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

Attachment C of Post-Construction Report for the A-Area Miscellaneous Rubble Pile, 731-6A

WSRC-RP-2004-4088, Revision.1, November 2004

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Attachment C

Land Use Control Implementation Plan and Inspection Checklist

(As modified from the CMI/RAIP)

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Land Use Control Implementation Plan for the A-Area Miscellaneous Rubble Pile (731-6A) Operable Unit

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

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

1.0 REMEDY SELECTION

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

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

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

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

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

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

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

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

The Figure 1 provides a unit map of the ARP OU.

1.2 Nature and Extent of Contamination in the ARP OU

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

Piles Area

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

the polychlorinated biphenyl/polycyclic aromatic hydrocarbon (PCB/PAH) waste pile, and

the lead hot spot.

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

0- to 0.3-m (0- to 1-ft) exposure data set. The waste pile in question was created during the characterization by physically pushing soil and debris aside to allow for 0- to 1-foot soil samples to be collected adjacent to the debris piles. Based on the physical shape of the pile, it was not appropriate to designate 0- to 1-foot samples. Grab and composite samples were taken from the pile by auguring into the side of the pile at several locations. These data were used to determine if the waste pile is principal threat source material (PTSM). The lead hot spot contains elevated levels of lead (maximum concentration of 9.6 percent) that contribute to unacceptable levels of the potential non-carcinogenic risk. Aroclor-1254, arsenic, lead, and PAHs [human-health constituents of concern (COCs)] are present in the Piles Area at acceptable risk levels (less than $1x10^{-6}$ under a hypothetical future residential scenario) if the two hot spots are removed.

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

Ash Area

In the Ash Area, arsenic was identified as a human-health COC for the future industrial worker and resident exposed to surface soil (ingestion risk $2x10^{-6}$ and $2x10^{-5}$, respectively). Average arsenic concentrations are approximately two times higher than average unit-specific background concentrations.

Trenches Area

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

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

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

1.3 Remedial Action Overview

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

Piles Area

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

- Excavate the lead hot spot soil (2 yd^3) and remove the PCB/PAH waste pile (10 yd^3).
- Remove the excavated soil and transport it from SRS to a permitted offsite disposal facility.

- Backfill the excavated spots with clean soil from an SRS borrow pit.

- Grade the clean soil to match the surrounding topography and cover the backfilled spots with vegetative cover to minimize erosion.

Excavation and removal of contaminated soil from the Piles Area will remove the PTSM (benzo(a)pyrene) from the ARP OU and protect future industrial workers or residents from exposure to refined COCs at the Piles Area (arsenic and lead at the lead hot spot; and aroclor-1254, and benzo(a)pyrene, and other PAHs at the PCB/PAH waste pile). Residual risks are less than $1x10^{-6}$ under a hypothetical future residential scenario upon removal of the hot spots, therefore, no LUCs are required.

Ash Area

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

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

- Install access control warning signs to restrict access to the unit and activities at the unit by future industrial workers.

Trenches Area

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

- Cover the contaminated portion of the Trenches Area with a 1-foot soil cover (minimum) to reduce the exposure of current remedial workers and future workers to surface contamination.

- Install 7 ASVE and 12 monitoring wells, connect the ASVE wells to an existing SVEU (782-3M) that is adjacent to the unit, and operate (estimated remediation time is 5 years) the system until the TCE and PCE are removed from the soil to the levels where they no longer pose a migration threat to the groundwater.
- Install access control warning signs and implement institutional controls to prohibit future residential land use and restrict access to the unit and activities at the unit by future industrial workers.

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

The post-remedial action conceptual site model (see Figure 2 through Figure 4) shows the broken pathways and the remaining residual risk to the future industrial worker. Without the soil cover, the total carcinogenic risks associated with exposure to soil for a future industrial worker and resident would be 3×10^{-5} and 2×10^{-4}, respectively. Therefore, LUCs are required to prevent exposure of soil beneath the cover.

