LUCIP for the
C-Area Operable Unit Early Action (consists of Potential Release from C-Area Disassembly Basin, Potential Release from C-Area Reactor Cooling Water System, C-Area Cask Car Railroad Tracks as Abandoned, ECODS C-1, C-Area Process Sewer Lines as Abandoned)
Land Use Control Implementation Plan for the C-Area Operable Unit Early Action
SRNS-RP-2015-00034, Revision 1, September 2015

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United States Department of Energy

Savannah River Site

Early Action Land Use Control Implementation Plan for the C-Area Operable Unit (U)

CERCLIS Number: 79

SRNS-RP-2015-00034

Revision 1

September 2015

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Prepared for
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and
Savannah River Nuclear Solutions, LLC
Aiken, South Carolina

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LIST OF ABBREVIATIONS AND ACRONYMS

~	approximately
ACP	Area Completion Projects
ARAR	applicable, or relevant and appropriate requirement
CAOU	C-Area Operable Unit
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CM	contaminant migration
+D	plus daughters
D&D	deactivation and decommissioning
EACMIR/RACR	Early Action Corrective Measures Implementation Report / Remedial Action Completion Report
EALUCIP	Early Action Land Use Control Implementation Plan
EAROD	Early Action Record of Decision
ECODS	Early Construction and Operational Disposal Site
ERA	ecological risk assessment
FFA	Federal Facility Agreement
HH	human health
HHRA	human health risk assessment
km, km^2	kilometer, square kilometers
LUC	land use control
LUCAP	Land Use Control Assurance Plan
mi, mi^2	miles, square miles
NTCR	non-time critical removal
OU	operable unit
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PSA	Potential Source Area
PTSM	principal threat source material
QA	Quality Assurance
RCOC	refined constituent of concern
RCRA	Resource Conservation and Recovery Act
RG	remedial goal
SCDHEC	South Carolina Department of Health and Environmental Control
SDC	Site Development Control
SRNS	Savannah River Nuclear Solutions, LLC
SRS	Savannah River Site
TCR	total cumulative risk
U.S.	United States
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 Early Action Land Use Control Implementation Plan (EALUCIP) has been prepared for the C-Area Operable Unit (CAOU) at the Savannah River Site (SRS). The CAOU comprises multiple subunits, Potential Source Areas (PSAs), and deactivation and decommissioning (D&D) facilities within C Area. Groundwater is not considered part of the scope of the CAOU. An Early Action Record of Decision (EAROD) documented the selection of an early action remedy to implement land use controls (LUCs) for portions of the CAOU (SRNS 2015). The purpose of this EALUCIP is to describe how the LUCs selected in the CAOU EAROD will be implemented and maintained. The LUC objectives have been documented in the CAOU EAROD and are listed in Section 3.0.

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 contaminated media (i.e., soil, gravel, concrete and steel) 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 periodically verified. The requirements of that LUCAP also apply to the LUCs that were selected as part of the early action remedy for the CAOU. This additional document, the CAOU EALUCIP, contains the detailed and specific measures required to implement and maintain the LUCs selected as part of this particular remedial decision. The LUCs shall be maintained until the operable unit (OU) 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 EALUCIP. Upon final approval, the EALUCIP will be appended to the LUCAP and should be considered incorporated by reference into the CAOU EAROD, 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 EALUCIP will remain in effect unless and until modifications are approved by USEPA and SCDHEC as necessary for protection of human health (HH) and the environment. In accordance with Section 121(c) of CERCLA and National Oil and Hazardous Substances Pollution Contingency Plan §300.430(f)(5)(iii)(c), a statutory review will be conducted within five years of initiation of the remedial action, and every five years thereafter, to ensure that the remedy continues to be protective of HH and the environment. Any approved EALUCIP modification will be appropriately documented for incorporation by reference into the CAOU EAROD.

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

2.0 OVERVIEW OF CAOU EARLY REMEDIAL ACTION

2.1 General Description and History of the CAOU

SRS occupies approximately (~) 802.9 km^2 (310 mi^2) of land adjacent to the Savannah River, principally in Aiken and Barnwell counties of South Carolina. SRS is located ~40.2-km (25-mi) southeast of Augusta, Georgia, and 32.1-km (20-mi) south of Aiken, South Carolina.

The CAOU is one of several OUs identified at SRS. It is located within the Fourmile Branch watershed (Figure 1). In 1955, C-Reactor began operations with a mission of producing nuclear materials for the defense program. SRS reactors were both low pressure and low temperature reactors with heavy water cooling of the core. C-Reactor was placed on cold standby in 1987, followed by shutdown due to reduced requirements for defense-related products. Reactor operations resulted in the generation of chemical and radioactive wastes. The C-Reactor is currently used as a storage site for tritiated-moderator water in tanks and for cask car refurbishment.

The CAOU is located in an area currently designated for industrial land use and is expected to remain industrial in the future. The *Early Action Record of Decision Remedial Alternative Selection for the C-, K-, L-, and R-Reactor Complexes* (SRNS 2009) selected in situ

decommissioning as the preferred end-state, with current LUCs in place for the C-Reactor Complex as specified by the *Early Action Land Use Control Implementation Plan (EALUCIP) for the C-, K-, and L-Reactor Complexes* (SRNS 2010).

Several CAOU subunits have undergone removal actions. Non-Time Critical Removal (NTCR) actions were completed for the C-Area Reactor Area Cask Car Railroad Tracks as Abandoned subunit and the C-Area Process Sewer Lines as Abandoned subunit in June 2011 and May 2012, respectively. A NTCR action was also completed for the C-Reactor (105-C) Disassembly Basin to evaporate the basin water and grout the basin to ground surface in September 2012. This NTCR action also included removal and evaporation of the tritiated water from the Containment Tank (C803-7-1). Upon future completion of ongoing missions at the C-Reactor Building Complex, the details of the final in situ decommissioning remedy will be selected in the final CAOU Record of Decision.

