Savannah River NUCLEAR SOLUTIONS℠

Land Use Control Implementation Plan for the Early Construction and Operational Disposal Site L-3 (NBN), L-Area Rubble Pit (131-1L), and L-Area Rubble Pit (131-4L) Operable Unit (U)

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SAVANNAH RIVER SITE • AIKEN, SOUTH CAROLINA

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LIST OF ABBREVIATIONS AND ACRONYMS

~	approximate, approximately
ACM	asbestos containing material
BRA	baseline risk assessment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
ECODS	Early Construction and Operational Disposal Site
EPC	exposure point concentration
FFA	Federal Facility Agreement
ft	feet
HH	human health
km, km^2	kilometer, square kilometers
LRP 131-1L	L-Area Rubble Pit (131-1L)
LRP 131-4L	L-Area Rubble Pit (131-4L)
LLC	Limited Liability Company
LUC	land use controls
LUCAP	Land Use Controls Assurance Plan
LUCIP	Land Use Controls Implementation Plan
m	meter
mg/kg	milligrams per kilogram
mi, mi^2	mile, square miles
OU	operable unit
NBN	no building number
PCB	polychlorinated biphenyl
PTSM	principal threat source material
QA	quality assurance
RACR	Remedial Action Completion Report
RCOC	refined constituents of concern
RCRA	Resource Conservation and Recovery Act
RFI/RI	RCRA Facility Investigation / Remedial Investigation
ROD	Record of Decision
SCDES[1]	South Carolina Department of Environmental Services
SDC	Site Development Control
SE	site evaluation
SEMS	Superfund Enterprise Management System
SER	site evaluation report
SRNS	Savannah River Nuclear Solutions, LLC
SRS	Savannah River Site
TAL	Target Analyte List
TCL	Target Compound List
USDOE	United States Department of Energy
USEPA	United States Environmental Protection Agency
WSRC	Westinghouse Savannah River Company, LLC

[1] SCDES was known as the South Carolina Department of Health and Environmental Control prior to July 1, 2024.

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2.1.1 ECODS L-3 Subunit

The ECODS L-3 subunit is one of twenty-five ECODS at SRS which were identified during a review of early 1950s aerial photographs. These sites were used during the construction and early operation of SRS for disposal of trash, construction debris and other non-radioactive waste materials, such as rubble and concrete. The ECODS L-3 subunit is estimated to have been in use from November 1953 to June 1954. Prior to its use as a disposal site, the area was used as farmland. Sections of the trenches may have been used as a burn pit for disposal of combustible waste.

The ECODS L-3 subunit is located in the southern portion of the SRS, east of L Area (Figure 2). The ECODS L-3 subunit is located ~ 518 m (1,700 ft) east of the eastern corner of the L Area perimeter fence.

Based on historical photographs and a ground-penetrating radar survey completed in 2002 during a site evaluation (SE) of the subunit, it was estimated that waste disposed of in the ECODS L-3 subunit was buried in two trenches located end-to-end (Figure 3). The original trenches were estimated to be 18 m (60 ft) wide by 30 m (100 ft) long. The 2002 SE effort determined the trench dimensions were ~15 m (50 ft) wide by 27 m (90 ft) long and 4.6 m (15 ft) wide by 27 m (90 ft) long (WSRC 2003).

Soil samples were collected and analyzed during the 2002 SE of the ECODS L-3 subunit and results were reported in the *Site Evaluation Report for the Early Construction and Operational Disposal Site (ECODS) L-3 (NBN) (U)* (WSRC 2003). All samples were analyzed for the complete list of Target Analyte List (TAL) and Target Compound List (TCL) constituents. Based on the site evaluation report (SER) results, the ECODS L-3 subunit was placed in Appendix C, RCRA/CERCLA Units (FFA 1993) for further assessment.

An asbestos survey was not completed for the ECODS L-3 subunit during the 2002 SE. Based on the disposal history of similar SRS ECODS and the dates of operation of the ECODS L-3 subunit, asbestos containing material (ACM) may be present in soils at the ECODS L-3 subunit.

