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Second Early Action Post-Construction Report for the D-Area Operable Unit (U)

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DISCLAIMER

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U.S. Department of Energy
and
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LIST OF ABBREVIATIONS AND ACRONYMS

~	approximately
ac	acre
BRA	Baseline Risk Assessment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CPRB	Coal Pile Runoff Basin
DAOU	D Area Operable Unit
DEXOU	D Area Expanded Operable Unit
DIPSL	D Area Inactive Process Sewer Line
EA	Early Action
EALUCIP	Early Action Land Use Control Implementation Plan
EAPCR	Early Action Post-Construction Report
FFA	Federal Facility Agreement
ft	feet
ha	hectare
IOU	Integrated Operable Unit
km	kilometer
km^2	square kilometer
LLC	Limited Liability Company
LUC	Land Use Controls
m^3	cubic meter
mi	mile
NPDES	National Pollution Discharge and Elimination System
NTCR	Non-Time-Critical Removal
O&M	operation and maintenance
OU	operable unit
RADP	Removal Action Design Plan
RAR	Removal Action Report
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
RSER/EE/CA	Removal Site Evaluation Report/Engineering Evaluation/Corrective Action Report
SCDHEC	South Carolina Department of Health and Environmental Control
SRNS	Savannah River Nuclear Solutions, LLC
SRS	Savannah River Site
TCE	trichloroethylene
USDOE	United States Department of Energy
USEPA	United States Environmental Protection Agency

LIST OF ABBREVIATIONS AND ACRONYMS *(Continued/End)*

VOC	volatile organic compound
WOF	Waste Oil Facility
WSRC	Washington Savannah River Company, LLC
WSRC	Westinghouse Savannah River Company, LLC

1.0 GENERAL DESCRIPTION

1.1 Purpose and Scope

This Second Early Action Post-Construction Report (EAPCR) documents the completion of field implementation of the Second Early Action (EA) for the closure of portions of the D-Area Operable Unit (DAOU) at the Savannah River Site (SRS) (Figure 1)) and applies to the following DAOU subunits: 488-1D Ash Basin, 488-2D Ash Basin, 488-4D Ash Landfill, 489-D Coal Pile Runoff Basin (CPRB) (Southern 75%), and the Inlet Basins. This report summarizes the activities performed to implement the selected Second EA remedy requirements defined in the *Second Early Action Record of Decision* (EAROD) *Remedial Alternative Selection for the D Area Operable Unit* (SRNS 2020a) and the *Second Early Action Land Use Control Implementation Plan (EALUCIP) for the D-Area Operable Unit* (SRNS 2020b). The Second EA remedy selected is Land Use Controls (LUCs) to prevent unrestricted use for the 488-1D Ash Basin, 488-2D Ash Basin, and the 488-4D Ash Landfill (Figure 2). The selected remedial alternative for the 489-D CPRB (Southern 75%) and the Inlet Basins is No Action.

The DAOU is comprised of multiple subunits within D Area (Figure 3). In order to accelerate the DAOU cleanup schedule, representatives from the U.S. Department of Energy (USDOE), U.S. Environmental Protection Agency (USEPA) and South Carolina Department of Health and Environmental Control (SCDHEC) agreed to conduct non-time-critical removal (NTCR) actions for select DAOU subunits to support the EA for the DAOU. Because a final Record of Decision (ROD) for the DAOU would not be issued until after the D-Area Powerhouse is shutdown, the USDOE, USEPA and SCDHEC agreed that an EAPCR and EALUCIP would be developed at the conclusion of these NTCR actions to document the accelerated activities. The preferred NTCR actions were described in multiple Removal Site Evaluation Report/Engineering Evaluation/Corrective Action reports, multiple Action Memoranda, and Removal Action Reports (RARs). Table 1 provides a "Summary of Administrative Paths for Areas and Subunits in and around DAOU".

Regulatory decisions (i.e., early removal actions) were made for the 488-1D Ash Basin, 488-2D Ash Basin, the 488-4D Ash Landfill, 489-D CPRB (Southern 75%) and the Inlet Basins. (Figure 2). The selected remedial alternatives are documented in the *Removal Action Design Plan (RADP) for the 488-4D Ash Landfill and 488-2D Ash Basin (U)* (SRNS 2014) and *Removal Action Design Plan (RADP) for the 488-1D Ash Basin and 489-D Coal Pile Runoff Basin (U)* (SRNS 2016). Cleanup goals established for the DAOU subunits (including goals identified for the early removal actions) are based on industrial land use. Therefore, hazardous substances will remain at the DAOU at levels that pose a threat to human health and prevent unrestricted land use. The response action selected in the Second EAROD (SRNS 2020a) for a portion of DAOU was necessary to protect the public health, welfare, and the environment from actual or threatened releases of hazardous substances into the environment. The second removal action LUC remedy is the final remedial action for the *Removal Action Design Plan (RADP) for the 488-4D Ash Landfill and 488-2D Ash Basin (U)* (SRNS 2014) and *Removal Action Design Plan (RADP) for the 488-1D Ash Basin and 489-D Coal Pile Runoff Basin (U)* (SRNS 2016).