The CAOU subunits, PSAs, and D&D facilities are grouped based on potential future land use scenarios. Figure 2 identifies the subunits and the D&D facilities associated with the CAOU. The three D&D facilities (Air Compressor Building [607-9C], Effluent Monitoring Building [614-2C], and Gatehouse Entrance at Building 105 [701-2C]) are listed on Appendix K.2 and require no further action.

In addition, no action is required for the following subunits located outside the C Area perimeter fence line that have been determined to pose no threat to HH (residential and industrial) or the environment:

- Building 904-89G, Retention Basin for 100-C Containment (including Containment Tank C803-7-1 [no building number]); and
- Outfall C-01.

Groundwater is not part of the CAOU. Groundwater is being addressed separately under the C-Area Groundwater OU.

Subunits located within the C Area perimeter fence line were evaluated for industrial land use only since this area will not support unrestricted land use due to proximity to the reactor building complex. Therefore, all subunits inside the perimeter fence will require LUCs as part of any remedial decision to prevent unrestricted land use. For risk management purposes, subunits and PSAs outside the C Area perimeter fence were evaluated for both the industrial and residential land use scenarios since some of these units may be able to support unrestricted land use if residual risks do not pose a threat to HH and the environment.

The early remedial action selected in the EAROD is LUCs for the following subunits located within the C Area perimeter fence line to prevent unrestricted use and/or meet remedial goals (RGs):

- Building 717-C, Contaminated Maintenance Facility;
- C-Area Process Sewer Lines as Abandoned (including the Process Water Storage Tank [106-C], Cooling Water Effluent Sump [107-C], and Storage Basin [109-C]);
- C-Area Reactor Area Cask Car Railroad Tracks as Abandoned;
- Potential Release from C-Area Disassembly Basin (including the Pre-Manufactured Metal Shelter [710-C]); and
- Potential Release from C-Area Reactor Cooling Water System (186/190-C).

In addition, LUCs are the selected early remedial action at the following subunits located outside the C Area perimeter fence line to prevent unrestricted use and/or meet RGs:

- Early Construction and Operational Disposal Site (ECODS) C-1; and
- Outfall C-03.

2.2 Nature and Extent of Contamination in CAOU

A detailed description of the nature and extent of contamination associated with each of the CAOU subunits can be found in the *RCRA Facility Investigation / Remedial Investigation (RFI/RI) Report with Baseline Risk Assessment (BRA) and Focused Corrective Measures Study / Feasibility Study (CMS/FS) for the C-Area Operable Unit (U)* (SRNS 2014). Table 1

summarizes the results of the human health risk assessment (HHRA), ecological risk assessment (ERA), principal threat source material (PTSM) evaluation and contaminant migration (CM) to groundwater analysis and identifies refined constituents of concern (RCOCs) for each subunit that requires remedial action.

Subunits located inside the C Area perimeter fence line for which RCOCs were determined include:

- *Building 717-C, Contaminated Maintenance Facility:* surface concrete media, RCOCs identified for the future industrial worker scenario include cesium-137 and strontium-90, with a total cumulative risk (TCR) = 1.2E-05.

- *C-Area Cask Car Railroad Tracks as Abandoned:* surface soil/gravel media, cesium-137 identified as a RCOC for the future industrial worker scenario with a risk = 2.8E-06.

- *C-Area Process Sewer Lines as Abandoned*: potential exposure to fixed radiological contaminants within the subsurface pipelines (concrete/steel media).

The other subunits located within the current C Area perimeter fence line [i.e., Potential Release from C-Area Disassembly Basin and Potential Release from C-Area Reactor Cooling Water System (186/190-C)] were determined to have no problems warranting action under the industrial land use scenario. However, these subunits will be managed with LUCs because of their proximity to the C-Reactor Building (105-C).

Subunits located outside the perimeter fence line for which RCOCs were determined include:

- *ECODS C-1:* surface soil media, RCOCs identified for the future resident scenario include Aroclor 1254 and polycyclic aromatic hydrocarbons (PAHs) that include benzo(a)pyrene and benzo(b)fluoranthene, with a TCR = 2.2E-05. Aroclor 1254 was also identified as a RCOC for the future industrial worker scenario with a risk = 3.6E-06.

- *Outfall C-03:* surface soil media, cesium-137 identified as a RCOC for the future resident scenario with a risk = 1.9E-05 and the future industrial worker scenario with a risk = 1.2E-05.

No ecological or CM RCOCs were identified for any of the subunits that comprise the CAOU.

The following remedial action objectives were developed for CAOU:

- Prevent future resident exposure to contaminated media or structures located within the perimeter fence line.

- Prevent industrial worker exposure to cesium-137(+D) and strontium-90(+D) contaminated concrete that exceed 1E-06 risk levels at Building 717-C, Contaminated Maintenance Facility subunit.
- Prevent industrial worker exposure to fixed radiological contamination in concrete and/or steel inside the inactive C-Area Process Sewer Lines as Abandoned that exceeds a 1.0E-06 risk or PTSM levels.
- Prevent industrial worker exposure to cesium-137(+D) in rail bed gravels and soils that exceed 1E-06 risk levels at the C-Area Reactor Area Cask Car Railroad Tracks as Abandoned subunit.
- Prevent residential and industrial worker exposure to Aroclor 1254 in soils that exceed the polychlorinated biphenyl (PCB) applicable, or relevant and appropriate requirement (ARAR) and 1E-06 risk at ECODS C-1 subunit.
- Prevent residential exposure to PAHs in surface soil that exceed 1E-06 risk at ECODS C-1 subunit.
- Prevent residential and industrial worker exposure to cesium-137(+D) in surface soil at Outfall C-03 subunit.

