

**LUCIP for the  
Lower Three Runs Integrator Operable Unit (Upper Subunit)  
(consists of PAR Pond [Including the Pre-Cooler Ponds and Canals], 685-G and Old  
R-Area Discharge Canal, NBN)<sup>20</sup>**  
*Land Use Control Implementation Plan  
for the Lower Three Runs Integrator Operable Unit (U)*  
SRNS-RP-2022-00017, Revision 1, August 2022

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<sup>20</sup> The LUCIP for the Lower Three Runs Integrator Operable Unit (Upper Subunit) (SRNS-RP-2022-00017, Revision 1, August 2022) was approved by South Carolina Department of Health and Environmental Control and United States Environmental Protection Agency on September 22, 2022 and October 4, 2022, respectively. However, the LUCs will not be implemented until Spring of 2023.

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# **Land Use Control Implementation Plan for the Lower Three Runs Integrator Operable Unit (Upper Subunit) (U)**

**SEMS Number: 35**

**SRNS-RP-2022-00017**

**Revision 1**

**August 2022**

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**LIST OF ABBREVIATIONS AND ACRONYMS**

~	approximate, approximately
ACP	Area Completion Projects
BRA	Baseline Risk Assessment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EA	exposure area
EALUCIP	Early Action Land Use Control Implementation Plan
ESD	Explanation of Significant Differences
FFA	Federal Facility Agreement
IOU	Integrator Operable Unit
km	kilometer
km <sup>2</sup>	square kilometer
LTR	Lower Three Runs
LUC	Land Use Control
LUCIP	Land Use Control Implementation Plan
LUCAP	Land Use Control Assurance Plan
mi	mile
mi <sup>2</sup>	square mile
MNR	Monitored Natural Recovery
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
OU	Operable Unit
PCR	Post Construction Report
PTSM	principal threat source material
QA	Quality Assurance
RA	Remedial Action
RCOC	Refined constituent of concern
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROD	Record of Decision
SCDHEC	South Carolina Department of Health and Environmental Control
SDC	Site Development Control
SEMS	Superfund Enterprise Management System
SRNS	Savannah River Nuclear Solutions, LLC
SRS	Savannah River Site
USDOE	United States Department of Energy
USEPA	United States Environmental Protection Agency
WSRC	Washington Savannah River Company, LLC

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## **1.0 INTRODUCTION**

This Land Use Control Implementation Plan (LUCIP) has been prepared for the Upper subunit of the Lower Three Runs Integrator Operable Unit (LTR IOU) at the Savannah River Site (SRS). The LTR IOU is comprised of three subunit areas (i.e., Upper, Middle, and Lower subunits) within the LTR watershed at the SRS. The LTR watershed encompasses approximately (~) 460 square kilometers (km<sup>2</sup> [180 square miles {mi<sup>2</sup>}]). Land use controls (LUCs) for the Middle and Lower subunits of the LTR IOU were previously implemented by the *Early Action Land Use Control Implementation Plan (EALUCIP) for the Lower Three Runs Integrator Operable Unit Tail Portion (Middle and Lower subunits) (U)* (SRNS 2013) and are established as the final remedial action (RA) for those subunits in the LTR IOU Record of Decision (ROD) (SRNS 2021). The purpose of this LUCIP is to describe how the LUCs selected in the LTR IOU ROD (SRNS 2021) for the Upper subunit will be implemented and maintained. The LUC objectives for the Upper subunit are listed in Section 3.0. Groundwater is not considered part of the scope of the LTR IOU.

The selected remedy leaves hazardous substances in place that pose a potential future risk and will require land use restrictions until the concentrations of hazardous substances in the sediment/soil and biota are at levels that allow for unrestricted use. 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 Assurance Plan (LUCAP) (WSRC 1999) to ensure that the LUCs required by numerous remedial decisions at SRS are properly maintained and their effectiveness periodically verified. The requirements of that LUCAP also apply to the LUCs that were selected as part of this RA for the LTR IOU Upper subunit. This LUCIP for the LTR IOU Upper subunit contains the detailed and specific measures required to implement and maintain the LUCs selected as part of this remedial decision. The LUCs shall be maintained until the LTR IOU Upper subunit is suitable for unlimited exposure and unrestricted use. Approval by USEPA and SCDHEC is required for any modification or termination of the LUCs.

USDOE is responsible for implementing, maintaining, monitoring, reporting, and enforcing the LUCs in accordance with the approved LUCIP. Upon final approval, the LUCIP will be appended to the LUCAP and should be considered incorporated by reference into the LTR IOU ROD,

establishing implementation and maintenance requirements for the LUCs under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the SRS Federal Facility Agreement (FFA) (FFA 1993). The LUCIP will remain in effect unless and until modifications are approved by USEPA and SCDHEC as necessary for protection of human health and the environment. In accordance with Section 121(c) of CERCLA and National Contingency Plan §300.430(f)(5)(iii)(c), a statutory review will be conducted within five years of initiation of the RA, and every five years thereafter, to ensure that the remedy continues to be protective of human health and the environment. Any approved LUCIP modification will be appropriately documented for incorporation by reference into the LTR IOU ROD (SRNS 2021).

## **1.1 Format of LUCIP**

The format of this LUCIP is consistent with the FFA protocol format approved by the USEPA and SCDHEC in March 2004.

## **2.0 OVERVIEW OF LOWER THREE RUNS INTEGRATOR OPERABLE UNIT REMEDIAL ACTION**

### **2.1 General Description and History of the Lower Three Runs IOU**

SRS occupies ~803 km<sup>2</sup> (310 mi<sup>2</sup>) of land adjacent to the Savannah River, principally in Aiken and Barnwell counties of South Carolina (Figure 1). SRS is located ~40.2-km (25-mi) southeast of Augusta, Georgia, and 32-km (20-mi) south of Aiken, South Carolina.

The LTR IOU watershed is located in the southeastern portion of SRS. LTR is a large blackwater stream containing ponds and tributary systems that are designated as freshwater. The stream originates in the northeast portion of SRS and follows a southerly direction for ~40 kilometers (km [24.5 miles {mi}]), discharging into the Savannah River.

The LTR IOU is delineated into Upper, Middle, and Lower subunits (Figure 2). The Upper subunit, which is the subject of this LUCIP, is located upgradient of the PAR Pond Dam and includes PAR Pond and the pre-cooler ponds and canal system (Figure 2). The Middle and Lower subunits are located below the PAR Pond Dam. The Lower subunit includes and bounds the LTR

stream system by a narrow buffer of USDOE property, an area referred to as the “tail portion” of the LTR IOU. As previously discussed, LUCs for the Middle and Lower subunits are in place as per the 2013 EALUCIP (SRNS 2013) and established as final in the LTR IOU ROD (SRNS 2021).

The LTR stream system received effluent discharges from reactor operations in both R Area and P Area. R-Reactor began operations in 1953 and was followed by P-Reactor in 1954. Both received cooling water from the Savannah River via the river water distribution system. R-Reactor discharged reactor effluent directly into Joyce Branch, while P-Reactor discharged reactor effluent directly into Steel Creek. In 1958, PAR Pond and a series of pre-cooler ponds and a canal system were constructed to address the cooling water requirements of both R- and P-Reactors. Effluent from R-Reactor was routed to the R-Area Discharge Canal and pre-cooler Pond B where it discharged into what was identified as the north arm of PAR Pond (Figure 3). This effluent pathway was used for R-Reactor discharge from 1961 until the reactor was shut down in 1964. Since the shutdown of R-Reactor, R-Area Discharge Canal and Pond B have remained essentially undisturbed.

