LUCIP for the
L- and P-Area Bingham Pump Outage Pits, 643-2G, 643-3G and 643-4G
Section 2.0 of *Final Remediation Report for the L- and P-Area Bingham Pump Outage Pits,643-2G 643-3G and 643-4G*
(WSRC-RP-2000-4030, Revision 0, March 2000)

On February 6, 2014, the DOE submitted a letter (ACP-14-125, ARF #019315) to the EPA and SCDHEC to perform the inspections for this operable unit on an annual basis. The EPA and SCDHEC approved the request in letters dated March 20, 2014 (ARF #019385) and March 7, 2014 (ARF #019360), respectively.

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United States Department of Energy

Savannah River Site

Final Remediation Report (FRR) for the L- and P-Area Bingham Pump Outage Pits (643-2G, 643-3G, and 643-4G) (U)

WSRC-RP-2000-4030

Revision 0

March 2000

Prepared by:
Westinghouse Savannah River Company LLC
Savannah River Site
Aiken, SC 29808

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

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And

Westinghouse Savannah River Company LLC

Aiken, South Carolina

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CERTIFICATION

L and P-Area Bingham Pump Outage Pits (643-2G, 643-3G, and 643-4G)
Final Remediataion Report, WSRC-RP-2000-4030 Revision. 0

"I certify under the 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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, 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 fines and imprisonment for knowing violations."

Date: 27 JUN 2000 Signature:

Richard R. Harbert
Vice President and General Manager
Environmental Restoration Division
Westinghouse Savannah River Company
Co-operator for the U.S. Department of Energy
Savannah River Operations Office

Date: 13 July 2000 Signature:

Cynthia V. Anderson
Director
Environmental Restoration Division
U.S. Department of Energy
Savannah River Operations Office
Owner and Co-operator

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bls	below land surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CM COC	contaminant migration constituents of concern
COC	constituents of concern
CSM	conceptual site model
FFA	Federal Facility Agreement
FRR	Final Remediation Report
ft	feet
LUC	Land Use Control
LUCAP	Land Use Control Assurance Plan
LUCIP	Land Use Control Implementation Plan
L- and P-BPOPs	L- and P-Area Bingham Pump Outage Pits
m	meter
miR/hr	milliRoentgen per hour
PAH	polyaromatic hydrocarbons
PCB	polychlorinated biphenyls
OU	Operable Unit
RAO	Remedial Action Objectives
RCRA	Resource Conservation and Recovery Act
RG	Remedial Goal
RI/BRA	Remedial Investigation/Baseline Risk Assessment
ROD	Record of Decision
SCDHEC	South Carolina Department of Health and Environmental Control
SRS	Savannah River Site
US DOE	United States Department of Energy
US EPA	United States Environmental Protection Agency
UTRA	Upper Three Runs Aquifer
WSRC	Westinghouse Savannah River Company

1.0 GENERAL DESCRIPTION OF THE L- AND P--AREA BINGHAM PUMP OUTAGE PITS

The L- and P-Reactors (Figure 1) are located in the central portion of the Savannah River Site (SRS), approximately 1 mile from the nearest SRS boundary. The L- and P-Area Bingham Pump Outage Pits (L and P BPOPs), Building Numbers 643-2G, 643-3G, and 643-4G, are situated north and outside the L- and P-Reactor fence lines (Figures 2 and 3). The L BPOPs consist of two pits (643-2G and 643-3G) aligned end-to-end with approximately 38 m (125 ft) between them; one pit is 83.8 x 6.7 m (275 x 22 ft) and the other is 114.9 x 6.1 m (377 x 20 ft). The P BPOP consists of one pit (643-4G) having dimensions of 143.9 x 7.9 m (472 x 26 ft). The mean depth of each pit is approximately 4.0 m (13 ft). The L and P BPOP waste units are listed as Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) waste units in the SRS Federal Facility Agreement (FFA) and are not subject to Resource Conservation and Recovery Act (RCRA) permit modification per the SRS FFA, Appendix C.

