCATION COORDINATES AND ELEVATION ENGRAVED ON A 2-INCH DIAMETER BRASS PLATE. THE TOP OF THE INSTALLED BOUNDARY MARKER SHALL NOT BE MORE THAN 2 INCHES ABOVE THE SURROUNDING GRADE.

10. WELL SHOWN AS  ARE NOT SUBJECT TO ONGOING MAINTENANCE, MONITORING, OR SAMPLING.
11. INSTALL CLOSED OPERABLE UNIT SIGN AT APPROXIMATE LOCATIONS SHOWN ON THE DRAWING.

**P-AREA BURNING RUBBLE PIT
(PBRP) OPERABLE UNIT CLOSURE (131-P)**

GRADING PLAN (U)

SK-C-53133, REV. 0



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PSC = 20
PLOT DATE 01/13/03

DRAWN BY (ORIG): T.HICKMAN
TIME

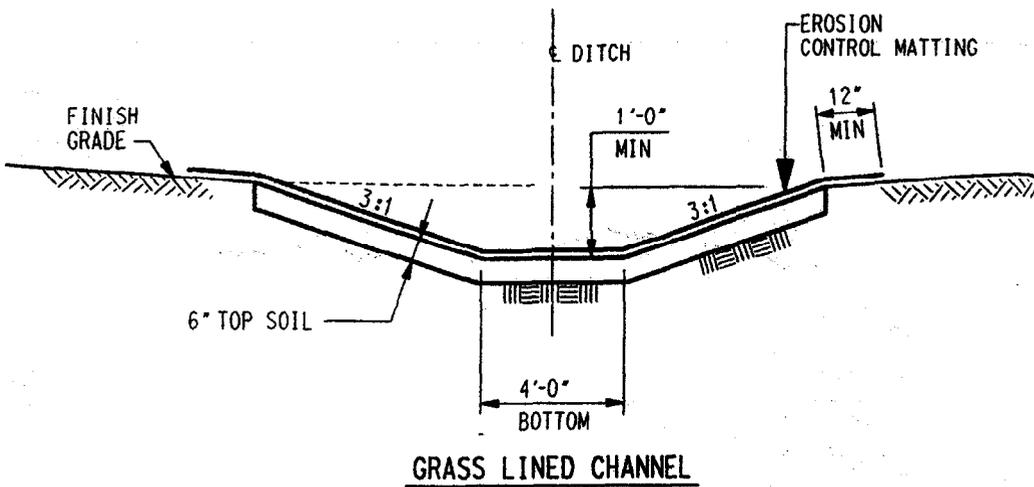
LAST CADD REV. BY: T.HICKMAN
DATE: 01/13/03

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CONNECT AND BAND
AS REQUIRED

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CHANNEL)

DETAIL 3
NOT TO SCALE SK-C-53133



DETAIL 5
NOT TO SCALE SK-C-53134
(EAST-WEST CHANNEL)

P-AREA BURNING RUBBLE PIT
(PBRP) OPERABLE UNIT CLOSURE (131-P)

SECTION AND DETAILS (U)

SK-C-53134, REV. 0

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PSC= 20 DRAWN BY (ORIG):
PLOT DATE 01/08/03 TIME

LAST CADD REV. BY: T.HICKMAN
DATE: 01/08/03

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ATTACHMENT B

**STORMWATER MANAGEMENT AND SEDIMENT REDUCTION PLAN /
POLLUTION PREVENTION PLAN (SMSRP/PPP)**

(For Reference Only)



WESTINGHOUSE SAVANNAH RIVER COMPANY
INTEROFFICE MEMORANDUM

November 27, 2002

ESH-ECS-2002-00516

TO: J. K. PRICE, 730-2B

FROM: J. A. LINTERN, 742-A 

APPROVED GRADING PERMIT # 02-19-P-1.25 FOR LAND DISTURBING ACTIVITIES ASSOCIATED WITH THE P-AREA BURNING RUBBLE PIT (PBRP) OPERABLE UNIT (131-P) CLOSURE

Grading Permit #02-19-P-1.25 has been issued for land disturbing activities associated with the PBRP closure project, which includes tree removal, the installation of soil cover layers, and the placement of off-site topsoil over the unit totaling (1.25 acres). Enclosed is one (1) copy of the approved Stormwater Management & Sediment Reduction Plan (SMSRP), and one (1) copy of the Grading Permit. This information is to be maintained on the construction site.

Controls and sequences, as dictated in the approved SMSRP, are required to be maintained and inspected at intervals noted in the plan. Any changes to this plan must be reviewed and approved by EPD prior to implementation.

Upon completion of project and establishment of a perennial vegetative cover, close out of this Grading Permit is required. If this project is delayed or suspended after land disturbing activities have commenced, the area should be properly stabilized per plan requirements and notification made to EPD.

Please call me at 5-9003, if you have any questions.

jal/aeo
Att.*

- c: L. Anderson, 730-2B
- T. R. Bland, 730-2B
- H. L. Davis, 703-A
- D. E. Haley, 730-2B
- N. J. Lowry, 742-A
- B. D. McGee, 772-1G*
- S. M. Mead, 730-2B
- M. K. Patel, 730-2B
- S. L. Stinson, 742-A
- EPD Files, 742-A
- Records Processing, 773-52A*

FILE INFO.
Stormwater; PBRP
10040;
DOE 1-8.a(1);
Permanent

GRADING PERMIT APPLICATION FOR LAND DISTURBING ACTIVITIES
AT THE SAVANNAH RIVER SITE

SECTION 1

PAGE 1 OF 3

DATE: 11/6/2002 FILE NUMBER: 02-19-P-1.25 A (To be assigned by EPD)

1. FACILITY NAME OR PROJECT NAME: P-Area Burning Rubble Pit (PBRP) Operable Unit Closure (131-P)
SIZE, TOTAL (ACRES): 1.25 SURFACE AREA OF LAND DISTURBANCE (ACRES): 1.25
SRS AREA: P-Area COUNTY: Barnwell START DATE: 11/03 COMPLETION DATE: 5/04
LOCATION: PBRP is located northwest of the intersection of the P-Area Reactor and south of the intersection of Road F and Road 7.
CATEGORY B

2. FOR LAND DISTURBANCES GREATER THAN OR EQUAL TO 5 ACRES: Savannah River Company
Environmental Protection Department
SIC CODE: _____ LATITUDE: _____ LONGITUDE: _____
USGS QUADNAME: _____ File# 02-19-P-1.25
Date Issued 11/26/02
3. NEAREST RECEIVING WATER BODY: Steel Creek By: [Signature]
DISTANCE TO NEAREST RECEIVING WATER BODY: 1000 feet
ULTIMATE RECEIVING WATER BODY: "Atlantic Ocean"
4. LIST NPDES OUTFALLS DOWNSTREAM OF THIS ACTIVITY: None
5. ARE FRESHWATER WETLANDS LOCATED ON PROPERTY? YES NO
If Yes, Have The Wetlands Been Delineated? YES NO

SECTION 2

Provide Applicable Information as Requested Below: (List name, address, and phone/pager #)

6. RESPONSIBLE ORG.: Environmental Restoration
PROJECT MANAGER: Terry R. Bland, 730-2B-2124, 2-6387, Pager 17911
ENVIR. COMPLIANCE AUTHORITY: Price, Joe K., 730-2B-2127, (2-6708, B-17718)
7. DESIGN AGENCY: PE&CD/ER
RESPONSIBLE ENGINEER: Stephen M. Mead, 730-2B-2037, 2-6768
8. CONSTRUCTION ENGR.: N/A
SUBCONTRACT TEC. REP. (STR): Larry Anderson, 730-2B-2096, 2-6700/14471
9. CONTRACTOR: Subcontractor
RESPONSIBLE SUPT.: _____
SUBCONTRACTOR/CO-PERMITTEES: _____

SIC CODES:

- 15 General Building Contractors __ 1541-Industrial buildings and Warehouses
- 16 Heavy Const. __ 1611-Hwy and str. const., 1622-Bridge, tunnel, & elev. hwy, 1623-Water sewer, and utility lines, 1629 Heavy const., nec.
- 17 Special Trade Contractors __ 1794-Excavation work, 1795-Wrecking and demolition work

**GRADING PERMIT APPLICATION FOR LAND DISTURBING ACTIVITIES
AT THE SAVANNAH RIVER SITE**

SECTION 3

PAGE 2 OF 3

10.a *[Signature]* 11-21-02
Environmental Coordinator Signature / Date

10.b *[Signature]* 11-18-2002
Design Agency Rep. Signature / Date

11. I HEREBY CERTIFY THAT ALL LAND DISTURBING CONSTRUCTION AND ASSOCIATED ACTIVITY PERTAINING TO THIS SITE SHALL BE ACCOMPLISHED PURSUANT TO AND IN KEEPING WITH THE TERMS AND CONDITIONS OF THE APPROVED PLANS. I ALSO CERTIFY THAT A RESPONSIBLE PERSON WILL BE ASSIGNED TO THE PROJECT FOR DAY-TO-DAY CONTROL. I ALSO GRANT AUTHORIZATION TO THE DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL AND/OR THE IMPLEMENTING AGENCY THE RIGHT OF ACCESS TO THE SITE AT ALL TIMES FOR THE PURPOSE OF ON SITE INSPECTIONS DURING THE COURSE OF CONSTRUCTION AND TO PERFORM MAINTENANCE INSPECTIONS FOLLOWING THE COMPLETION OF THE LAND DISTURBING ACTIVITY.

T. R. BLAND
Printed Name

[Signature] 11/21/02
Signature / Date

12. I HEREBY CERTIFY THAT ALL LAND DISTURBING CONSTRUCTION AND ASSOCIATED ACTIVITY PERTAINING TO THIS SITE SHALL BE ACCOMPLISHED PURSUANT TO AND IN KEEPING WITH THE TERMS AND CONDITIONS OF THE APPROVED PLANS. I ALSO CERTIFY THAT A RESPONSIBLE PERSON WILL BE ASSIGNED TO THE PROJECT FOR DAY-TO-DAY CONTROL. I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHERED AND EVALUATED THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS. I ALSO GRANT AUTHORIZATION TO THE DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL AND/OR THE IMPLEMENTING AGENCY THE RIGHT OF ACCESS TO THE SITE AT ALL TIMES FOR THE PURPOSE OF ON SITE INSPECTIONS DURING THE COURSE OF CONSTRUCTION AND TO PERFORM MAINTENANCE INSPECTIONS FOLLOWING THE COMPLETION OF THE LAND DISTURBING ACTIVITY.

Printed Name*

Signature / Date

*Owner / Person Financially Responsible or Authorized Representative of DOE (corporate officer or their delegate)

13. DESIGNER CERTIFICATION: FOUR COPIES OF THE PLANS, ALL SPECIFICATIONS AND SUPPORTING CALCULATIONS, FORMS, AND REPORTS ARE HEREWITH SUBMITTED AND MADE A PART OF THIS APPLICATION. I HAVE PLACED MY SIGNATURE AND SEAL ON THE DESIGN DOCUMENT SUBMITTED SIGNIFYING THAT I ACCEPT RESPONSIBILITY FOR THE DESIGN OF THE SYSTEM. FURTHER, I CERTIFY TO THE BEST OF MY KNOWLEDGE AND BELIEF THAT THE DESIGN IS CONSISTENT WITH THE REQUIREMENTS OF TITLE 48, CHAPTER 14 OF THE CODE OF LAWS OF SC, 1976 AS AMENDED, AND PURSUANT REGULATION 72-300.

S.C. Registration Number

- ENGINEER
- TIER B, LAND SURVEYOR
- LANDSCAPE ARCHITECT

Signature / Date

LAND DISTURBANCE
1/2 ACRES
2 ACRES
> 2 ACRES

REQUIRED SIGNATURE (S)
ENVIRONMENTAL COORDINATOR (EC)
EC, DESIGN AGENCY, & Owner or person financially responsible (Block 11)
EC, OWNER/PERSON FINANCIALLY RESPONSIBLE (BLOCK 12)
DESIGNER CERTIFICATION (BLOCK 13)

**GRADING PERMIT APPLICATION FOR LAND DISTURBING ACTIVITIES
AT THE SAVANNAH RIVER SITE**

SECTION 4

PAGE 3 OF 3

FOR INTERNAL USE ONLY:

1. I HEREBY CERTIFY THAT I HAVE THOROUGHLY REVIEWED THE APPLICATION, PLANS AND SUPPORTING DOCUMENTS AND FOUND THEM TO BE IN COMPLIANCE WITH THE LETTER AND THE INTENT OF THE LAW. THIS STAMP OF APPROVAL ON THE PLANS IS SOLELY AN ACKNOWLEDGEMENT OF SATISFACTORY COMPLIANCE WITH THE REQUIREMENTS OF THESE REGULATIONS. THE APPROVAL STAMP DOES NOT CONSTITUTE A REPRESENTATION OF WARRANTY TO THE APPLICANT OR ANY OTHER PERSON CONCERNING THE SAFETY, APPROPRIATENESS OF EFFECTIVENESS OF ANY PROVISIONS, OR OMISSION FROM THE STORMWATER AND SEDIMENT PLAN. I HAVE STAMPED 6 SETS OF APPROVED PLANS.

I HAVE FILED ONE SET AND DISTRIBUTED

Grading Permit Application only to SCDHEC - Aiken, SC

[Signature] 11/26/02
PLAN REVIEWER

- 2A. WILL SITE MONITORING/INSPECTION BY A SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER RESPONSIBLE FOR CONSTRUCTION BE REQUIRED? YES NO
(TO BE SPECIFIED BY REVIEWER)

IF YES, LIST REASON: CATEGORY A PROJECT _____

OTHER _____

CAN APPROVED SITE INSPECTOR (ASI) OPTION BE UTILIZED IN LIEU OF SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER?

YES NO IF NO, GIVE REASON _____

SIGNATURE / DATE

- 2B. WILL AS BUILT CERTIFICATION BY A REGISTERED PROFESSIONAL RESPONSIBLE FOR CONSTRUCTION BE REQUIRED FOR THIS PROJECT FOR FINAL APPROVAL? YES NO
(TO BE SPECIFIED BY REVIEWER)

IF YES

PRIOR TO FINAL APPROVAL, I WILL SUBMIT A STATEMENT CERTIFYING THAT CONSTRUCTION IS COMPLETE AND IN ACCORDANCE WITH APPROVED PLANS AND SPECIFICATIONS. THIS WILL BE BASED UPON PERIODIC OBSERVATIONS OF CONSTRUCTION AND FINAL INSPECTION FOR DESIGN COMPLIANCE BY ME OR A REPRESENTATIVE OF MY OFFICE WHO IS UNDER MY SUPERVISION.

(To be signed by a registered professional responsible for construction)

SIGNATURE / DATE

3. Records: Please ensure that this document is included with the official Project Files and is handled per SCD4 requirements. EPD will maintain "Information Only" copies of this document.

4. CATEGORY B PROJECT OPTION FOR ASI:

I, _____ (NAME AND TITLE)
REQUEST THAT THIS PROJECT BE INSPECTED BY AN APPROVED SITE INSPECTOR.

STORMWATER MANAGEMENT & SEDIMENT REDUCTION PLAN /
POLLUTION PREVENTION PLAN
(SMSRP/PPP)

P-AREA BURNING RUBBLE PIT (I31-P) CLOSURE (U)

Document No. ERD-SMP-2002-00008

REVISION 0

CA-1221

Westinghouse Savannah River Company
Environmental Protection Department

File# 02-19-P-1,25
Date Issued 11/26/02
By: Jeff Intern

Originator Stephen M. Mead
Stephen M. Mead

Date: 11-15-2002

Verifier/
Checker Mukul Patel
M. K. Patel

Date: 11/18/02

Approval Damon E. Haley for
D. E. Haley

Date: 11/18/02

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2.0 SOIL EROSION CHARACTERISTICS & RUNOFF DETERMINATION.....5

3.0 STORMWATER MANAGEMENT & SEDIMENT REDUCTION PLAN/POLLUTION PREVENTION PLAN

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3.2 EROSION AND SEDIMENT REDUCTION MEASURES6

4.0 CONSTRUCTION SCHEDULE AND SEQUENCING.....6

5.0 INSPECTION AND MAINTENANCE.....7

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1.0 INTRODUCTION

This Stormwater Management & Sediment Reduction Plan/Pollution Prevention Plan (SMSRP/PPP) is prepared for closure of the P-Area Burning Rubble Pit (PBRP) Operable Unit (131-P).

The PBRP Operable Unit will be closed using a low permeability soil cover. Prior to work under this plan, the PBRP Operable Unit will be cleared of marketable timber by Forest Services. The project scope and key activities include the following:

- Installation and maintenance of temporary erosion and sediment reduction measures.
- Site work including surveys, earthwork, and clearing and grubbing.
- Clearing all trees and vegetation from within the PBRP operable unit limits and disposal to an off unit area.
- Grinding all stumps to a minimum of 6" below existing grade and disposal of grindings beneath the low permeability soil layer. Chipping of uprooted stumps and roots, and placement under the low permeability soil layer.
- Removal of perimeter fence posts, signs and orange ball and disposal into an inert landfill.
- Removal and distribution of soil from high areas including rough grading of the PBRP operable unit area per the project drawings and specification.
- Installation of soil cover layers atop the PBRP operable unit area per the project drawings and specification.
- Installation and maintenance of drainage channels and stormwater management structures per the project drawings and specification.
- Placement of topsoil from an off-site source.
- Installation of gravel access ramp for the PBRP cover.
- Seeding and fertilization of soil cover area including all disturbed areas.
- Installation of markers (signs) along the perimeter of soil cover area.
- Installation of waste unit boundary monuments.
- Installation of monitoring wells.

1.1 LOCATION & ORIENTATION

The PBRP operable unit is located northwest of the P-Reactor and south of the intersection of Road F and Road 7. (See attached drawing C-CV-G-0098). The PRBP operable unit closure area is approximately 265 ft long by 95 ft wide and encompasses a single inactive burial pit approximately 200 ft long by 30 ft. wide. At present, the project area gently slopes southward and is well vegetated. There is a fair growth of pine trees within the operable unit limits.

At the west side of the site, there is a steep embankment with a drainage swale at the embankment's toe. There is a compacted gravel/soil perimeter road located at the north and east sides of the unit. The land surface at PBRP slopes gently to the south towards the embankment of Steel Creek. The drainage from the operable unit closure area is intercepted by a drainage swale south of the unit, which intercepts and conveys the stormwater westward towards a 18-inch diameter corrugated plastic pipe (CPP) culvert.

At present, site stormwater runoff primarily sheet flows and becomes shallow concentrated flow as it flows into the swale located to the south of the unit. The PBRP is relatively flat and contributes very little runoff. The surrounding areas outside of the PBRP operable unit are the major contributors of runoff to the south and west side swales. Stormwater runoff from areas outside the operable unit closure area does not sheet flow over the unit, but flows around the unit in swales.

1.2 OBJECTIVES OF SMSRP/PPP

This SMSRP/PPP specifies the stormwater management and sediment reduction measures that will be utilized during the project construction activities to prevent off-site sediment migration beyond the limits of disturbance. The SMSRP/PPP complies with:

- South Carolina Department of Health and Environmental Control (SCDHEC) Stormwater Management and Sedimentation Control Handbook for Land Disturbance Activities.

The SMSRP/PPP incorporates the following criteria as a means of satisfying the regulations referenced above:

- The smallest practical area will be cleared and grubbed.
- Where feasible, natural vegetation will be retained and protected from damage.
- Temporary plant cover and mulching to control runoff will be used to protect areas that are exposed to erosion during periods of development.
- Wire-backed silt fence check dams will be utilized to remove sediment from runoff prior to release of the stormwater from the disturbed area.
- The long-term re-vegetation activities will begin no later than 14 days after construction completion.
- An 18-inch CPP elbow riser will be utilized at the existing 18-inch CPP culvert to detain water and settle out sediment.

2.0 SOIL EROSION CHARACTERISTICS & RUNOFF DETERMINATION

To assist in the existing site evaluation, a topographic survey (see attached drawing C-CV-G-0098) was used to accurately establish land slopes and to predict stormwater runoff rates. Also, a walk down of the project site and adjacent surrounding areas was conducted during August 2002. The purpose of the walk down was to determine and evaluate drainage patterns at the project site, surrounding area drainage patterns, and the extent and condition of existing ground cover.