2.1.2 LRP 131-1L Subunit

The LRP 131-1L subunit is located in the southern portion of the SRS, east of L Area (Figure 2). The LRP 131-1L subunit is a former waste disposal area reportedly used for various construction

debris and operated from 1973 to 1982 (DuPont 1983a). However, the term "pit" may be a misnomer as the 2022 characterization activities did not indicate that a pit was constructed or that waste was placed below ground surface. There is no record of hazardous or radioactive material disposed of at the subunit.

The subunit is a rectangular area approximately 12 m (40 ft) by 46 m (150 ft) with the four corners marked by orange ball markers.

A preliminary screening was performed at the LRP 131-1L subunit in 1991, which included a soil-gas survey to determine if hazardous waste may be present in the subsurface soils and to identify potential areas of contamination within the subunit. The survey results determined that volatile organic compounds from methane through hexane are likely to be present in the subunit soils. The LRP 131-1L subunit was placed in Appendix C of the Federal Facility Agreement (FFA), RCRA/CERCLA Units (FFA 1993) for further assessment. No other characterization was performed at the LRP 131-1L subunit prior to the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI)/Remedial Investigation (RI) characterization in 2022 (SRNS 2025~~a~~).

The LRP 131-1L subunit was characterized in 2022 to support RFI/RI/Baseline Risk Assessment (BRA) of the subunit and for remedial decision making. Based on observation of soil cores during sampling activities, it was determined no waste material was placed below ground surface at the LRP 131-1L subunit. Construction debris was encountered at only one soil boring in the 0.3 to 1.2 m (1 to 4 ft) interval and appeared to be a railroad tie or other creosote wooden material. No potential ACM was observed in any soil borings. All samples collected in the 2022 characterization were analyzed for the complete list of TAL and TCL constituents, as well as radiological screening for gross alpha and nonvolatile beta.

2.1.3 LRP 131-4L Subunit

The LRP 131-4L subunit is located north of the L-Area fence and just north of the rail line (Figure 2). Records indicate the LRP 131-4L subunit received inert rubble from the L-Area Powerhouse Stack and Silo demolition (Dupont 1983a and DuPont 1983b). The rubble consisted primarily of concrete and asphalt material with some metal. The unlined pit was reported to have operated from 1973 to 1983 before it was filled and seeded in 1983. Operating procedures indicate

it was to receive inert, non-hazardous materials, and there are no records indicating any disposal of hazardous or radioactive materials.

Orange ball markers are present to designate the subunit boundaries, an area ~30.5 m by 30.5 m (100 ft by 100 ft) (Figure 4). However, during site walkdowns to support a 1994 SE effort, the subunit size was questioned due to land disturbance on the northwestern side of the subunit, outside of the orange ball markers. Additionally, during site walkdowns in 2021, in preparation of the RFI/RI Work Plan for the LRP 131-4L subunit, surface disturbance and debris (e.g., rebar, concrete, asphalt) were observed on the northeastern side of the subunit outside of the orange ball markers. Therefore, the LRP 131-4L subunit area to be investigated was expanded to approximately 36.6 m by 36.6 m (120 ft by 120 ft) to include the disturbed land and observed debris (Figure 4).

A SE of the LRP 131-4L subunit was conducted from 1992 to 1994, and results were reported in the *Site Evaluation Report for the L-Area Rubble Pit (131-4L) (U)* (WSRC 1994). Based on the SER results, the LRP 131-4L subunit was placed in Appendix C, RCRA/CERCLA Units (FFA 1993), for further assessment.

The LRP 131-4L subunit was characterized in 2022 to support RFI/RI/BRA of the subunit and for remedial decision making. Characterization activities included soil boring, observation of core for waste material, and soil sampling. Estimation of the pit boundary and depth was determined through sampling activities. Although the extent of waste was not defined to the northwest by sampling, the extent of contamination was conservatively estimated by extending the waste unit boundary to a ditch feature northwest of the subunit (Figure 4). This feature incises the ground surface ~0.9-1.2 m (3-4 ft) below ground surface and shows no evidence of buried waste present. This feature acts as a maximum subunit boundary in lieu of confirmatory borings to define the exact extent of buried waste.