PAR Pond also served as a heat exchange/cooling reservoir for P-Reactor until 1988. Heated water was released through a series of man-made canals and smaller impoundments into the pre-cooler Pond C and released into PAR Pond (Figure 3). Effluent discharges from P-Reactor ceased in 1987. As with the R-Area Discharge Canal, the associated canal system and pre-cooler ponds have remained essentially undisturbed since the termination of P-Reactor discharges to PAR Pond.

## **2.2 Nature and Extent of Contamination in Lower Three Runs IOU**

A detailed description of the nature and extent of contamination associated with the Upper subunit of the LTR IOU can be found in the *Feasibility Study for the Lower Three Runs Integrator Operable Unit (U)* (SRNS 2020). A summary of the results from the human health risk assessment, ecological risk assessment, and principal threat source material (PTSM) evaluation for the Upper subunit is provided below.

Liquid releases before and after the construction of PAR Pond and the pre-cooler ponds and canal system included process leaks, reactor disassembly basin purges, and thermal discharges contaminated primarily with cesium-137 (Cs-137), but also tritium, metallic contaminants, and

other radiological contaminants in much smaller quantities. Past characterization efforts have shown that Cs-137 is the major contaminant in the LTR IOU.

In 2009/2010, extensive sampling of the Upper subunit was undertaken to augment previously collected data to support the risk evaluation. The sampling was performed as outlined in approved Sampling and Analysis Plans (SRNS 2010, SRNS 2016) and included sampling of sediment/soil, surface water, and fish (i.e., biota). The sampling included the canals, pre-cooler ponds, PAR Pond, and the Lower Three Runs stream system below PAR Pond dam. Stream channel/floodplain sediment and floodplain/wetland soil (i.e., sediment/soil) are combined as a single medium and referred to as “sediment/soil.” The results of the characterization activities and human health and ecological risk evaluations are documented in the 2017 *Remedial Investigation/Baseline Risk Assessment (RI/BRA) for the Lower Three Runs IOU* (SRNS 2017). As detailed in the Feasibility Study and RI/BRA, the refined contaminants of concern (RCOC) are Cs-137 and, to a lesser degree cobalt-60 (Co-60), in sediment/soil media. In addition, Cs-137 and mercury were identified as RCOCs in fish tissue; however, the presence of mercury is the result of atmospheric deposition and from the use of water from the Savannah River, containing elevated levels of mercury, as part of the river water distribution system, not from SRS operations.

The selected remedy for the LTR IOU leaves hazardous substances in place within the sediment/soil that poses a potential future exposure risk to the onsite worker and fish tissue that poses a potential ingestion risk to a hypothetical recreational fisherman and will require land use restrictions until the concentrations of hazardous substances in the sediment/soil and fish tissue are at levels that allow for unrestricted use and exposure.

### 2.3 Remedial Action Selected

As stated in the ROD, RA for the Middle and Lower subunits was previously addressed and documented in the *Explanation of Significant Differences (ESD) for the Revision 0 Interim Action Record of Decision Remedial Alternative Selection: PAR Pond Unit (U); Lower Three Runs Integrator Operable Unit Tail Portion (Middle and Lower Subunits) (U)* (SRNS 2012). As documented in the ESD, no additional data collection, risk assessment, or response evaluation is necessary for the Middle and Lower subunits, and the RA of LUCs is documented as the final

action for the Middle and Lower subunits in the LTR IOU ROD. The LUCs for the Middle and Lower subunits are in place as per the 2013 EALUCIP (SRNS 2013).

Due to the variability of environmental conditions and large scale of the LTR IOU, the Upper subunit is segregated into the following nine individual exposure areas (EAs) (Figure 4):

- EA1 includes Pond A and the R-Area Discharge Canal
- EA2 consists of the section of the canal system between Pond A and Pond B.
- EA3 includes Pond B and the overflow canal connecting Pond B to Pond C.
- EA4 consists of the section of the canal system between Pond B and the North Arm of PAR Pond.
- EA5 consists of Joyce Branch (also known as the Old R-Area Discharge Canal).
- EA6 consists of PAR Pond.
- EA7 includes Pond 2 and the Discharge Canal between P Area and Ponds 4 and 5.
- EA8 includes Ponds 4 and 5 and the Discharge Canal between Ponds 4 and 5 to Pond C.
- EA9 consists of Pond C.

As such, the Upper subunit required multiple RAs to address the nature and extent of contamination within the LTR IOU system. LUCs with Monitored Natural Recovery (MNR) is the selected alternative for all nine EAs (EA1 through EA9). Excavation, Treatment and Disposal of PTSM Sediment/Soil is the selected alternative for the PTSM location in EA1 (Pond A – Including R Discharge Canal) to reduce potential exposure and mitigate sediment/soil migration; Maintain Water in Ponds is the selected alternative for EA3 (Pond B) and EA6 (PAR Pond) to maintain water levels in Pond B, PAR Pond, and Pond C to reduce potential exposure and mitigate sediment/soil migration. Water levels in Pond B, PAR Pond, and Pond C will be maintained by performing inspections and necessary maintenance on the individual dams for each pond system. Inspections will note any significant water level drops and will be reported in the five-year remedy reviews or earlier as conditions warrant. In addition, appropriate signage will be posted at viable surface water bodies within the Upper subunit that maintain fishable fish populations, i.e., Pond B, Pond C, and PAR Pond.

A separate monitoring plan will be submitted to monitor the decay of Cs-137 and Co-60 at all nine EAs and will be implemented in accordance with the *Monitored Natural Recovery Effectiveness Plan for the Lower Three Runs Integrator Operable Unit – Upper Subunit (U)*, SRNS-RP-2022-00085, Revision 0, March 2022. MNR will also include consideration of biological sampling and passive sampling techniques to assess bioavailability of Cs-137 and mercury. Monitoring data will be presented in the five-year remedy reviews and will be used to document the effectiveness of the RA or evaluate the need for further actions.

The post-RA conceptual site model (Figure 5) demonstrates that the exposure pathways to an onsite worker (external exposure to radiation) and hypothetical recreational fisherman (ingestion of fish tissue) are incomplete following implementation of the RA. According to the *Savannah River Site Future Use Project Report* (USDOE 1996), residential use of SRS land is prohibited.

### **3.0 LAND USE CONTROL OBJECTIVES**

The following LUC objectives for the Upper subunit, as documented in the LTR IOU ROD, have been developed to ensure the protectiveness of the RAs.

- Prevent contact, removal, or excavation of sediment/soil within the LTR IOU.
- Prohibit the development and use of property for residential use.
- Prevent fishing within the LTR IOU.

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

### **4.0 IMPLEMENTATION OF LAND USE CONTROLS**

This section describes the LUCs selected in the ROD to achieve the LUC objectives stated in Section 3.0. A summary of the types of LUCs controls is provided in Table 1. USDOE is responsible for implementing, maintaining, reporting on and enforcing the LUCs required for the LTR IOU. The LUCIP will become enforceable and will be implemented when approved by USEPA and SCDHEC following the completion of the RAs prescribed by the LTR IOU ROD.

USDOE shall notify USEPA and SCDHEC 60 days in advance of any proposed land use changes that are inconsistent with LUC objectives or the selected remedy.