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

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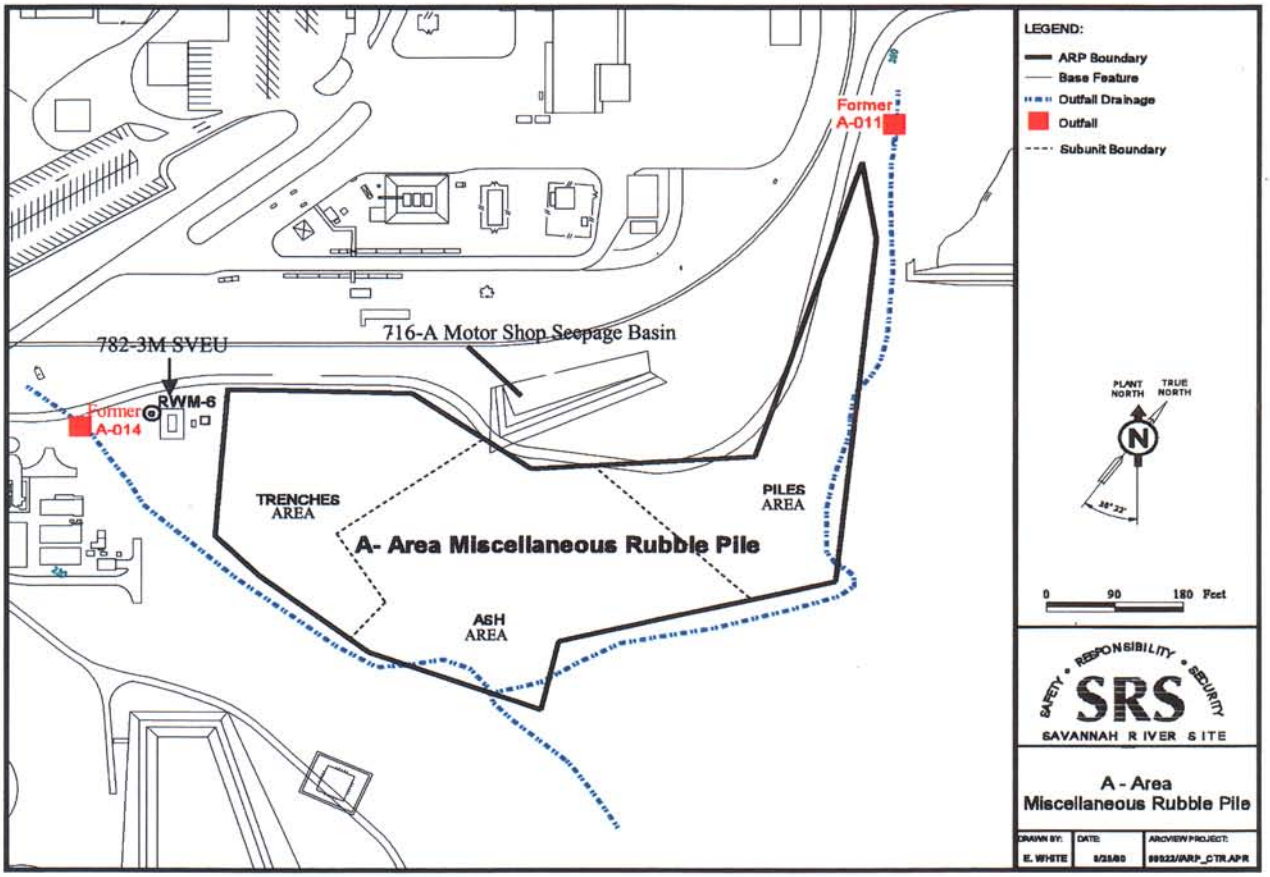