The selected remedy for portions of the CAOU leaves hazardous substances that pose a potential future risk and will require land use restrictions until the concentrations of hazardous substances in the contaminated media (i.e., soil, gravel, concrete and steel) are at levels that allow for unrestricted use and exposure.

2.3 Early Remedial Action Selected

LUCs will be implemented to limit access to and the use of the contaminated portions of the CAOU so human exposure to contaminated media is controlled within acceptable limits for the industrial worker and/or future resident. LUCs do not remove or eliminate receptor exposure potential by removal or treatment of hazardous substances – only exposure is controlled. Through administrative and engineering controls, work activities are limited and controlled by the use of work clearance permits throughout the area of contamination. LUCs restrict access to, contact with, and excavation of the contaminated media. Warning signs will be posted informing personnel to contact the waste unit custodian prior to conducting work to prevent contact with hazardous substances. LUCs prevent the current and future industrial worker from being exposed to hazardous substances in the contaminated media. Deed restrictions will be in place to prevent future industrial uses that result in unacceptable exposure to contaminated media and to prohibit future residential housing, elementary and secondary schools, childcare facilities and playground uses of the property.

The post-early remedial action conceptual site model (Figure 3) demonstrates that the exposure pathways to an industrial worker are incomplete following implementation of the early action remedy. 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 CAOU LUC objectives have been developed to ensure the protectiveness of the remedy described above:

- Restrict unauthorized worker access to prevent contact, removal, or excavation of contaminated media (i.e., soil / gravel / concrete / steel).
- Prohibit the development and use of property for residential housing, elementary and secondary schools, child care facilities and playgrounds.

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

4.0 IMPLEMENTATION OF LAND USE CONTROLS

This section describes the LUCs selected in the EAROD to achieve the LUC objectives stated in Section 3.0. Table 2 contains a summary of the LUCs, including the purpose, duration, implementation, and affected areas. USDOE is responsible for implementing, maintaining, reporting on and enforcing the LUCs required for the CAOU. The EALUCIP will become enforceable and will be implemented when approved by USEPA and SCDHEC following the completion of the early remedial actions prescribed by the CAOU EAROD. 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 affected areas in the CAOU will be maintained as industrial use areas 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 CAOU. 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 CAOU. Physical access controls (Section 4.4) are implemented at the SRS boundary to control and restrict public and trespasser access to the CAOU.

Signs at the affected areas in the CAOU will be maintained to alert onsite workers to the presence of hazardous substances. The signs will also convey the restrictions of unauthorized personnel. Access control warning signs will be placed and maintained around the CAOU to prevent unknown entry and unrestricted use.

4.1 Property Record Notices and Restrictions

The term ‘Property Record Notice,’ as used in this LUCIP, refers to nonenforceable, information device(s) included in or recorded by USDOE along with a property transfer document(s) alerting anyone searching the records to important information about the contamination present in the CAOU, as depicted in Figure 4. The term ‘Deed Restriction,’ as used in this LUCIP, refers to conditions and/or covenants running with the land that restrict or prohibit certain uses of real

property as necessitated by residual contamination, and in accordance with federal and state law. 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 remedial action 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 to prevent future industrial uses that result in unacceptable exposure to contaminated media and to prohibit future residential housing, elementary and secondary schools, childcare facilities and playground uses of the property. If any portion of CAOU is transferred to non-federal ownership, the deed(s) (or other transfer document) will contain appropriate provisions to ensure that the use restrictions continue to run with the land and are enforceable by the USDOE against the Grantee (including any successors and/or assigns). The deed(s) will provide that any lease or subsequent deed executed by the Grantee for the parcel(s) within CAOU must include land use restrictions that are no less restrictive than the use restrictions described in this LUCIP. However, the need for these 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 LUCs will be done through an amended EAROD with USEPA and SCDHEC review and approval.

- In addition, if the Site is ever transferred to nonfederal ownership, a survey plat of the OU depicting the areas subject to LUCs as indicated on Figure 4 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. The USDOE shall provide a copy of executed deed or transfer assembly to USEPA and SCDHEC.

4.2 LUC Boundary Maps

This LUCIP identifies the proposed areas under land use restrictions in Figure 4. Following field implementation of the early remedial action, a final (as-built) survey plat for each of these areas will be developed and certified by a professional land surveyor registered in the State of South Carolina. The final plat will include the boundary coordinates for the area subject to land use restrictions and general locations of access control warning signs. The final as-built survey plats will be submitted to USEPA and SCDHEC in the Early Action Corrective Measures Implementation Report / Remedial Action Completion Report (EACMIR/RACR).

In addition, if the Site is ever transferred to non-federal ownership, a certified survey plat of the OU will be prepared at or near the time of conveyance to support the EALUCIP required

restrictive covenants on land use and will be recorded with the appropriate county recording agency.

4.3 Site Use Program

Under USDOE 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 Manual 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

There are no physical access controls, including fencing, required at the affected areas of the CAOU. Physical access controls are provided at the SRS boundary as mentioned in Table 2, Item 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. Approximate sign locations for the affected CAOU areas are indicated in Figure 4. Warning signs will not be posted on a portion of the west side of the Outfall-C-03 subunit since this area is not accessible due to the steep terrain. Installation of the access control warning signs will follow the CAOU construction schedule as identified in the CAOU EAROD with an early remedial action start date of January 5, 2016. In addition, the final placement of the signage will be documented in the EACMIR/RACR. The signs will be legible for a distance of at least 7.6 meters (25 feet).

Custodial responsibilities for maintenance and inspection of the CAOU 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 CAOU, only inspection and maintenance activities will be required by this early remedial action.

The affected areas of the CAOU will be inspected per the Field Inspection Checklist in Appendix B. Field inspections will be performed annually. Additional inspections may be necessary in the event of unusual weather or any other condition warranting inspection. Inspections will be performed to ensure that access control signs are in place and undamaged. Necessary repairs will be performed for items in Appendix B that are found to be in unsatisfactory condition.