The LTR IOU will be maintained as an industrial use area by implementation of the property record notices and restrictions (Section 4.1) and the LUC boundary map (Section 4.2).

The Site Use Program (Section 4.3) will be implemented to prevent onsite worker exposure to contamination left in place at the LTR IOU. Other existing measures (i.e., Site Clearance Program, worker training, health and safety requirements, work controls) will also be used to ensure worker safety at the LTR IOU. Physical access controls (Section 4.4) are implemented at the SRS boundary to control and restrict public and trespasser access to the LTR IOU Upper subunit.

Signage posted at LTR IOU Upper subunit access points include access control signs with no unauthorized fishing warnings. These signs will be maintained to alert onsite workers to the presence of hazardous and radiological substances and prevent unknowing entry and unrestricted use. The signs will also convey the restrictions of unauthorized personnel. Access gates will be placed and maintained on access roads leading to known, accessible PTSM locations that remain within the Joyce Branch stream of the LTR IOU to prevent unknowing entry and unrestricted use.

A monitoring program will be initiated as defined by the *Monitored Natural Recovery Effectiveness Plan for the Lower Three Runs Integrator Operable Unit – Upper Subunit (U)* (SRNS 2022) SEMS Number: 35 (SRNS-RP-2022-00085, Revision 1, August 2022).

#### **4.1 Property Record Notices and Restrictions**

In the long term, if the property, or any portion thereof, is ever transferred from USDOE, the U.S. Government and/or USDOE will take those actions necessary pursuant to Section 120(h)(1) of CERCLA. Those actions will include in any contract, deed, or other transfer document, notice of the type and quantity of any hazardous substances that were known to have been stored (for more than one year), released, or disposed of on the property. The notice will also include the time at which the storage, release, or disposal took place to the extent such information is available.

In addition, if the property, or any portion thereof, is ever transferred by deed, the U.S. Government will also satisfy the requirements of CERCLA 120(h)(3). The requirements include: a description

of the RA taken, a covenant, and an access class. These requirements are also consistent with the intent of the Resource Conservation and Recovery Act (RCRA) deed notification requirements at final closure of a RCRA facility if contamination will remain at the unit.

LUCs will be implemented through the following:

- The contract, deed, or other transfer document shall also include restrictions precluding residential use of the property. However, the need for these 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 LUCs will be done through an amended ROD with USEPA and SCDHEC review and approval.
- In addition, if the site is ever transferred to nonfederal ownership, a survey plat of the IOU will be prepared, certified by a professional land surveyor, and recorded with the appropriate county recording agency.

In the event of a property lease or interagency agreement, the equivalent restrictions will be implemented as required by CERCLA Section 120(h).

USDOE shall provide the USEPA and SCDHEC at least a six month notice prior to transfer or sale of property subject to LUCs to ensure that USEPA and SCDHEC can be involved in discussions to ensure that appropriate provisions are included in the transfer documents to maintain effective LUCs. If it is not possible for the USDOE to notify the USEPA and SCDHEC at least six months prior to the transfer or sale, then the facility will notify the USEPA and SCDHEC as soon as possible but no later than 60 days prior to the transfer or sale of any property subject to LUCs. In addition to the land transfer notice and discussion provisions above, USDOE further agrees to provide the USEPA and SCDHEC with similar notice within the same time frames as to federal-to-federal transfer of property.

## **4.2 LUC Boundary Maps**

This LUCIP identifies the proposed area under land use restrictions in Figure 6 for the LTR IOU. Following field implementation of the RA, a final as built map will be developed to include the

boundary for the area subject to land use restrictions and general locations of access control warning signs and gates. The final as built map will be submitted to USEPA and SCDHEC in the Post-Construction Report (PCR).

In addition, if the site is ever transferred to non-federal ownership, a certified survey plat of the IOU will be prepared at or near the time of conveyance to support the LUCIP required restrictive covenants on land use and will be recorded with the appropriate county recording agency.

### **4.3 Site Use Program**

Under DOE Order 430.1A, *Life Cycle Management* (USDOE 1998), SRS is required to implement an asset management program for the use, maintenance, and disposal of physical assets, including real estate. SRS complies with this USDOE Order through the Site Use Program which is administered by Site Development Control (SDC) in accordance with SRS Manual 1D, *Site Infrastructure and Services Manual*, Procedure 3.02, "Site Real Property Configuration Control" (SRS 2006). Use of all lands and waters on the SRS are coordinated via the Site Use Program. No use of land (i.e., excavation or any other land use) shall be undertaken without prior approval by the USDOE and documented by a Site Use Permit.

SRS identifies all buildings, facilities, and FFA waste units on SRS site development maps that are maintained by SDC in accordance with SRS Manual 1D. If LUCs are required for an FFA waste unit, the unit-specific LUC boundaries are identified on the SRS site development maps. SDC must verify that any proposed work to be performed on a site is sanctioned by a Site Use Permit and verify that the proposed activity does not conflict with any previously approved land use.

In addition to the management of the use of SRS lands and waters through the Site Use Program, the SDC also administers the Site Clearance Program to control the construction, alteration, or demolition activities at SRS. Before any work that adds or modifies features or facilities portrayed on the SRS site development maps is conducted, a Site Clearance Permit is required. USDOE approval of the intended land via a Site Use Permit must be verified before a Site Clearance Permit is issued. If a Site Clearance request potentially impacts a FFA waste unit, the Site Clearance Request Form is sent to the appropriate FFA reviewer for approval. The FFA reviewer will

evaluate the proposed activity to identify any conflicts with the waste unit and to verify that waste unit specific LUCs are not compromised. The roles and responsibilities of the individuals responsible for review and approval of Site Use and Site Clearance permits are detailed in SRS 1D, Procedure 3.02. All employees, contractors, and visitors at SRS are required to adhere to the Site Use Program and the Site Clearance Program.

The USDOE will notify USEPA and SCDHEC in advance of any change to any internal procedure, including the Site Use Program, which would affect implementing or maintaining the LUCs. Approval by USEPA and SCDHEC is required for any modification or termination of the LUCs and implementation actions, and the USDOE must obtain prior approval from USEPA and SCDHEC before taking any anticipated action that may disrupt the effectiveness of the LUCs or alter or negate the need for LUCs. The Site Use Permit and site development maps must be amended when the geographic configuration or buffer zone used to establish the permit boundary changes or there is a change to the land use. The processes are controlled within the SRS Quality Assurance (QA) Program in accordance with SRS 1Q Manual, *Quality Assurance* (SRS 2007). The SRS QA program governs all SRS activities.

#### **4.4 Physical Access Controls**

The Upper subunit of the LTR IOU is located within the main SRS boundary fencing where physical access controls (fencing, security gates) are provided. There are two locations in EA5 (Joyce Branch) where PTSM has been located within the stream's boundary. In addition to signage, access gates will be installed at two vehicle entrance roads approaching these locations (see Figure 7) as a physical reminder to the onsite worker that contamination is still present in the stream bed. The access gates will be put into place during the installation of the signs for the Upper subunit as discussed in Section 4.5.