Figure 1. Unit Map of the ARP OU

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

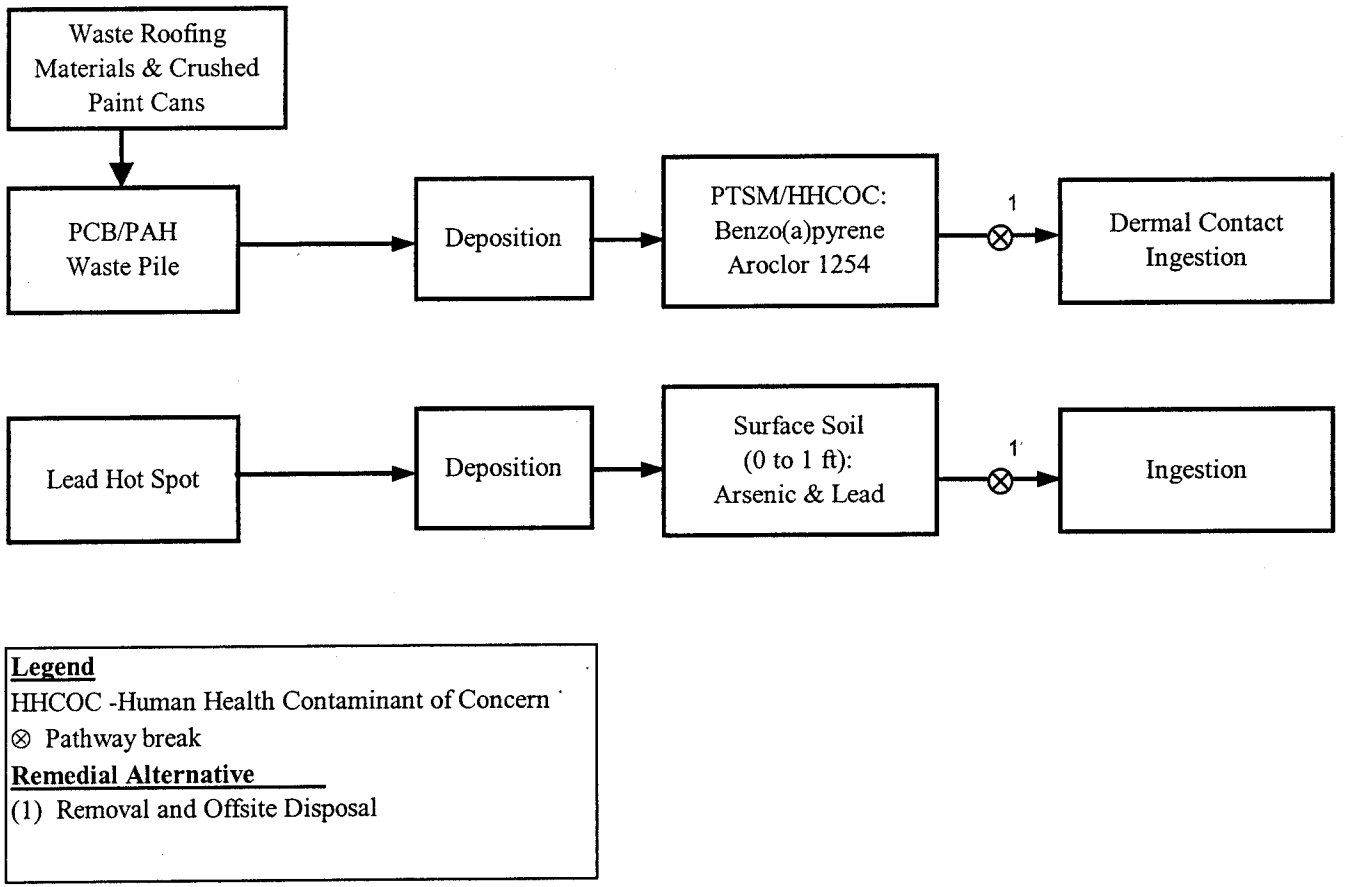

Figure 2. Conceptual Site Model for the Piles Area

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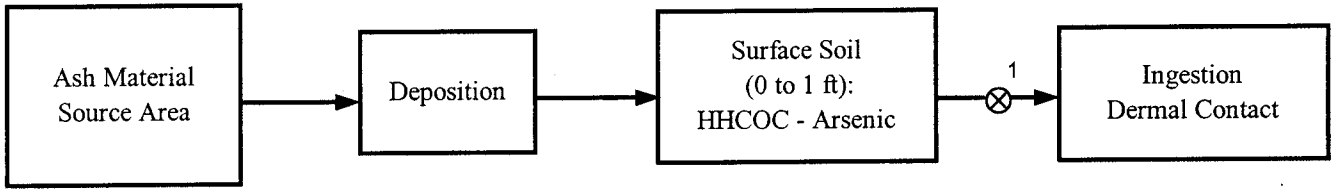
A-Area Miscellaneous Rubble Pile Problem Statement Conceptual Site Model:
Ash Area Exposure Unit