The completion of the final remedial action for the entire DAOU, will be reported in the Corrective Measures Implementation Report/Remedial Action Completion Report in accordance with the Federal Facility Agreement (FFA) (FFA 1993).

This EAPCR includes the following items:

- A brief description of the DAOU background, including remedial action objectives and remedial actions.
- A chronology of completed subunits related to remediation of the DAOU.
- A summary of activities performed for the DAOU.
- Deviations from the original design.
- Verification of compliance with the acceptance criteria.
- Verification of construction completion.
- As-built documentation
- Post-construction activities required for the remedial action
- Project costs

1.2 Document Format

This report has been prepared in accordance with the requirements for submittal of regulatory documents as identified in the FFA (FFA 1993) and the latest format for the Post-Construction Report. The format of this document is consistent with the FFA protocol format approved by the USEPA and SCDHEC in March 2003.

1.3 Operable Unit Background

The DAOU is listed as a Resource Conservation and Recovery Act (RCRA) 3004(u) Solid Waste Management Unit/Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) unit in Appendix C of the FFA for the SRS (FFA 1993).

1.3.1 General Description and Location

SRS occupies approximately (~) 802.8 square kilometer (310 square mile) of land adjacent to the Savannah River, principally in Aiken and Barnwell counties of South Carolina. SRS is located ~6.4-kilometer (km) (25-miles) southeast of Augusta, Georgia, and 32.1-km (20-mi) south of Aiken, South Carolina.

D Area is located in the southwest quadrant of SRS, ~914-meters (3,000-feet [ft]) east of the nearest site boundary, the Savannah River (Figure 1). While groundwater is not included in the DAOU, the DAOU consists of surface units and source areas that are potentially responsible for contaminating groundwater. Previous groundwater investigations at D Area have identified relatively large, commingled, dilute and depleting plumes of tritium, volatile organic compounds (VOCs) [primarily trichloroethylene (TCE)], and metals. Tritium and TCE have resulted from historical releases associated with operations at D Area. Metals are attributable to leaching of contaminants from coal used at the powerhouse. Groundwater is being addressed separately under the D Area Groundwater Operable Unit (OU). D-Area also includes deactivation and decommissioning activities which are ongoing at the 484-D Powerhouse subunit.

Following a series of removal actions, an *Early Action Record of Decision Remedial Alternative Selection for the D-Area Operable Unit (U)* (SRNS 2011) was issued in 2011

that selected LUCs as the final remedial action to prevent unrestricted use for the Bubble Tower Subunit (i.e., D-Area Heavy Water Facility), the Moderator Processing Subunit, 489-D CPRB (Northern 25%), D-Area Asbestos Pit (including restrictions against land disturbance), and D-Area Process Sewer Lines as Abandoned inside the area fence

The Second EALUCIP applies to the following four DAOU subunits: 488-1D Ash Basin (including Inlet Basins), 488-2D Ash Basin, 488-4D Ash Landfill and the 489-D CPRB (Southern 75%) subunits of the DAOU. Figure 3 presents a layout of D Area and a delineation of the subunits for the early remedial actions. Table 2 provides a detailed listing of administrative paths for subunits and areas for the DAOU EAs.

The current land use for the DAOU is industrial with USDOE maintaining control of the land as long as necessary to keep the selected remedy fully protective of human health and the environment.

1.3.2 Nature and Extent of Contamination

There had not been any prior CERCLA documentation specific to the 488-1D Ash Basin, 488-2D Ash Basin and 488-4D Ash Landfill subunits before submittal of the removal action documents (SRNS 2016, SRNS 2014) for each subunit. However, previous remedial investigations and baseline risk assessments performed by SRS yield consistent conclusions for coal and/or ash contaminated media which typically contain toxic metals, such as arsenic, and naturally occurring radionuclides. These historical results were used to presumptively identify the problems warranting action at these subunits. Based on this historical information, the USDOE, USEPA, and SCDHEC concluded that the 488-1D Ash Basin, 488-2D Ash Basin and the 488-4D Ash Landfill contained unacceptable levels of contaminants, (including arsenic and naturally-occurring radionuclides) that require remediation to meet CERCLA cleanup requirements.