#### **4.5 Warning Signs**

To prevent unknowing entry and to ensure that unrestricted use of the waste unit does not occur while the unit is under ownership of the USDOE, access control warning signs as shown in Appendix A will be posted at the unit. No Unauthorized Fishing as part of the warning will be for viable surface water bodies (Pond B, Pond C, and PAR Pond) that maintain consumable fish

populations. Soil contamination area signs may also be posted, at the discretion of the Radiological Protection Department, where applicable, in accordance with SRS radiological control procedures. Installation of the signage will follow the LTR IOU construction schedule as described in the Remedial Action Implementation Plan and will be completed by May 2024. In addition, the final placement of the signage will be document in the final PCR. The signs will be legible for a distance of at least 7.6 meters (25 feet). Figure 7 depicts the locations of the warning signs as well as the access gates.

Custodial responsibilities for maintenance and inspection of the LTR IOU will be maintained by the SRS Post-Closure Maintenance Group.

#### **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 2013 RCRA 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 Land Use Controls**

After remediation of the Upper subunit of the LTR IOU, monitoring (MNR), inspection and maintenance activities will be required by this RA.

The LTR IOU will be inspected per the Field Inspection Checklist in Appendix B. Field inspections will be completed every five years. Additional inspections may be necessary in the event of unusual weather or any other condition warranting inspection. For the LTR IOU, inspections will be performed to ensure that access signs are in place and are legible, all gates are in place and in working order, and any evidence of trespassing is documented and reported.

Any activity that is inconsistent with the LUC objectives or use restrictions, or any other action that may interfere with the effectiveness of the LUCs will be addressed by the USDOE as soon as practicable, but in no case will the process be initiated later than 10 days after the USDOE becomes

aware of the breach. The USDOE will notify USEPA and SCDHEC as soon as practicable but no longer than 10 days after discovery of any activity that is inconsistent with the LUC objectives or use restrictions, or any other action that may interfere with the effectiveness of the LUCs. The USDOE will notify USEPA and SCDHEC regarding how the USDOE has addressed or will address the breach within 10 days of sending USEPA and SCDHEC notification of the breach.

The FFA Annual Progress Report, submitted to the regulatory agencies by USDOE, will provide the status of the LUCs and describe how any LUC deficiencies or inconsistent uses have been addressed. In the event of property transfer or lease, the Annual Report will cite findings on the following: whether the use restrictions and controls referenced above were communicated in the deed(s) or lease restrictions; whether property use conforms with the deed or lease restrictions and controls; and whether the owners and state/local agencies have been notified regarding the deed or lease restrictions and controls. The FFA Annual Progress Report(s) will be used in the preparation of the Five-Year Remedy Review 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 Area Completion Projects (ACP) Document Control. The LUCs shall be maintained until the concentration of hazardous substances associated with the unit have been reduced to levels that allow for unlimited exposure and unrestricted use.

The waste unit inspectors are to be trained in Hazardous Waste Operations and Emergency Response, ACP RCRA Waste Unit Inspections, Radiological Worker Training, 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 maintenance activities.

This unit-specific LUCIP, including the checklist (Appendix B), will be appended to the SRS LUCAP upon final regulatory approval. After completion of the PCR, the preliminary checklist in the LUCAP will be replaced with the final approved checklist.

## **5.0 REFERENCES**

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SRNS, 2012. *Explanation of Significant Differences (ESD) for the Revision 0 Interim Action Record of Decision Remedial Alternative Selection: PAR Pond Unit (U); Lower Three Runs Integrator Operable Unit Tail Portion (Middle and Lower Subunits) (U)* SRNS-RP-2012-00121, Rev. 1, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

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SRNS, 2020. *Feasibility Study for the Lower Three Runs Integrator Operable Unit (U)*, SRNS-RP-2018-00199, Rev. 1.1, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

SRNS, 2021. *Record of Decision Remedial Alternative Selection for the Lower Three Runs Integrator Operable Unit (OU)*, SRNS-RP-2020-00542, Rev. 1, Savannah River Site, Aiken, SC

*SRNS, 2022. Monitored Natural Recovery Effectiveness Plan for the Lower Three Runs Integrator Operable Unit – Upper Subunit (U) (SRNS 2022) SEMS Number: 35 (SRNS-RP-2022-00085, Revision 1, August 2022)*

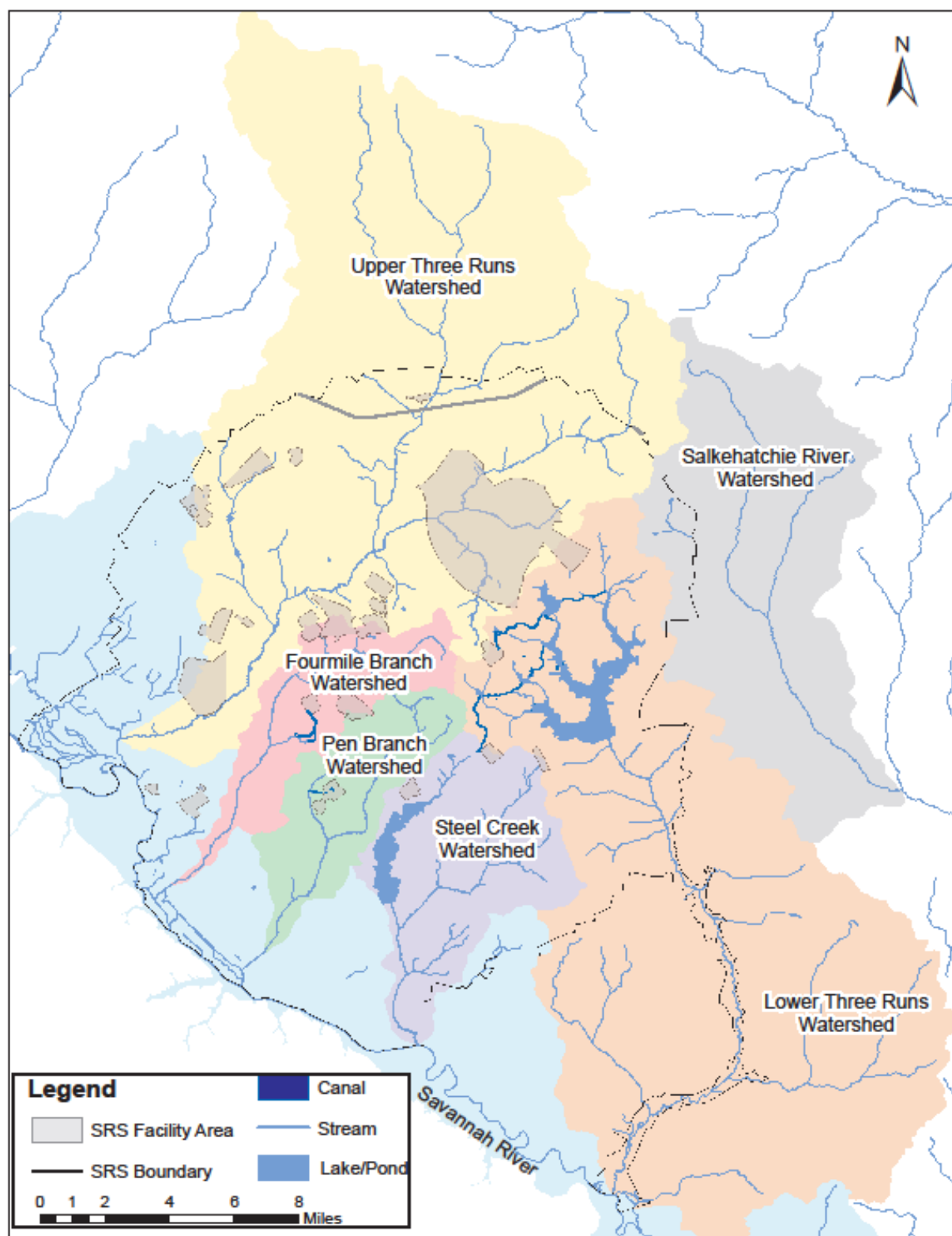
SRS, 2006. SRS Procedure Manual 1D, *Site Infrastructure and Services Manual (U)*, Procedure 3.02, "Site Real Property Configuration Control," Savannah River Site, Aiken, SC