There are no surface water drainage ditches or surface water associated with the L and P BPOPs. The local topography is generally level but occasionally gently sloping. The units are grass covered and surrounded by trees. Consequently, surface water drainage from other areas has little or no effect on the surface of the L and P BPOPs.

At the L BPOPs, the vadose zone is approximately 11.9 m (39 ft) thick and is composed primarily of Upland Unit clay and silt with lesser sand. The water table aquifer represents the "upper" aquifer zone of the Upper Three Runs Aquifer (UTRA) and is composed of silt and clay. The aquifer is approximately 23.5 m

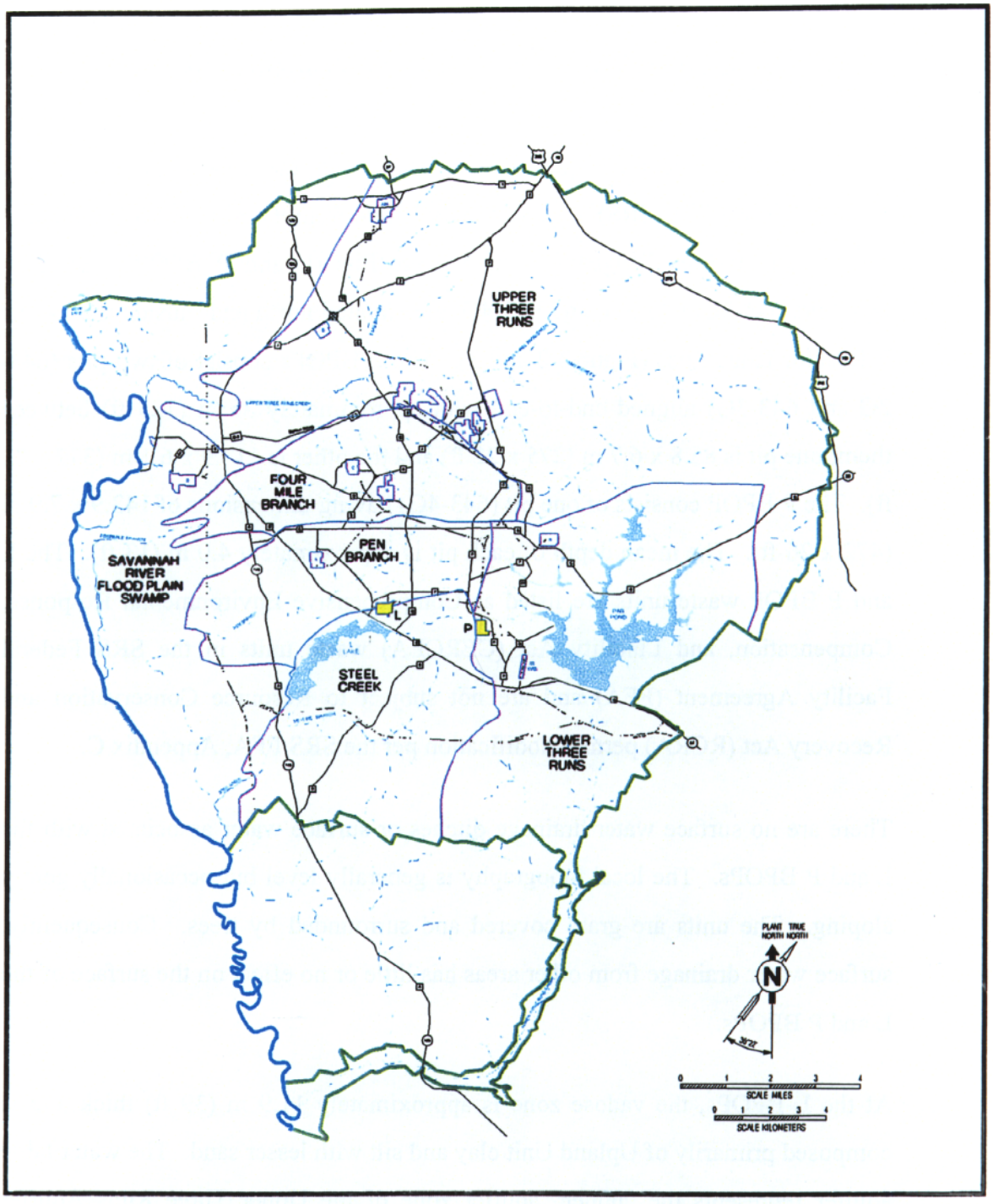

Figure 1. Location of the L and P Reactor Areas and SRS Watersheds

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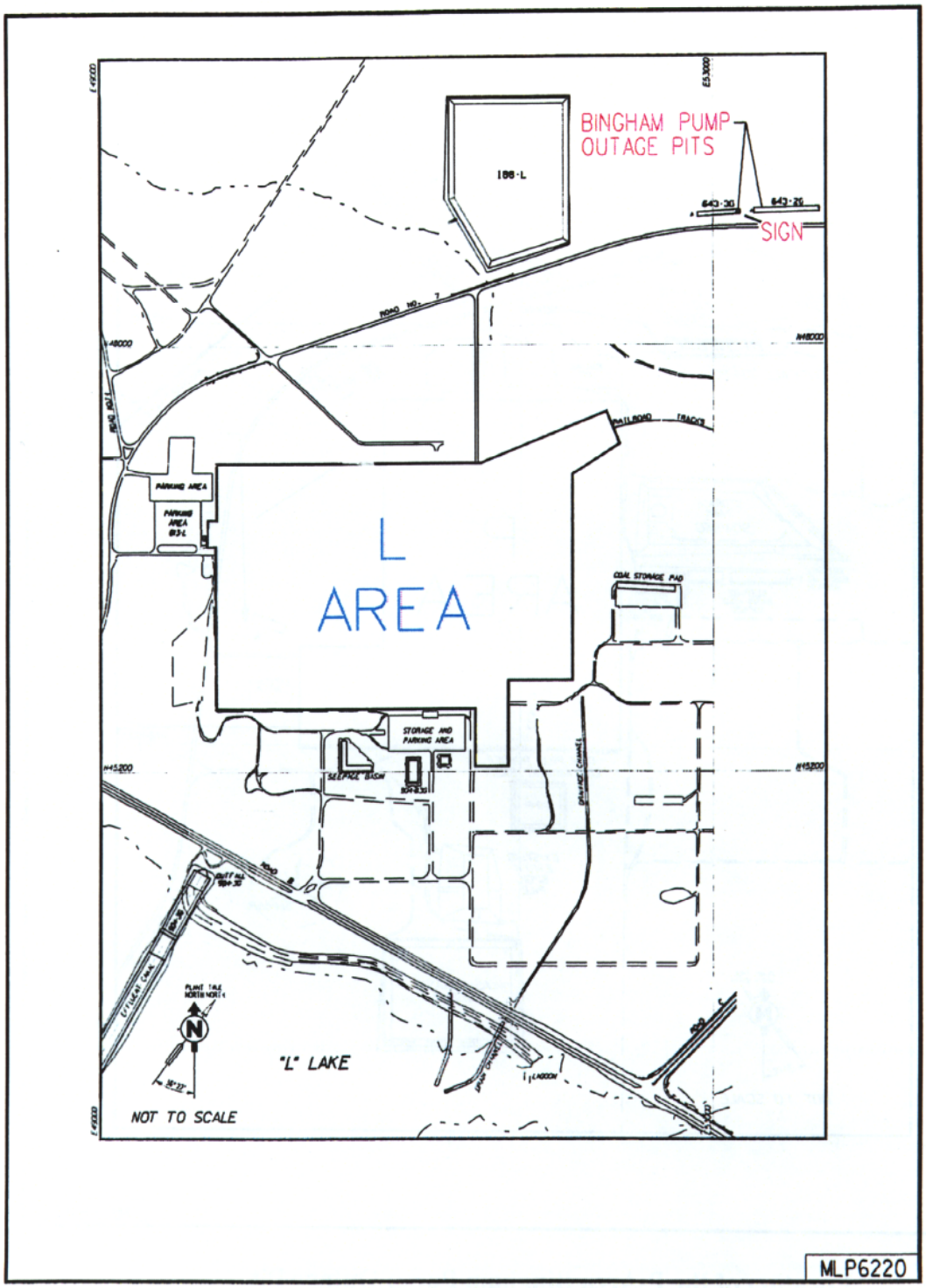