ACM was identified at one location at the LRP 131-4L subunit, which is consistent with expected building materials and the time period that the LRP 131-4L subunit was in operation.

2.2 Nature and Extent of Contamination

Results of the ecological risk assessment identified no contaminants that pose a risk to ecological receptors (SRNS 2025). The contaminant migration evaluation indicated the contaminants at the ECODS L-3, LRP 131-1L, and LRP 131-4L OU are not a potential source for groundwater contamination (SRNS 2025). Additionally, the principal threat source material (PTSM) assessment concluded that there are no contaminants that constitute PTSM.

The primary contaminants associated with the ECODS L-3 subunit is the following:

- Aroclor 1254 is present in surface soil (0 to 0.3 m [0 to 1 ft]) (exposure point concentration [EPC] = 1.28 mg/kg) exceeding 1E-06 risk level for the resident (risk = 5.4E-06). Aroclor 1254 was identified as a HH refined constituents of concern in soil media for the future resident scenario. No constituents were identified as HH refined constituents of concern (RCOCs) in soil for the future industrial worker; and

- Aroclor 1260 is present in surface soil (0 to 0.3 m [0 to 1 ft]) (EPC = 0.365 mg/kg) exceeding 1E-06 risk level for the resident (risk = 1.5E-06). Aroclor 1260 was identified as a HH refined constituents of concern in soil media for the future resident scenario. No constituents were identified as HH RCOCs in soil for the future industrial worker.

- There were no RCOCs identified at the LRP 131-1L subunit.

The primary contaminants associated with the LRP 131-4L subunit are the following:

- Benzo[a]pyrene is present in surface soil (0 to 0.3 m [0 to 1 ft]) (EPC = 0.164 mg/kg) exceeding 1E-06 risk level for the resident (risk = 1.4E-06). Benzo[a]pyrene was identified as a HH RCOC in soil media for the future resident scenario. No constituents were identified as HH RCOCs in soil for the future industrial worker.

2.3 Remedial Actions Selected

As stated in the ROD for the ECODS L-3, LRP 131-1L, and 131-4L OU (SRNS 2026):

The selected remedy for the ECODS L-3 subunit is LUCs to prevent human exposure to ACM that is likely present in unit soils and to polychlorinated biphenyls (Aroclor 1254 and Aroclor 1260)

that are present in surface soils that would present an unacceptable risk to a hypothetical future resident.

The LRP 131-1L subunit poses no unacceptable risk based on unlimited exposure and unrestricted land use scenario.

The selected remedy for the LRP 131-4L subunit is LUCs to prevent human exposure to presumed ACM that is present in unit soils and to benzo[a]pyrene that is present in surface soils that would be an unacceptable risk to a hypothetical future resident.

LUCs for the ECODS L-3 subunit and LRP 131-4L subunit will be in effect until concentrations of hazardous substances are at levels that allow for unrestricted use and exposure and include the following:

- Warning signs posted at the ECODS L-3 and LRP 131-4L subunits around the waste unit boundaries/areas~~. The number and location of warning signs were based on size of the subunits and access points to the subunits. O~~, including operations and maintenance of the signage.

- Administrative/Worker Access Controls: Includes SRS administrative controls and land use restrictions for onsite workers as implemented under the Site Use/Site Clearance Program and other controls that are in place to ensure worker safety, including work controls/work packages that include worker training, and health and safety requirements, and pre-work briefings.

- Engineering Controls: SRS access controls that limit and inform SRS workers and inadvertent trespassers as described in the 2023 RCRA Permit Renewal Application, Volume I, Section F.1, which describes the security procedures and equipment, 24-hour surveillance system, artificial or natural barriers, control entry systems, and warning signs in place at the SRS boundary.

This remedy was selected because it meets the remedial action objectives, provides overall protection of human health and the environment, complies with Applicable or Relevant and Appropriate Requirements, and is cost-effective. The remedy provides a high level of long-term protection from the hazardous constituents that remain in place.

The RCRA permit will be revised to reflect selection of the final remedy using the procedures under 40 Code of Federal Regulations Part 270, and South Carolina Hazardous Waste Management Regulations R.61-79.264.101; 270.