SRS, 2007. SRS Procedure Manual 1Q, *Quality Assurance (U)*, Savannah River Site, Aiken, SC

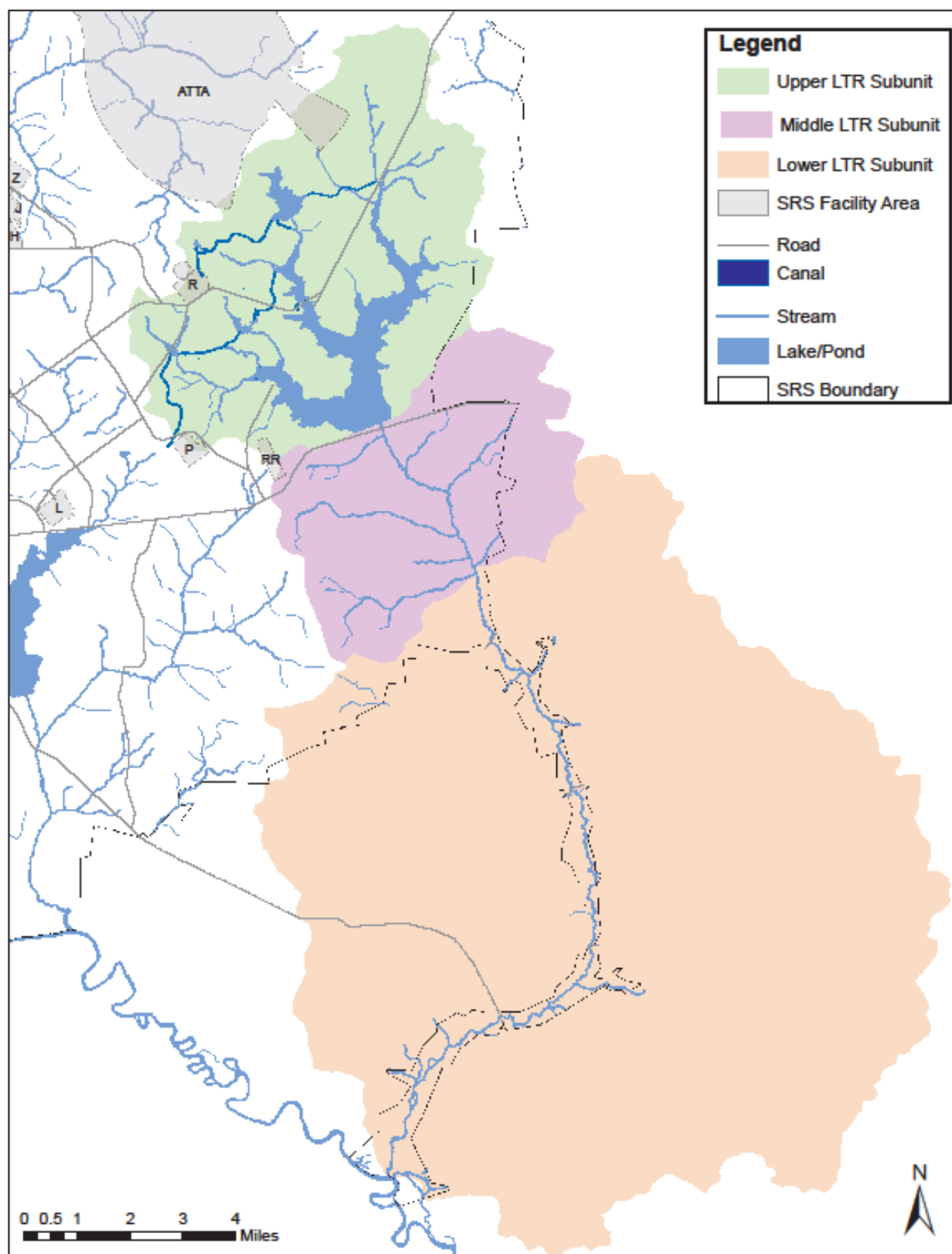
USDOE, 1996. *SRS Future Use Project Report, Stakeholder Preferred Recommendations for SRS Land Use Facilities*, United States Department of Energy, Savannah River Operations Office, Aiken, SC

USDOE, 1998. DOE Order 430.1A, *Life Cycle Management* (Approved October 14, 1998)

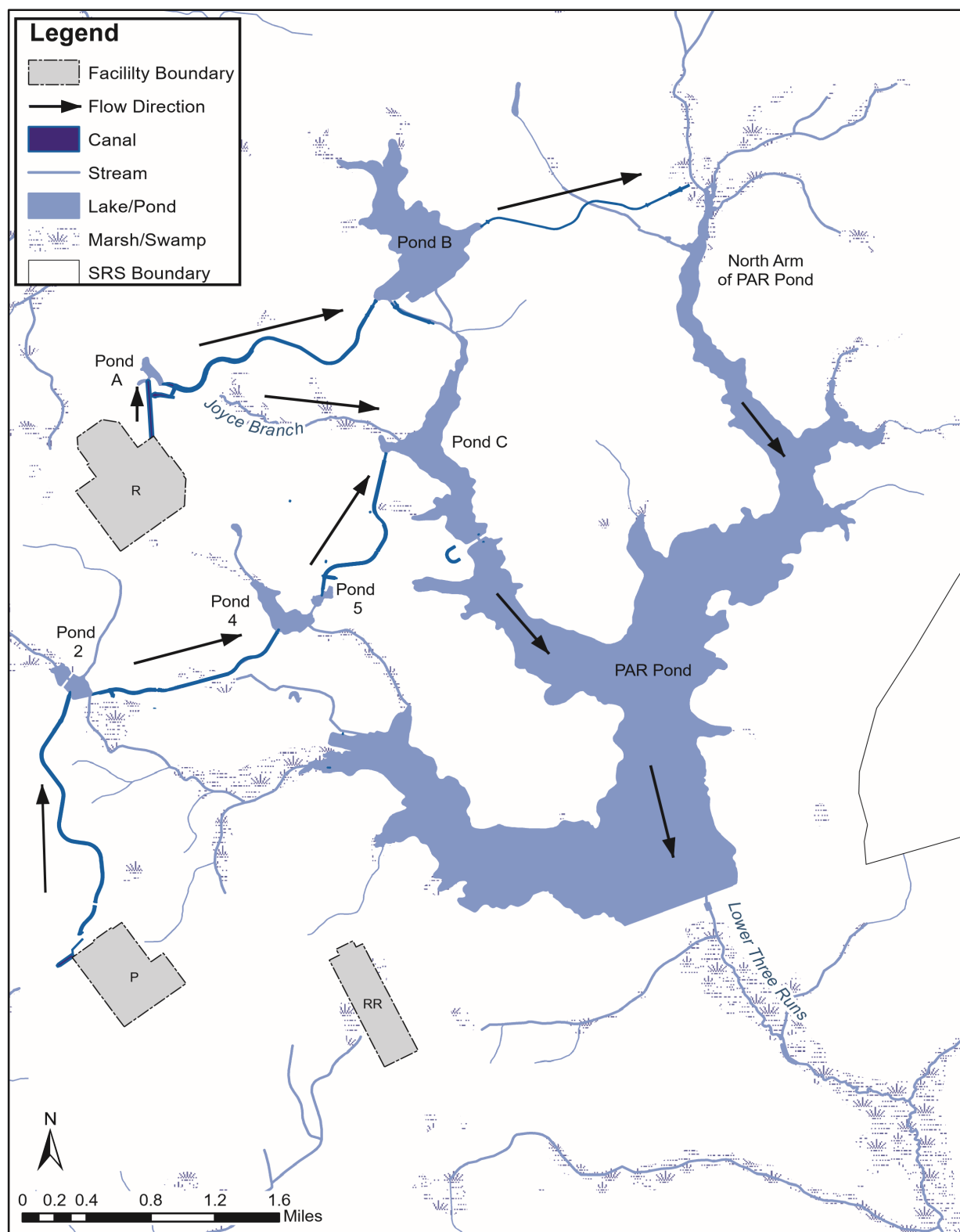
WSRC, 1999. *Land Use Control Assurance Plan for the Savannah River Site*, WSRC-RP-98-4125, Revision 1.1, August 1999, latest update, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC.