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(s) to evaluate the effectiveness of the remedy.

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 RCRA Well Inspections (ACP-specific training), 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 EALUCIP, including the checklist (Appendix B), will be appended to the SRS LUCAP upon final regulatory approval. After completion of the EACMIR/RACR, the preliminary checklist in the LUCAP will be replaced with the final approved checklist.

5.0 REFERENCES

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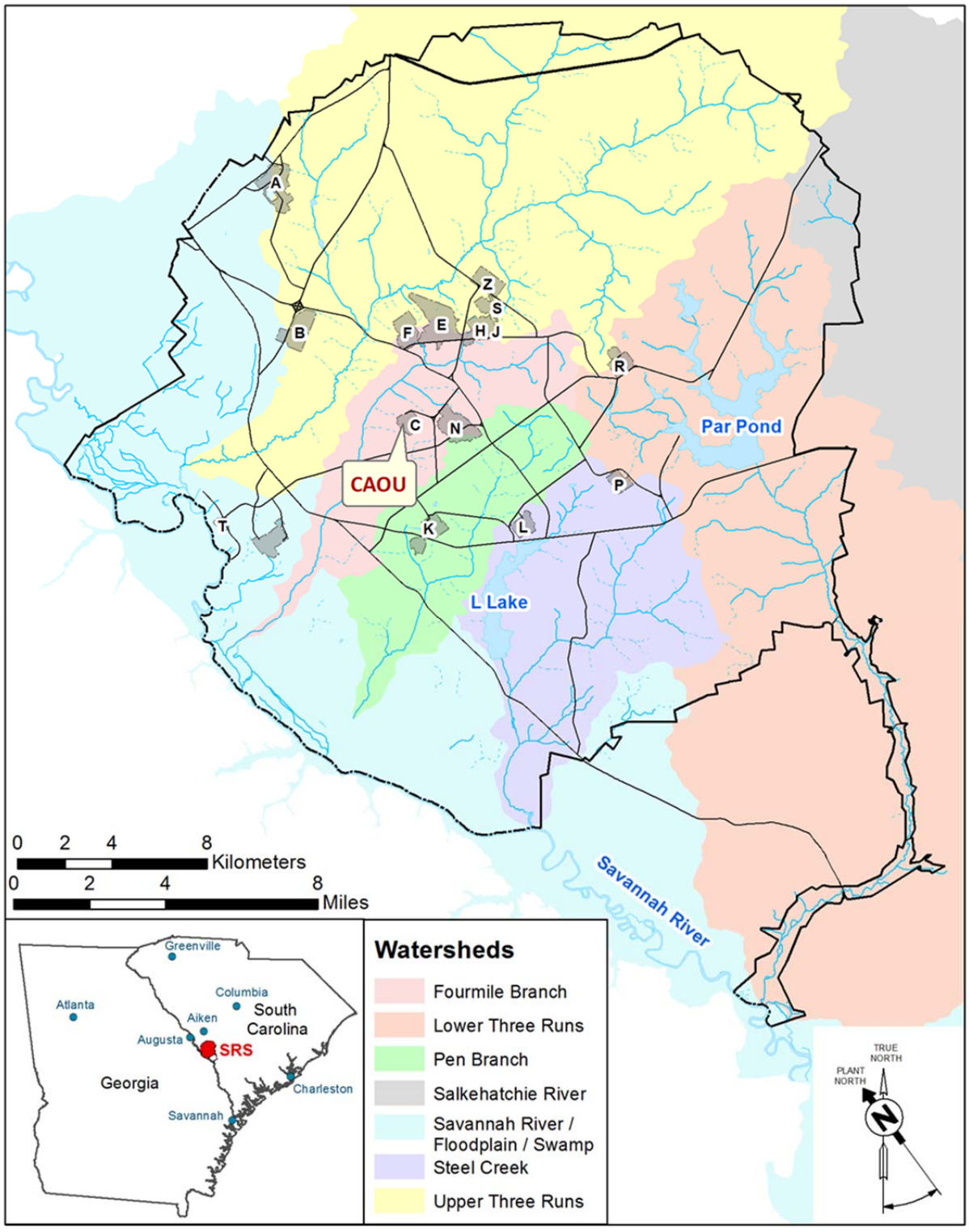