Current access controls and land transfer requirements needed to maintain the future land use are described in Section 4.1.

3.0 LAND USE CONTROL OBJECTIVES

The following LUC objectives have been identified for the ECODS L-3 and LRP 131-4L subunits to ensure protectiveness of the remedy described above.

ECODS L-3 subunit

- Prevent contact, removal, or excavation of soil within the ECODS L-3 subunit; and
- Prohibit the development and use of property for residential housing, elementary/secondary schools, childcare facilities, and playgrounds.

LRP 131-4L subunit

- Prevent contact, removal, or excavation of soil within the LRP 131-4L subunit; and
- Prohibit the development and use of property for residential housing, elementary/secondary schools, childcare 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 LUCIP.

4.0 IMPLEMENTATION OF LAND USE CONTROLS

This section describes the remedial actions prescribed by the ROD to achieve the LUC objectives stated in Section 3.0. A summary of the types of LUCs is provided in Table 1. USDOE is responsible for implementing, maintaining, reporting on and enforcing the LUCs. The LUCIP will become enforceable and will be implemented when approved by USEPA and SCDES following the completion of the remedial actions prescribed by the ROD. USDOE shall notify USEPA and

Report (RACR). For a LUC only remedy, a Post-Construction Report is not required and therefore will not be submitted for the ECODS L-3, LRP 131-1L, and LRP 131-4L OU.

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 ECODS L-3, LRP 131-1L, and LRP 131-4L OU LUCIP 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 2024). 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 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 (SR~~N~~S 2024). All employees, contractors, and visitors at SRS are required to adhere to the Site Use Program and the Site Clearance Program.

USDOE will notify USEPA and SCDES 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 SCDES is required for any modification or termination of the LUCs and implementation actions, and USDOE must obtain prior approval from USEPA and SCDES 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 2021). The SRS QA program governs all SRS activities.

4.4 Physical Access Controls

There are no physical access controls required at the ECODS L-3, LRP 131-1L, and LRP 131-4L OU; however, physical access controls are provided at the SRS boundary as mentioned in Table 1, 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 USDOE, access control warning signs, as worded in Appendix A, will be posted at the unit. A total of six signs at ECODS L-3 subunit and four signs at the LRP 131-4L subunit will be approximately located as depicted in Figures 3 and 4. The final placement of the signage will be documented in the final RACR. The signs will be legible from a distance of at least 7.6 m (25 ft). Custodial responsibilities for maintenance and inspection will be performed by the SRS Post-Closure Maintenance Group.