Approximately 0.90 acres will be covered with a low permeability soil cover and an 18-inch thick vegetative layer placed atop the low perm layer. Construction activities will disturb 1.25 acres. The proposed finished cover grades are from 3 to 5 percent with 4:1 side slopes. The proposed ground cover is a well-established dense grass that will receive regular maintenance. Therefore, the site hydrology between the pre and post conditions for a 10-year 24-hour storm will not change significantly. Based on these facts and that the site is very small, a formal calculation for the runoff determination and sediment volume predictions was not prepared. Given the site topography and size, proposed disturbance area, and construction duration, temporary sediment and erosion control measures were selected.

3.0 STORMWATER MANAGEMENT & SEDIMENT REDUCTION PLAN/POLLUTION PREVENTION PLAN

Materials used for erosion and sediment reduction will conform to the project specification sections listed in the references of this SMSRP/PPP plan. Inspection of erosion and sediment reduction measures will be performed per Section 5.0 of this SMSRP/PPP. Any damages shall be repaired immediately.

3.1 STORMWATER MANAGEMENT MEASURES

On-site stormwater runoff will sheet flow southward from the construction site. There is no off-site stormwater run-on to the disturbed area. The existing site grading will be maintained until construction of the low-permeability soil cover system begins. The final grading of the site will sheet flow towards the east, west and south into the same drainage swales that existed prior to construction. The existing west and south side swales will be regraded and improved to increase hydraulic performance. A riprap apron will be installed at the inlet of the 18-inch diameter CPP to minimize erosion.

The temporary erosion and sediment control measures will remain in place until it has been determined that there is a 70 percent vegetation coverage. Once 70 percent vegetation coverage is confirmed, the ERD Post Closure Maintenance organization will assume all responsibility for ensuring that a 70% long-term cover is established. Also, this same group shall dismantle and remove all temporary sediment control measures such as silt fences, riser, etc.

3.2 EROSION AND SEDIMENT REDUCTION MEASURES

3.2.1 Wire-backed temporary silt fence will be located along the south and east sides of the construction site and will be relocated as required to facilitate grading activities during the construction phases. Wire backed silt fence check dams will be installed in the regraded channels upstream of the riprap apron to capture transported sediments from the disturbed areas. Also, a temporary riser will be installed at the inlet end of existing 18 inch diameter corrugated plastic pipe (CPP) culvert to detain the stormwater during construction activities. These temporary measures will be located as indicated on drawing C-CV-G-0099 and -0100 and installed to conform to the requirements of drawing C-CV-G-0102.

3.2.2 Attempts to vegetate disturbed areas will begin immediately whenever each phase has temporarily or permanently ceased.

If it is determined that construction activity will be temporarily delayed for more than 21 days, temporary vegetative cover or extensive mulching shall be provided within 14 days of the construction termination.

4.0 CONSTRUCTION SCHEDULE AND SEQUENCING

Listed below is a forecast of the construction schedule for the PRBP Closure Project. The proposed construction duration is subject to change based on funding and regulatory constraints.

Construction Task	Approximate Duration
Install erosion and sediment reduction measures	½ month
Vegetation removal and rough grading	1 month
Install low-permeability soil cover	5 months
Vegetate final grade and disturbed areas	½ month
Remove temporary stormwater management and sediment reduction measures	Upon acceptance of long term vegetation

5.0 INSPECTION AND MAINTENANCE

Inspections shall be performed on all stormwater management and sediment reduction measures. The inspection frequency shall be once every seven days and/or after any storm event of greater than 0.5 inches of precipitation during any 24-hour period. These inspections will be performed and documented as required by the project specification document. This SMSRP/PPP will be retained at the construction site with the inspection log containing completed Inspection Reports until construction is completed and until site ownership is transferred to the permanent site custodian.

6.0 POST CONSTRUCTION SITE CONDITION

The receiving waters from stormwater runoff of this site will remain unchanged after construction. Site stormwater presently is intercepted by Steel Creek and conveyed to L Lake. L Lake impounds Steel Creek but eventually discharges water downgradient to Steel Creek once again. Steel Creek flows southward and joins Pen Branch. The Pen Branch waters are received by the Savannah River.

Post construction ground surfaces will be well vegetated with established long-term vegetation. All temporary stormwater management and sediment reduction measures will be inspected and maintained until stabilization of the disturbed areas is confirmed.

7.0 PLAN AMENDMENT

This SMSRP/PPP will be revised and amended as required to properly reflect any proposed changes. The revised SMSRP/PPP shall receive EPD approval prior to implementation of any proposed changes.

8.0 SUMMARY AND CONCLUSION

This sediment reduction plan is prepared in compliance with the provisions of SCDHEC Stormwater Management and Sediment Control Handbook for Land Disturbance Activities. The plan recognizes the importance of sediment migration. The high degree of abatement is accomplished through the use of the following:

- Minimizing the size of the disturbed areas;
- Filtering the runoff from the disturbed areas; and,
- Stabilizing all disturbed areas as soon as possible

It is imperative that stormwater management and erosion reduction structures be maintained during construction activities and for the entire project duration. The structures are specifically designed to minimize the amount of soil that may migrate from the site. It is concluded that the plan, as developed, will be an effective means of controlling erosion.

9.0 ATTACHMENTS

C-CV-G-0098	Existing Topographic Map and Drawing Index (U)
C-CV-G-0099	Top of Low Permeability Soil Layer Grading Plan (U)
C-CV-G-0100	Top of Vegetative Layer Grading Plan (U)
C-CV-G-0101	Sections and Details (U)
C-CV-G-0102	Erosion and Sediment Reduction Notes and Details (U)

10.0 REFERENCES

- South Carolina Regulation 72-300 Standards for Stormwater Management and Sediment Reduction, 1998
- South Carolina Stormwater Management and Sedimentation Control Handbook for Land Disturbance Activities, SCDHEC.
- Manual No. WSRC-IM-91-69, SRS Environmental Permitting, "HOW" Manual, Sections 1.9 and 1.13.
- DOE/SR-5000-29, Handbook for Erosion and Sediment Control on the Savannah River Site.
- Permit No. SCR100000 - SCDHEC NPDES General Permit for Stormwater Discharge from Construction Activities that are Classified as "Associated with Industrial Activity" by EPA Regulation, Issue Date: January 15, 1998, Expiration Date: January 31, 2003.
- Specification C-SPP-P-00001, Section 02230 Clearing and Grubbing
- Specification C-SPP-P-00001, Section 02300 Earthwork
- Specification C-SPP-P-00001, Section 02374 Erosion Control
- Specification C-SPP-P-00001, Section 02924 Seeding, Fertilizing and Mulching

STAGE CONSTRUCTION OF SOIL COVER OF EXPOSED AREAS AND THE LENGTH OF EXPOSED. TOPSOIL SHALL BE PLACED ON ALL SUBGRADES ARE ESTABLISHED AND THE ELEVATION AS SPECIFIED IN THE DRAWING 02-00008.

AVAILABLE BOUNDARY MARKERS AT THE PERIMETER INDICATED ON THE PROJECT DRAWINGS. MARKERS SHALL BE 36 INCHES LONG WITH THE ELEVATION ENGRAVED ON A 2-INCH DIA. ROD. THE TOP OF THE INSTALLED BOUNDARY MARKERS SHALL BE MORE THAN 2 INCHES ABOVE THE GROUND SURFACE.

CONSTRUCTION ACTIVITIES EXISTING AT THE PERIMETER TO BE ABANDONED IN PLACE BY BSRI.

CONSTRUCTION ACTIVITIES, EXISTING AT THE PERIMETER TO BE REMOVED BY BSRI.

ALONG THE PERIMETER OF THE PDRP AS SHOWN ON THE DRAWING FOR CLARITY.

INFORMATION ONLY

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DRAWING INDEX

TOPOGRAPHIC MAP AND DRAWING INDEX

PERMEABILITY SOIL LAYER GRADING PLAN

IMPERVIOUS LAYER GRADING PLAN

DETAILS

SEDIMENT REDUCTION NOTES AND DETAILS

C	V	G	0098	LATEST	0
				REVISION	

DEPARTMENT OF ENERGY

RIVER SITE

DESIGN AREA NO. P-AREA	DESIGN GROUP PE&CD/ER
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**EXISTING RUBBLE PIT
AND UNIT CLOSURE**

**TOPOGRAPHIC MAP
AND DRAWING INDEX (U)**

SHEET NO. 1 OF 1	LATEST REVISION 0
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Scale shown on this drawing is only applicable when plotted at 30"x42" (actual drawing size)

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PV119E

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DEPARTMENT OF ENERGY

RIVER SITE

DESIGN AREA NO. P-AREA	DESIGN GROUP PE&CD/ER
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ING RUBBLE PIT
E UNIT CLOSURE

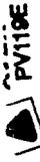
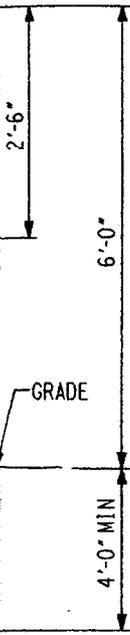
TIVE SOIL LAYER
PLAN (U)

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File shown on this drawing is only applicable if plotted at 30"x42" (actual drawing size)

C-CV-G-0100 Rev.0
TOP OF VEGETABLE SOIL
LAYER GRADING PLAN (U)

SIGN FURNISHED BY BSRI.
POST AND FASTENING
HARDWARE BY SUBCONTRACTOR



INFORMATION ONLY

SIGN

LOCATION.

0100

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DEPARTMENT OF ENERGY

RIVER SITE

DESIGN AREA NO.
P-AREA

DESIGN GROUP
PEBCD/ER

ING RUBBLE PIT
LE UNIT CLOSURE

D DETAILS (U)

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Scale shown on this drawing is only applicable
when plotted at 30"x42" (actual drawing size)

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PROTECTIVE MEASURES PROVE TO BE

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IZING AND MULCHING PER SECTION
PECIFICATION FOR ALL DISTURBED

WITH THE REQUIREMENTS OF THE
ND SEDIMENT REDUCTION PLAN/
AN (SMSRP/PPP) ERD-SMP-2002-00008.

TURBANCE WILL REQUIRE A MODIFICATION
MSRP/PPP BY EPD AND BSRI ENGINEERING

FOR LOCATION PLAN, GENERAL NOTES,
WINGS.

INFORMATION ONLY

IRING DOC. CONTROL - SRS



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H RIVER SITE

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NING RUBBLE PIT
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EDIMENT REDUCTION
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SHEET NO. 1 OF 1	LATEST REVISION 0
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LUCIP for the
P-Area Reactor Seepage Basins, 904-61G, -62G, and -63G

Land Use Control Implementation Plan for P-Area Reactor Seepage Basins, 904-61G, -
62G, and -63G,

WSRC-RP-2003-4139, Revision.1, January 2004

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United States Department of Energy

Savannah River Site

**Land Use Control Implementation Plan (LUCIP)
for P-Reactor Seepage Basins (904-61G, 904-62G, and
904-63G) OU (U)**

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**Prepared for
U.S. Department of Energy
and
Westinghouse Savannah River Company LLC
Aiken, South Carolina**

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LIST OF ACRONYMS AND ABBREVIATIONS

b/g	beta-gamma
bls	below land surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
Ci	curie
COC	constituent of concern
cm/s	centimeter per second
CSM	conceptual site model
ECA	Environmental Compliance Authority
FFA	Federal Facility Agreement
ft	feet
ft ²	square feet
GCL	geosynthetic clay liner
GDL	geocomposite drainage layer
HAZWOPER	Hazardous Waste Operations and Emergency Response
HDPE	high-density polyethylene liner
IPSL	inactive process sewer pipelines
LUC	Land Use Control
LUCAP	Land Use Control Assurance Plan
LUCIP	Land Use Control Implementation Plan
MCL	maximum contaminant levels
NCP	National Oil and Hazardous Substance Contingency Plan
OU	Operable Unit
pCi/g	picocuries per gram
PCM	Post-Closure Manager
PRSB	P-Area Reactor Seepage Basins
PTSM	principal threat source materials
PVC	polyvinyl chloride
QA	Quality Assurance

LIST OF ACRONYMS AND ABBREVIATIONS (Continued)

RA	remedial action
RAIP	remedial action implementation plan
RAO	remedial action objective
RBC	risk-based concentrations
RCRA	Resource Conservation and Recovery Act
RG	remedial goal
ROD	Record of Decision
S/S	stabilization/solidification
SCA	soil contamination area
SCDHEC	South Carolina Department of Health and Environmental Control
SGCP	Soil and Groundwater Closure Projects
SRS	Savannah River Site
TER	Technical Evaluation Report
TTV	treatment threshold value
URMA	underground radioactive management area
USDOE	United States Department of Energy
USEPA	United States Environmental Protection Agency
WSRC	Westinghouse Savannah River Company, LLC

1.0 INTRODUCTION

This Land Use Control Implementation Plan (LUCIP) has been prepared for P-Reactor Seepage Basin (PRSB) (904-61G, 904-62G, and 904-63G) Operable Unit (OU) (Figure 1) at the Savannah River Site (SRS). The purpose of the LUCIP is to describe how the land use controls (LUCs) selected in the PRSB OU Record of Decision (ROD) will be implemented and maintained. The following LUCs have been selected for this OU:

- Property Record Notices
- Property Record Restrictions
- Other Public Notices
- Site Use Program
- Warning Signs
- Access Controls and Security/Surveillance Measures
- Field Inspection and Maintenance for Institutional Controls

Section 4.0 of this LUCIP describes the LUCs that will be implemented at the PRSBs.

The selected remedy leaves hazardous substances in place that pose a potential future risk and will require land use restrictions for an indefinite period of time. As agreed on March 30, 2000, among the United States Department of Energy (USDOE), the United States Environmental Protection Agency (USEPA), and the South Carolina Department of Health and Environmental Control (SCDHEC), SRS is implementing a Land Use Control Action Plan (LUCAP) to ensure that the LUCs required by numerous remedial decisions at SRS are properly maintained and periodically verified. The requirements of that LUCAP also apply to the LUCs that were selected as part of the remedial action (RA) for the PRSB OU. This additional document, the

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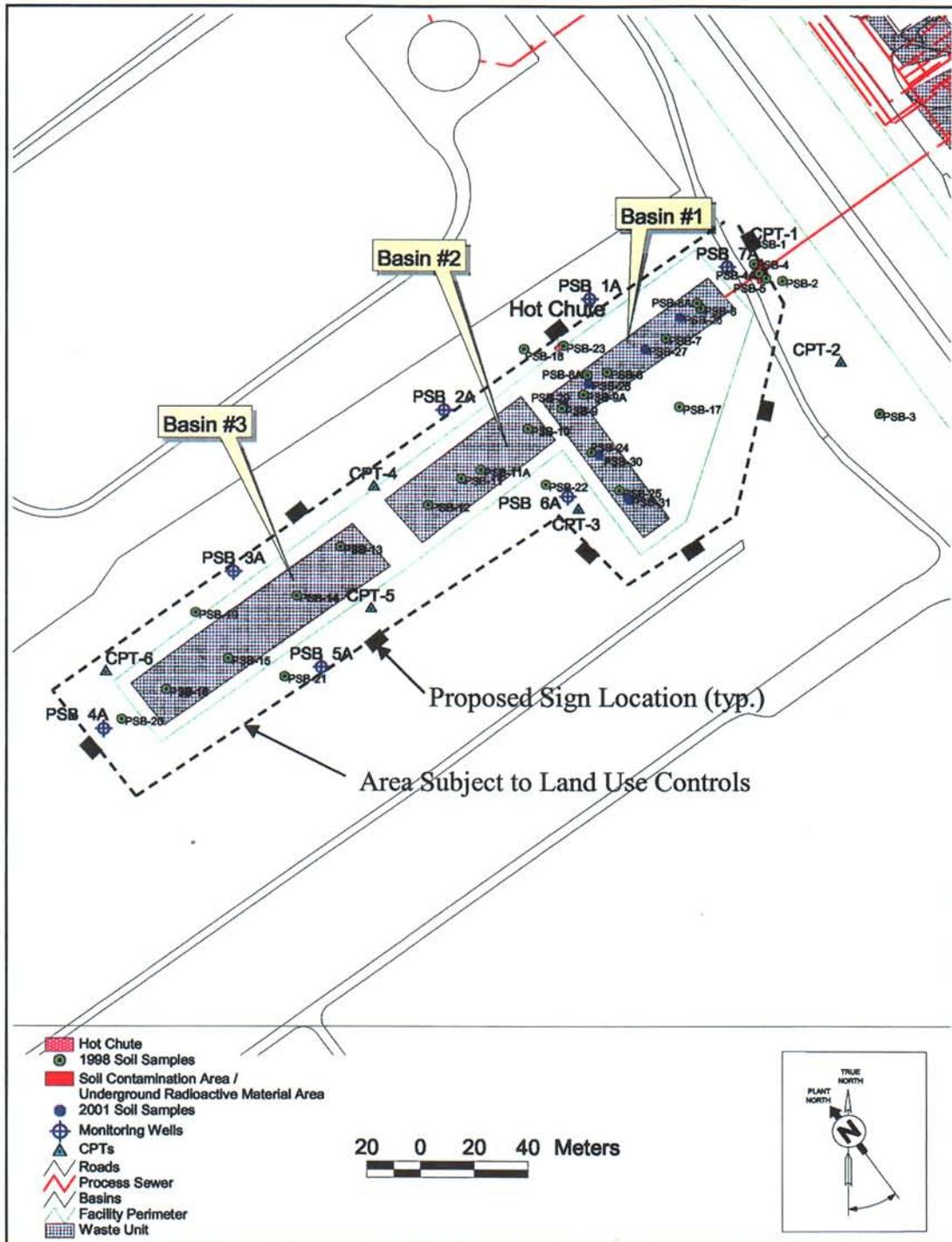


Figure 1. Conceptual Site Detail of P-Area Reactor Seepage Basins

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PRSB (904-61G, 904-62G, and 904-63G) OU LUCIP, contains the detailed and specific measures required to implement and maintain the LUCs selected as part of this particular remedial decision.

2.0 OVERVIEW OF P-REACTOR SEEPAGE BASINS REMEDIAL ACTION

2.1 Description of the P-Reactor Seepage Basins (904-61G, 904-62G, and 904-63G) Operable Unit

The PRSB (904-61G, 904-62G and 904-63G) OU is listed as a Resource Conservation and Recovery Act (RCRA) 3004(u) Solid Waste Management Unit/Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) unit in Appendix C of the Federal Facility Agreement (FFA) (1993) for SRS. The media associated with this OU include soils, inactive process pipelines (IPSLs), a hot chute, cascade overflow pipes, and woody vegetation.

The PRSB OU is located in the central portion of SRS west of P Area. The basins are in an open area with vegetative cover. The ground slopes southwestward toward Steel Creek, approximately 2,500 ft to SRS west. The PRSBs are located in an industrial zone identified in the proposed SRS future land use map of the SRS FFA Implementation Plan. The basins are adjacent to a nuclear facility and have been selected to remain an industrial use area.

Constructed in 1957, the PRSB OU comprises three unlined (earthen) basins. Basin 1 is L-shaped and was constructed with approximate outside dimensions of 211 x 50 ft in the north-south direction and 254 x 50 ft in the east-west direction, at a depth of 13 to 17 ft below land surface (bls). Basin 2 was constructed with approximate outside dimensions of 211 x 70 ft at a depth of 8 ft bls. Basin 3 was constructed with approximate outside dimensions of 340 x 70 ft at a depth of 9 ft bls. None of the three basins has been backfilled to grade, and all are currently open.

Two IPSLs extend from the disassembly basin within P Reactor to the eastern end of Basin 1. One IPSL is made of 3-inch diameter carbon steel and the other is made of 4-inch diameter high

density polyethylene (HDPE). The IPSLs are approximately 660 ft in length. From 1957 until 1970 and from 1978 until 1991, the process sewer lines conveyed low-level radioactive purge water from the P-Area Reactor Disassembly Basin to the seepage basins. Historical records indicate that the original IPSL leaked in an area east of Basin 1, contaminating the soils in a 15 by 30 ft (450 ft²) area. A second line was installed as a replacement, but contaminated soils were not removed during this installation. This area is posted as a Soil Contamination Area (SCA) and an Underground Radioactive Management Area (URMA).

Cascade overflow pipes connect Basin 1 to Basin 2 and Basin 2 to Basin 3. The cascade overflow pipes are 12-inches in diameter and are made of corrugated steel. Flow between the basins was via the cascade overflow pipes positioned near the top of the basin walls.