488-1D Ash Basin Subunit (including Inlet Basins)

The 488-1D Ash Basin was an unlined, earthen containment structure that was built generally on existing grade (ground elevation). Powerhouse ash slurry flowed via an ash

sluice line from the 484-D Powerhouse into one of two Inlet Basins identified as Inlet Basin #1 (northern) and Inlet Basin #2 (southern), each ~1.2 ha (3 ac) in size. The bulk of ash settled out of the slurry in the Inlet Basins and the remaining wastewater flowed into the eastern end of the 488-1D Basin (~14 ha [35 ac]). As the wastewater level increased in the 488-1D Ash Basin, the wastewater flowed through a pipe located at the western end of the basin into the 488-2D Ash Basin for polish settling of any remaining solids.

As part of the early removal action, ash from the western end of the 488-1D Ash Basin was consolidated into the eastern end of the 488-1D Ash Basin and a geosynthetic cover system was constructed over the east end 488-1D Ash Basin. The Inlet Basins were excavated and backfilled.

488-2D Ash Basin Subunit

The 488-2D Ash Basin (6 ha [15 ac]), served as the final settling stage for the treatment of the 484-D Powerhouse operation ash contaminated wastewater. This basin received the overflow wastewater from the 488-1D Ash Basin and provided final settling of the solids as the water flowed from the western end of the 488-2D Ash Basin to the discharge pipe located at the eastern end of the 488-2D Ash Basin. As the water flowed from west to east, the flow distance, along with the settling velocity of solids, provided sufficient removal of any remaining solids to ensure compliance with the National Pollution Discharge and Elimination System (NPDES) discharge permit at Outfall D-01C. The 488-2D Ash Basin discharged the treated water into the D-Area Discharge Canal at the D-01C Outfall which eventually flowed into Beaver Dam Creek.

As part of the early removal action, ash from the 488-2D Ash Basin was consolidated into the 488-4D Ash Landfill and regraded with common fill and stabilized by vegetation. 488-2D is now a stormwater detention basin that controls stormwater discharges originating from both the 488-1D and 488-4D cover systems.

488-4D Ash Landfill Subunit

The 488-4D Ash Landfill was an 8.9-ha (22-ac) basin that was initially part of the SRS As-Built Construction Permit #7295 and the associated 1991 SRS permit-to-operate for

existing SRS wastewater facilities. Per agreement with SCDHEC, the basin was permitted in November 2007 as a Class Two Solid Waste Landfill under Solid Waste Landfill Permit #025800-1602 to accept ash waste for disposal. All storm water drainage was directed into the infiltration basin located within the western end of the landfill which had an overflow channel that directed any contaminated water to the 488-2D Ash Basin for treatment (settling). The water was combined with the 488-1D Ash Basin wastewater, treated per the 488-2D Ash Basin IWT permit, and released through NPDES Outfall D-01C.

As part of the early removal action, ash from outside the western boundary of the 488-4D Ash Landfill, ash from surrounding roads/berms, and ash from the 488-2D Ash Basin was consolidated into the 488-4D Ash Landfill. A geosynthetic SCDHEC Class 3 Solid Waste Landfill cover system was then constructed over the 488-4D Ash Landfill.

489-D Coal Pile Runoff Basin – Southern 75% Subunit

The 489-D CPRB is located in the southern portion of the DAOU and has a total area of ~5.7 ha (14 ac). During operation of the 484-D Powerhouse, runoff storm water from the 484-17D Coal Storage Area was collected through a network of drainage ditches and flowed to the 489-D CPRB via storm sewers for settling. The remedy for this basin was accomplished under the scope of two separate action memorandums. The Northern 25% section of the 489-D CPRB was addressed by the removal action completed in 2010 (US~DOE 2010) with LUCs, and the remaining Southern 75% section removal action was completed in 2018 with a final remedy of No Action (USDOE 2015).

As part of the early removal action, coal fines and contaminated soil from the 489-D CPRB was consolidated into the 488-4D Ash Landfill. 489-D CPRB was regraded with common fill and stabilized by vegetation. 489-D CPRB is now a stormwater retention basin that controls stormwater discharges originating from the adjacent closed 484-17D Coal Storage Area.

1.4 Remedial Action Objectives and Selected Remedial Action

1.4.1 Remedial Action Objectives

The following DAOU LUC objectives have been developed to ensure the protectiveness of the selected EA remedy:

- Prevent contact, removal, or excavation of coal and coal-combustion waste that is buried underneath the engineered cover systems as well as protect against disturbance of soil overlaying the caps;
- Prohibit the development and use of property for residential housing, elementary and secondary schools, childcare facilities and playgrounds;
- Maintain the integrity of any current or future remedial or monitoring system, such as soil covers or groundwater monitoring wells;
- Prevent construction of inhabitable buildings without an evaluation of indoor air quality to address vapor intrusion; and
- Prevent construction of facilities or structures on/above the engineered cover systems.