Figure 1. Location of the CAOU within the Savannah River Site

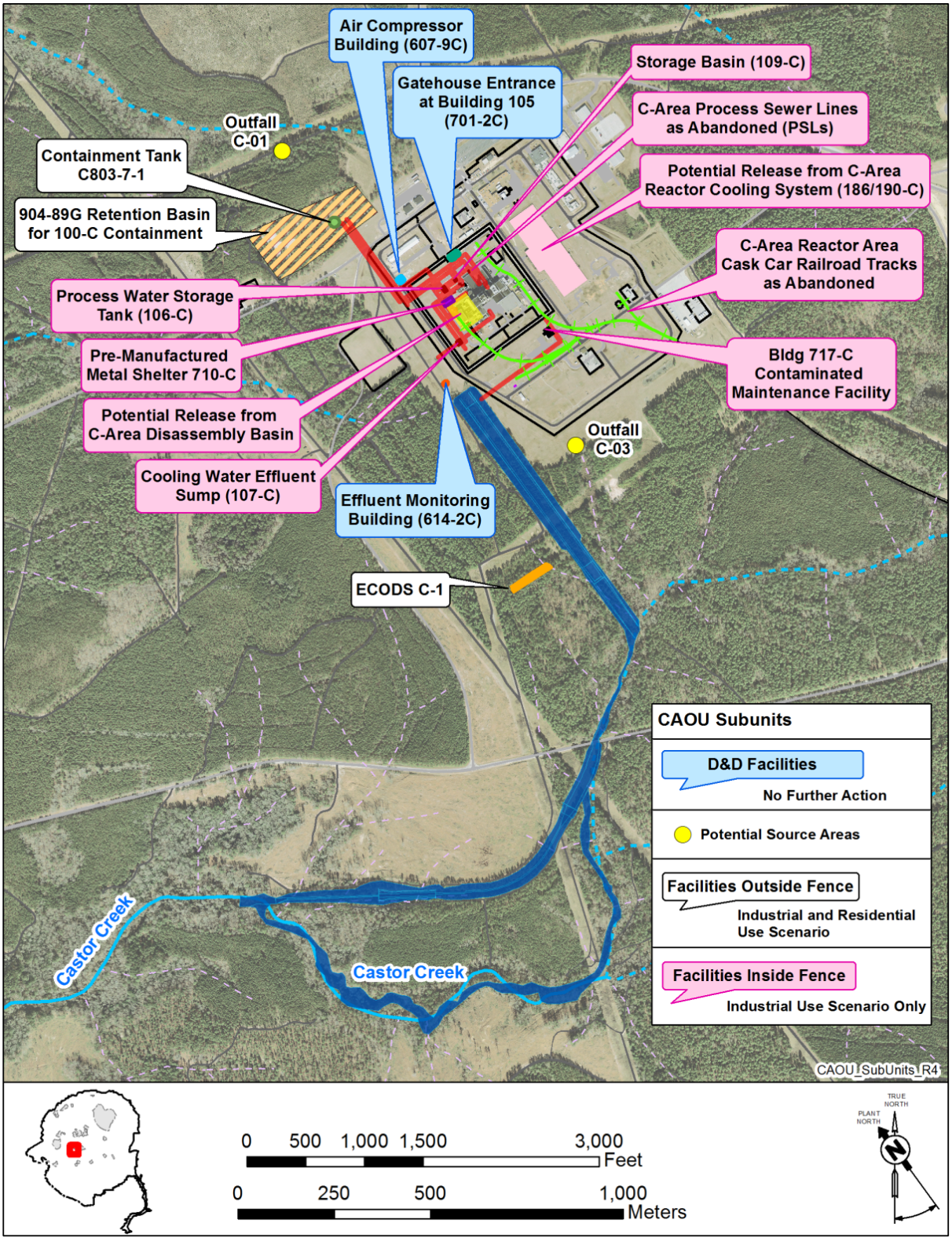
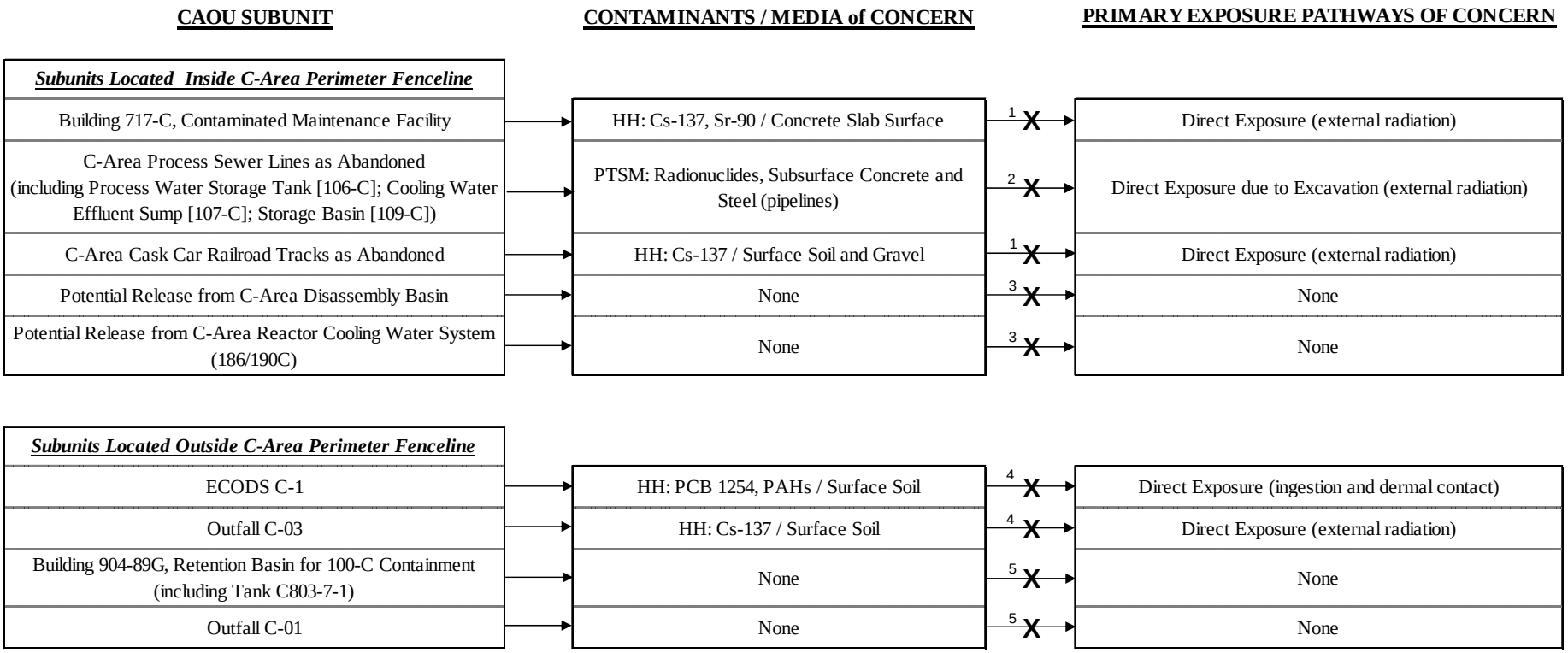


Figure 2. Location of the CAOU Subunits



HH = human health risk assessment
PTSM = principal threat source material
1 - COCs identified based on an evaluation of the industrial land use scenario; CAOU Land Use Controls required to prevent land disturbance activities and unrestricted land use.
2 - Radionuclides qualitatively identified as PTSM due to fixed contamination inside buried pipelines; CAOU Land Use Controls required to prevent land disturbance activities and unrestricted land use.
3 - No COCs identified based on an evaluation of the industrial land use scenario; CAOU Land Use Controls required to prevent unrestricted land use.
4 - COCs identified based on an evaluation of the residential and industrial land use scenarios; CAOU Land Use Controls required to prevent land disturbance activities and unrestricted land use.
5 - No COCs identified based on either the residential or industrial land use scenario; Land Use Controls are not required and unrestricted use is permitted (No Action).