In addition to the cascade overflow pipe in Basin 1, a "hot chute" was placed at the north wall of the basin during operation. The chute consists of several 10-ft sections of polyvinyl chloride (PVC) pipes and several coils of fire hose located outside of the basin perimeter fence. There is no documentation indicating when the "hot chute" was used and if it was used for waste disposal. Previous radiological surveys of the "hot chute" are consistent with background radiation levels.

The seepage basins were used from 1957 to 1970 to dispose of low-level radioactive process purge water from the reactor disassembly basin. Beginning in 1963, disassembly basin wastewater was deionized and filtered prior to discharge, which reduced radioactivity and removed solids and sludges. The seepage basins were not used from 1971 to 1977. Purge water was mixed with large volumes of heat exchanger cooling water and discharged to area streams. After improvements for processing disassembly basin water had been made, purge water discharges to the seepage basins resumed in 1978. The seepage basins have not received wastewater since P-Reactor was shut down for repairs in 1991.

Waste disposal records indicate that the main basin (Basin 1) received aqueous radioactive waste. Radionuclides in the wastewater from the disassembly basin, sumps, tanks, and drums included tritium, strontium-90, chromium-51, cobalt-60, cesium-134, cesium-137, and other

beta-gamma (b/g) fission products. The records show most of the radioactivity in reactor seepage basin discharge water was due to tritium, cesium-137, cobalt-60, and strontium-90. During the entire operation of the PRSBs, it is estimated that 70,000 curies (Ci) of tritium, 4.74 Ci of strontium-90, 19.5 Ci of cesium-137, and 0.835 Ci of other b/g emitters were released to the PRSBs.

2.2 Nature and Extent of Contamination in P-Reactor Seepage Basins (904-61G, 904-62G, and 904-63G) OU

The PRSB soils have been characterized in the unit-specific Plug-in Technical Evaluation Report (TER). (WSRC 2003c). The radionuclides that are designated as principal threat source material (PTSM) in the TER are briefly addressed in the following paragraphs. Tritium was a major contributor to the production waste stream and may still be present in the soil and pipelines.

For the plug-in remedy, PTSM has been defined as highly contaminated basin soils and any other unit-related soils that pose a radiological risk to the future industrial worker equal to or greater than 1×10^{-3} risk (using baseline risk assessment exposure assumptions). Based on the presumptive approach used in the Plug-in ROD, a bias for treatment of PTSM that consists of soil stabilization/solidification (S/S) (by grouting) has been used.

The TER (WSRC 2003c) provides a comparison of the average radionuclide concentration detected in the three basins and SCA/URMA to the PTSM treatment threshold value (TTV). The TTV relates to a risk of 1×10^{-3} for an industrial worker. The average cesium-137 concentration exceeds the TTV in Basin 1, Basin 2, and the SCA/URMA; therefore, this plug-in criteria is met because this unit contains PTSM. No PTSM was detected in Basin 3 or below 19 ft in Basin 1 or 2 or the SCA/URMA. Data in the TER illustrate that PTSM is present in Basin 1, Basin 2, and the SCA/URMA. Basin 1 PTSM is composed of cesium-137 and cobalt-60. The average cesium-137 concentration exceeds the 1×10^{-3} risk and TTV. The TER (WSRC 2003c) indicates the maximum depth of S/S of PTSM for Basin 1, which is 10 ft.

Basin 2 PTSM is composed of cesium-137. TTVs are exceeded in Basin 2 in all four boreholes to a depth of 4 ft. The depth designated for S/S, which extends 4 ft below the basin bottom, is shaded in gray on Table 10 of the TER (WSRC 2003c).

Very little contamination was ever released to Basin 3 and, as result, no PTSM is present. See Table 11 of TER (WSRC 2003c). PTSM located in the SCA/URMA and associated with the original process sewer line is composed of cesium-137. The average concentration of cesium-137 exceeds the TTV between a depth of 1 to 4 ft bls (Table 12 of the TER).

The “hot chute” does not contain any PTSM but will be removed, placed in Basin 1 or Basin 2 and encapsulated within the grouted mass. The cascade overflow pipes connecting the three basins will be crushed and encapsulated within the grout mass.

2.3 Remedial Action Selected

The selected RA established in the ROD is based on an evaluation of potential alternatives performed in accordance with the National Oil and Hazardous Substance Contingency Plan (NCP) and CERCLA, as amended.

The RA addressed in the Remedial Action Implementation Plan (RAIP) for PRSB is applicable to the in situ grouting of the two IPSLs, in situ S/S of the PRSB PTSM soils, excavation and encapsulation of the IPSLs within the grouted mass, and capping of the PRSB with a low permeability geosynthetic closure cover system.

The PRSB conceptual site model (CSM) (Appendix C) illustrates how implementation of the RA breaks the contaminant exposure pathways.

The following are key elements of the selected RA for the PRSB soils and IPSLs (WSRC 2003c):

- Based on the analysis and conclusions of the TER, the S/S treatment depth for Basin 1 will be graduated as follows:

- For the east-west section of Basin 1, the treatment depth will be 10 ft below basin bottom (approximately 15 ft bls) at the eastern end (source location of IPSL discharge) and will be graduated to 6 ft (approximately 11 ft bls) at the basin corner.
- For the north-south section of Basin 1, the S/S treatment depth will be graduated from 6 ft (approximately 11 ft bls) at the corner to 2 ft (approximately 7 ft bls) at the south end.
- Basin 2 soils will be stabilized in place to a depth of 4 ft below the basin bottom with a cement-based grout mixture to achieve the CERCLA preference for treatment of PTSM. This treatment will convert the waste to a solid form, which is less likely to result in human exposure to radionuclides. Since there is no PTSM soil in Basin 3, it does not need S/S treatment.
- A low permeability geosynthetic closure cover system will be installed over the PRSB to meet the remedial action objectives (RAOs) as stated in Section 1.6 of this RAIP. This closure cover system will be placed over basins 1, 2, and 3 and will extend beyond the edges of the seepage basins. The soil cover will encompass all of the stabilized PTSM and contaminated soils located at the basins. Because arsenic and strontium-90 were estimated to migrate to the groundwater at concentrations above the MCL within a period of 1,000 years, a closure cover system with a maximum hydraulic conductivity of 1×10^{-5} cm/s or lower will be provided to reduce infiltration. The closure cover system consists of a structural fill layer, geosynthetic clay liner (GCL), geocomposite drainage layer (GDL), grading fill layer, and a vegetative layer. The closure cover system is designed to reduce water infiltration and to prevent exposure to highly contaminated soils in the PRSBs in accordance with the approved Plug-in ROD (WSRC 1999a) and the approved Unit-Specific Plug-in TER (WSRC 2003c). The installed cover system will be maintained to provide long-term protection.

- Institutional controls will consist of near- and long-term actions. These actions will be consistent with industrial land use and the SRS LUCAP. For the near term, signs and existing SRS access controls will be used to prevent disturbance of the soil cover system. In the long term, if the property is ever transferred to nonfederal ownership, the U.S. Government will take those actions necessary pursuant to Section 120(h) of CERCLA, which will likely include deed restrictions precluding residential use or excavation within the boundaries of the unit. Residential use of SRS land will be prohibited as stated in the *SRS Future Use Project Report, Stakeholder Recommendations for SRS Land and Facilities* (USDOE 1996).
- The IPSLs will be grouted, removed, and placed in Basin 1 or 2 and incorporated in the S/S mix to prevent or limit contact of plants and animals to contamination, thereby protecting the ecological receptors indigenous to the area. Historical records, supported by more recent characterization data, indicate that the original IPSL leaked in an area east of Basin 1, contaminating the soils in a 15 by 30 ft (450 ft²) area. A second line was installed as a replacement; however, the contaminated soils were not removed during this installation. This area is posted as an SCA/URMA. Because the soil adjacent to the IPSLs in the SCA/URMA is considered PTSM, the contaminated soil does meet the Plug-in ROD requirement for treatment or consolidation. The contaminated soil in the SCA/URMA area will be excavated and placed in Basin 1 or 2 (consolidation) for inclusion in the S/S treatment. Soils exceeding 20 pCi/g gross alpha or 50 pCi/g nonvolatile beta screening/sampling criteria will be excavated and consolidated within the S/S mass in Basin 1 or Basin 2.

The remedy selected in the Plug-in ROD is designed to meet the following RAOs for the PRSB and any contaminated soils encountered during removal of the IPSLs:

- 1) Prevent human exposure to highly contaminated basin soils (PTSM) through stabilization treatment to the extent practicable and backfill of the basins with clean soil. Reduce risks to the future worker from surface soils (0 to 1 ft) outside the basin by establishing

remedial goals (RGs) for constituents of concern (COCs) at concentrations equivalent to 1×10^{-6} for carcinogens and a hazard quotient of 1 for noncarcinogens or background (where background levels of COCs exceed 1×10^{-6}).

- 2) Prevent the release of COCs in the soil to groundwater beneath the unit above maximum contaminant levels (MCLs) or risk-based concentrations (RBCs) if there are no MCLs. The soil RGs are back-calculated based on MCLs or RBCs.
- 3) Protect the ecological receptors indigenous to the area by preventing or limiting contact with contaminated basin soil/pipelines and preventing plants and animals from bringing contaminants up towards the surface.

3.0 LAND-USE CONTROL OBJECTIVES

Considering the residual risk mentioned above, the following LUCs have been established for the PRSB OU:

- Maintain the use of the site for industrial activities only.
- Prevent unauthorized access to the unit as long as the waste remains a threat to human health or the environment.
- Prevent unauthorized residential or agricultural access to soil. (Note: P-Area Reactor groundwater is a separate OU).

Current access controls and deed notification needed to maintain the future land use are described in the following sections of this LUCIP.

4.0 LAND-USE CONTROL DESCRIPTIONS

4.1 Property Record Notices

In the long term, if the property is ever transferred to non-federal ownership, the U.S. Government will take those actions necessary pursuant to Section 120(h) of CERCLA. Those actions will include a deed notification disclosing former waste management and disposal activities as well as the RA taken on the site. The contract for sale and the deed will contain the notification required by CERCLA Section 120(h).

The deed notification shall, in perpetuity, notify any potential purchaser that the property has been used for management and disposal of waste. These requirements are also consistent with the intent of RCRA deed notification requirements at final closure of a RCRA facility if contamination will remain at the unit.

4.2 Property Record Restrictions

The deed shall also include deed restrictions precluding residential use of the property. However, the need for these deed restrictions may be re-evaluated at the time of transfer in the event that exposure assumptions differ and/or the residual contamination no longer poses an unacceptable risk under residential use. Any re-evaluation of the need for the deed restrictions will be done through an amended ROD.

4.3 Other Public Notices

The LUCIP identifies the area under land use restriction via a survey plat certified by a professional land surveyor. The survey plat will be incorporated in this LUCIP upon completion of the construction phase. A conceptual site detail is provided in Figure 1.

4.4 Site Use Program

SRS is required under DOE Order 430.1A, *Life Cycle Management* (USDOE 1998), to implement an asset management program for the use, maintenance, and disposal of physical assets, including real estate. SRS has complied with this order by establishing its Site Use Program in accordance with WSRC 1D, *Site Infrastructure and Services Manual*, Procedure 3.02, "Site Real Property Configuration Control" (WSRC 2003a). In accordance with this procedure, use of all lands and waters on SRS shall be coordinated via the Site Use Program, and all employees, contractors, and visitors at SRS must comply with it. This program ensures that any work performed at SRS that adds, modifies, or removes features portrayed on the SRS development maps is authorized. No use of land (i.e., excavation or any other land use) shall be undertaken without prior approval documented by a Site Use Permit. This authorization is obtained through the completion of a Site Clearance Request Form. Also, in accordance with WSRC 1D, Procedure 3.02, all work at SRS that adds to or modifies features or facilities portrayed on SRS development maps (i.e., plot plans of facilities/utilities at SRS) will be authorized by a Site Clearance Permit before any excavation activities are conducted. All site clearance requests will be reviewed to verify that either an approved Site Use Permit has been obtained or that an existing Site Use Permit has sanctioned the request.

SRS is responsible for updating, maintaining, and reviewing site maps, including FFA OU identifications (FFA 1993). If a site clearance request that may impact an FFA OU is made, the Site Clearance Request Form is sent to the appropriate FFA OU reviewer for either approval or disapproval. The roles and responsibilities of each individual are detailed in WSRC 1D, Procedure 3.02. Verification of USDOE approval for intended land use must be obtained before a Site Clearance Permit is issued. The site use and site clearance processes are applicable to all activities and personnel on site (including subcontractors).

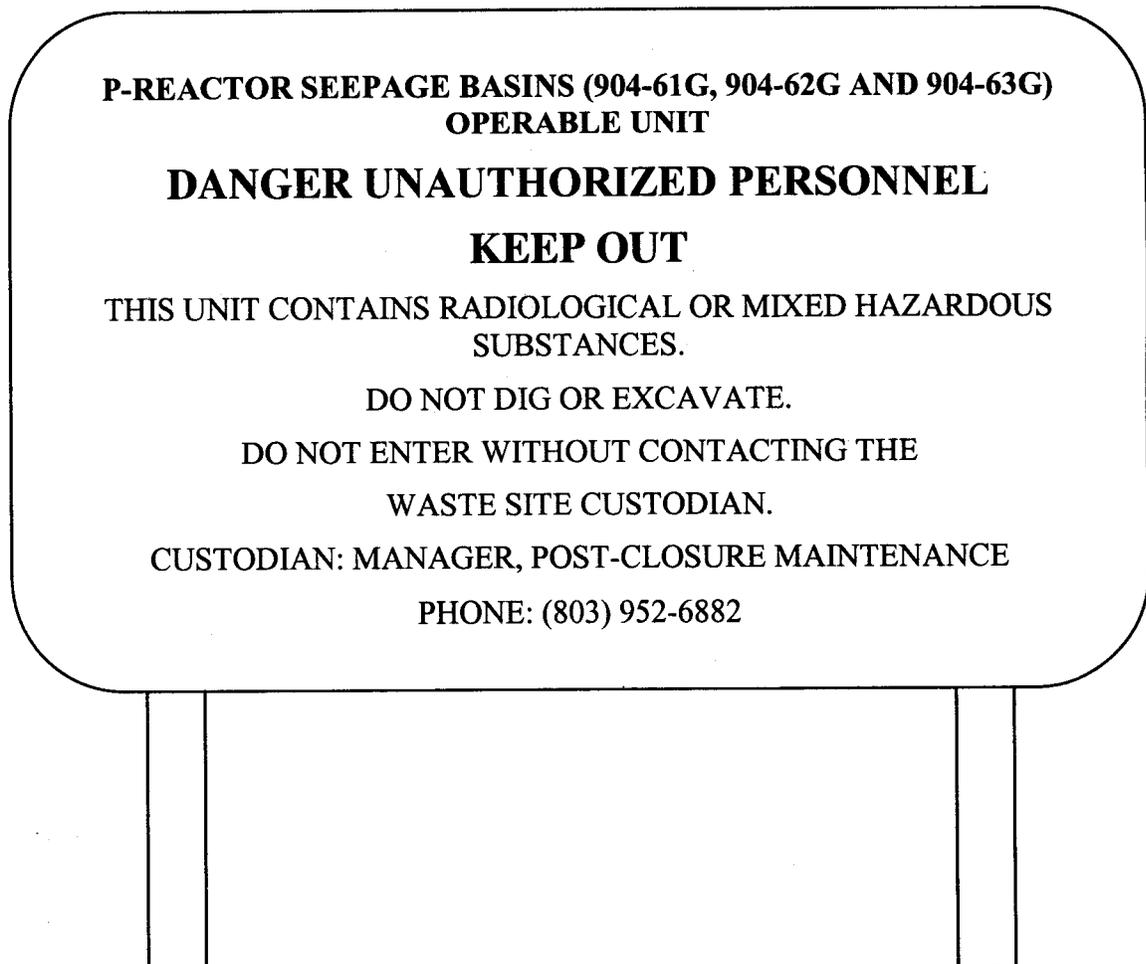
The processes are controlled in accordance with the WSRC 1Q, SRS Quality Assurance (QA) Program (WSRC 2003b). The SRS QA program is the governing QA program for all SRS activities.

SRS identifies all buildings and facilities on maps used in the Site Use/Site Clearance Program. This waste unit is identified on these maps as a CERCLA facility.

Any work proposed in these areas will be strictly controlled, and workers will be appropriately trained and briefed about health and safety requirements if work is deemed necessary for maintenance. No major change in land use or excavation at the PRSB OU shall be undertaken without USEPA and SCDHEC approval.

4.5 Warning Signs

To prevent unknowing entry and to ensure that unrestricted use of the waste unit does not occur while it is under ownership of the government, identification signs will be posted at the unit (Figure 1). The signs will be legible for a distance of at least 25 ft. The signs will read as follows:



Custodial responsibilities for maintenance and inspection of the PRSB OU will be maintained by the Post-Closure Maintenance Group within Soil and Groundwater Closure Projects (SGCP).

4.6 Other Access Controls and Security/Surveillance Measures

While under the ownership of USDOE, access control of the entire SRS will be maintained in accordance with the 1992 RCRA Part B Permit Renewal Application, Volume I, Section F.1. This section describes the 24-hour surveillance system (R.61-79.264.14(b)(1)), artificial or natural barriers (R.61-79.264.14(b)(2)(I)), control entry systems (R.61-79.264.14(b)(2)(ii)), and access control warning signs (R.61-79.264.14(c)) in place at the SRS boundary to comply with the security requirements for a RCRA-permitted facility.

4.7 Field Inspection and Maintenance for Institutional Controls

“Monitoring” will be performed to verify that the LUCIP requirements are met. Semi-annual monitoring of the PRSB OU will be conducted for items such as accuracy and legibility of signs, visible subsidence or erosion of the waste unit, proper vegetative growth, and mowing. Subsidence or erosion will be corrected by backfilling the affected area with clean soil and seeding the area to prevent further erosion. After remediation of the PRSB OU, only maintenance activities will be required per this RA. USEPA and SCDHEC will be notified of the results of any event and/or action that could indicate some potential compromise of institutional controls within 30 days of identification. These events or actions will be documented in the FFA Annual Progress Report. All other routine maintenance activities will be documented and maintained in files subject to USEPA and SCDHEC review and audit. A copy of the complete inspection form is maintained in the SGCP Document Control Center. The LUCs will be implemented as long as the waste remains a threat to human health or the environment.

A unit-specific field inspection checklist is provided in Appendix B of this LUCIP. The waste site inspectors are to be trained in Hazardous Waste Operations and Emergency Response (HAZWOPER), RCRA Well Inspections (SGCP-specific training), SGCP RCRA Waste Unit

Inspections, Radiological Workers, etc., as applicable for the specific inspection. They will also be trained based on the individual requirements of the regulatory approved closure documents for each waste unit. In addition, the inspectors are to attend yearly refresher courses. Over the years, different personnel may conduct the inspections and grass cutting operations.

5.0 REFERENCES

FFA, 1993. *Federal Facility Agreement for the Savannah River Site*, Administrative Docket No. 89-05-FF (Effective Date: August 16, 1993)

USDOE, 1996. *SRS Future Use Project Report, Stakeholder Recommendations for SRS Land and Facilities*, U.S. Department of Energy Savannah River Operations Department, January

USDOE, 1998. DOE Order 430.1A, *Life Cycle Management* (Approved 10/14/98)

WSRC, 2003a. WSRC Procedure Manual 1D, *Site Infrastructure and Services Manual (U)*, Procedure 3.02, "Site Real Property Configuration Control," Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 2003b. WSRC Procedure Manual 1Q, *Quality Assurance (U)*, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 2003c. *Unit-Specific Plug-In Technical Evaluation Report for the P-Area Reactor Seepage Basins 904-61G, 904-62G, and 904-63G) Operable Unit (U)*, WSRC RP-2002-4082, February, Rev. 1.1, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

6.0 APPENDICES

Appendix A Survey Plat

Appendix B Field Inspection Checklist

Appendix C Post-Remedial Action Conceptual Site Model

APPENDIX A

SURVEY PLAT

LAND USE CONTROL IMPLEMENTATION PLAN SURVEY PLAT

(The survey plat will be incorporated in this LUCIP upon completion of the construction phase).

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APPENDIX B

FIELD INSPECTION CHECKLIST

FOR LUCIP FOR P-REACTOR SEEPAGE BASINS

APPENDIX B

SGCP FIELD INSPECTION CHECKLIST - TYPICAL

Note: This unit-specific LUCIP, including the checklist, will be appended to the SRS LUCAP. The Appendix A survey plat will be provided upon completion of the construction phase.