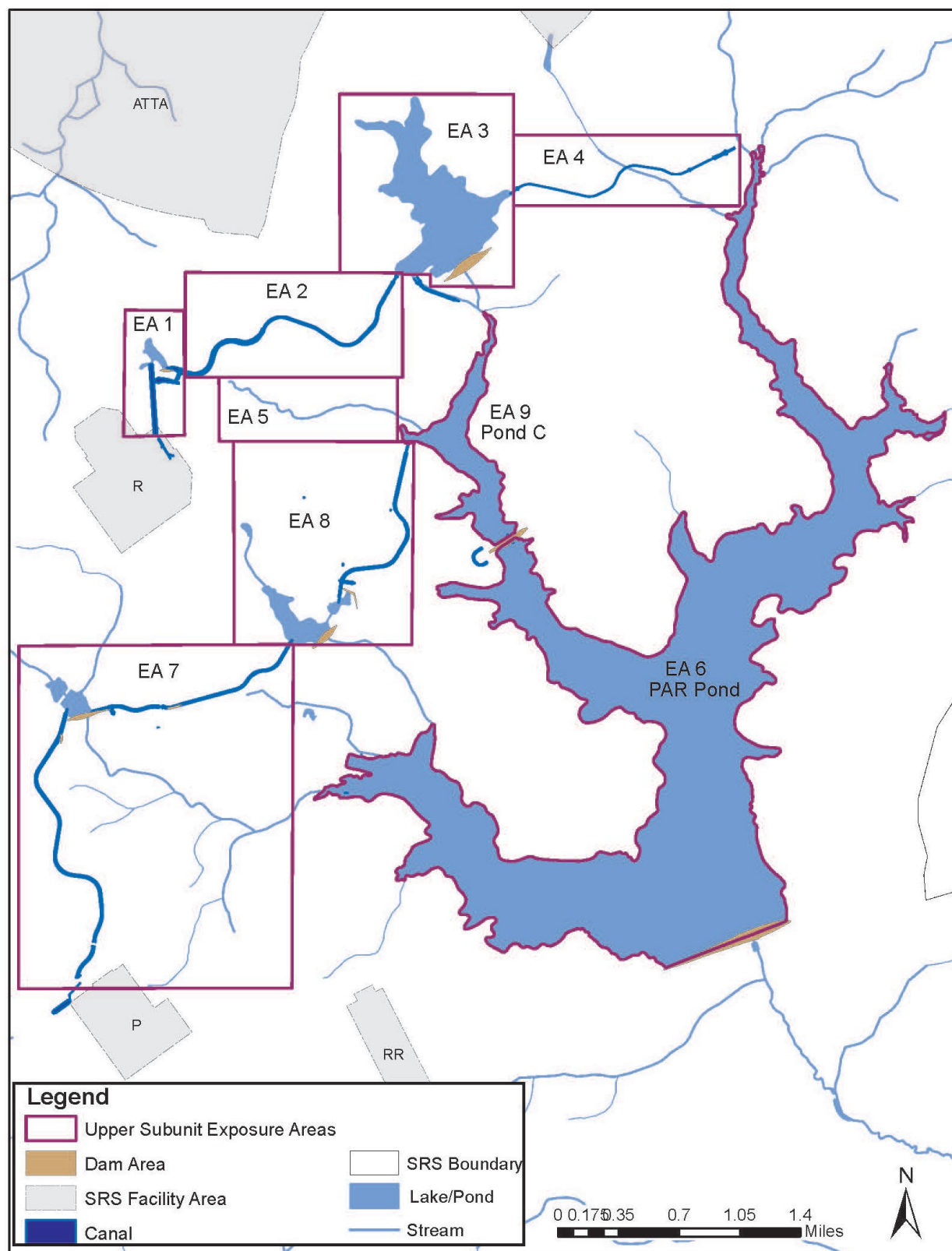
**Figure 1. Location of the Lower Three Runs Integrator Operable Unit within the Savannah River Site**



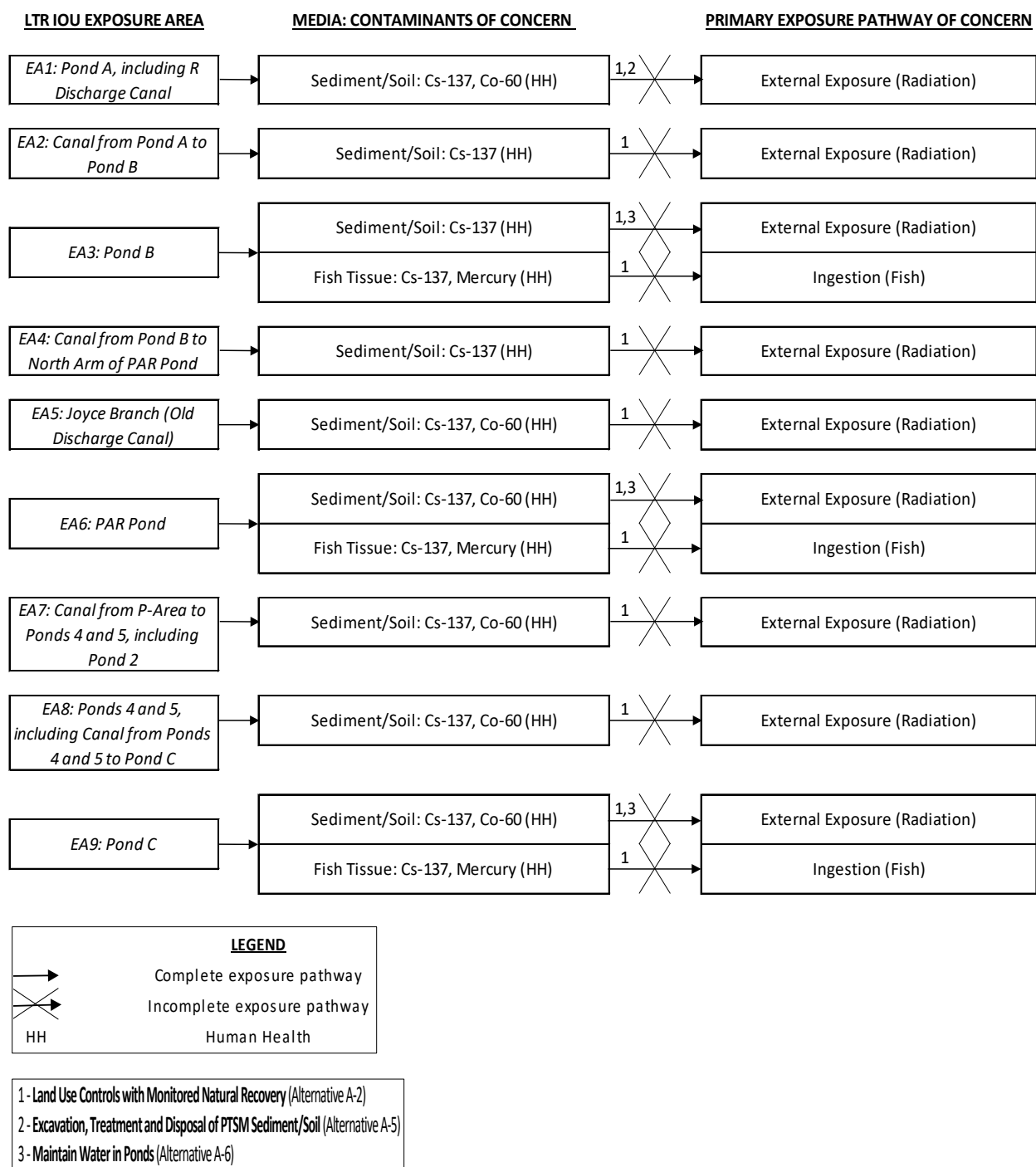
**Figure 2.** Location of the Lower Three Runs Integrator Operable Unit Subunits