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

Figure 3. Conceptual Site Model for the Ash Area

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

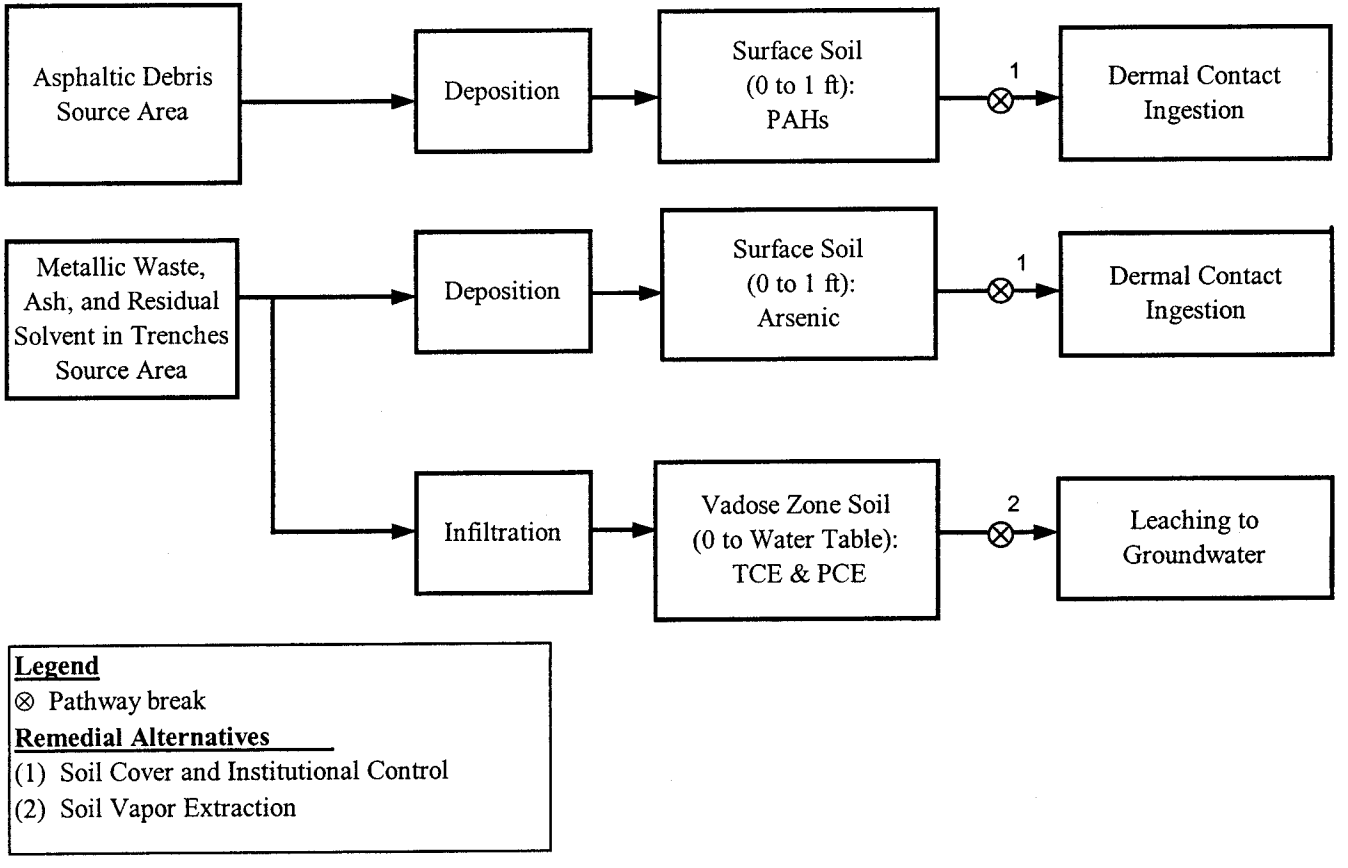

Figure 4. Conceptual Site Model for the Trenches Area

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2.0 LAND USE CONTROLS

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

- maintain the use of the Ash and Trenches Areas for industrial activities only in order to prevent residential exposure,
- prevent unauthorized access to the closed CERCLA unit as long as the waste remains a threat to human health or the environment in order to protect the industrial worker, and
- provide public notices for disclosing former waste management and disposal activities and remedial actions taken on the site in order to protect the future residents, trespassers, and industrial workers.