SCHEDULED

UNSCHEDULED

A= Satisfactory X= Unsatisfactory (Explanation required)	A or X	Observation of Corrective Action Taken
1. Verify that the roads are accessible.		
2. Verify that the waste unit signs (specify the number) are in acceptable condition, have the correct information, and are legible from a distance of 25 feet.		
3. Verify that there are no excavation, digging, or construction activities on the soil cover.		
4. Check the integrity of drainage ditches (if any) for the presence of excessive erosion, sediment buildup, and any debris restricting water flow.		
5. Verify that no woody vegetation is growing on the soil cover. Remove or identify as needed.		
6. Visually check the vegetative cover for grass density, with no bare spots more than 3 by 3 feet in area. The height of the vegetative cover should not impair the visual inspection of the soil cover. This will be determined by the inspector.		
7. Check the closure cover system for signs of erosion or depressions (subsidence).		
8. Check for signs of burrowing animals.		

Inspected by: _____ / _____ Date _____
(Print Name) (Signature)

Post-Closure Manager: _____ / _____ Date _____
(Print Name) (Signature)

CAUTION: The inspector shall notify the Post-closure manager (PCM) and Environmental Compliance Authority (ECA) **IMMEDIATELY** if there has been a breach or compromise of the institutional controls at this waste unit. Refer to post-closure inspection procedures.

APPENDIX C

POST-REMEDIAL ACTION CONCEPTUAL SITE MODEL

FOR THE LUCIP FOR P-REACTOR SEEPAGE BASINS

APPENDIX C

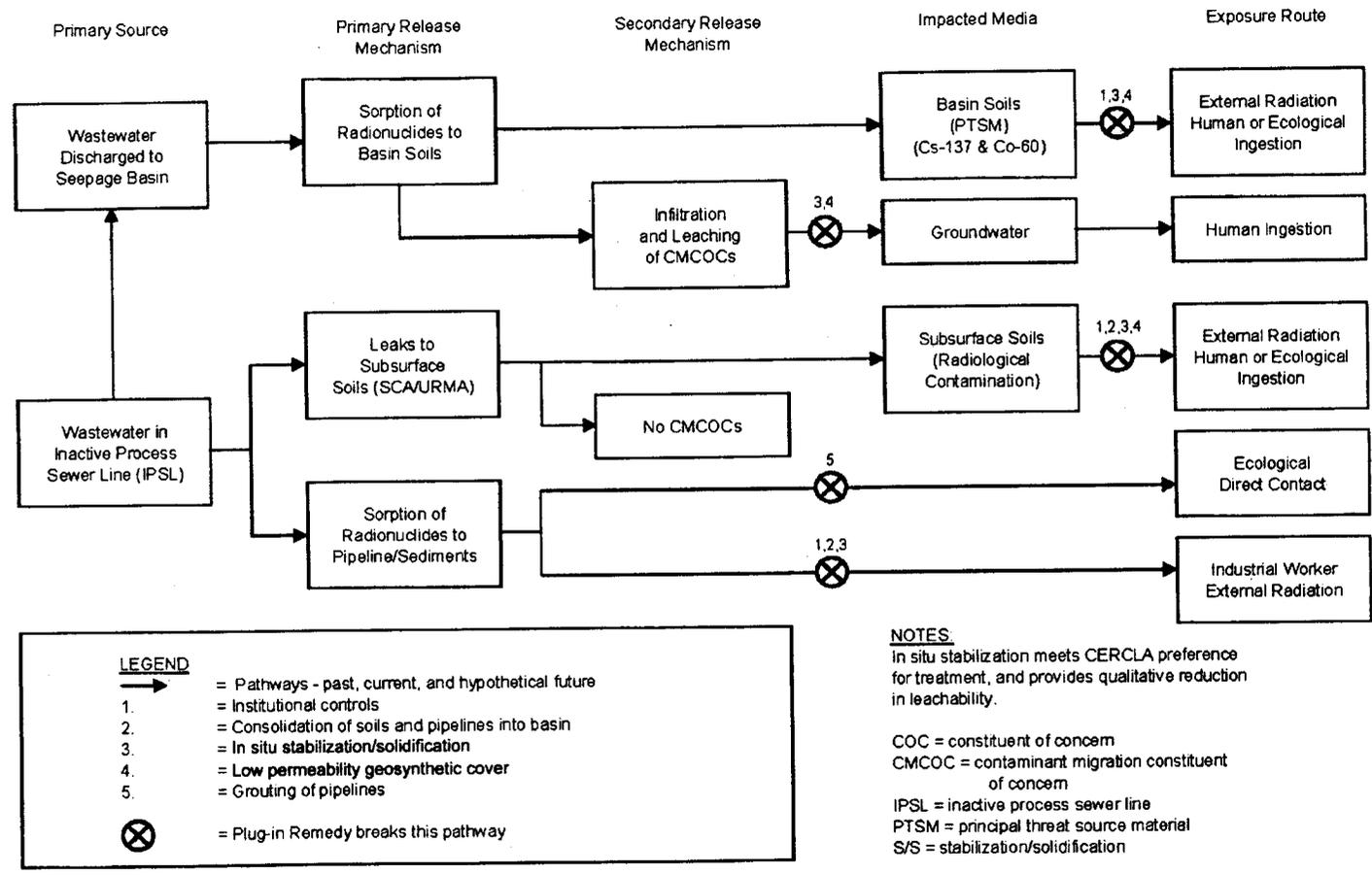


Figure C1. Post-Remedial Action Conceptual Site Model for the LUCIP For P-Reactor Seepage Basins

LUCIP for the
R-Area Bingham Pump Outage Pits, 643-8G, -9G, and -10G and R-Area Unknown Pits
#1, #2, and #3, RUNKS-1, -2, and -3

Appendix B of Final Remediation Report for the R-Area Bingham Pump Outage Pits,
643-8G, -9G, and -10G and R-Area Unknown Pits #1, #2, and #3, RUNKS-1, -2, and -3

WSRC-RP-2003-4061, Revision.1, July 2003

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Appendix B

LAND USE CONTROL IMPLEMENTATION PLAN (LUCIP)

for the

R-AREA BINGHAM PUMP OUTAGE PITS (643-8G, 643-9G, AND 643-10G)

and

R-AREA UNKNOWN PITS #1, #2, and #3 (RUNKS -1, -2 and -3)

LAND USE CONTROL IMPLEMENTATION PLAN

This R-Area Bingham Pump Outage Pits (643-8G, 643-9G, and 643-10G) and R-Area Unknown Pits #1, #2, and #3 (R BPOPs and RUNKs) OU Land Use Control Implementation Plan (LUCIP) will be appended to the Savannah River Site (SRS) Land Use Control Assurance Plan (LUCAP) (WSRC 1999b).]

The selected remedy leaves hazardous substances in place that pose a potential future risk and will require land use restrictions for an indefinite period of time. As negotiated with the United States Environmental Protection Agency (USEPA) and in accordance with USEPA Region IV policy (Johnston 1998), the SRS has developed a LUCAP (WSRC 1999b) to ensure that land use restrictions are maintained and periodically verified. This LUCIP provides detailed and specific measures required for the land use controls selected as part of this remedy. The United States Department of Energy (USDOE) is responsible for implementing, maintaining, monitoring, reporting upon, and enforcing the land use controls described herein. Upon final approval, the LUCIP will be appended to the LUCAP and is considered incorporated by reference into the FRR, establishing land use controls implementation and maintenance requirements enforceable under the Comprehensive Environmental Response, Compensation, and Recovery Act (CERCLA). The approved LUCIP will establish implementation, monitoring, maintenance, reporting and enforcement requirements for the unit. The LUCIP will remain in effect until modified as needed to be protective of human health and the environment. LUCIP modification will only occur through another CERCLA document.

1.0 REMEDY SELECTION

1.1 R-Area Bingham Pump Outage Pits (643-8G, 643-9G, and 643-10G and RUNKs 1, 2 and 3)

R Area is located in the central portion of SRS, approximately 5 miles from the nearest SRS boundary. The R BPOPs and RUNKs OU is situated northeast and outside the R-Area fence line. The R BPOPs and RUNKs OU consists of six pits including three known pits called R BPOPs (643-8G, 643-9G, and 643-10G) and three pits with unknown or incomplete histories called RUNKs (RUNK-1, RUNK-2, and RUNK-3). Pits 643-8G and 643-9G are approximately 250 ft long, 16 ft and 20 ft wide, respectively, and up to 13 ft deep. Pit 643-10G is approximately 522 ft long, 19 ft wide, and 14 ft deep. RUNK-1 and RUNK-3 are approximately 105 ft and 135 ft long, respectively, 25 ft wide, and up to 8 ft deep. RUNK-2 is approximately 445 ft long, 30 ft wide, and up to 12 ft deep. The sum of the areas for each pit is 0.9 acres; the area of a polygon around all the pits, which includes the areas between the pits, is 1.75 acres.

The land surface at R BPOPs and RUNKs OU is gently sloping and covered by grassy vegetation. Dense vegetation and trees are located around the unit. The habitats at the OU generally do not meet the needs of most threatened, endangered, or sensitive species. No unique or sensitive ecosystems have been identified.

RUNK-2 predates the R BPOPs and was in existence as early as 1953. Construction debris has been verified in RUNK-2 based upon a magnetic survey, ground penetrating radar (GPR) surveys, and soil sampling in the pit. Liquid wastes were also introduced into the pit, but no containerized liquids were discovered during characterization. RUNK-2 was closed in 1956.

The R BPOPs were constructed during 1957 and 1958 when major modifications were made to primary and secondary SRS reactor cooling water systems. The outages of the cooling water systems that occurred as a result of these modifications became known as Bingham Pump Outages. Wastes generated during these outages were segregated based

on levels of radioactivity. Higher activity waste was sent to the SRS Burial Ground Complex in E Area while lower activity waste was buried in the R BPOPs. Waste disposed of in the R BPOPs consisted of miscellaneous construction materials such as pipes, cables, ladders, concrete, and miscellaneous hardware. The R BPOPs were closed in the late 1950s by backfilling with approximately 4 ft of cover soil.

RUNK-1 and RUNK-3 were discovered in 1993 during a GPR survey of the area. The survey indicated that these areas had been previously disturbed, but their history is unknown. Magnetic surveys of these RUNKs indicated they do not contain metallic debris; furthermore, no metallic or non-metallic debris was encountered during soil sampling. Due to the lack of any identified debris, it is possible that no debris was ever placed in these two RUNKs.

The R-Area BPOPs and RUNKs waste units are listed as CERCLA waste units in the SRS Federal Facility Agreement (FFA) but are not subject to Resource Conservation and Recovery Act (RCRA) permit modification in accordance with Appendix C of the SRS FFA (FFA 1993).

The OU has been assessed through characterization and a series of documents written by USDOE and approved by the regulatory agencies (South Carolina Department of Health and Environmental Control [SCDHEC] and USEPA). These documents include a Work Plan (WSRC 1999a), a Remedial Investigation (RI) Report with Baseline Risk Assessment (BRA) (WSRC 2000), and a Proposed Plan (PP) (WSRC 2001b). A Feasibility Study (FS) was not prepared because USDOE, SCDHEC, and USEPA agreed that the problem warranting action and the scope of the problem was well-defined and that the list of likely response actions was short enough to proceed directly from the RI/BRA to the PP. The types of assessments typically done in an FS were included in Appendix A of the PP. A PP 30-day public comment period began on April 18, 2002, and ended on May 17, 2002. No comments were received during the public comment period. These documents culminated in a Record of Decision (ROD) (WSRC 2002) for

the OU. The scope of the problem addressed by this final ROD action was contamination in soil and on buried debris at R BPOPs and RUNKs OU. USDOE, USEPA, and SCDHEC have agreed in the R BPOPs and RUNKs OU ROD that groundwater at the OU will be evaluated separately in association with the R Area Groundwater OU.

1.2 Nature and Extent of Contamination in R BPOPs and RUNKs OU

The sampling data were evaluated in the RI/BRA to identify refined constituents of concern (RCOCs), which are constituents warranting remedial action. RCOCs were identified using the SRS protocols for data processing, human health and ecological risk assessment, and contaminant migration modeling. Table 1 lists the RCOCs and risks at the unit from the RI/BRA. Modeling indicated that there are no contaminant migration (CM) refined constituents of concern (RCOCs).

Table 1. Summary of Risks and Hazards: Surface Soil at R BPOPs and RUNKs

Known On-Unit Worker				
No RCOCs				
Future On-Unit Industrial Worker				
RCOC	Ingestion	Inhalation	Dermal/External	Total of All Exposure Routes
Benzo(a)pyrene	2.54 x 10 ⁻⁶	----	5.24 x 10 ⁻⁶	7.78 x 10 ⁻⁶
Dibenzo(a,h)anthracene	----	----	1.54 x 10 ⁻⁶	1.54 x 10 ⁻⁶
Cesium-137	----	----	1.94 x 10 ⁻⁶	1.94 x 10 ⁻⁶
Cobalt-60	----	----	2.17 x 10 ⁻⁶	2.17 x 10 ⁻⁶
Total Cumulative Risk				1.34 x 10 ⁻⁵

---- = not a RCOC for this pathway.

There are no ecological RCOCs or CM RCOCs for the R BPOPs and RUNKs OU.

A risk of 1 x 10⁻⁶ means there is a risk of one additional incident of cancer per one million people.

There are no RCRA-listed or characteristic wastes at the unit. There is no principal threat source material (PTSM) (highly-mobile or highly-toxic source materials that require a bias toward treatment alternatives) at the R BPOPs and RUNKs OU. The contamination is largely isolated by backfill and exposure to RCOCs is limited by land use restrictions. Therefore, the waste is categorized as a low-level threat.

1.3 Remedial Action Overview

As documented in the ROD (WSRC 2002), based upon the characterization data and risk assessments in the RI/BRA (WSRC 2000), the RAOs, and the evaluation of alternatives, the selected remedy for the R BPOPs and RUNKs OU is Alternative 2: Institutional Controls.

The post-remedial action (RA) conceptual site model (see Attachment B-1) shows the broken pathways and the remaining residual risk to the future industrial worker.

According to the SRS Future Use Project Report (USDOE 1996), residential use of SRS land should be prohibited.

2.0 LAND USE CONTROLS

Considering the residual risk mentioned above, the land use control objectives are to

- maintain the use of the site for industrial activities only and
- prevent unauthorized access, contact, removal and excavation of buried RCOCs exceeding remedial goals at the closed CERCLA unit as long as the waste remains a threat to human health or the environment.

Current access controls and deed notification needed to maintain the future land use are described in the following sections of this LUCIP.

2.1 Access Controls

2.1.1 On-Site Workers

In accordance with WSRC 1D, *Site Infrastructure and Services Manual*, Procedure 3.02, "Site Real Property Configuration Control," use of all lands and waters on SRS shall be

coordinated via the Site Use Program. All employees, contractors, and visitors to the SRS must adhere with the requirements of the Site Use Program. This program ensures that all work performed on the SRS that adds, modifies, or removes features portrayed on the SRS development maps is authorized. No use of land (i.e., excavation or any other land use) shall be undertaken without prior approval documented by a Site Use Permit. This authorization is obtained through the completion of a Site Clearance Request Form. Also, in accordance with Procedure 3.02, all work at SRS that adds to or modifies features or facilities portrayed on SRS development maps (i.e., plot plans of facilities/utilities at SRS) will be authorized by a Site Clearance Permit before any excavation activities are conducted. All site clearance requests will be reviewed to verify that either an approved Site Use Permit has been obtained or that an existing Site Use Permit has sanctioned the request.

SRS, specifically the Site Development, Planning, and Mapping Department, is responsible for updating, maintaining, and reviewing site maps, including FFA (1993) operable unit (OU) identifications. If a site clearance request is made that may impact an FFA OU, the Site Clearance Request Form is sent to the FFA OU reviewer, who is in the Soil and Groundwater Closure Projects (SGCP), for either approval or disapproval. The roles and responsibilities of each individual are detailed in WSRC 1D, Procedure 3.02. Verification of USDOE approval for intended land use must be obtained before issuance of a Site Clearance Permit. The site use and site clearance processes are applicable to all activities and personnel on site (including subcontractors).

The processes are controlled within the SRS Quality Assurance (QA) Program. The SRS QA program is the governing QA program for all SRS activities, including those in SGCP. The activities that are performed in SGCP must comply with SRS QA Program procedures as well as with SGCP -specific procedures.

SRS identifies all buildings and facilities on maps used in the Site Use/Site Clearance Program. This waste unit is identified on these maps as a CERCLA facility.

Any work proposed in these areas will be strictly controlled and workers will be appropriately trained and briefed about health and safety requirements if work is deemed necessary for maintenance. No major change in land use or excavation at the R BPOPs and RUNKs OU shall be undertaken without USEPA and SCDHEC approval. To prevent unknowing entry and to ensure that unrestricted use of the waste unit does not occur while under ownership of the government, access control warning signs will be posted at the unit. The warning signs will be legible from a distance of at least 25 feet and will read as shown in Attachment B-2, which depicts a drawing of a typical access control warning sign. Custodial responsibilities for maintenance and inspection of the R BPOPs and RUNKs OU will be maintained by the Post-Closure Maintenance Group within SGCP.

2.1.2 *Trespassers*

While under the ownership of USDOE, access control of the entire SRS will be maintained in accordance with the 1992 RCRA Part B Permit Renewal Application, Volume I, Section F.1. This section describes the 24-hour surveillance system (R.61-79.264.14(b)(1)), artificial or natural barriers (R.61-79.264.14(b)(2)(I)), control entry systems (R.61-79.264.14(b)(2)(ii)), and warning signs (R.61-79.264.14(c)) in place at the SRS boundary to comply with the security requirements for a RCRA-permitted facility.

2.2 LUCIP Deed Notification

In the long-term, if the property is ever transferred to non-federal ownership, the US Government will take those actions necessary pursuant to Section 120(h) of CERCLA. Those actions will include a deed notification disclosing former waste management and disposal activities as well as RAs taken on the site. The contract for sale and the deed will contain the notification required by CERCLA Section 120(h).

The deed shall also include deed restrictions precluding residential use of the property. However, the need for these deed restrictions may be re-evaluated at the time of transfer in the event that exposure assumptions differ and/or the residual contamination no longer poses an unacceptable risk under residential use. Any re-evaluation of the need for the deed restrictions will be done through an amended ROD with USEPA and SCDHEC review and approval.

In addition, if the site is ever transferred to non-federal ownership, a survey plat of the OU will be certified by a professional land surveyor and recorded with the appropriate county recording agency.

Note: Survey Plat (Attachment B-3), and the line marked "AREA SUBJECT TO LAND USE CONTROLS" define the area subject to Land Use Controls. The OU boundary is delineated by survey markers.

2.3 Field Walkdown and Maintenance for Institutional Controls

After the remediation of the R BPOPs and RUNKs OU, only maintenance activities will be required per this RA.

The USEPA and SCDHEC will be notified of the results of any events and/or actions that indicate some potential compromise of institutional controls within 30 days of identification. The events/actions will be documented in the FFA Annual Progress Report. All other routine maintenance activities will be documented and maintained in files subject to USEPA and SCDHEC review and audit. A copy of the complete inspection form is maintained in the SGCP Administrative Record Files. The land use controls will be implemented as long as the waste remains a threat to human health or the environment.

Site maintenance will consist of inspections of the OU and maintenance of existing drainage features to minimize the formation of large gullies. Minor earthwork will be

performed as needed to repair any erosion damage that may occur. No grading or construction of new drainage features is anticipated to be needed. Site maintenance will also include mowing of the existing cleared areas of OU. Trees will be removed as necessary to facilitate mowing. Site maintenance will ensure that site conditions for which the remedial action has been implemented do not change. Site maintenance and inspections will be performed annually.

Administrative controls (land use restrictions) will be implemented to restrict human exposure to contaminants remaining at the unit. Access controls will include security measures such as posting and maintenance of warning signs. To prevent unknowing entry and to ensure that unrestricted use of the waste unit does not occur while under ownership of the government, warning signs will be posted at each entrance to the restricted portion of the unit. Signs will be legible from a distance of at least 25 ft.