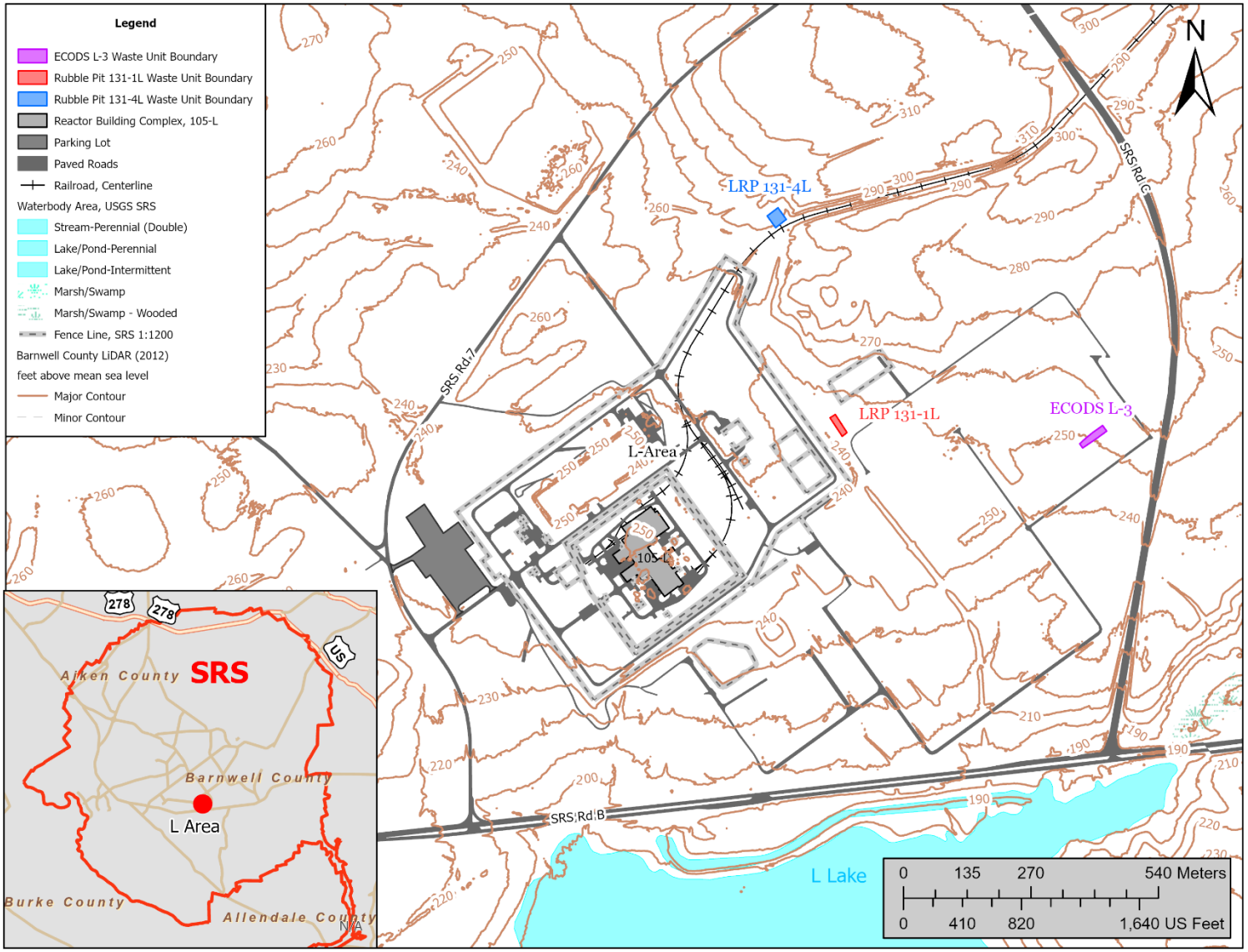


Figure 2. Location of the ECODS L-3, LRP 131-1L, and LRP 131-4L OU (L Area)



Figure 3. Approximate Area of Land Use Control Boundary for the ECODS L-3 Subunit