Figure 2. Location of the L-Area Bingham Pump Outage Pits

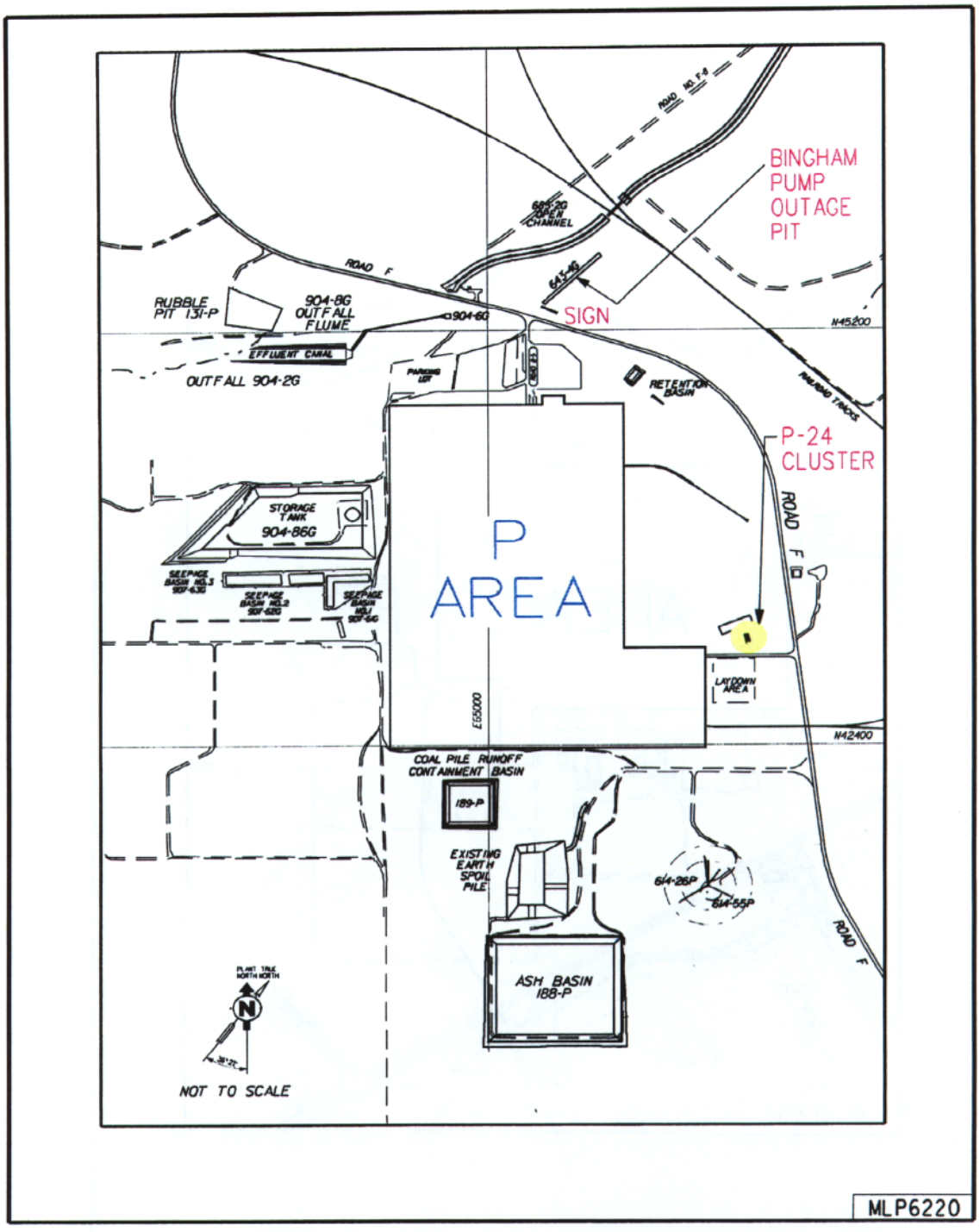

Figure 3. Location of the P-Area Bingham Pump Outage Pit

(77 ft) thick; it extends from the water table to a locally continuous clay layer at a depth of approximately 35.4 m (116 ft) below land surface (bls). Groundwater flow direction at the L BPOPs is to the northwest. No groundwater constituents of concern (COC) were identified for the L BPOPs.

At the P BPOP, the vadose zone is approximately 10.7 m (35 ft) thick and is composed of clay interbedded with lesser sand and silt of the Upland Unit and Tobacco Road sand. The water table aquifer represents the "upper" aquifer zone of the UTRA and is composed of discontinuous layers of clay, silt, and sand. The aquifer is approximately 20.1 m (66 ft) thick; it extends from the water table to the local confining unit at a depth approximately 30.8 m (101 ft) bls. The groundwater flow direction at the P BPOP is generally to the west. No groundwater constituents of concern were identified for P BPOP.

The L and P BPOPs are burial pits containing waste debris generated by major modifications to primary and secondary reactor cooling systems including the primary system Bingham Pumps in 1957 and 1958. The units were formed by excavating trenches to an average depth of 4.0 m (13 ft), disposing of 2.7 m (9 ft) of debris, and then returning the unit to grade by covering the debris with 1.2 m (4 ft) of backfill. The waste consists of miscellaneous construction materials such as pipes, cables, ladders, and concrete. No known pumps or liquid wastes were buried in the L and P BPOPs. The radioactive contamination was less than 25 milliRoentgen per hour (mR/hr) with no detected alpha activity. The buried waste is categorized as Low Level Threat Waste (US EPA, 1991) because of the absence of free liquids or mobile or highly toxic material. The L and P BPOPs were backfilled with approximately four feet of fill material in 1958 and are now an open grassy area marked by orange ball markers.

The contact person (title, address, and phone number) for the L and P BPOPs 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 BPOPs 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 BPOPs 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 BPOPs 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 BPOPs 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