Figure 3. Post-Early Remedial Action Conceptual Site Model for the CAOU

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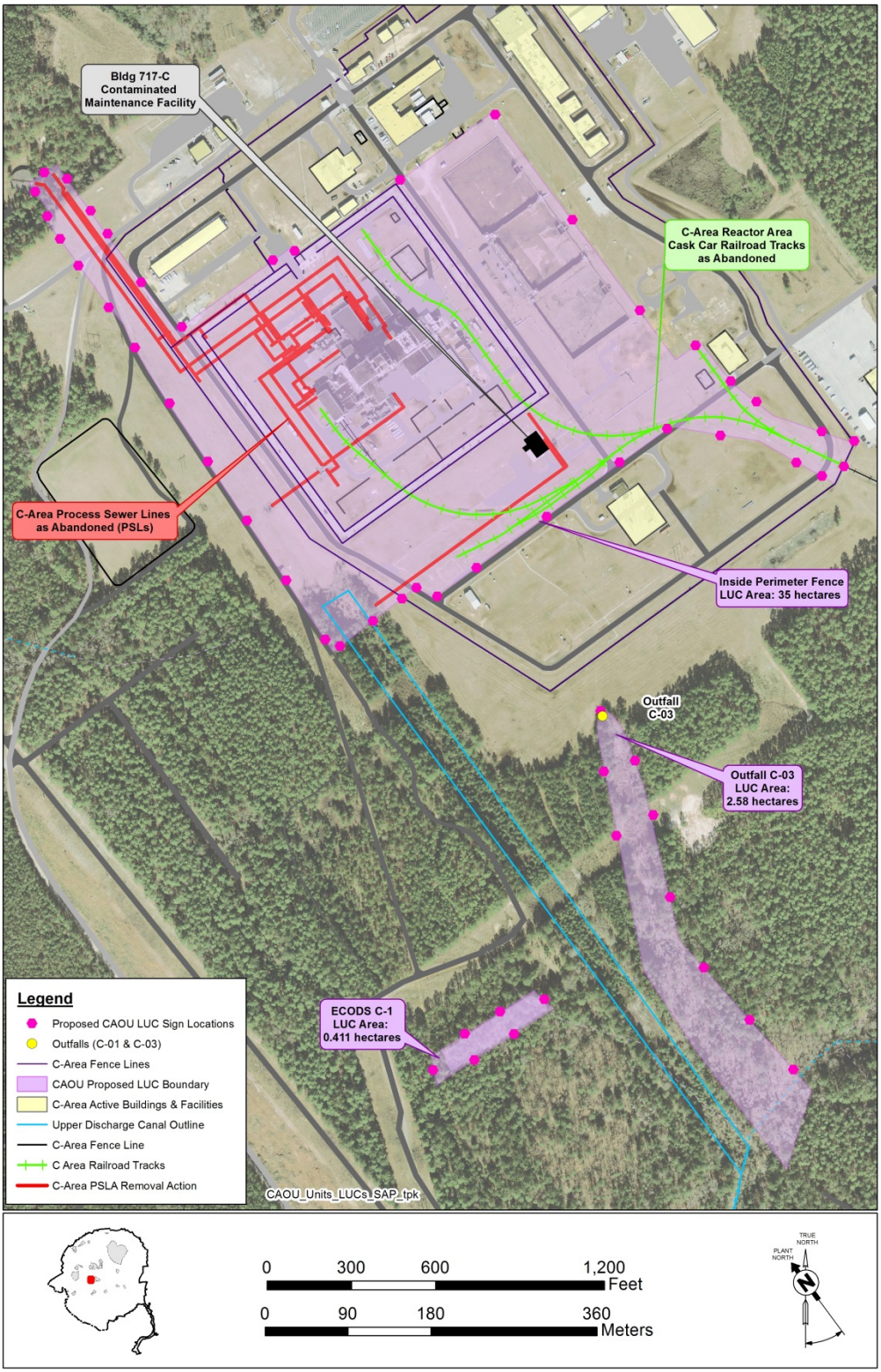

Figure 4. Approximate LUC Boundaries for CAOU Subunits

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Table 1. CAOU Risk Summary

Subunit	Media	ARAR[1]	PTSM[2]	HHRA[3]	ERA[4]	CM[5]
Building 717-C, Contaminated Maintenance Facility	Soil	None	None	*Resident*: NC *Worker:* None	NC	None
	Concrete	None	None	*Resident:* NC *Worker*: **Cs-137 (risk = 9.3E-06); Sr-90 (risk = 2.2E-06); TCR = 1.2E-05**	NC	None
C-Area Process Sewer Lines as Abandoned	Concrete / Steel	None	**Radionuclides**[6]	*Resident:* NC *Worker*: None (potential risk to fixed radiological contamination)	NC	None
C-Area Reactor Area Cask Car Railroad Tracks as Abandoned	Soil/Gravel	None	None	*Resident:* NC *Worker:* **Cs-137 (risk = 2.8E-06)**	NC	None
Potential Release from C-Area Disassembly Basin	Soil	None	None	*Resident:* NC *Worker*: None	NC	None
Potential Release from C-Area Reactor Cooling Water System (186/190C)	Soil/Sediment	None	None	*Resident*: NC *Worker:* None	NC	None
	Surface Water	None	None	*Resident:* NC *Worker:* None	NC	NC
Building 904-89G, Retention Basin for 100-C Containment	Soil	None	None	*Resident:* None *Worker:* None	None	None
ECODS C-1	Soil	**PCB 1254**	None	*Resident:* **PCB 1254 (risk = 1.2E-05); Benzo(a) pyrene (risk = 8.5E-06); Benzo(b)fluoranthene (risk = 1.5E-06); TCR = 2.2E-05** *Worker:* **PCB 1254 (risk = 3.6E-06)**	None	None
Outfall C-01	Soil	None	None	*Resident:* None *Worker:* None	None	None
Outfall C-03	Soil	None	None	*Resident:* **Cs-137 (risk = 1.9E-05)** *Worker:* **Cs-137 (risk = 1.2E-05)**	None	None