1.4.2 Selected Remedial Action

As documented in the Second EAROD for the DAOU (SRNS 2020a), the selected early remedial action is LUCs to prevent unrestricted use for the 488-1D Ash Basin (excluding Inlet Basins which were closed with unrestricted use), 488-2D Ash Basin, and the 488-4D Ash Landfill subunits of the DAOU. The EA LUC remedy is the final remedial action for the 488-1D Ash Basin, 488-2D Ash Basin, and the 488-4D Ash Landfill. This remedy effectively balances short-term effectiveness, implementability, and cost criteria, while providing a high level of long-term protection to hazardous contaminants that will remain at the site above levels that would allow for unrestricted use.

The selected remedial alternative for the 489-D CPRB (Southern 75%) and the area where the Inlet Basins were formally located is No Action. In their current state, these subunits

pose no unacceptable risk requiring a response action to human health and the environment and support unrestricted land use.

Table 2 shows the types of LUCs, purposes of control, duration, and affected areas in the DAOU. The Second EA LUCs as required per the EALUCIP (SRNS 2020b) consist of the following:

- Signage is located along the perimeter of 488-1D Ash Basin, 488-2D Ash Basin and 488-4D Ash Landfill subunit boundaries to alert on-site workers to the presence of hazardous substances and to prevent unauthorized entry and unrestricted uses. The signs were installed in 2019. The SRS site coordinates of the LUC boundaries and sign locations are provided in Appendix A.
- Institutional Controls (i.e., administrative measures) and use restrictions for on-site workers are controlled via the Site Use/Site Clearance Program. Other administrative controls to ensure worker safety include work controls, worker training, and worker briefings of health and safety requirements.
- SRS access controls prevent exposure to trespassers per the 2013 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 that are in place at the SRS boundary.

1.5 Chronology of Events

The major activities and dates related to the selected remedial action for the second removal action at DAOU is provided in Table 3.

2.0 CONSTRUCTION ACTIVITIES

This section provides a summary of the DAOU early remedial action construction activities performed in accordance with the EALUCIP (SRNS 2011).

2.1 Sign Installation and Surveying

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, monuments and access control warning signs were posted on November 1, 2018, at the unit by Envirocon, the prime contractor for implementation of the removal action at the 488-1D Ash Basin, 488-2D Ash Basin, 488-4D Ash Landfill and 489-D CPRB. A total of 12 signs were installed as shown in Appendix A. See Appendix B for a warning sign example. A photo of a warning sign posted at the ash basins is shown in Figure 4.

A survey plat of the OU was prepared and certified by a professional land surveyor, John M. Bailey and Associates and recorded with the appropriate county recording agency. Project management and oversight was provided by SRNS.

3.0 DEVIATIONS FROM ORIGINAL DESIGN

The construction of the remedial action at the DAOU was completed in accordance with the approved Second EAROD (SRNS 2020a) and Second EALUCIP (SRNS 2020b). No changes deviating from the established acceptance criteria were needed during project execution.

4.0 VERIFICATION SAMPLING, TESTING AND ANALYSIS, PERFORMANCE STANDARDS, AND CONSTRUCTION QUALITY CONTROL

As applicable to the limited activities in the scope of this document the performance requirements are:

- Established controlled physical access into D Area;
- Placement of signage and monuments at the LUC boundaries;
- Verify administrative controls are in place to require authorization before beginning any future excavation activities;
- Provide a schedule for the periodic field inspections.

5.0 VERIFICATION OF CONSTRUCTION COMPLETION AND FINAL INSPECTION

5.1 Verification of Construction Completion

The completion of the Second EA for the DAOU was based on the successful completion of the NTCR removal actions and verification that LUCs are established. Removal actions for 488-1D, 488-2D and 488-4D are presented in detail in the respective RARs (SRNS 2017 and SRNS 2019). Following completion of the NTCR actions, residual substances remain at the DAOU that require LUCs as part of the final remedy for the entire DAOU.

During all field activities, the DAOU Project Team and field personnel routinely performed walkdowns and surveillances. The final survey plat (Appendix A) provides evidence that the LUC boundary monuments and warning signs have been installed around the perimeter of the DAOU as required.

Verification of the established acceptance criteria defined in the Second EAROD (SRNS 2020a) and Second EALUCIP (SRNS 2020b) have been met based on the following activities:

- Controlled physical access into D Area has been established. A single primary road leads into D Area with access to the area controlled (i.e., fence, controlled lock and key). Only authorized personnel may enter.
- Signage and monuments have been located along the LUC boundary to alert on-site workers to the presence of hazardous substances and to prevent unknowing entry and unrestricted use.
- Administrative controls are in place as managed through the SRS Site Use/Site Clearance Program to require authorization before beginning any excavation activity.
- A schedule for the periodic field inspections of the cover system, access roads and warning signs has been established to ensure that there is no cover system or sign damage and to prevent unauthorized excavation or construction activities.