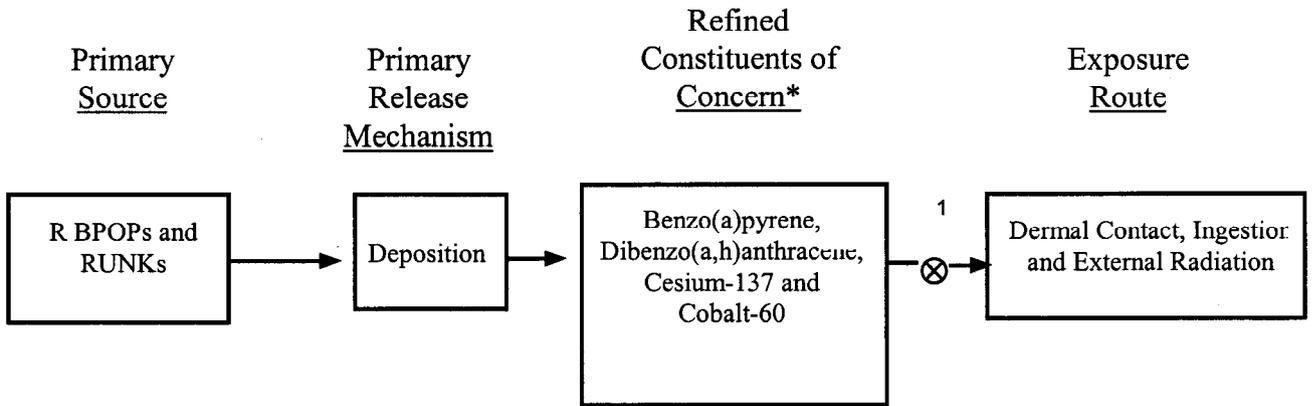
As required by the National Oil and Hazardous Substance Contingency Plan (NCP), statutory 5-year reviews of the RA for the R BPOP and RUNKs OU will be performed as long as the waste remains a threat to human health or the environment.

The waste site inspectors are to be trained in Hazardous Waste Operations and Emergency Response (i.e. HAZWOPER), RCRA Well Inspections (SGCP-specific training), SGCP RCRA Waste Unit Inspections, Radiological Workers, etc., as applicable for the specific inspection. They will also be trained based on the individual requirements of the regulatory approved closure documents for each waste unit. In addition, the inspectors are to attend yearly refresher courses. Over the years, different personnel will conduct the inspections and grass cutting operations.

This unit-specific LUCIP, including the inspection checklist (Attachment B-4), will be appended to the SRS LUCAP. If the OU is ever transferred to non-federal ownership, a survey plat of the area, prepared by a certified professional land surveyor, will be recorded with the county recording agency.

ATTACHMENT B-1

CONCEPTUAL SITE MODEL FOR THE R-AREA BPOPs AND RUNKs
POST-REMEDIAL ACTION



Legend
⊗ Pathway break
Remedial Alternative:
(1) Institutional Controls
*Based on industrial worker scenario
(found in soil at depths of 0 to 1 ft)

ATTACHMENT B-2
ACCESS CONTROL WARNING SIGNS

R-Area Bingham Pump Outage Pits (643-8G, 643-9G, and 643-10G)

and R-Area Unknown Pits #1, #2, and #3 (RUNKs -1, -2, -3)

DANGER UNAUTHORIZED PERSONNEL

KEEP OUT

This Waste Unit Was Used To Manage Waste Materials/Hazardous Substances
(Radioactively Contaminated Construction Material).

Do Not Dig or Excavate.

Do Not Enter Without Contacting the Waste Site Custodian.

CUSTODIAN: MANAGER, POST CLOSURE MAINTENANCE

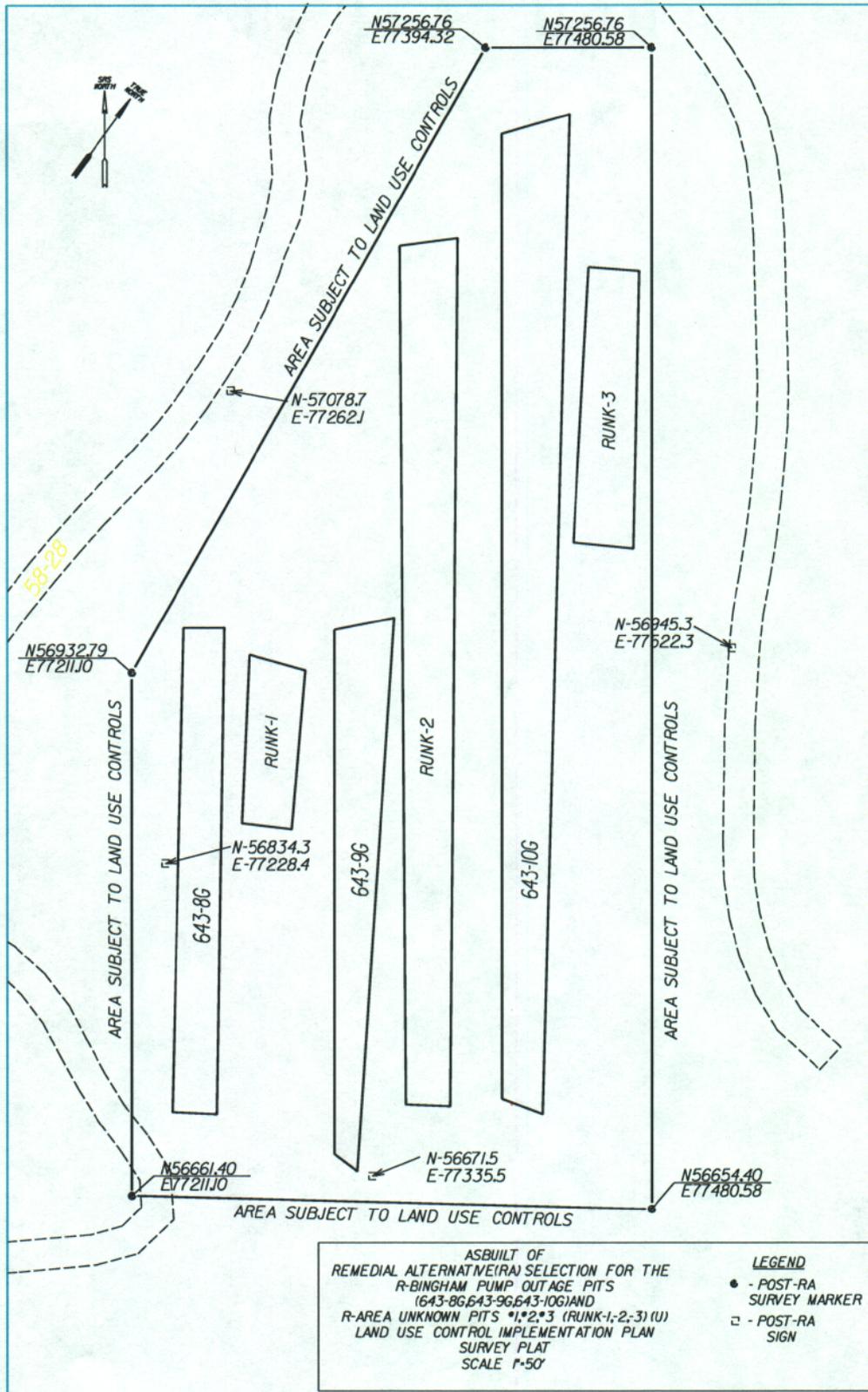
Phone: (803) 952-6882

ATTACHMENT B-3

SURVEY PLAT

LAND USE CONTROL

IMPLEMENTATION PLAN SURVEY PLAT



ATTACHMENT B-4

SGCP FIELD INSPECTION CHECKLIST

for the

R-AREA BINGHAM PUMP OUTAGE PITS (643-8G, 643-9G, and 643-10G)

and

R-Area Unknown Pits #1, #2, and #3 (RUNKs 1, 2, and 3)

SGCP ANNUAL INSPECTION DATA SHEET
for R-AREA BPOPs and RUNKs OU

A = Satisfactory X = Unsatisfactory (Explanation Required)	A or X	Comments or Corrective Action Taken (See Maintenance Register for Corrected Items)
Verify there is no unauthorized digging; excavation, or construction activities within the OU.		
Verify that roads are accessible.		
Verify that the waste unit signs are in acceptable condition, have the correct information, and they are legible from at least 25 feet.		
Mow vegetation (and remove trees to facilitate mowing) within the existing cleared area.		
Maintain existing drainage features to minimize the formation of large gullies (i.e. 3 ft. wide and 1 ft. deep). Minor earthwork will be performed as needed to repair any erosion damage that may occur. No grading or construction of new drainage features is needed.		
Comments:		

Inspected By: _____ / _____ Date/Time: _____ / _____
(Print Name) (Signature)

Reviewed By
Post-Closure Manager: _____ / _____ Date/Time: _____ / _____
(or designee) (Print Name) (Signature)

CAUTION: The inspector shall notify the PCM and ECA **IMMEDIATELY** if there has been a breach or compromise of the institutional controls of this waste unit. Refer to post-closure inspection procedures.

LUCIP for the
SRL Seepage Basins, 904-51G1, -53G3, -54G, and -55G

Appendix A of Corrective Measures Implementation Report/Post-Construction Report/
Final Remediation Report for the SRL Seepage Basins, 904-51G1, -53G3, -54G, & -55G

WSRC-RP-2001-4123, Revision.1, February 2002

NOTE: The Westinghouse Savannah River Company (WSRC) and Department of Energy (DOE) organizations responsible for environmental restoration at the Savannah River Site underwent name changes in 2003, as shown below. The responsibilities as outlined in the following document did not change.

Organization	Previous Name	Current Name
WSRC	Environmental Restoration Division (ERD)	Soils and Groundwater Closure Projects (SGCP)
DOE	Environmental Restoration Division (ERD)	Soil and Groundwater Project (SGP)

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APPENDIX A
UNIT-SPECIFIC LAND USE CONTROL IMPLEMENTATION PLAN FOR
SRL SEEPAGE BASINS INCLUDING SRLSB SURVEY PLAT

The SRL Seepage Basin (SRLSB) Land Use Control Implementation Plan (LUCIP) will be appended to the Savannah River Site (SRS) Land Use Control Assurance Plan (LUCAP). SRS is responsible for implementing the land use controls (LUCs) (e.g., inspections, maintenance, etc.) outlined in this unit-specific LUCIP.

1.0 REMEDY SELECTION

The SRLSB unit consists of four unlined basins that received low-level radioactive wastewater from SRL until 1982. Basins 1 and 2 were placed in operation in 1954, and Basins 3 and 4 were added in 1958 and 1960, respectively. The basins were used from 1954 to 1982 to dispose of low-level radioactive liquid waste generated in the laboratories located in Buildings 735-A and 773-A. Waste was transferred from the laboratories to the basins via a 900-foot long, 10-inch diameter, clay, process sewer line pipe.

Characterization of the SRLSB revealed that the highest concentrations of contaminants and the contaminants with the highest potential risk were primarily restricted to surface and subsurface soils within the unit. It was determined that the SRLSB does not represent a source of contamination to groundwater.

The remedy for the SRLSB was excavation and off-SRS disposal of all principal threat source material, soil above the 1×10^{-3} industrial worker health risk level. The remedy entailed the following actions:

- a) Excavation of approximately 4 feet of soil from the bottom and 1 foot of soil from the berms of Basin 1
- b) Excavation of approximately 5 feet of soil from the bottom and approximately 1 foot from the berms of Basin 2
- c) Excavation of approximately 1 foot from the bottom and berms of Basin 3
- d) No soil was removed from Basin 4

- e) Removal of the process sewer pipeline and associated soils from Basin 1 to the first manhole
- f) Backfill of all four basins and the process sewer trench with clean soil. The soil cover was then vegetated to prevent erosion. The depth of the clean soil is nominally between 9 to 19 feet
- g) Transportation and disposal of all excavated soil and the pipeline to Envirocare of Utah, Inc., an approved, licensed, off-SRS low-level waste disposal facility

According to the *Savannah River Site Future Use Project Report* (USDOE 1996), “residential uses of SRS land should be prohibited”. The Conceptual Site Model (CSM), Figure A-1, was revised to reflect the implementation of the remedy. Since it shows some remaining residual risk that would preclude unrestricted land use, LUCs are needed to maintain the future land use (industrial) and to ensure continued protection of human health and the environment. The LUCs were developed based on there being some residual risk remaining and that the residual risk is located 10 to 14 feet below the final grade.

2.0 LAND USE CONTROLS

For SRLSB, the LUC objective necessary to ensure protectiveness of the remedy is:

Controlled access to the SRLSB unit in accordance with the current site use/site clearance programs, including signs posted in the area to indicate that soil beneath the unit has been contaminated with radionuclides

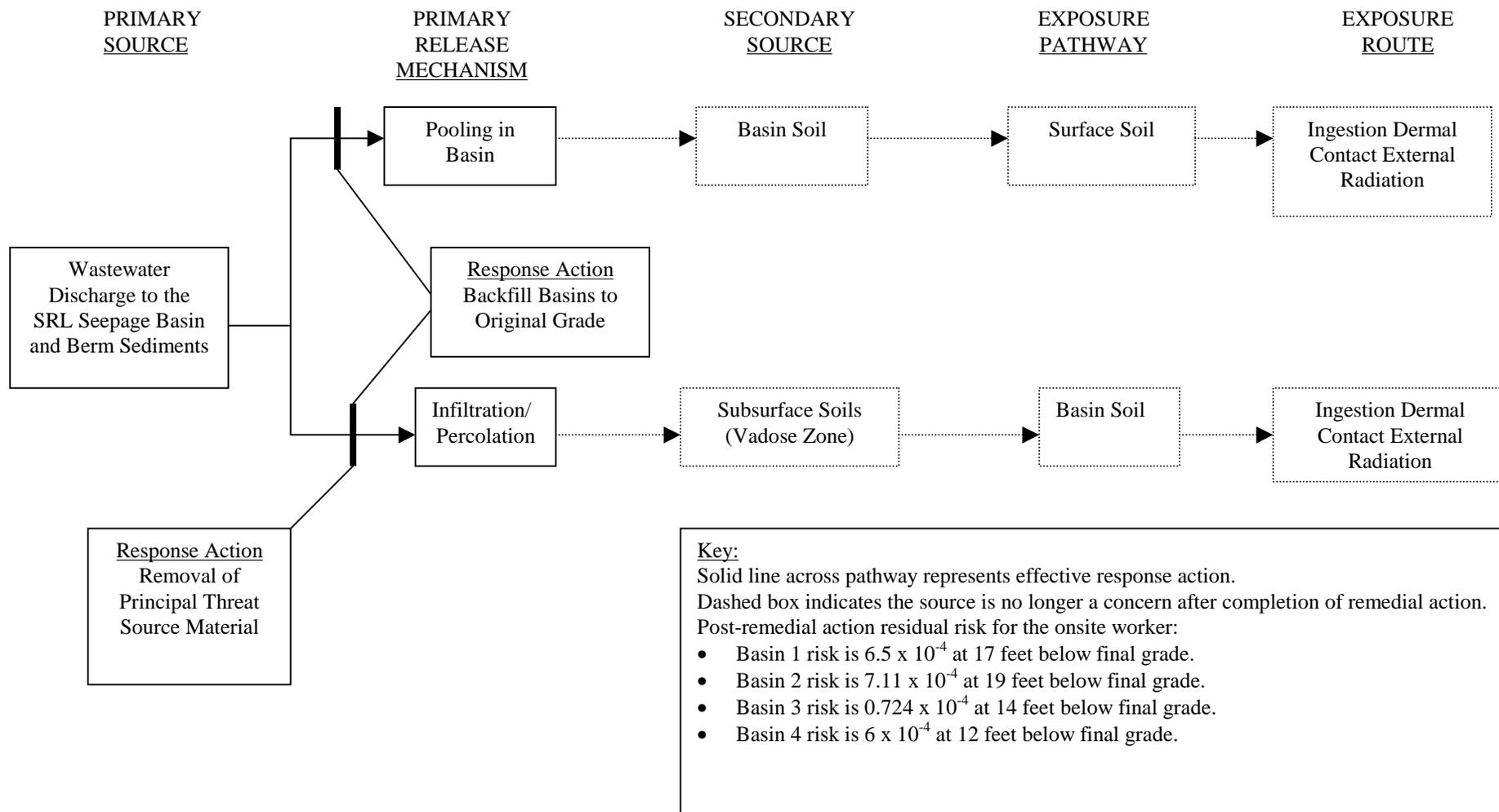


Figure A-1. Conceptual Site Model for the SRL Seepage Basin

The elements of the institutional control corrective action, which consists of land restrictions without any engineering controls, are composed of deed notifications when the parcel is transferred from federal ownership (Section 2.1), access controls that include posting of identification signs (Section 2.2), and field walkdowns for general site conditions (Section 2.3). These LUCs will be implemented in perpetuity for this operable unit.

Each element of the institutional controls corrective action is discussed below.

2.1 Deed Notification

A deed notification shall be filed in the appropriate county records in accordance with CERCLA 120(h), which requires the government to create a deed when land on which any hazardous substance was stored, released, or disposed is transferred to non-federal ownership. In the event the property is transferred, a deed notification will be filed with Aiken County. Per CERCLA 120(h)(3)(A), the deed shall contain, to the extent practical, such information as is available based on the complete search of agency files, including the following:

- A notice of the type and quantity of such hazardous substances;
- Notice of the time at which such storage, release, or disposal took place;
- A description of the remedial action taken, if any.

Per CERCLA 120(h)(3)(B), the deed shall also contain a covenant warranting that

- All remedial action necessary to protect human health and the environment with respect to any such substance remaining on the property has been taken before the date of such transfer.
- Any additional remedial action found to be necessary after the date of such transfer shall be conducted by the United States Government.

- A clause granting the United States Government access to the property in any case in which remedial action or corrective action is found to be necessary after the date of such transfer.

RCRA permit requirements are applicable for this waste unit per the SRS Federal Facility Agreement, Appendix C.

2.2 Access Controls

2.2.1 On-Site Workers

In accordance with WSRC 1D, *Site Infrastructure and Services Manual*, Procedure 3.02, *Site Real Property Configuration Control*, use of all lands and waters on the SRS shall be coordinated via the Site Use Program. No use of land (i.e., excavation or any other land use) shall be undertaken without prior approval documented by a Site Use Permit. Also, in accordance with Procedure 3.02, all work at SRS that adds to or modifies features or facilities portrayed on the SRS development maps (i.e., plot plans of facilities/utilities at SRS) is authorized by a Site Clearance Permit before any excavation activities. All Site Clearance requests are reviewed to verify that either an approved Site Use Permit has been obtained or that an existing Site Use Permit has sanctioned the request. Verification of USDOE approval for intended land use must be obtained before issuance of a Site Clearance Permit. The Site Use and Site Clearance processes are applicable to all activities and personnel on site (including subcontractors). The processes are controlled within the SRS Quality Assurance Program.

The SRS identifies all buildings and facilities on maps used in the Site Use/Site Clearance Program and includes a 200-foot buffer zone around each facility. This waste unit is identified on these maps as a CERCLA facility.

Any work proposed in these areas will be strictly controlled and workers will be appropriately trained and briefed about health and safety requirements if work is deemed necessary for maintenance. Any changes in the use or disturbance of the SRLSB will be cleared with the USEPA and SCDHEC before disturbance occurs.

To prevent unknowing entry and to ensure that unrestricted use of the waste unit does not occur while under ownership of the government, identification signs will be posted at the unit. The signs will be legible from a distance of at least 25 feet and located around the basin as shown on the SRLSB Remediation Grading Plan As-Built (U) (SK-C-5388, Attachment 2 of this LUCIP). Also provided in this LUCIP is the SRLSB Survey Plat (Attachment 3) which shows only the boundary signs.

The signs will read:

SRL Seepage Basins (904-53G (1&2), -54G, and -55G)
“Danger – Unauthorized Personnel Keep Out. This unit was used to manage hazardous substances. Do not dig or excavate. Do not enter without contacting the waste site custodian.”
Custodian: Manager, Post Closure Maintenance
Phone: (803) 952-6882

2.2.2 *Trespassers*

Additionally, while under the ownership of the USDOE, access control of the entire SRS will continue to be maintained in accordance with the 1992 RCRA Part B Permit Renewal Application, Volume I, Section F.1. This section describes the 24-hour surveillance system (R.61-79.264.14(b)(1)), artificial or natural barriers (R.61-79.264.14(b)(2)(i)), control entry systems (R.61-79.264.14(b)(2)(ii)), and warning signs (R.61-79.264.14(c)) in place at the SRS boundary to comply with the security requirements for a RCRA-permitted facility.