1 - ARAR = applicable or relevant and appropriate requirement
2 - PTSM = principal threat source material evaluation
3 - HHRA = human health risk assessment
4 - ERA = ecological risk assessment
5 - CM = contaminant migration analysis
6 - radionuclides qualitatively identified as PTSM due to fixed contamination inside the pipelines

NC = not calculated for this receptor or this media- for the HHRA, a quantitative residential evaluation was not required for the subunits inside the fence. For the ERA, a quantitative evaluation was not performed for the subunits located inside the fence because the exposure pathways were considered incomplete for wildlife receptors.
TCR = total cumulative risk

Table 2. Land Use Controls for the CAOU

Type of Control	Purpose of Control	Duration	Implementation	Affected Areas[a]
1. Property Record Notices[b]	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.	Waste management areas/subunits identified in this EALUCIP where hazardous substances are left in place at levels requiring land use restrictions.
2. Property record restrictions[c]: 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.	Waste management areas/subunits identified in this EALUCIP where hazardous substances are left in place at levels requiring land use restrictions.
3. Other Notices[d]	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.	Waste management areas/subunits identified in this EALUCIP where hazardous substances are left in place at levels requiring land use restrictions.
4. Site Use Program[e]	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.	Waste management areas/subunits identified in this EALUCIP where hazardous substances are left in place at levels requiring land use restrictions.
5. Physical Access Controls[f] (e.g., fences, gates, portals)	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.	Fencing and security is provided at SRS Site boundaries in accordance with SRS procedures. Additional physical access controls, including fencing, is not required at the affected areas of the CAOU.

Table 2. Land Use Controls for the CAOU *(Continued/End)*

Type of Control	Purpose of Control	Duration	Implementation	Affected Areas[a]
6. Warning Signs[g]	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 in appropriate areas at the CAOU.
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 remedial actions or property transfer.	Patrol of waste management areas/subunits identified in this EALUCIP, as necessary.

[a]Affected areas – Specific locations identified in the OU-specific EALUCIP.
[b]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.
[c]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.
[d]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.
[e]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.
[f]Physical Access Controls – Physical barriers or restrictions to entry.
[g]Signs – Posted command, warning or direction.

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APPENDIX A

ACCESS CONTROL WARNING SIGNS

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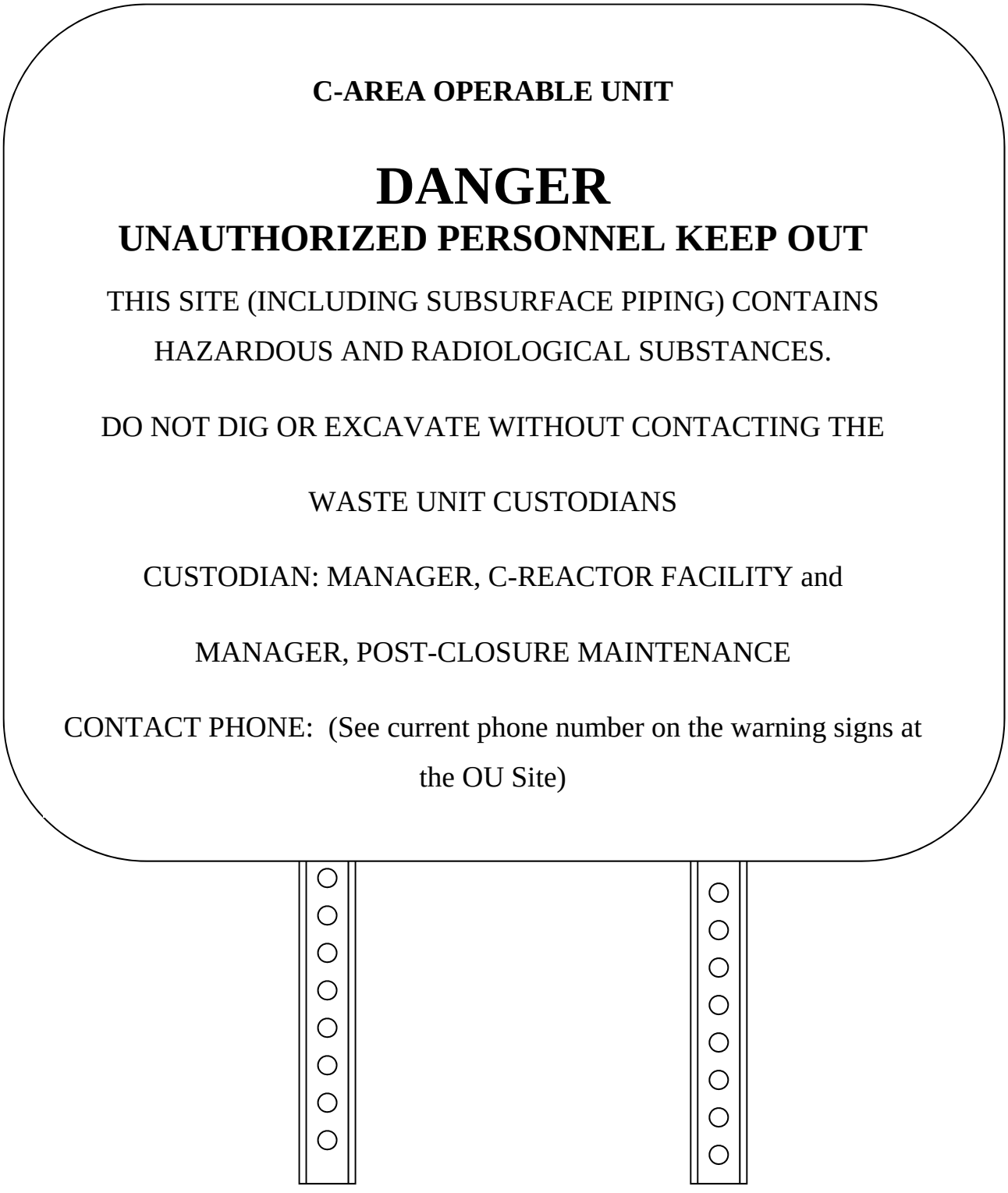