Applicable post-construction activities will be performed as described in Section 7.0 of this EAPCR.

5.2 Final Inspection

Due to COVID and the simplicity of the remedial actions completed per the Second EAROD for the DAOU, a final Core Team walkdown was not completed for this remedy. However, final inspection walkdowns for the individual removal actions were performed by DOE Federal Project Director, USEPA, SCDHEC, Project Management, Engineering, and Environmental Compliance Authority (Appendix C) as follows:

- 488-2D: November 3, 2016
- 488-4D: November 3, 2016
- 489-D: October 29, 2018
- 488-1D: October 29, 2018

A final walkdown will be scheduled if the Core Team requests one as part of this document review. If not, a final walkdown will be scheduled as part of the Sixth Five-Year Review.

6.0 AS-BUILT DOCUMENTATION

6.1 As-Built Drawings

SRS site coordinates of the LUC boundaries are provided in the final Second EALUCIP certified survey plat by a licensed professional land surveyor in Appendix A of this EAPCR. Sign locations are also provided as a separate listing in Appendix A.

7.0 POST-CONSTRUCTION ACTIVITIES

SRS will implement, maintain, and monitor the LUC elements for the DAOU to ensure the remedial action remain protective of human health and the environment per the EALUCIP (SRNS 2020b). The LUCs for the DAOU include controlled access to SRS, controlled industrial use, warning signs, and deed restrictions (upon property transfer) for future use. Annual inspection requirements for the Second EA (e.g., signs, access roads, cover system integrity) are specified in the Second EALUCIP.

The post-construction activities include maintenance of the cover system which will be performed as necessary to ensure that there is no erosion damage, no woody vegetation growth, and no unauthorized excavation or construction activities. A summary of inspections and maintenance actions will be reported during the five-year review of the DAOU.

8.0 PROJECT COSTS

Table 4 compares the actual EA remediation cost with the estimated cost specified in the Second EAROD (SRNS 2020a). Total capital costs did not exceed -30% or +50% criteria that would require discussion. The incurred cost differential was +8% greater than the Second EAROD estimate. The actual cost is well within an acceptable range for the preliminary estimate provided in the Second EAROD.

9.0 REFERENCES

FFA 1993. *Federal Facility Agreement for the Savannah River Site,* Administrative Docket No. 89-05-FF (Effective Date: August 16, 1993)

SRNS, 2011. *Early Action Record of Decision Remedial Alternative Selection for the D Area Operable Unit (DAOU) (U)*, CERCLIS Number: 63, SRNS-RP-2010-00162, Revision 1.2, July 2011, Savannah River Nuclear Solutions, Savannah River Site, Aiken, SC

SRNS, 2014. *Removal Action Design Plan (RADP) for the 488-4D Ash Landfill and 488-2D Ash Basin (U)*, CERCLIS Number 63, SRNS-RP-2014-00459, Revision 1.1, March 2015, Savannah River Nuclear Solutions, Savanah River Site, Aiken, SC

SRNS, 2016. *Removal Action Design Plan RADP for the 488-1D Ash Basin and 489-D Coal Pile Runoff Basin (U)*, CERCLIS Number 63, SRNS-RP-2015-00196, Revision 1, May 2016, Savannah River Nuclear Solutions, Savanah River Site, Aiken, SC

SRNS, 2017. *Removal Action Report for the 488-2D Ash Basin and 488-4D Ash Landfill (U)*, CERCLIS Number: 63, SRNS-RP-2017-00057, Revision 1, September 2017, Savannah River Nuclear Solutions, Savannah River Site, Aiken, SC

SRNS, 2019. *Removal Action Report for the 488-1D Ash Basin and 489-D Coal Pile Runoff Basin (U)*, CERCLIS Number: 63, SRNS-RP-2018-01091, Revision 1, August 2019, Savannah River Nuclear Solutions, Savannah River Site, Aiken, SC

SRNS, 2020a. *Second Early Action Record of Decision Remedial Alternative Selection for the D Area Operable Unit (DAOU) (U)*, CERCLIS Number: 63, SRNS-RP-2018-00461, Revision 1, July 2020, Savannah River Nuclear Solutions, Savannah River Site, Aiken, SC

SRNS, 2020b. *Second Early Action Land Use Control Implementation Plan (EALUCIP) for the D-Area Operable Unit (DAOU) (U)*, CERCLIS Number: 63, SRNS-RP-2020-00759, Revision 0, November 2020, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