2.3 **Field Walkdowns and Maintenance for Institutional Controls**

Monitoring will be performed to verify that LUCIP requirements are being met. Based on the amount of fill placed (9 to 19 feet), that the basins (holes) have been backfilled with clean soils, and the surrounding area being virgin, wooded and well established, once vegetation is established on the backfilled basins, erosion to depths that would expose the residual is not expected. Based on this, annual monitoring of the SRLSB OU will be conducted. These inspections will look for items such as accuracy and legibility of signs, visible subsidence or erosion of the

waste unit, proper vegetative growth, etc. Subsidence or erosion will be corrected by backfilling the affected area with clean soil and seeding the area to prevent further erosion. The results of any events and/or action that could indicate some potential compromise of institutional controls will be documented in the Federal Facility Agreement Annual Progress Report. All other routine maintenance activities will be documented and maintained in files that are subject to USEPA and SCDHEC review and audit. A copy of the completed inspection form is maintained in the Environmental Restoration Division administrative record files.

Inspections at the SRLSB will be performed to ensure that institutional controls remain protective and consistent with all remedial action objectives. Annual inspections will be conducted. The SRL Seepage Basins (904-53G (1 & 2), -54G, and -55G) Inspection Sheet is included in Attachment 1 of this LUCIP.

ATTACHMENT 1
SRL SEEPAGE BASINS INSPECTION SHEET
SRL SEEPAGE BASINS (904-53G (1 & 2), -54G, and -55G) INSPECTION SHEET

A = Satisfactory X = Unsatisfactory (Comments required)	A or X	Comments of Corrective Action Taken (See Maintenance Register for Corrected Items)
Check for potential encroachments (Ensure that there is no building on the site).		
Does the site have brush or woody vegetation that needs cutting and disposal?		
Does the site need to have the grass cut?		
Verify that the roads are accessible.		
Verify that the waste unit's signs are correct and legible.		
Does the site show signs of erosion or subsidence? Are there any signs of burrowing animals (holes)?		
Does the site have adequate vegetative cover?		
Check the integrity of drainage ditches (around the area) for the presence of excessive erosion, sediment buildup, and any debris restricting water flow.		
Does the site need general cleanup (housekeeping)?		

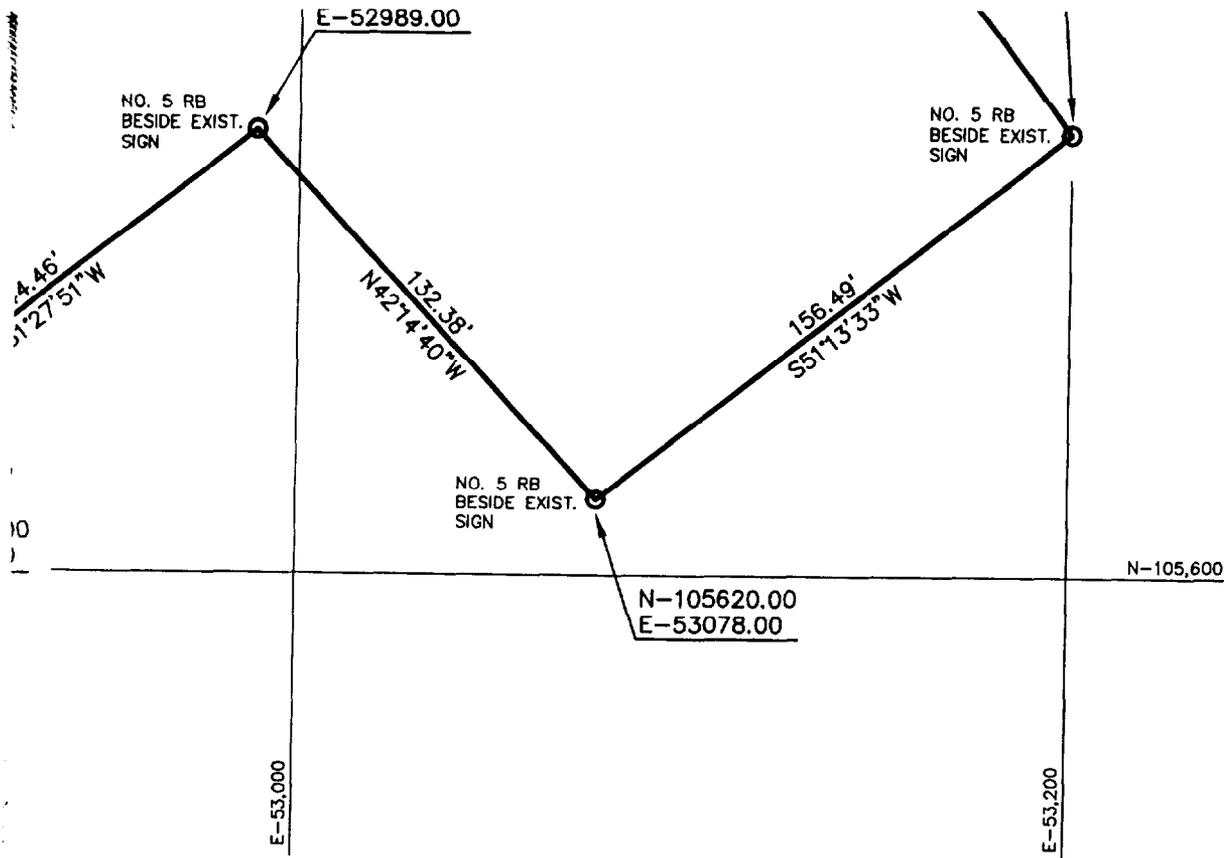
Inspected By: _____ / _____ Date/Time: _____ / _____
 (Print Name) (Signature)

Post Closure Manager: _____ / _____ Date/Time: _____ / _____
 (Print Name) (Signature)

Note: USEPA and SCDHEC must be notified within 30 days of identification of any area where any breach or compromise of restrictions place on this institutional control operable unit has occurred

ATTACHMENT 2

ATTACHMENT 3



BOUNDARY SURVEY

OF

SRL SEEPAGE BASIN AREA

PROPERTY LOCATED AT SAVANNAH RIVER SITE

PREPARED FOR

ESTINGHOUSE SAVANNAH RIVER COMPANY

BUILDING 730-2B RM. 3007 AIKEN, S. C. 29808

C/O MARK CRIST (803)952-6021

OF: AIKEN STATE OF: S. CAROLINA

SCALE: 1" = 50' DWN. BY: JMB DATE: 25 JULY 2001

PREPARED BY

John M. Bailey & Associates, P.C.

PROFESSIONAL LAND SURVEYORS
110 WILDE DRIVE, BELVEDERE, S.C. 29841
(803)278-0721

**Attachment 3
SRLSB Survey Plat**

APPENDIX C

MAPS AND TABLES OF WASTE UNITS WITHIN EACH WATERSHED

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Figure C- 1. Fourmile Branch Watershed Waste Units

The information on Figure 2 and Figure C – 1 has been combined on one figure.

Please see Figure 2, located on page 4 of 24.

Table C- 1 Fourmile Branch Watershed Waste Units

Unit No.	Unit Name
1	TANK 105-C HAZARDOUS WASTE MANAGEMENT FACILITY
3	F-AREA HAZARDOUS WASTE MANAGEMENT FACILITY (F-AREA SEEPAGE BASIN, 904-41G)
4	F-AREA HAZARDOUS WASTE MANAGEMENT FACILITY (F-AREA SEEPAGE BASIN, 904-42G)
5	F-AREA HAZARDOUS WASTE MANAGEMENT FACILITY (F-AREA SEEPAGE BASIN, 904-43G)
6	H-AREA ACID/CAUSTIC BASIN, 904-75G
7	H-AREA HAZARDOUS WASTE MANAGEMENT FACILITY (H-AREA SEEPAGE BASIN, 904-44G)
8	H-AREA HAZARDOUS WASTE MANAGEMENT FACILITY (H-AREA SEEPAGE BASIN, 904-46G)
9	H-AREA HAZARDOUS WASTE MANAGEMENT FACILITY (H-AREA SEEPAGE BASIN, 904-45G)
10	H-AREA HAZARDOUS WASTE MANAGEMENT FACILITY (H-AREA SEEPAGE BASIN, 904-56G)
<i>18^a</i>	<i>OLD RADIOACTIVE WASTE BURIAL GROUND (INCLUDING SOLVENT TANKS 650-01E-22E) 643-E</i>
19	F & H-AREA HAZARDOUS WASTE MANAGEMENT FACILITIES (GROUNDWATER)
<i>27^a</i>	<i>WARNER'S POND, 685-23G</i>
<i>28^a</i>	<i>H-AREA RETENTION BASIN, 281-3H</i>
<i>29^a</i>	<i>HP-52 PONDS, NBN</i>
43	211-FB PU-239 RELEASE, 081-F
51	C-AREA BURNING/RUBBLE PIT, 131-C
<i>53^a</i>	<i>C-AREA REACTOR SEEPAGE BASINS, 904-066G</i>
<i>54^a</i>	<i>C-AREA REACTOR SEEPAGE BASINS, 904-067G</i>
<i>55^a</i>	<i>C-AREA REACTOR SEEPAGE BASINS, 904-068G</i>
57	CENTRAL SHOPS BURNING/RUBBLE PIT, 631-5G
<i>58^a</i>	<i>CENTRAL SHOPS BURNING/RUBBLE PIT, 631-1G</i>
<i>59^a</i>	<i>CENTRAL SHOPS BURNING/RUBBLE PIT, 631-3G</i>
<i>73^a</i>	<i>F-AREA RETENTION BASIN, 281-3F</i>
80	H-AREA HAZARDOUS WASTE MANAGEMENT FACILITY (H-AREA INACTIVE PROCESS SEWER LINE 081-H)
82	HYDROFLUORIC ACID SPILL, 631-4G
103	MIXED WASTE MANAGEMENT FACILITY (GROUNDWATER)
125	ROAD A CHEMICAL BASIN, 904-111G
132	SRL OIL TEST SITE, 080-16G
146	C-AREA REACTOR GROUNDWATER
210	C-AREA ASH PILE, 188-0C
225	SPILL ON 02/01/57 OF UNKNOWN OF SEEPAGE BASIN PIPE LEAK FROM 904-44G, NBN
239	ARSENIC TREATED WOOD STORAGE AREA, NBN
240	C-AREA DISASSEMBLY BASIN, 105-C
242	C-AREA REACTOR COOLING WATER SYSTEM, 186/190-C
244	CENTRAL SHOPS SCRAP LUMBER PILE, 631-2G
261	COMBINED SPILLS FROM 241-84H, NBN
262	COMBINED SPILLS FROM 241-H, NBN
263	COMBINED SPILLS FROM 242-F, NBN

Unit No.	Unit Name
264	COMBINED SPILLS FROM 242-H, NBN
266	COMBINED SPILLS FROM 643-G, NBN
274	DITCH TO OUTFALL H-13 (TRIBUTARY TO FOURMILE CREEK), NBN
275	DIVERSION BOX - RADIOACTIVITY FROM 907-1H, NBN
277	F-AREA ASH BASIN, 288-1F
280	F-AREA RETENTION BASIN, 281-08F
283	F-AREA TANK FARM, 241-F
285	H-AREA ACID/CAUSTIC BASIN (GROUNDWATER)
292	H-AREA ASH BASIN, 288-0H
293	H-AREA RETENTION BASIN, 281-08H
298	H-AREA TANK FARM, 241-H
309	MISCELLANEOUS RUBBLE PILE, 631-7G
311	NEW SALVAGE YARD, 741-G
332	SPILL ON 10/07/85 OF 20,000 GALLONS OF CONTAMINATED WATER FROM 244-H, NBN
345	SANDBLAST AREA CMH-003, NBN
348	SANDBLAST AREA CMH-004, NBN
354	SANDBLAST AREA CMN-001, NBN
375	SPILL ON 01/19/80 OF UNKNOWN OF CHROMATED WATER FROM H-AREA PUMP HOUSE, NBN
376	SPILL ON 01/19/83 OF 1000 FT2 OF RADIOACTIVE SPILL
380	SPILL ON 10/01/71 OF 100 SQ FT OF FLUSH WATER - RAD, NBN
381	SPILL ON 10/16/81 OF 30 GAL OF LOW LEVEL WASTE FROM TRAILER, NBN
383	SPILL ON 11/10/81 OF 500 GAL OF CHROMATED WATER FROM 243-H, NBN
386	SPILL ON 11/24/89 OF 10 MCI OF CS - 137 FROM 254-8H, NBN
390	SPILL ON 02/01/69 OF UNKNOWN OF WASTE TANK SPILL, NBN
398	SPILL ON 02/08/78 OF UNKNOWN OF H-AREA PROCESS SEWER LINE CAVE-IN, NBN
399	SPILL ON 03/01/66 OF 500 SQ FT OF FLUSH WATER - RAD, NBN
403	SPILL ON 03/28/87 OF <15000 GAL OF CHROMATED WATER FROM 241-24H, NBN
405	SPILL ON 03/08/78 OF UNKNOWN OF SEEPAGE BASIN PIPE LEAK IN H-AREA SEEPAGE BASIN
411	SPILL ON 04/14/81 OF 3 GAL OF CONTAMINATED FLUSH WATER, NBN
412	SPILL ON 04/18/80 OF UNKNOWN OF CHROMATED WATER FROM VALVE HOUSE 3, NBN
417	SPILL ON 05/01/56 OF UNKNOWN OF RETENTION BASIN PIPE LEAK, NBN
418	SPILL ON 05/01/71 OF UNKNOWN OF SEEPAGE BASIN PIPE LEAK, NBN
423	SPILL ON 05/02/85 OF 10 GAL OF COOLING WATER FROM TANK FARM, NBN
431	SPILL ON 05/28/81 OF 9000 GAL OF CHROMATED WATER, NBN
432	SPILL ON 05/30/78 OF UNKNOWN OF SUMP OVERFLOW, NBN
438	SPILL ON 06/26/75 OF 250 CU FT OF RAD CONTAMINATED SOIL, NBN
442	SPILL ON 06/06/79 OF <1 GAL OF CONTAMINATED LIQUID, NBN
459	STORMWATER OUTFALL H-013, NBN
475	C AREA: C-AREA REACTOR AREA CASK CAR RAILROAD TRACKS AS ABANDONED, NBN
489	C-AREA ASH PILE OFF POWERLINE ROAD, NBN
490	SPILL ON 04/57 OF RAD LIQUID FROM SOLVENT TRAILER, NBN
499	CENTRAL SHOPS OPEN DISPOSAL TRENCH
502	HEAVY EQUIPMENT WASH BASIN
511	C-AREA REACTOR DISCHARGE CANAL, NBN

Unit No.	Unit Name
522	ECODS C-1 (NEAR C-AREA REACTOR DISCHARGE CANAL)
531	ECODS H-1 (WEST OF MAIN H-AREA FACILITIES)
545	ECODS N-2 (ADJACENT TO MISCELLANEOUS RUBBLE PILE, 631-7G)
554	H-AREA PROCESS SEWER LINES AS ABANDONED, NBN
555	C-AREA PROCESS SEWER LINES AS ABANDONED, NBN
565	N-AREA PROCESS SEWER LINES AS ABANDONED, NBN
566	OLD C-AREA BURNING/RUBBLE PIT, NBN

^a – land use controls/institutional controls are part of the selected remedy

Figure C- 2. Lower Three Runs Watershed

**The information on Figure 3 and Figure C – 2 has been combined on one figure.
Please see Figure 3, located on page 6 of 24.**

Table C- 2. Lower Three Runs Watershed Waste Units

Unit No.	Unit Name
17	P-AREA ACID/CAUSTIC BASIN, 904-78G
39	GUNSITE 218 RUBBLE PILE, 631-23G
42	108-4R OVERFLOW BASIN, 108-4R
<i>107^a</i>	<i>P-AREA BINGHAM PUMP OUTAGE PIT, 643-4G</i>
110	PAR POND (INCLUDING THE PRE-COOLER PONDS AND CANALS), 685-G
111	PAR POND SLUDGE LAND APPLICATION SITE, 761-5G
112	R-AREA ACID/CAUSTIC BASIN, 904-77G
<i>113^a</i>	<i>R-AREA BINGHAM PUMP OUTAGE PITS, 643-10G</i>
<i>114^a</i>	<i>R-AREA BINGHAM PUMP OUTAGE PITS, 643-8G</i>
<i>115^a</i>	<i>R-AREA BINGHAM PUMP OUTAGE PITS, 643-9G</i>
116	R-AREA BURNING/RUBBLE PITS, 131-1R
117	R-AREA BURNING/RUBBLE PITS, 131-R
118	R-AREA RUBBLE PILE, 631-25G
121	R-AREA REACTOR SEEPAGE BASINS, 904-57G
122	R-AREA REACTOR SEEPAGE BASINS, 904-58G
163	GUNSITE 012 RUBBLE PILE, NBN
230	R-AREA CONCRETE LAKE, 183-1R/186R
231	AREA ON THE NORTH SIDE OF BUILDING 105-R, NBN
271	COOLING WATER EFFLUENT SUMP, 107-R
288	R-AREA GROUNDWATER, NBN
312	OLD R-AREA DISCHARGE CANAL, NBN
316	P-AREA REACTOR COOLING WATER SYSTEM, 186/190-P
324	POTENTIAL RELEASE OF NAOH/H2 SO4 FROM 183-2R, NBN
329	R-AREA ASH BASIN, 188-0R
330	R-AREA DISASSEMBLY BASIN, 105-R
337	RUBBLE PILE ACROSS FROM GUNSITE 012, NBN
478	R REACTOR AREA: R-AREA REACTOR AREA CASK CAR RAILROAD TRACKS AS ABANDONED, NBN
513	RELEASE FROM THE DECONTAMINATION OF R-AREA REACTOR DISASSEMBLY BASIN, NBN
540	ECODS R-1A, -1B, -1C (EAST OF R REACTOR)
544	ECODS G-3 (ADJACENT TO GUNSITE 012, NBN)
546	DUNBARTON RAILROAD YARD, NBN
547	P-AREA COAL PILE, NBN
<i>550^a</i>	<i>R-AREA UNKNOWN PIT #1 (RUNK-1), NBN</i>
<i>551^a</i>	<i>R-AREA UNKNOWN PIT #2 (RUNK-2), NBN</i>
<i>552^a</i>	<i>R-AREA UNKNOWN PIT #3 (RUNK-3), NBN</i>
556	R-AREA PROCESS SEWER LINES AS ABANDONED, NBN
557	P-AREA PROCESS SEWER LINES AS ABANDONED, NBN

^a – land use controls/institutional controls are part of the selected remedy

Figure C- 3. Pen Branch Watershed

The information on Figure 4 and Figure C – 3 has been combined on one figure.

Please see Figure 4, located on page 8 of 24.