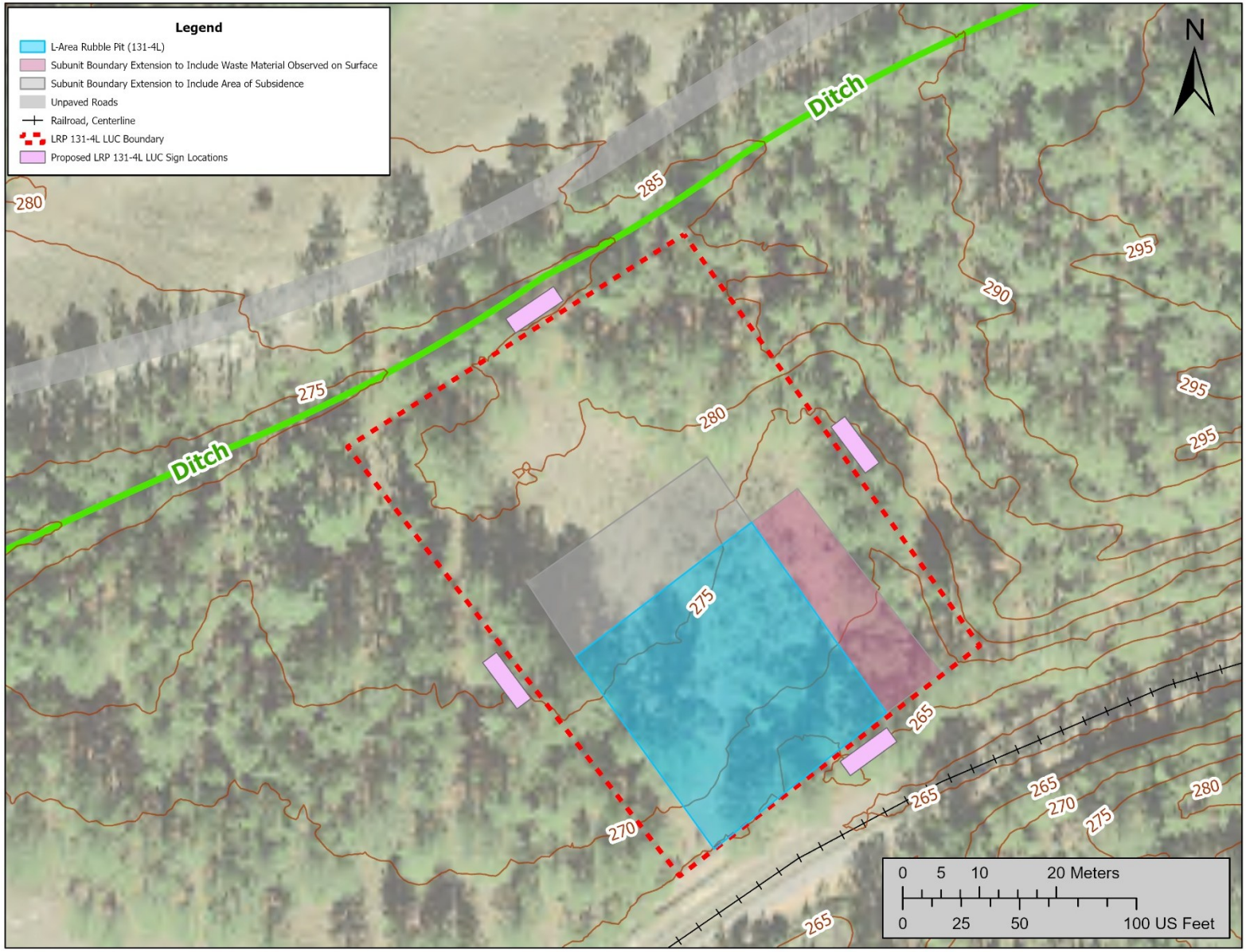
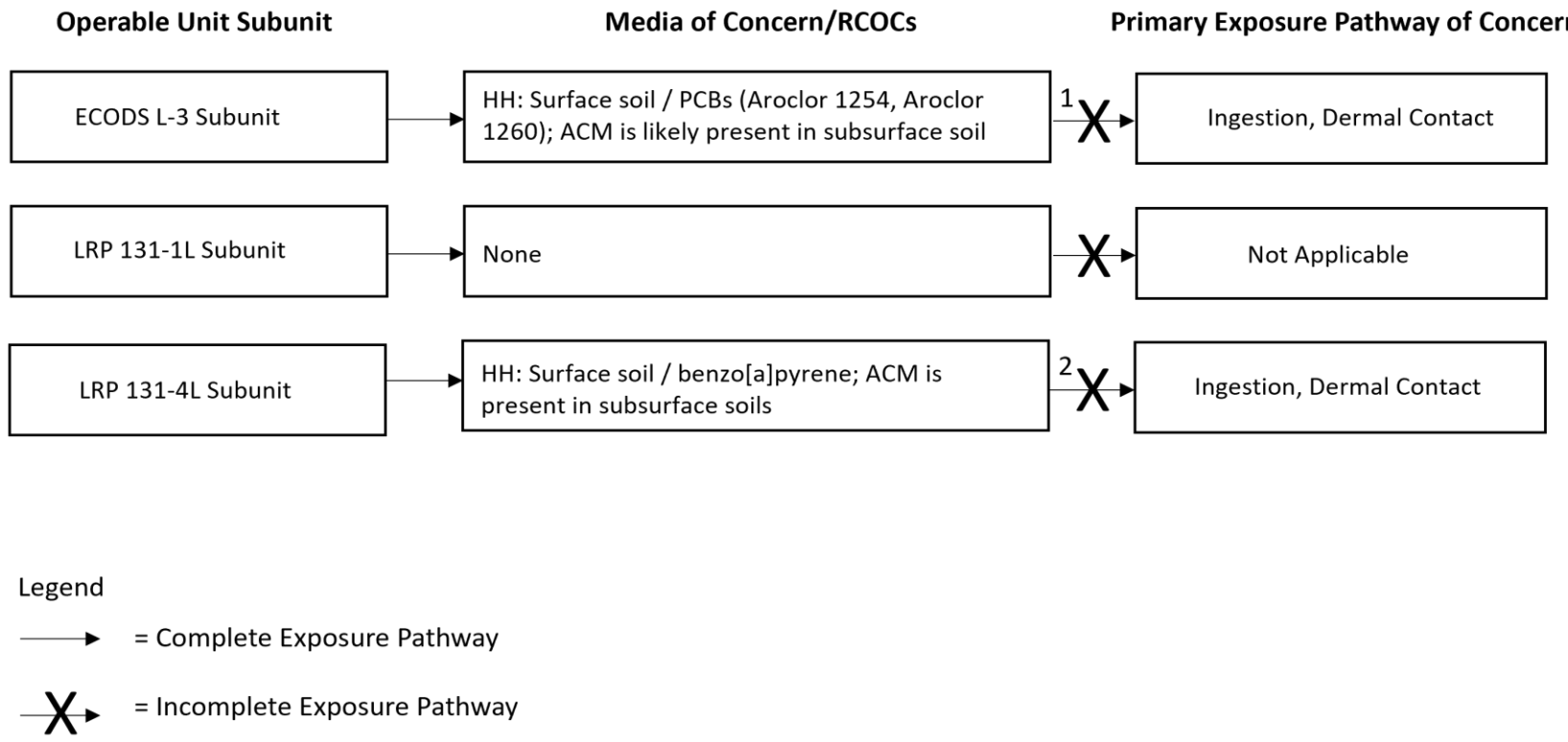