Figure A-1. Access Control Warning Sign for the CAOU Subunits

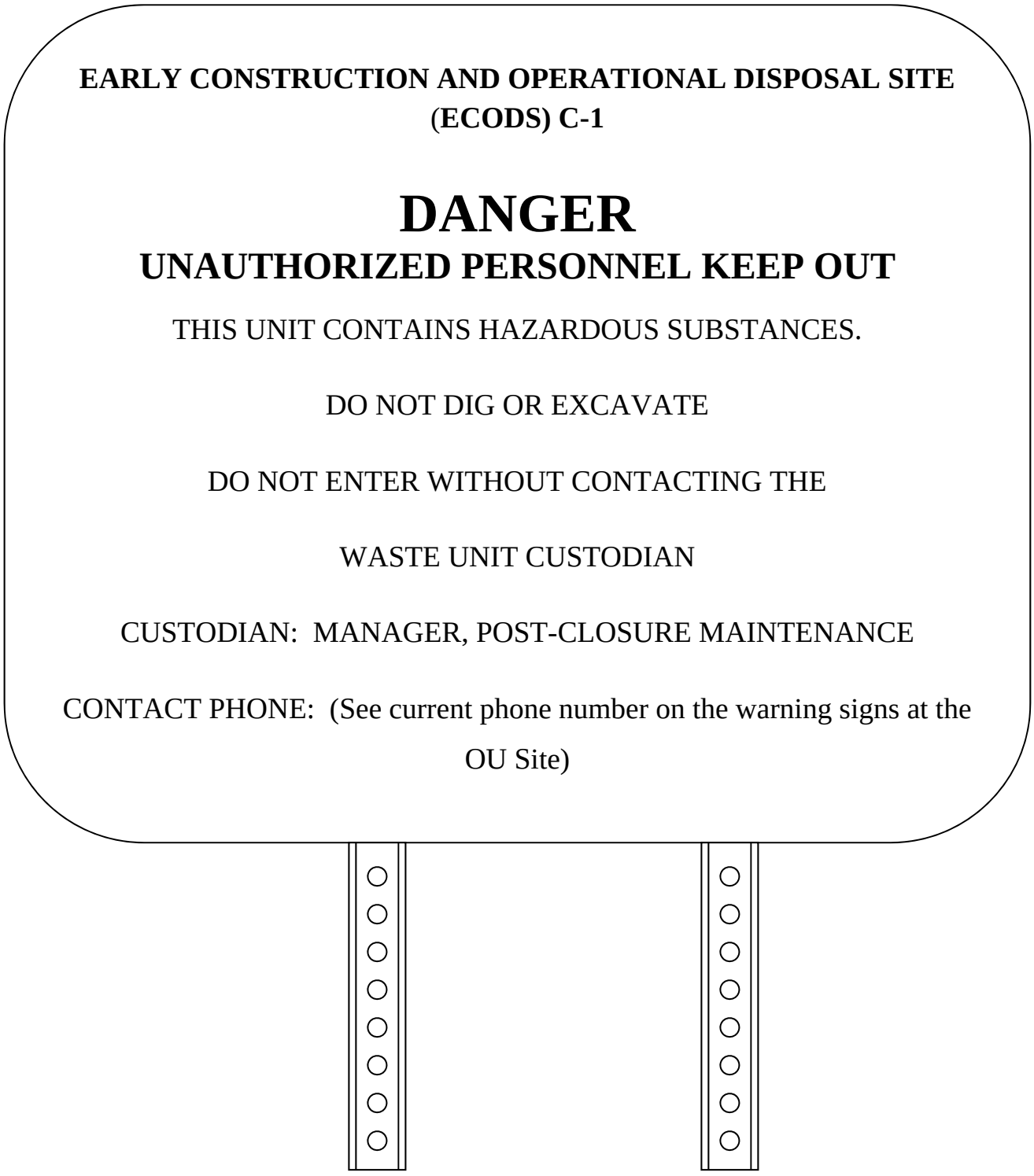

Figure A-2. Access Control Warning Sign for ECODS C-1

Figure A-3. Access Control Warning Sign for Outfall C-03

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APPENDIX B

FIELD INSPECTION CHECKLIST

FOR C-AREA OPERABLE UNIT

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FIELD INSPECTION CHECKLIST

FOR C-AREA OPERABLE UNIT

☐ **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 are in acceptable condition, have the correct information, and are legible from a distance of 25 feet.		
3. Verify that there are no unauthorized excavation, digging, or construction activities within the boundaries.		

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 land use controls of this waste unit. The notification shall be in accordance with SRS post-closure inspection procedures.

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