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

2.1 Access Controls

2.1.1 On-Site Workers

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

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

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

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

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

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

The signs will read as follows:

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

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

Custodian: Manager, Post Closure Maintenance

Phone: (803) 725- 7243 Pager ID: 19192

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

2.1.2 Trespassers

While under the ownership of USDOE, access control of the entire SRS will be maintained in accordance with the 2000 RCRA Part B Permit Renewal Application, Volume I, Section F.1. This section describes the 24-hour surveillance system (R.61-79.264.14(b)(1)), artificial or natural barriers (R.61-79.264.14(b)(2)(I)), control entry systems (R.61-79.264.14(b)(2)(ii)), and access control warning signs (R.61-79.264.14(c)) in place at the SRS boundary to comply with the security requirements for a RCRA-permitted facility."

2.2 LUCIP Deed Notification

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

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

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

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

Per Section 3.6 of the LUCAP, the post-construction revision of this LUCIP will identify the area under land use restriction via a survey plat certified by a professional land surveyor. The line marked "AREA SUBJECT TO LAND USE CONTROL" on A-Area Miscellaneous Rubble Pile Operable Unit LUCIP Drawing defines the area subject to LUCs.

2.3 Field Walkdown and Maintenance for Institutional Controls

"Monitoring" will be performed to verify that LUCIP requirements are met. Annual monitoring of the ARP OU, 731-6A, will be conducted for items such as accuracy and legibility of signs, visible subsidence or erosion of the soil cover, proper vegetative growth, mowing, etc. Subsidence or erosion will be corrected by backfilling the affected area with clean soil and seeding the area to prevent further erosion. The results of any events and or actions that indicate some potential compromise of institutional controls will be documented in the FFA Annual Progress Report. All other routine maintenance activities will be documented and maintained in files subject to USEPA and SCDHEC review and audit. A copy of the complete inspection form is maintained in the SGCP Administrative Record Files.

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

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

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FIELD INSPECTION CHECKLIST

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

Page 1 of 2

❑ **SCHEDULED** ❑ **UNSCHEDULED**

A= Satisfactory X= Unsatisfactory (Explanation required)	A or X	Observation or Corrective Action Taken
1. Verify that the roads to waste unit are accessible.		
2. Verify that the Waste Unit signs (12) are in acceptable condition, have the correct information, and are legible from a distance of 25 feet.		
3. Verify that there are no excavation, digging, or construction activities on the soil cover.		
4. Verify that the integrity of any drainage ditches, sediment basins and required land grading for proper drainage is being maintained and that they are free of excessive erosion, sediment buildup and any debris restricting water flow.		
5. Verify that no woody vegetation is growing on the soil cover.		
6. Verify that the grass density of the vegetative cover has no bare spots more than 3 by 3 feet in area. The height of the vegetative cover should not impair the visual inspection of the soil cover. This verification will be determined by the inspector.		

FIELD INSPECTION CHECKLIST (Continued)

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

Page 2 of 2

❑ **SCHEDULED** ❑ **UNSCHEDULED**

A = Satisfactory X = Unsatisfactory (Explanation required)	A or X	Observation or Corrective Action Taken
7. Verify that the soil cover has no signs of unacceptable erosion or depression (subsidence).		
8. Verify that signs of burrowing or mounding animals are not present.		
Comments or Observations:		

Inspected by:

_____ / _____ Date:_____

(Print Name) (Signature)

Reviewed by:

_____ / _____ Date:_____

Post-Closure Manager (Print Name) (Signature)

CAUTION:

The Inspector shall notify the Post-Closure Manager (PCM) and the Environmental Compliance Authority (ECA) **IMMEDIATELY** if there has been a breach or compromise of this waste unit. Refer to Post Closure Inspection procedures.