USDOE, 2010. DOE Submittal of the *Revised Action Memorandum for the Non-Time Critical Removal Action for the 489-D Coal Pile Runoff Basin, D-006 Outfall, and 484-10D Waste Oil Facility at the D-Area Operable Unit (U)*, (SRNS-RP-2009-00805, Revision 1, CERCLIS Number: 63, Dated September 2009), August 26, 2010, USDOE Savannah River, Aiken SC

USDOE, 2015. DOE Submittal of the *Revision 3 Action Memorandum for the Non-Time Critical Removal Action for the D Area Coal Pile Runoff Basin 489-D (U),* CERCLIS Number 63, August 11, 2015, United States Department of Energy, Savannah River Operations, Aiken SC

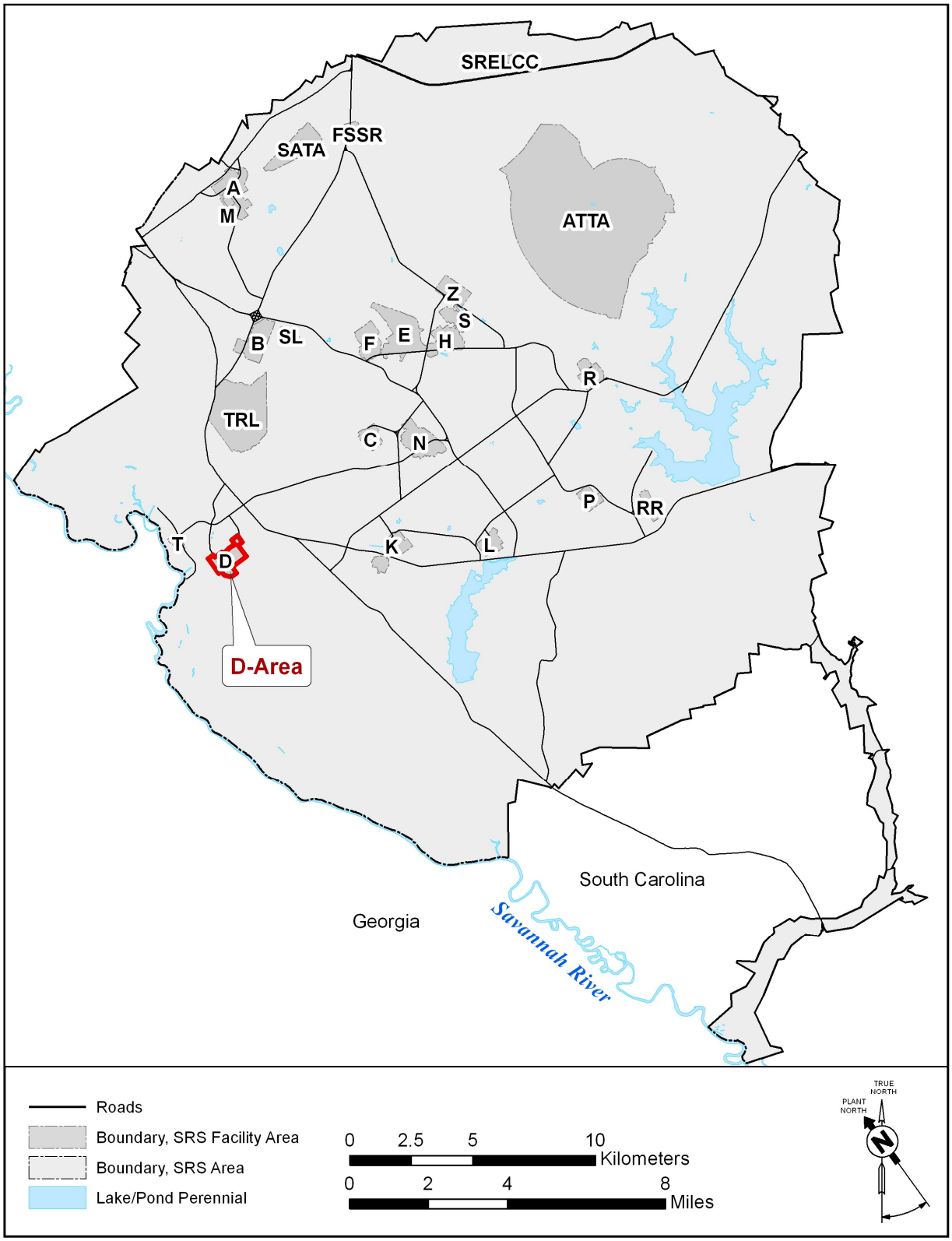

Figure 1. DAOU Location on SRS