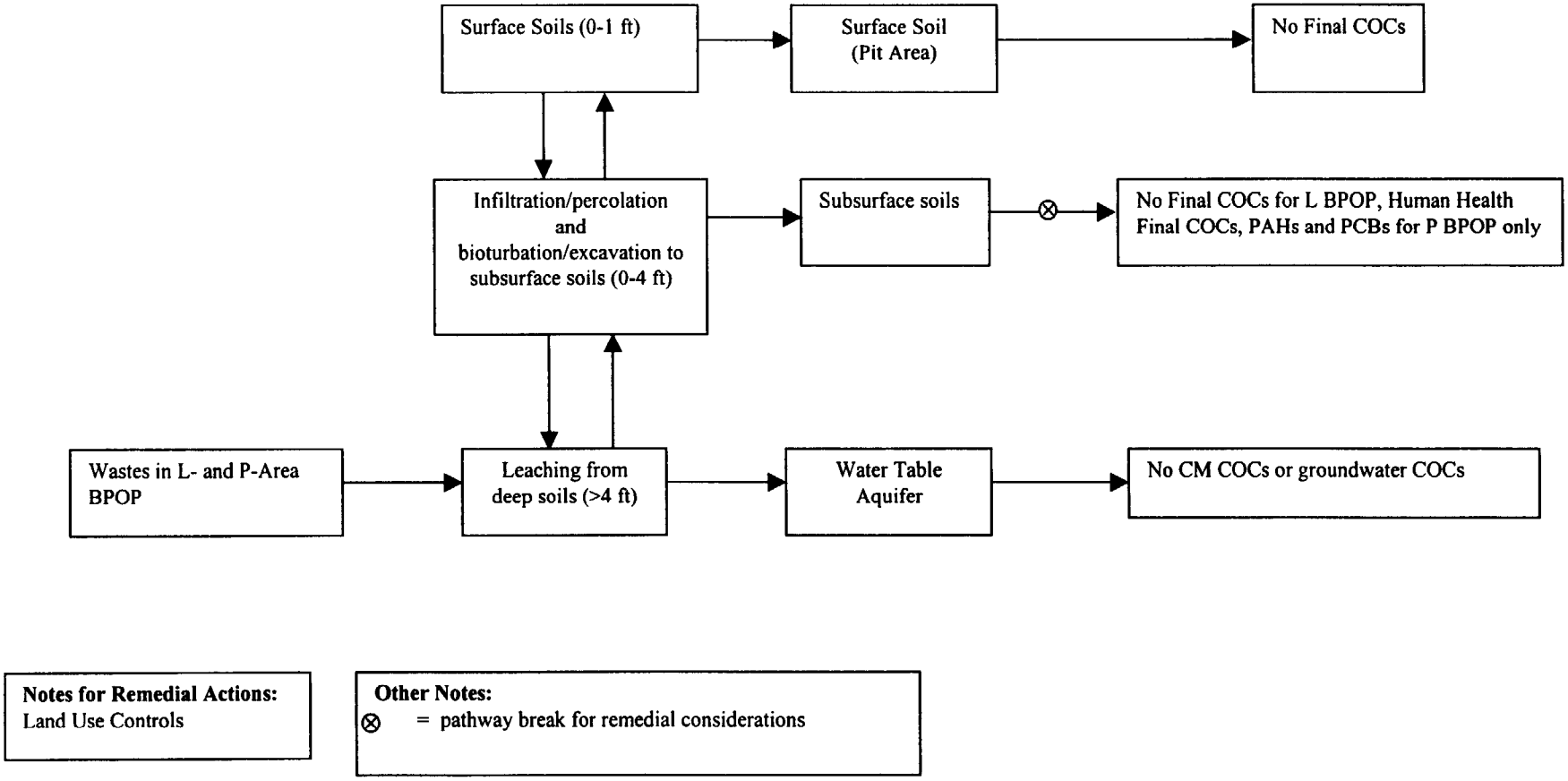

Figure 4. Simplified Conceptual Site Model for the L and P BPOPs

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)