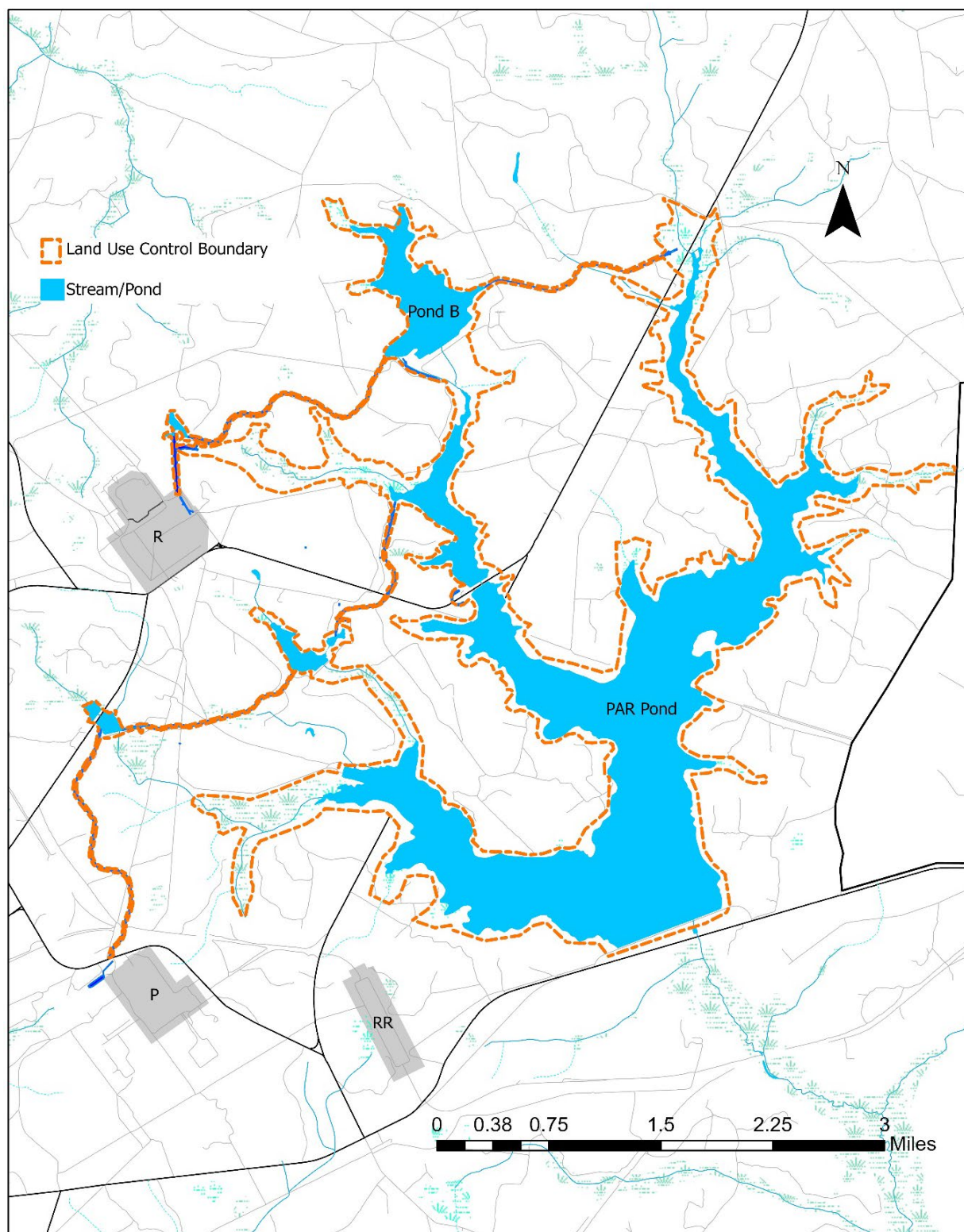
**Figure 3. Historical Flow Pattern for the Lower Three Runs Integrator Operable Unit Upper Subunit**