Figure 4. Approximate Area of Land Use Control Boundary for the LRP 131-4L Subunit



HH – Human health
ACM – Asbestos Containing Material
PCBs – Polychlorinated Biphenyls
RCOCs – Refined Constituents of Concerns

1. Alternative A-2, LUCs, prevents exposure of PCBs and ACM that is likely present in unit soils.
2. Alternative B-2, LUCs, prevents exposure to benzo[a]pyrene and ACM that is likely present in unit soils.

Figure 5. ECODS L-3, LRP 131-1L, and 131-4L OU Generic Conceptual Site Model after Completion of Final Remedial Action

Table 1. Land Use Controls for ECODS L-3 and 131-4L Subunits

Type of Control	Purpose of Control	Duration	Implementation	Affected Areas[a]
1. Property Record Notices[b]	Provide notice to anyone searching for 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.	ECODS L-3 and LRP 131-4L subunits as identified in this LUCIP where hazardous substances are left in place at levels requiring land use restrictions
2. Property record restrictions[c] A. Land Use	A. 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.	ECODS L-3 and LRP 131-4L subunits as identified in this LUCIP where hazardous substances are left in place at levels requiring land use restrictions.
3. Other Notices[d]	Provide notice to city &/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.	ECODS L-3 and LRP 131-4L subunits as identified in this LUCIP 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	ECODS L-3 and LRP 131-4L subunits as identified in this LUCIP where hazardous substances are left in place at levels requiring land use restrictions.

Table 1. Land Use Controls for the ECODS L-3 and LRP 131-4L Subunits *(continued/end)*

Type of Control	Purpose of Control	Duration	Implementation	Affected Areas[a]
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.	Security is provided at site boundaries in accordance with SRS procedures.
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 at perimeter of the ECODS L-3 and LRP 131-4L subunits where hazardous substances are left in place at levels requiring land use restrictions.
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.	Not required at ECODS L-3 and LRP 131-4L subunits.

a Affected areas – Specific locations for the ECODS L-3 and LRP 131-4L subunits will be identified in the OU-specific LUCIP or subsequent post-ROD documents. Unit boundaries are shown in Figure 4 for the ECODS L-3 subunits and Figure 4 for the LRP 131-4L subunit.
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 a 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.