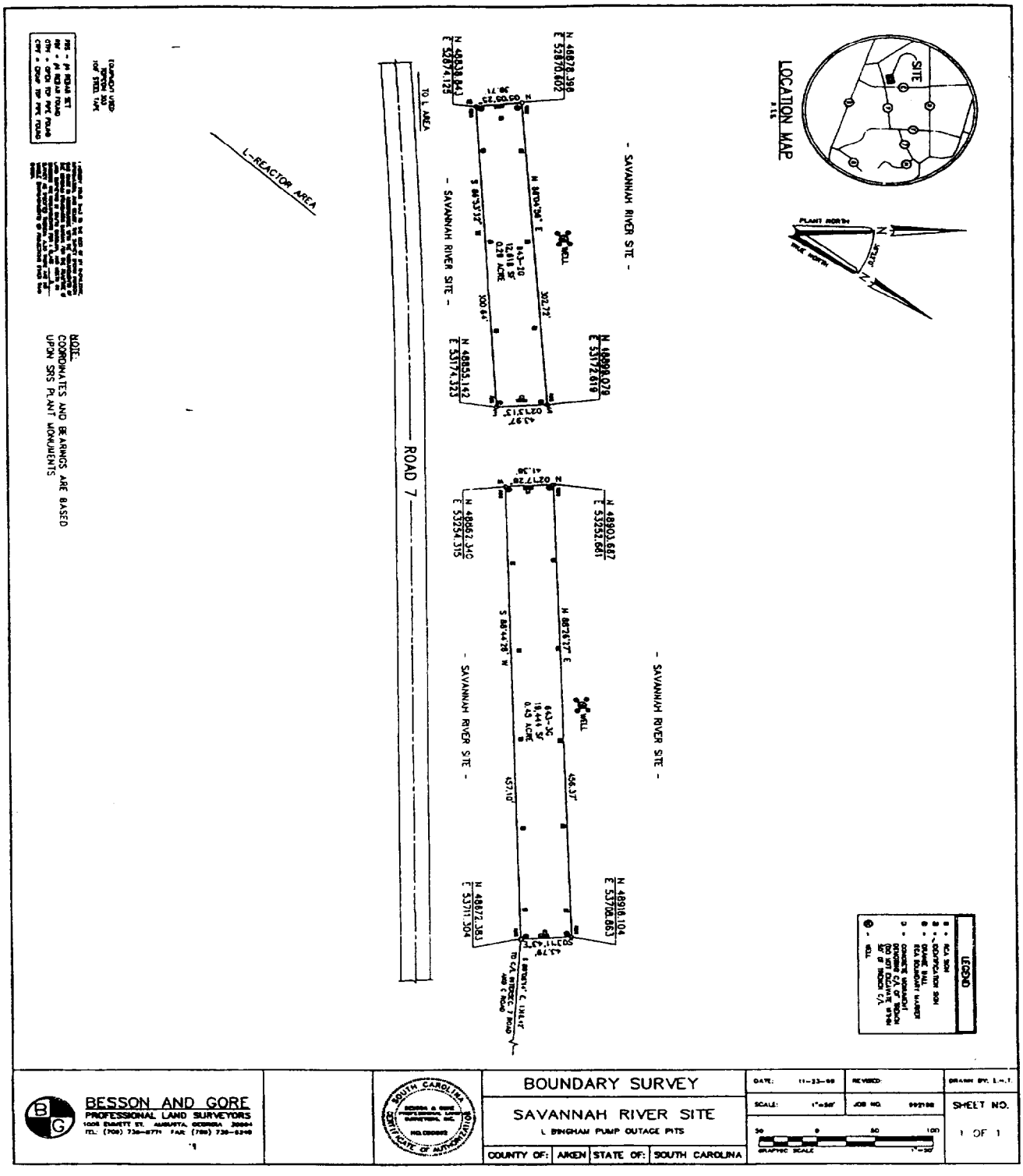

Figure 5. L Bingham Pump Outage Pits Survey Plat

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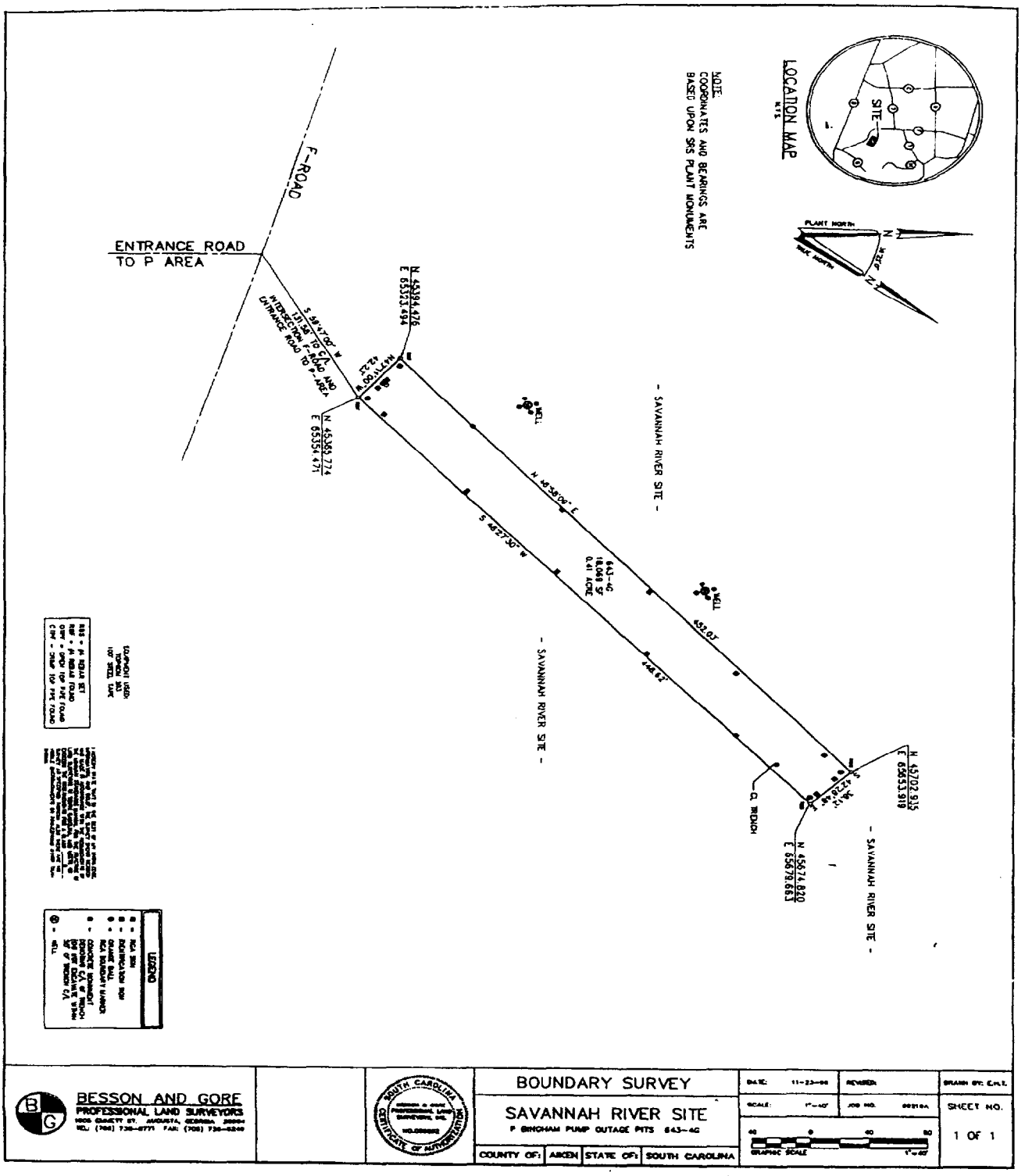

Figure 6. P Bingham Pump Outage Pit Survey Plat

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,

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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.

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

WSRC 1999a. *Approved Standardized Corrective Action Design (ASCAD™) Combined Document for the L- and P-Area Bingham Pump Outage Pits* (U) WSRC-RP-97-443, Rev. 1, Westinghouse Savannah River Company, Aiken, SC (April)

WSRC 1999b. *Record of Decision Remedial Alternative Selection for the L- and P-Area Bingham Pump Outage Pits (643-2G, 643-3G and 643-4G) (U)*, WSRC-RP-98-4105, Rev. 1, Westinghouse Savannah River Company, Aiken, SC (September).

5.0 ATTACHMENTS

5.1 Attachment A-1– Field Inspection Checklist for L- and P-Area BPOPs (643-2G, 643-3G and 643-4G)

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Attachment A-1. Field Inspection Checklist for L- and P-Area BPOPs (643-2G, 643-3G and 643-4G)

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 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 waste unit signs (2) are correct and legible.		
Does the site need general cleanup (housekeeping)?		
Verify that the orange balls are in place.		

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

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

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

Note: US EPA 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.