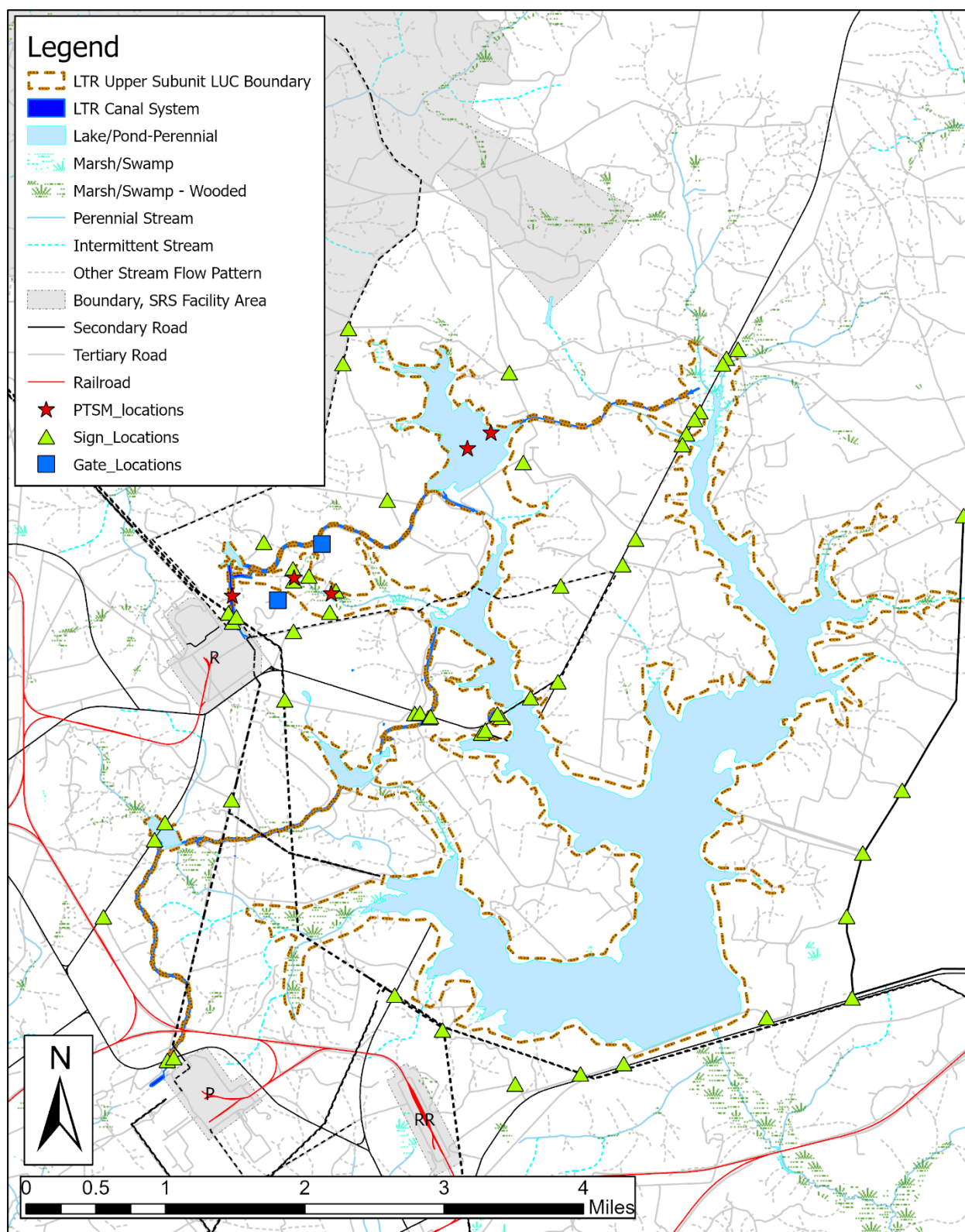
**Figure 4. Exposure Areas for the Upper Subunit of the Lower Three Runs Integrator Operable Unit**



**Figure 5. Post-Remedial Action Conceptual Site Model for the Lower Three Runs Integrator Operable Unit**



**Figure 6. Land Use Control Boundary for the Lower Three Runs Integrator Operable Unit – Upper Subunit**



**Figure 7. Warning Signs and Gate Locations of Upper Subunit**

**Table 1. Land Use Controls for the Lower Three Runs Integrator Operable Unit**

<b>Type of Control</b>	<b>Purpose of Control</b>	<b>Duration</b>	<b>Implementation</b>	<b>Affected Areas<sup>a</sup></b>
1. Property Record Notices <sup>b</sup>	Provide notice to anyone searching records about the existence and location of contaminated areas.	Until the concentration of hazardous substances associated with the unit have been reduced to levels that allow for unlimited exposure and unrestricted use.	Notice recorded by USDOE in accordance with state laws at County Register of Deeds office if the property or any portion thereof is ever transferred to non-federal ownership.	LTR IOU as identified in this ROD where hazardous substances are left in place at levels requiring land use restrictions.
2. Property record restrictions <sup>c</sup> : A. Land Use	Restrict use of property by imposing limitations.	Until the concentration of hazardous substances associated with the unit have been reduced to levels that allow for unlimited exposure and unrestricted use.	Drafted and implemented by USDOE upon any transfer of affected areas. Recorded by USDOE in accordance with state law at County Register of Deeds office.	LTR IOU as identified in this ROD where hazardous substances are left in place at levels requiring land use restrictions.
3. Other Notices <sup>d</sup>	Provide notice to city and/or county about the existence and location of waste disposal and residual contamination areas for zoning/planning purposes.	Until the concentration of hazardous substances associated with the unit have been reduced to levels that allow for unlimited exposure and unrestricted use.	Notice recorded by USDOE in accordance with state laws at County Register of Deeds office if the property or any portion thereof is ever transferred to non-federal ownership.	LTR IOU as identified in this ROD where hazardous substances are left in place at levels requiring land use.
4. Site Use Program <sup>e</sup>	Provide notice to worker/developer (i.e., permit requestor) on extent of contamination and prohibit or limit excavation/penetration activity.	As long as property remains under USDOE control	Implemented by USDOE and site contractors Initiated by permit request	LTR IOU as identified in this ROD where hazardous substances are left in place at levels requiring land use.

**Table 1. Land Use Controls for the Lower Three Runs Integrator Operable Unit (Continued/End)**

Type of Control	Purpose of Control	Duration	Implementation	Affected Areas <sup>a</sup>
5. Physical Access Controls <sup>f</sup> (e.g., fences, gates)	Control and restrict access to workers and the public to prevent unauthorized access.	Until the concentration of hazardous substances associated with the unit have been reduced to levels that allow for unlimited exposure and unrestricted use.	Controls maintained by USDOE.	Security is provided at site boundaries in accordance with SRS procedures. Gates will be installed at access points to Joyce Branch. Signs will be placed at road access points leading to the LTR IOU.
6. Warning Signs <sup>g</sup>	Provide notice or warning to prevent unauthorized uses.	Until the concentration of hazardous substances associated with the unit have been reduced to levels that allow for unlimited exposure and unrestricted use.	Signage maintained by USDOE.	Warning signs will be posted in accordance with applicable site procedures and will be placed at access roads leading to the LTR IOU.
7. Security Surveillance Measures	Control and monitor access by workers/public.	Until the concentration of hazardous substances associated with the unit have been reduced to levels that allow for unlimited exposure and unrestricted use.	Established and maintained by USDOE  Necessity of patrols evaluated upon completion of RAs or property transfer.	Patrol of LTR IOU as identified in this ROD, will be conducted as necessary.

<sup>a</sup>Affected areas – Specific locations identified in the OU-specific LUCIP or subsequent post-ROD documents.

<sup>b</sup>Property Record Notices – Refers to any non-enforceable, purely informational document recorded along with the original property acquisition records of USDOE and its predecessor agencies that alerts anyone searching property records to important information about residual contamination; waste disposal areas in the property.

<sup>c</sup>Property Record Restrictions – Includes conditions and/or covenants that restrict or prohibit certain uses of real property and are recorded along with original property acquisition records of USDOE and its predecessor agencies.

<sup>d</sup>Other Notices – Includes information on the location of waste disposal areas and residual contamination depicted on as survey plat, which is provided to a zoning authority (i.e., city planning commission) for consideration in appropriate zoning decisions for non-USDOE property.

<sup>e</sup>Site Use Program – Refers to the internal USDOE/USDOE contractor administrative program(s) that requires the permit requestor to obtain authorization, usually in the form of a permit, before beginning any excavation/penetration activity (e.g., well drilling) for the purpose of ensuring that the proposed activity will not affect underground utilities/structures, or in the case contaminated soil or groundwater, will not disturb the affected areas without the appropriate precautions and safeguards.

<sup>f</sup>Physical Access Controls – Physical barriers or restrictions to entry.

<sup>g</sup>Signs – Posted command, warning or direction.

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## **APPENDIX A**

### **WARNING SIGNS**

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Figure A-1. Access Control Warning Sign.

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