Table C- 3. Pen Branch Watershed Waste Units

Unit No.	Unit Name
11	K-AREA ACID/CAUSTIC BASIN, 904-80G
61	CMP PITS, 080-170G
62	CMP PITS, 080-171G
63	CMP PITS, 080-180G
64	CMP PITS, 080-181G
65	CMP PITS, 080-182G
66	CMP PITS, 080-183G
67	CMP PITS, 080-190G
<i>75^a</i>	<i>FORD BUILDING SEEPAGE BASIN, 904-91G</i>
77	G-AREA OIL SEEPAGE BASIN, 761-13G
<i>83^a</i>	<i>K-AREA BINGHAM PUMP OUTAGE PIT, 643-1G</i>
<i>84^a</i>	<i>K-AREA BURNING/RUBBLE PIT, 131-K</i>
<i>87^a</i>	<i>K-AREA REACTOR SEEPAGE BASIN, 904-65G</i>
<i>88^a</i>	<i>K-AREA RUBBLE PILE, 631-20G</i>
89	K-AREA SLUDGE LAND APPLICATION SITE, 761-4G
<i>91^a</i>	<i>L-AREA BINGHAM PUMP OUTAGE PITS, 643-2G</i>
<i>92^a</i>	<i>L-AREA BINGHAM PUMP OUTAGE PITS, 643-3G</i>
99	L-AREA RUBBLE PIT, 131-4L
148	L-AREA ASH BASIN 188-0L
<i>169^a</i>	<i>L-AREA RUBBLE PILE, 131-3L</i>
222	SPILL ON 01/01/57 OF <1 CI OF BETA - GAMMA, NBN
286	K-AREA ACID/CAUSTIC BASIN (GROUNDWATER)
299	K-AREA AREA OF CONCERN, NBN
300	K-AREA ASH BASIN, 188-0K
301	K-AREA DISASSEMBLY BASIN, 105-K
302	K-AREA REACTOR COOLING WATER SYSTEM, 186/190-K
305	L-AREA REACTOR COOLING WATER SYSTEM, 186/190-L
460	K-AREA REACTOR DISCHARGE CANAL, NBN
476	K REACTOR AREA: K-AREA REACTOR AREA CASK CAR RAILROAD TRACKS AS ABANDONED, NBN
503	L-AREA NORTHERN GROUNDWATER
514	COMBINED SPILLS FROM 105-K, 106-K, AND 109-K, NBN
519	K-AREA REACTOR GROUNDWATER (INCLUDING TRITIUM ANOMALY)
525	ECODS N-1 (SOUTH OF N AREA)
532	ECODS K-1 (SOUTHEAST OF FORMER LAYDOWN YARD AT K AREA)
533	ECODS K-2 (NORTHWEST OF K AREA FACILITIES)
534	ECODS K-3 (SOUTHEAST OF K AREA IN FORMER LAYDOWN YARD)

^a – land use controls/institutional controls are part of the selected remedy

Figure C- 4. Savannah River Floodplain Swamp Watershed

**The information on Figure 5 and Figure C – 4 has been combined on one figure.
Please see Figure 5, located on page 10 of 24.**

Table C- 4. Savannah River Floodplain Swamp Watershed Waste Units

Unit No.	Unit Name
25	TNX GROUNDWATER, 082-G
<i>26^a</i>	<i>D-AREA OIL SEEPAGE BASIN, 631-G</i>
<i>32^a</i>	<i>D-AREA BURNING/RUBBLE PITS, 431-ID</i>
<i>33^a</i>	<i>D-AREA BURNING/RUBBLE PITS, 431-D</i>
<i>41^a</i>	<i>SILVERTON ROAD WASTE SITE, 731-3A</i>
68	D-AREA ASH BASIN, 488-D
69	D-AREA COAL PILE RUNOFF BASIN, 489-D
70	D-AREA WASTE OIL FACILITY, 484-D
100	M-AREA SETTLING BASIN INACTIVE PROCESS SEWERS TO MANHOLE 1, 081-M
104	NEW TNX SEEPAGE BASIN, 904-102G
106	OLD TNX SEEPAGE BASIN, 904-076G
127	SPILL ON 01/12/53 OF 1/2 TON OF URANYL NITRATE, NBN
139	TNX BURYING GROUND, 643-5G
211	D-AREA ASBESTOS PIT, 080-20G
229	UNIDENTIFIED TRASH PILE, NBN
238	D-AREA ASH BASIN, 488-1D
265	COMBINED SPILLS FROM 483-D AND ASSOCIATED AREAS, NBN
272	D-AREA ASH BASIN, 488-2D
273	D-AREA RUBBLE PIT, 431-2D
310	NEUTRALIZATION SUMP, 678-T
326	POTENTIAL RELEASE OF TCT, TET TCE, HNO ₃ , U, HEAVY METALS FROM 321-M ABANDONED SEWER LINE, NBN
349	SANDBLAST AREA CMD-002, NBN
352	SANDBLAST AREA CMM-008, NBN
415	SPILL ON 04/25/87 OF 15 GAL OF WATER - RAD, NBN
440	SPILL ON 06/28/84 OF 100 GAL OF CHILLED WATER, NBN
458	STORMWATER OUTFALL A-024, NBN
465	UNDERGROUND SUMP 321 M #001 321-M
466	UNDERGROUND SUMP 321 M #002 321-M
467	X-001 OUTFALL DRAINAGE DITCH, NBN
500	TNX OUTFALL DELTA, LOWER DISCHARGE GULLY, AND SWAMP, NBN
520	D-AREA UPGRADIENT SOURCES
543	ECODS D-1 (NEAR D-AREA RUBBLE PILE, 431-2D)
548	D-AREA ASH BASIN, 488-4D
558	D-AREA PROCESS SEWER LINES AS ABANDONED, NBN
559	TNX-AREA PROCESS SEWER LINES AS ABANDONED, NBN

^a – land use controls/institutional controls are part of the selected remedy

Figure C- 5. Steel Creek Watershed

**The information on Figure 6 and Figure C – 5 has been combined on one figure.
Please see Figure 6, located on page 12 of 24.**

Table C- 5. Steel Creek Watershed Waste Units

Unit No.	Unit Name
<i>94^a</i>	<i>L-AREA HOT SHOP (INCLUDING SANDBLAST AREA CML-003, NBN), 717-G</i>
<i>96^a</i>	<i>L-AREA OIL/CHEMICAL BASIN, 904-83G</i>
98	L-AREA RUBBLE PIT, 131-1L
<i>108^a</i>	<i>P-AREA BURNING/RUBBLE PIT, 131-P</i>
143	P-AREA REACTOR GROUNDWATER
303	L-AREA DISASSEMBLY BASIN, 105-L
<i>306^a</i>	<i>L-AREA REACTOR SEEPAGE BASIN, 904-064G</i>
307	L LAKE, NBN
313	P-AREA ASH BASIN, 188-0P
314	P-AREA DISASSEMBLY BASIN, 105-P
315	P-AREA EROSION CONTROL SITE, 131-1P
<i>317^a</i>	<i>P-AREA REACTOR SEEPAGE BASIN, 904-061G</i>
<i>318^a</i>	<i>P-AREA REACTOR SEEPAGE BASIN, 904-062G</i>
<i>319^a</i>	<i>P-AREA REACTOR SEEPAGE BASIN, 904-063G</i>
391	SPILL ON 02/01/83 OF 50 GAL OF OIL - RAD, NBN
452	SPILL ON 09/21/84 OF 200 GAL OF WATER -RAD, NBN
462	P-AREA REACTOR DISCHARGE CANAL, NBN
477	P REACTOR AREA: P-AREA REACTOR AREA CASK CAR RAILROAD TRACKS AS ABANDONED, NBN
479	L REACTOR AREA: L-AREA REACTOR AREA CASK CAR RAILROAD TRACKS AS ABANDONED, NBN
487	L-AREA SOUTHERN GROUNDWATER, NBN
518	GUN EMPLACEMENT 407A & 407B RUBBLE PILE, NBN
535	ECODS L-1 (EAST OF L AREA)
536	ECODS L-2 (EAST OF L AREA)
537	ECODS L-3 (EAST OF L AREA)
538	ECODS P-1 (SOUTH OF P AREA)
539	ECODS P-2 (SOUTH OF P AREA)
560	L-AREA PROCESS SEWER LINES AS ABANDONED, NBN

^a – land use controls/institutional controls are part of the selected remedy

Figure C- 6. Upper Three Runs Watershed

The information on Figure 7 and Figure C – 6 has been combined on one figure.

Please see Figure 7, located on page 14 of 24.

Table C- 6. Upper Three Runs Watershed Waste Units

Unit No.	Unit Name
2	F-AREA ACID/CAUSTIC BASIN, 904-47G
12	M-AREA HAZARDOUS WASTE MANAGEMENT FACILITY (LOST LAKE)
13	M-AREA HAZARDOUS WASTE MANAGEMENT FACILITY (M-AREA SETTLING BASIN, 904-51G)
15	METALLURGICAL LABORATORY HAZARDOUS MANAGEMENT FACILITY, 904-110G
16	MIXED WASTE MANAGEMENT FACILITY (INCLUDING THE RCRA REGULATED PORTIONS OF LLRWF 643-7E), 643-28E
20	LOW LEVEL RADIOACTIVE WASTE DISPOSAL FACILITY (NON-HAZARDOUS WASTE DISPOSAL PORTION OF 643-7E), 643-7E
21	NON-RADIOACTIVE WASTE DISPOSAL FACILITY (AKA SANITARY LANDFILL RCRA PORTION), 740-G
22	NON-RADIOACTIVE WASTE DISPOSAL FACILITY (AKA SANITARY LANDFILL) (GROUNDWATER), 740-G
23	M-AREA HAZARDOUS WASTE MANAGEMENT FACILITY: A/M AREA GROUNDWATER PORTION, 904-110G
24	SRL GROUNDWATER
<i>34^a</i>	<i>F-AREA BURNING/RUBBLE PITS, 231-1F</i>
<i>35^a</i>	<i>F-AREA BURNING/RUBBLE PITS, 231-2F</i>
<i>36^a</i>	<i>F-AREA BURNING/RUBBLE PITS, 231-F</i>
<i>45^a</i>	<i>A-AREA BURNING/RUBBLE PITS, 731-1A</i>
<i>46^a</i>	<i>A-AREA BURNING/RUBBLE PITS, 731-A</i>
47	A-AREA COAL PILE RUNOFF BASIN, 788-3A
<i>48^a</i>	<i>A-AREA MISCELLANEOUS RUBBLE PILE, 731-6A</i>
<i>49^a</i>	<i>A-AREA RUBBLE PIT, 731-2A</i>
56	M-AREA HAZARDOUS WASTE MANAGEMENT FACILITY (CAROLINA BAY)
72	F-AREA HAZARDOUS WASTE MANAGEMENT FACILITY (F-AREA INACTIVE PROCESS SEWER LINE 081-1F)
79	H-AREA COAL PILE RUNOFF BASIN, 289-H
<i>101^a</i>	<i>MISCELLANEOUS CHEMICAL BASIN, 731-4A</i>
<i>102^a</i>	<i>METALS BURNING PITS, 731-5A</i>
<i>105^a</i>	<i>OLD F-AREA SEEPAGE BASIN, 904-49G</i>
119	R-AREA REACTOR SEEPAGE BASINS, 904-103G
120	R-AREA REACTOR SEEPAGE BASINS, 904-104G
123	R-AREA REACTOR SEEPAGE BASINS, 904-59G
124	R-AREA REACTOR SEEPAGE BASINS, 904-60G
131	SRL 904-A PROCESS TRENCH, 904-A
<i>133^a</i>	<i>SRL SEEPAGE BASINS, 904-53G1</i>
<i>134^a</i>	<i>SRL SEEPAGE BASINS, 904-53G2</i>
<i>135^a</i>	<i>SRL SEEPAGE BASINS, 904-54G</i>
<i>136^a</i>	<i>SRL SEEPAGE BASINS, 904-55G</i>
141	F-AREA INACTIVE PROCESS SEWER LINES FROM BUILDING TO THE SECURITY FENCE, 081-1F
142	H-AREA INACTIVE PROCESS SEWER LINES FROM BUILDING TO THE SECURITY FENCE, 081-H
208	ADVANCED TACTICAL TRAINING AREA (ATTA) FIRING RANGES, NBN
234	313-M AND 320-M INACTIVE CLAY PROCESS SEWERS TO TIMS BRANCH, NBN
236	A-AREA ASH PILE, 788-0A

Unit No.	Unit Name
237	A-AREA ASH PILE, 788-2A
260	COMBINED SPILLS FROM 211-H, NBN
270	COMBINED SPILLS FROM 701-1F SPILL, NBN
276	F-AREA ASH BASIN, 288-0F
279	F-AREA RAILROAD CROSSTIE PILE, NBN
284	F-AREA ACID/CAUSTIC BASIN (GROUNDWATER)
294	H-AREA RETENTION BASIN, 281-1H
295	H-AREA RETENTION BASIN, 281-2H
308	LOW LEVEL RADIOACTIVE DRAIN LINES, 772-F
339	S-AREA EROSION CONTROL SITE, NBN
340	SALVAGE YARD, 740-A
343	SANDBLAST AREA CMF-001, NBN
344	SANDBLAST AREA CMH-001, NBN
346	SANDBLAST AREA CMH-002, NBN
347	SANDBLAST AREA CMM-002, NBN
359	SMALL ARMS TRAINING AREA (SATA), NBN
374	SPILL ON 01/12/87 OF <100 GM OF MERCURY NORTH OF 211-H, NBN
387	SPILL ON 12/01/71 OF 1000 GAL OF RAD WATER FROM 773-A, NBN
394	SPILL ON 02/25/85 OF 20000 CM OF WATER VAPOR - RAD, NBN
414	SPILL ON 04/24/91 OF .11 CI OF PU 239, 772-1F
429	SPILL ON 05/26/88 OF 10 GAL OF ETHYLENE GLYCOL-RAD FROM 772-F, NBN
435	SPILL ON 06/01/59 OF <1 CI OF SEGREGATED SOLVENT FROM 211-F, NBN
436	SPILL ON 06/16/87 OF ~1 GAL OF WATER - RAD, NBN
456	STEED POND, NBN
457	STORMWATER OUTFALL A-002, NBN
480	SANDBLAST AREA CMM-003, NBN
481	A-001 OUTFALL, NBN
483	STORMWATER OUTFALL A-013, NBN
484	M-AREA HAZARDOUS WASTE MANAGEMENT FACILITY: M-AREA VADOSE ZONE, 643-28G
485	COMBINED SPILLS FROM 221-F, NBN
491	SANDBLAST AREA CMB-001, NBN
497	SANDBLAST AREA CMM-001, NBN
512	COMBINED SPILLS FROM 221-H, NBN
517	COMBINED SPILLS NORTH OF BUILDING 105-R, NBN
521	ECODS A-2 (NEAR SANDBLAST AREA CMM-001, NBN)
523	ECODS F-1 (SOUTHEAST OF F-AREA ASH BASIN, 276-0F)
524	ECODS F-3 (EAST OF ECOD F-1)
526	ECODS B-1A, 1B (SOUTH OF B AREA)
527	ECODS B-2 (SOUTH OF B AREA)
528	ECODS B-3 (EAST OF B AREA, SOUTH OF ROAD C)
529	ECODS B-4 (EAST OF B AREA, SOUTH OF ROAD C)
530	ECODS B-5 (ADJACENT TO ECODS B-3)
541	ECODS G-1 (ADJACENT TO GUNSITE 072 RUBBLE PILE, 080-31G)
542	ECODS G-2 (ADJACENT TO FORESTRY FACILITIES)
549	H-AREA GROUNDWATER OPERABLE UNIT

Unit No.	Unit Name
562	A-AREA PROCESS SEWER LINES AS ABANDONED, NBN
563	F-AREA PROCESS SEWER LINES AS ABANDONED, NBN
564	H-AREA PROCESS SEWER LINES AS ABANDONED, NBN

^a – land use controls/institutional controls are part of the selected remedy

APPENDIX D

**SAMPLE LAND USE CONTROL LANGUAGE FOR INCLUSION IN DECISION
DOCUMENTS**

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The following language is intended as sample language to be considered for inclusion in decision documents (e.g., proposed plans, records of decision) that have land use controls as part of the final selected remedy. This language may be modified as necessary for waste unit specific requirements.

This language should be considered for inclusion in the Executive Summary, The Preferred Alternative, and the Post-ROD Document Schedule sections of proposed plans and in the Declaration (Description of the Selected Remedy), The Selected Remedy, and the Post-ROD Document Schedule sections of records of decision, as indicated below.

Proposed Plan Executive Summary and The Preferred Alternative and Record of Decision Declaration (Description of the Selected Remedy)

Based upon the investigation, the remedial action objectives are to (*note: this list is just for sample purposes only and should be modified to meet waste unit specific requirements*):

- reduce the risk to human health and the environment and
- achieve remedial goals for soil

The LUC objective(s) necessary to ensure the protectiveness of the preferred alternative is (*note: this list is just for sample purposes only and should be modified to meet waste unit specific requirements*):

- prevent contact, removal, or excavation of buried waste in the area;
- preclude residential use of the area; and
- prevent unauthorized access to contaminated groundwater in the area.

Record of Decision The Selected Remedy Section Language

The (insert waste unit name) is in an (industrial or residential – choose one) zone as identified on the Proposed SRS Future Land Use Map of the *SRS FFA Implementation Plan* (FFA, 1993) for both current and anticipated future land use. However, USDOE has recommended that residential use of SRS land in the vicinity of the (insert area name (i.e., A Area, P Area, etc.) be controlled; therefore, future residential use, potential residential water usage, and other controls will be taken to ensure long-term protectiveness. Institutional controls will restrict the (insert waste unit name) to future industrial use and will prohibit residential use of the area. Unauthorized excavation will also be prohibited and the waste unit will remain undisturbed. Institutional Controls will be maintained until such time that they are deemed unnecessary.

In accordance with the USEPA Region-IV Land Use Controls (LUCs) Policy, a LUC Assurance Plan (LUCAP) for the SRS has been developed and approved by the USEPA and the SCDHEC. Based upon the results of the (insert waste unit name) [baseline risk assessment, or the presence of buried source material that constitutes a leachability threat, or to prevent the excavation of buried source material – choose as applicable] the selected remedial alternative for this operable unit incorporates LUCs and therefore, a LUC Implementation Plan (LUCIP) for the (insert waste unit name) will be developed and

submitted to the regulators for approval. The unit-specific LUCIP will be submitted with the (insert the name of the post-ROD document that the LUCIP will be submitted with) in accordance with the post-ROD document schedule provided in Figure (insert the post-ROD schedule figure number). The LUCIP details how SRS will implement, maintain, and monitor the land use control elements of the (insert waste unit name) ROD to ensure that the remedy remains protective of human health and the environment. Upon regulatory approval, the (insert waste unit name) LUCIP will be appended to the SRS LUCAP.

The LUC objective(s) necessary to ensure the protectiveness of the preferred alternative is (*note: this list is just for sample purposes only and will be modified to meet waste unit specific requirements*):

- prevent contact, removal, or excavation of buried waste in the area;
- preclude residential use of the area; and
- prevent unauthorized access to contaminated groundwater in the area.

The institutional controls required to prevent unauthorized exposure to the contaminated media at the (insert waste unit name) include the following (*note: this list is just for sample purposes only and will be modified to meet waste unit specific requirements*):

- controlled access to the (insert waste unit name) through existing SRS security gates and perimeter fences and the site use/site clearance program;
- installation of warning signs at the most probable access points to contact the waste unit custodian prior to entry;
- general maintenance of the waste unit, including signs and visible markers, to identify the waste unit; and
- evaluation of the need for deed notifications/restrictions if the property is ever transferred to non-federal ownership, as required under CERCLA Section 120(h).

In addition, a survey plat of the area under LUCs will be prepared, certified by a professional land surveyor, and included with the post-ROD documents. In the case of LUCs and groundwater, an appropriate survey will be provided to delineate the groundwater under LUCs.

Other actions to be performed if the property is ever transferred to non-Federal ownership include a deed notification disclosing former waste management and disposal activities, as well as any remedial actions taken at the waste unit, and any continuing groundwater monitoring commitments. The deed notification will, in perpetuity, notify any potential purchaser that the property has been used for the management and disposal of (list what items were disposed at the unit – e.g., construction debris, etc.), including hazardous substances. These requirements are also consistent with the intent of the RCRA deed notification required at final closure of the RCRA facility, if contamination would remain at the unit. (*If the unit is a CERCLA only unit, then the previous sentence should be replaced with the following: RCRA deed notification requirements are not required for this waste unit since it does not require a RCRA permit modification per the*

SRS FFA, Appendix C.) The deed will also include restrictions precluding residential use of the property. However, the need for these deed restrictions may be reevaluated at the time of transfer in the event that exposure assumptions differ and/or contamination no longer poses an unacceptable risk under residential use. Any reevaluation of the need for deed restrictions would be done through an amended ROD with the USEPA and the SCDHEC approval. In addition, the survey plat will be reviewed and updated, as necessary, at the time the site is transferred and will be recorded with the appropriate county recording agency.

The post-ROD document, (list the post-ROD document(s) that will be submitted for the waste unit), will be submitted to the USEPA and the SCDHEC within approximately (insert time period for issuance – e.g. 180 days, one month, four months, etc.) after the issuance of the ROD. The (insert name of post-ROD document) will describe (insert words that detail what the post-ROD document will do). The regulatory review period, SRS revision period, and final regulatory review and approval period will be X days, Y days, and Z days, respectively.

Record of Decision – Section II Site and Operable Unit Compliance History, SRS Compliance History Subsection

(Note: The following paragraphs should be added after the second paragraph in this subsection.)

By separate Memorandum of Agreement (MOA) dated (insert date), the USEPA, the SCDHEC, and the USDOE agreed to implement facility-wide, certain periodic site inspection, certification, and notification procedures set forth in a LUCAP, developed pursuant to the USEPA Region IV LUCs Policy. These procedures are designed to ensure the maintenance by USDOE-SRS personnel of any site-specific LUCs, set forth in a response action decision document, deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that MOA was that through USDOE-SRS's substantial good-faith compliance with the procedures called for in the LUCAP, reasonable assurances would be provided to USEPA and SCDHEC as to the permanency of those remedies, which included the use of specific LUCs.