LAND USE CONTROL IMPLEMENTATION PLAN

SURVEY PLAT

BOUNDARY DRAWING

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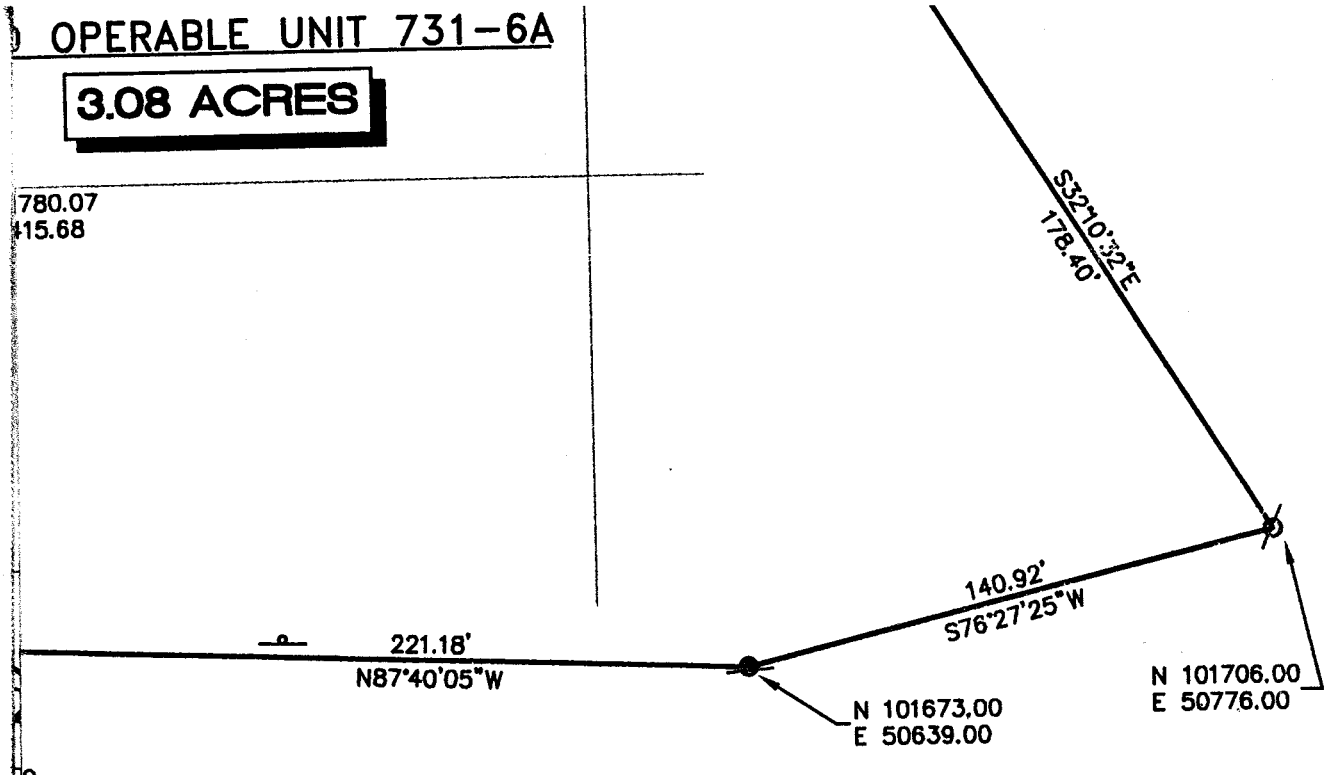

LAND USE CONTROL IMPLEMENTATION PLAN SURVEY PLAT

OF

A-AREA MISCELLANEOUS RUBBLE PILE OPERABLE UNIT

PROPERTY LOCATED AT SAVANNAH RIVER SITE

PREPARED FOR

U. S. DEPARTMENT OF ENERGY

SAVANNAH RIVER SITE
AIKEN, SOUTH CAROLINA 29802

NTY OF: AIKEN STATE OF: S. CAROLINA

SCALE: 1" = 50' DWN. BY: JMB DATE: 19 APRIL 2004

PREPARED BY

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