Although the terms and conditions of the LUCAP MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed upon by USDOE-SRS, USEPA, and SCDHEC that the contemplated permanence of the remedy reflected herein is in part dependent upon USDOE's substantial good-faith compliance with the

specific LUC maintenance commitments reflected therein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

A (list the post-ROD document(s) that will be submitted for the waste unit), will be submitted to the USEPA and the SCDHEC after the issuance of the ROD. The (insert name of post-ROD document) will describe (insert words that detail what the post-ROD document will do).

The post-ROD document schedule is illustrated in Figure XX. Key components of the schedule include the following (*note: this list is just for sample purposes only and will be modified to meet waste unit specific requirements*):

1. The (insert post-ROD document name) for the (insert waste unit name) will be submitted for USEPA and SCDHEC review (insert time period) after issuance of the ROD. This report will contain the LUCIP as part of the submittal.
2. USEPA and SCDHEC review of the Revision.0 (insert post-ROD document name) will be completed X days after submittal of the document.
3. SRS revision of the (insert post-ROD document name) will be completed Y days after receipt of all regulatory comments.

USEPA and SCDHEC final review and approval of the Revision.1 (insert post-ROD document name) will be completed Z days after submittal of the document.

APPENDIX E

MEMORANDUM OF AGREEMENT

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MEMORANDUM OF AGREEMENT

IMPLEMENTATION OF A LAND USE CONTROLS ASSURANCE PLAN FOR THE UNITED STATES DEPARTMENT OF ENERGY SAVANNAH RIVER OPERATIONS OFFICE

Section 1

PURPOSE AND SCOPE

This Memorandum of Agreement (MOA) is entered into by the United States Department of Energy Savannah River Operations Office (SR), the United States Environmental Protection Agency Region IV office (EPA Region IV), and the South Carolina Department of Health and Environmental Control (SCDHEC). The purpose of this MOA, together with the attached "Land Use Control Assurance Plan" (LUCAP), is to establish and implement procedures to assure the long-term effectiveness of Land Use Controls (LUCs) being relied upon to protect human health and the environment at certain contaminated portions of the Savannah River Site (SRS) undergoing remediation pursuant to the Federal Facility Agreement for SRS. Consistent with the purposes as set forth in the LUCAP, SR, EPA Region IV, and SCDHEC are entering into the MOA as means to implement the provisions of the LUCAP.

Section 2

RESPONSIBILITIES

The responsibilities of the Parties under this MOA shall be set forth in the attached "Land Use Control Assurance Plan for the Savannah River Site" which LUCAP is fully incorporated herein. The Parties agree to act in good faith in carrying out their responsibilities under the LUCAP.

Section 3

MODIFICATION

Any minor modifications to this MOA and/or the LUCAP incorporated herein shall be made effective upon the written approval of the Parties' Federal Facilities Agreement Project Managers. Any major modification shall be made effective upon the written approval by each of the signatories to this MOA (or their successors). A modification will be considered major if so determined by any of the three Parties hereto.

Memorandum of Agreement
Implementation of a Land Use Controls Assurance
Plan for the United States Department of Energy
Savannah River Site Operations Office

004759

2

Section 4
TERMINATION

This MOA shall terminate at such time as the undersigned representatives of the Parties or their successors mutually concur that the objectives of the Parties pursuant to this agreement have been fulfilled. Alternatively, any Party may withdraw from this MOA upon sixty (60) days written notice to the other Parties. This 60-day notice requirement is for the purpose of allowing the Parties an opportunity to discuss any issues contributing to a Party's desire to withdraw from this agreement in the interest of reaching resolution so that the agreement can continue. It is understood that, should SR withdraw from this MOA, EPA and/or SCDHEC may, consistent with applicable law, reconsider any remedy(ies) associated with any SRS area having a LUC in place at the time of such withdrawal.

Signature Blocks:



Greg Rudy, Manager
U.S. Department of Energy, Savannah River Operations Office

Date: 10/15/99



R. Lewis Shaw, Deputy Commissioner
South Carolina Department of Health and Environmental Control

Date: 11/29/99



John H. Hankinson, Jr., Regional Administrator
U.S. Environmental Protection Agency, Region IV

Date: 3/26/2000

APPENDIX F
MODIFICATION and UPDATE RECORD

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The following table is the record of modifications and updates to this document.

Table F- 1. Record of Modifications or Updates

Date	Pages Changed	Modification or Update Made
03/25/2000	NA	LUCAP was declared effective.
01/12/2002	Added Pages B-1 through B-120	Update All applicable tables were updated and the following Unit-Specific LUCIPs were added: <ul style="list-style-type: none"> • A-Area Burning/Rubble Pit, 731-1A • A-Area Burning/Rubble Pit, 731-A • A-Area Rubble Pit, 731-2A • C-Area Reactor Seepage Basin, 904-66G • C-Area Reactor Seepage Basin, 904-67G • C-Area Reactor Seepage Basin, 904-68G • K-Area Reactor Seepage Basin, 904-65G • L-Area Bingham Pump Outage Pit, 643-2G • L-Area Bingham Pump Outage Pit, 643-3G • Metals Burning Pit, 731-5A • Miscellaneous Chemical Basin, 731-4A • P-Area Bingham Pump Outage Pit, 643-4G • SRL Seepage Basin, 904-51G1 • SRL Seepage Basin, 904-53G2 • SRL Seepage Basin, 904-54G • SRL Seepage Basin, 904-55G
06/25/2003	Pages B-7 through B-120	Update To aid in the update of the LUCAP, the Appendix B was changed from numbered pages to Tabbed inserts. Each unit-specific LUCIP is located behind a tab.
06/25/2003	Appendix B, Tables and Figures	Update All applicable tables and figures were updated and the following Unit-Specific LUCIPs were added: <ul style="list-style-type: none"> • Ford Building Seepage Basin, 904-91G • L-Area Reactor Seepage Basin, 904-064G • L-Area Rubble Piles, 131-3L The Figures in Appendix C duplicated the information contained in the Figures 2 -7. The Figures were combined and the Figures in Appendix C were eliminated.

Table F- 1. (Continued) Record of Modifications

Date	Pages Changed	Modification or Update Made
10/31/2003	Appendix B, Tables and Figures	Update All applicable tables and figures were updated and the following Unit-Specific LUCIPs were added: <ul style="list-style-type: none"> • A-Area Miscellaneous Rubble Pile, 731-6A • Central Shops Burning/Rubble Pits, 631-1G, -3G • F-Area Retention Basin, 281-3F • L-Area Rubble Pile, 131-3L • L-Area Oil and Chemical Basin, 904-83G • Old F-Area Seepage Basin, 904-49G • P-Area Burning/Rubble Pit, 131-P • R-Area Bingham Pump Outage Pits, 643-8G, -9G,, -10G and R-Area Unknowns, RUNK-1, -2, and -3
03/15/2004	Appendix B, Tables and Figures	Update All applicable tables and figures were updated and the following Unit-Specific LUCIPs were added: <ul style="list-style-type: none"> • General Separations Area Consolidation Unit • L-Area Hot Shop (Including Sandblast Area CML-003, NBN), 717-G
04/30/2004	Section 3.3	Update The name, title, and phone number of the point of contact was updated.
04/30/2004	Appendix B, Tables and Figures	Update All applicable tables and figures were updated and the following Unit-Specific LUCIPs were added: <ul style="list-style-type: none"> • P-Area Rector Seepage Basins, 904-61G, -62G, and -63G • L-Area Reactor Seepage Basin, 904-064G • L-Area Rubble Piles, 131-3L

APPENDIX G

ANNUAL LAND USE CERTIFICATION REQUIRED UNDER SECTION 3.9

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INSTITUTIONAL CONTROL UNITS

Records of Decision have been issued for RCRA/CERCLA Units at the Savannah River Site in which the selected alternative is or contains requirements for Institutional Control. In order to assure to U.S. EPA, SCDHEC, and the public that SRS is maintaining the Institutional Controls as stipulated in the Records of Decision and unit-specific Post-Record of Decision Documents, the Director of the Environmental Restoration Division, U.S. Department of Energy, Savannah River Operations Office and the Vice-President and General Manager of the Environmental Restoration Division, Westinghouse Savannah River Company shall certify that these units are currently being controlled in accordance with the institutional controls corrective actions described in their respective Records of Decision.

The following certifications are applicable to the RCRA/CERCLA Units:

- Silverton Road Waste Site (731-3A)
- F-Area Burning/Rubble Pits(231-F, -1F, and 2F)
- D-Area Burning/Rubble Pits (431-D, and -1D)

I certify to the U. S. Department of Energy, Savannah River Operations Office that Westinghouse Savannah River Company, Environmental Restoration Division, in accordance with Contract No. DE-AC09-96SR1 8500, will continue compliance with all unit-specific Land Use Controls Implementation Plans as described in *the Federal Facility Agreement Annual Progress Report for Fiscal Year 1998*.

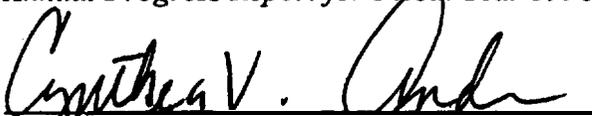


Richard R. Harbert
Vice President and General Manager
Environmental Restoration Division
Westinghouse Savannah River Company

3 NOV 98

Date

I certify that the Savannah River Site will continue compliance with all unit-specific Land Use Controls Implementation Plans as described in *the Federal Facility Agreement Annual Progress Report for Fiscal Year 1998*.



Cynthia V. Anderson
Director, Environmental Restoration Division
U.S. Department of Energy, Savannah River Operations Office

12 NOV 98

Date

INSTITUTIONAL CONTROL UNITS

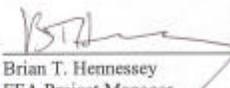
Records of Decision have been issued for RCRA/CERCLA Units at the Savannah River Site in which the selected alternative is or contains requirements for Institutional Control. In order to assure the US EPA, SCDHEC and the public that SRS is maintaining the Institutional Controls as stipulated in the Records of Decision and unit-specific Post-Record of Decision Documents, the Director of Environmental Restoration Division, U.S. Department of Energy, Savannah River Operations Office and the Vice-President and General Manager of the Environmental Restoration Division, Westinghouse Savannah River Company shall certify that these units are currently being controlled in accordance with the institutional controls corrective actions described in their respective Records of Decision.

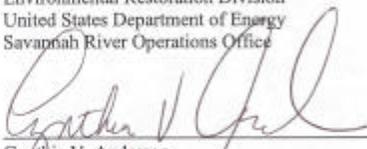
The following certification is applicable to the RCRA/CERCLA units:

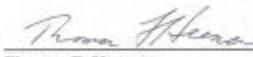
Silverton Road Waste Site (731-3A)	F-Area Burning/Rubble Pit (231-F, -1F, -2F)
D-Area Burning/Rubble Pits (431-D, -1D)	D-Area Oil Seepage Basin (631-G)
F-Area Retention Basin (281-3F)	K-Area Bingham Pump Outage Pit (643-1G)
L-Area Oil and Chemical Basin (904-83G)	Old F-Area Seepage Basin (904-49G)

US DOE-SR INTERNAL CERTIFICATION FOR LAND USE CONTROLS

I certify that the Savannah River Site has maintained compliance with all site-specific Land Use Control Implementation Plans in accordance with the *Land Use Control Assurance Plan for the Savannah River Site*.

Signature:  _____ Date: 11-22-99
Brian T. Hennessey
FFA Project Manager
Environmental Restoration Division
United States Department of Energy
Savannah River Operations Office

Signature:  _____ Date: 11-22-99
Cynthia V. Anderson
Director
Environmental Restoration Division
United States Department of Energy
Savannah River Operations Office

Signature:  _____ Date: 11/24/99
Thomas F. Heenan
Assistant Manager for Environmental Programs
Environmental Restoration Division
United States Department of Energy
Savannah River Operations Office

Signature:  _____ Date: 11/23/99
Greg Rudy
Manager
United States Department of Energy
Savannah River Operations Office

INSTITUTIONAL CONTROL UNITS

INSTITUTIONAL CONTROL UNITS

Records of Decision (RODs) have been issued for RCRA/CERCLA units at the SRS in which the selected alternative is or contains requirements for Institutional Controls. In order to assure the US EPA, SCDHEC and the public that SRS is maintaining the Institutional Controls as stipulated in the RODs and unit-specific Land Use Control Implementation Plans (LUCIPs), the Manager, Savannah River Operations Office, shall annually certify that these units are currently being controlled in accordance with the unit-specific RODs and LUCIPs.

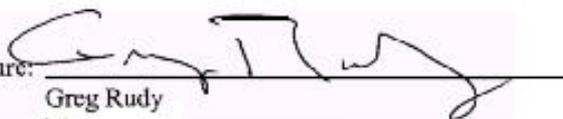
The following certification is applicable to the following RCRA/CERCLA units:

D-Area Burning/Rubble Pits (431-D, -1D)
D-Area Oil Seepage Basin (631-G)
F-Area Burning/Rubble Pits (231-F, -1F, -2F)
F-Area Retention Basin (281-3F)
K-Area Bingham Pump Outage Pit (643-1G)
L- and P-Area Bingham Pump Outage Pits (643-2G, -3G, and -4G)
L-Area Oil and Chemical Basin (904-83G)
Miscellaneous Chemical Basin/Metals Burning Pit (731-4A, -5A)
Old F-Area Seepage Basin (904-49G)
Savannah River Laboratory (SRL) Seepage Basins (904-53G1, -53G2, -54G, and -55G)
Silver-ton Road Waste Site (731-3A)

US DOE-SR CERTIFICATION FOR LAND USE CONTROLS

I certify that the Savannah River Site has maintained compliance with all site-specific Land Use Control Implementation Plans in accordance with the *Land Use Control Assurance Plan for the Savannah River Site*.

Signature: _____



Greg Rudy
Manager
United States Department of Energy
Savannah River Operations Office

Date: 11-13-00

INSTITUTIONAL CONTROL UNITS

Records of Decision (RODs) have been issued for RCRA/CERCLA units at the SRS in which the selected alternative is, or contains requirements for, Institutional Controls. In order to assure the USEPA, SCDHEC and the public that SRS is maintaining the Institutional Controls as stipulated in the RODs and unit-specific Land Use Control Implementation Plans (LUCIPs), and in accordance with the *Land Use Control Assurance Plan for the Savannah River Site*, the Manager, Savannah River Operations Office, shall annually certify that these units are currently being controlled in accordance with the unit-specific RODs and LUCIPs.

The following certification is applicable to the following RCRA/CERCLA units:

A-Area Burning/Rubble Pits (731-A, -1A) and Rubble Pit (731-2A)
C-Area Reactor Seepage Basin (904-68G)
D-Area Burning/Rubble Pits (431-D, -1D)
D-Area Oil Seepage Basin (631-G)
F-Area Burning/Rubble Pits (231-F, -1F, -2F)
F-Area Retention Basin (281-3F)
K-Area Bingham Pump Outage Pit (643-1G)
K-Area Burning/Rubble Pit (131-K) and Rubble Pile (631-20G)
L- and P-Area Bingham Pump Outage Pits (643-2G, -3G, and -4G)
L-Area Oil and Chemical Basin (904-83G)
Miscellaneous Chemical Basin/Metals Burning Pit (731-4A, -5A)
Old F-Area Seepage Basin (904-49G)
Savannah River Laboratory (SRL) Seepage Basins (904-53G1, -53G2, -54G, and -55G)
Silverton Road Waste Site (731-3A)

US DOE-SR CERTIFICATION FOR LAND USE CONTROLS

I certify that the Savannah River Site has maintained compliance with all site-specific Land Use Control Implementation Plans, in accordance with the *Land Use Control Assurance Plan for the Savannah River Site*.

Signature: _____


Greg Rudy
Manager
United States Department of Energy
Savannah River Operations Office

Date: 11-21-01

Institutional Control Units

Records of Decision (RODs) have been issued for RCRA/CERCLA units at the SRS in which the selected alternative is or contains requirements for Institutional Controls. To assure the USEPA, SCDHEC and the public that SRS is maintaining the Institutional Controls as stipulated, the Manager, Savannah River Operations Office, shall annually certify these units. These units are currently being controlled in accordance with the unit-specific RODs, unit-specific Land Use Control Implementation Plans (LUCIPs), and in accordance with the *Land Use Control Assurance Plan for the Savannah River Site*.

The following certification is applicable to the following RCRA/CERCLA units:

A-Area Burning/Rubble Pits (731-A, -1A) and Rubble Pit (731-2A)
C-Area Reactor Seepage Basins (904-66G, -67G, and -68G)
D-Area Burning/Rubble Pits (431-D, -1D)
D-Area Oil Seepage Basin (631-G)
F-Area Burning/Rubble Pits (231-F, -1F, -2F)
F-Area Retention Basin (281-3F)
K-Area Bingham Pump Outage Pit (643-1G)
K-Area Burning/Rubble Pit (131-K) and Rubble Pile (631-20G)
K-Area Reactor Seepage Basin (904-65G)
L- and P-Area Bingham Pump Outage Pits (643-2G, -3G, and -4G)
L-Area Oil and Chemical Basin (904-83G)
L-Area Reactor Seepage Basin (904-64G)
Miscellaneous Chemical Basin/Metals Burning Pit (731-4A, -5A)
Old F-Area Seepage Basin (904-49G)
Savannah River Laboratory (SRL) Seepage Basins (904-53G1, -53G2, -54G, and -55G)
Silverton Road Waste Site (731-3A)

USDOE-SR CERTIFICATION FOR LAND USE CONTROLS

I certify that the Savannah River Site has maintained compliance with all site-specific Land Use Control Implementation Plans in accordance with the *Land Use Control Assurance Plan for the Savannah River Site*.

Signature: _____



Jeffrey M. Allison
Acting Manager
United States Department of Energy
Savannah River Operations Office

Date: 11/27/02

Institutional Controls Units

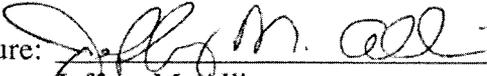
Records of Decision (RODs) have been issued for RCRA/CERCLA units at the SRS in which the selected alternative is or contains requirements for Institutional Controls. To assure the USEPA, SCDHEC and the public that SRS is maintaining the Institutional Controls as stipulated, the Manager, Savannah River Operations Office, shall annually certify these units. These units are currently being controlled in accordance with the unit-specific RODs, unit-specific Land Use Control Implementation Plans (LUCIPs), and in accordance with the *Land Use Control Assurance Plan for the Savannah River Site*.

The following certification is applicable to the following RCRA/CERCLA units:

A-Area Burning/Rubble Pits (731-A, -1A) and Rubble Pit (731-2A)
A-Area Miscellaneous Rubble Pile (731-6A)
C-Area Reactor Seepage Basins (904-66G, -67G, and -68G)
Central Shops Burning/Rubble Pits (631-1G, -3G)
D-Area Burning/Rubble Pits (431-D, -1D)
D-Area Oil Seepage Basin (631-G)
F-Area Burning/Rubble Pits (231-F, -1F, -2F)
F-Area Retention Basin (281-3F)
Ford Building Seepage Basin (904-1G)
K-Area Bingham Pump Outage Pit (643-1G)
K-Area Burning/Rubble Pit (131-K) and Rubble Pile (631-20G)
K-Area Reactor Seepage Basin (904-65G)
L- and P-Area Bingham Pump Outage Pits (643-2G, -3G, and -4G)
L-Area Oil and Chemical Basin (904-83G)
L-Area Reactor Seepage Basin (904-64G)
Miscellaneous Chemical Basin/Metals Burning Pit (731-4A, -5A)
Old F-Area Seepage Basin (904-49G)
Savannah River Laboratory (SRL) Seepage Basins (904-53G1, -53G2, -54G, and -55G)
Silverton Road Waste Site (731-3A)

USDOE-SR CERTIFICATION FOR LAND USE CONTROLS

I certify that the Savannah River Site has maintained compliance with all site-specific Land Use Control Implementation Plans in accordance with the *Land Use Control Assurance Plan for the Savannah River Site*.

Signature: 

Jeffrey M. Allison
Manager
United States Department of Energy
Savannah River Operations Office

Date: 11/26/03