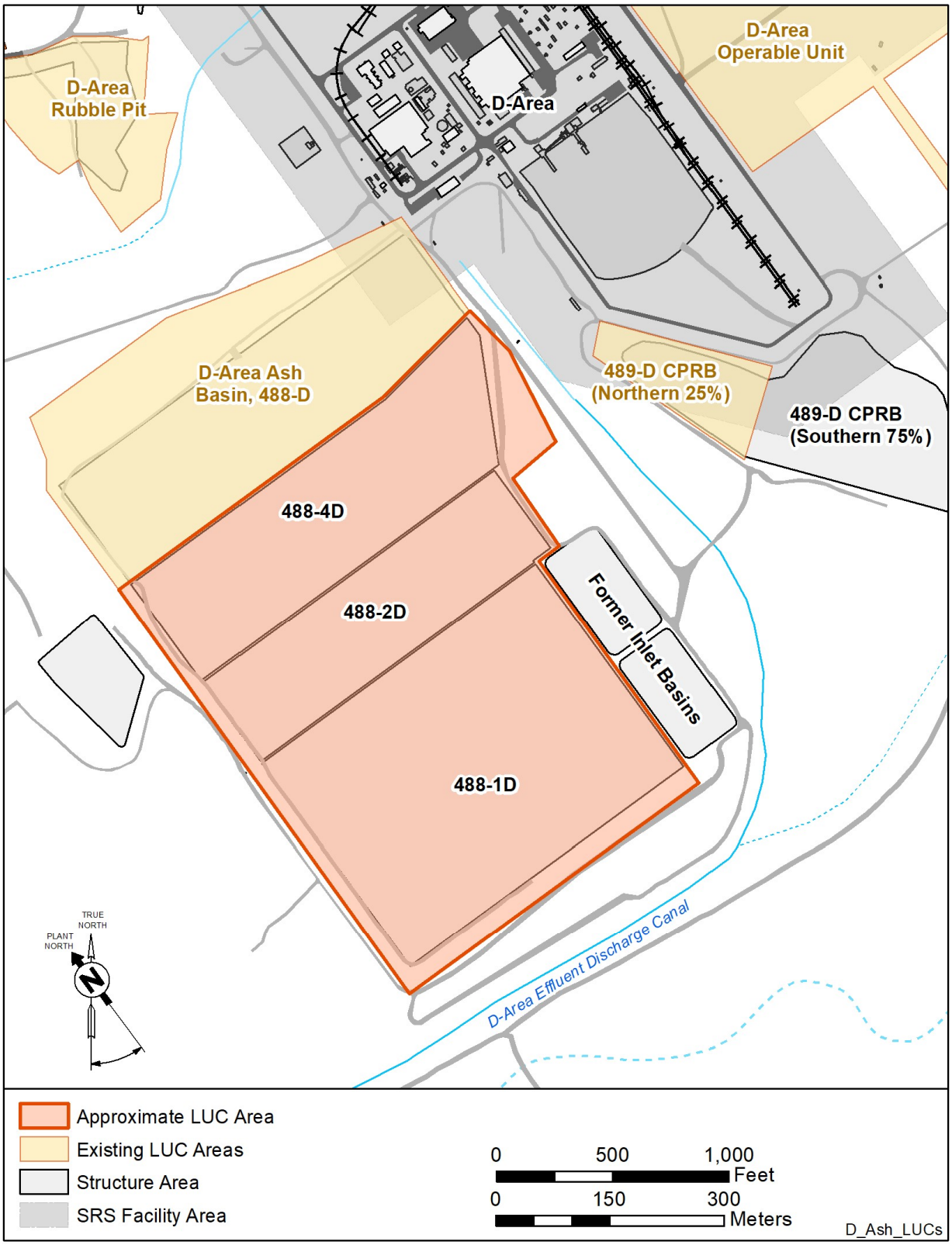

Figure 2. Second Early Action Land Use Map for DAOU

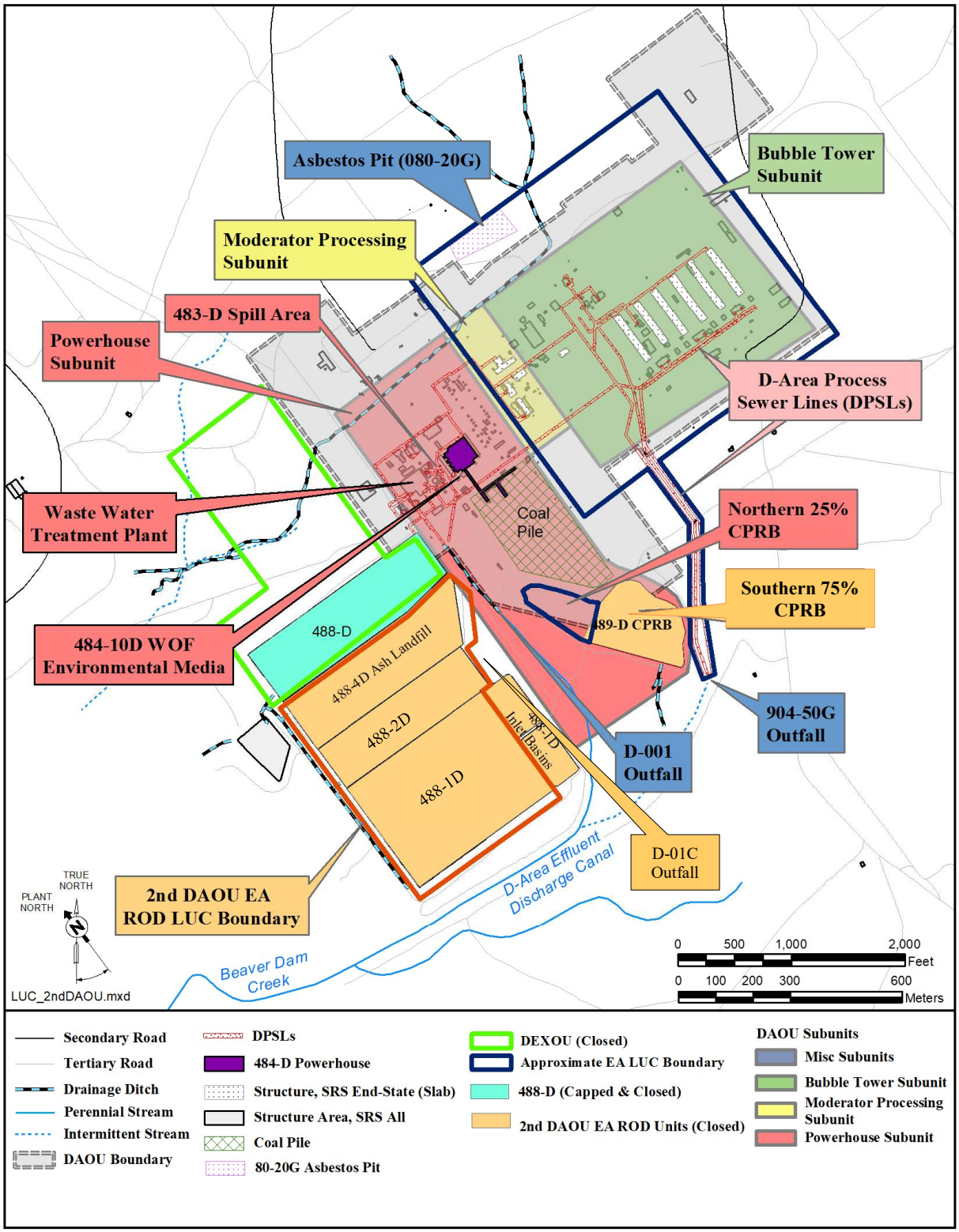

Figure 3. DAOU Subunits In and Around the DAOU

Figure 4. Typical Warning Sign at D-Area Ash Basins

Table 1. Summary of Administrative Paths for Area and Subunits in and Around the DAOU

	ADMINISTRATIVE PATH					
Subunit/Area	**EA ROD[1]**	**Second[2] EA ROD**	**Final ROD**	**IOU**	**GW OU**	**Other**
Bubble Tower Subunit	X					
Moderator Processing Subunit	X					
Powerhouse Subunit			X			
489-D CPRB - northern 25%	X					
489-D CPRB - southern 75%		X				
484-D Powerhouse building			X			
484-10D WOF Building			X			
484-10D WOF environmental media	X					
Ash sluice lines		X				
D Area Coal Pile			X			
483-D Combined Spills			X			
Miscellaneous Units						
D-01 Outfall					X	
D-06 Outfall (Petroleum Release Site [PRS])				X		
904-50G Outfall	X					
D Area Asbestos Pit (80-20G)	X					
DIPSLs	X					
Electrical Transformers	X					
Miscellaneous Buildings	X					
D Area Rubble Pit (431-2D)						Closed; D Area Expanded OU (DEXOU) ROD 2004
D Area Oil Seepage Basin						Closed; D Area Oil Seepage Basin (DAOSB) ROD 1998
Ash Basin (488-D)						Closed; DEXOU ROD 2004
Ash Basin (488-1D)		X				Closed via Industrial Wastewater Permit (IWT).
Ash Basin (488-2D)		X				Closed via IWT.
Ash Basin (488-4D)		X				Closed via Solid Waste (SW) permit.
D Area Groundwater					X	

1. EA ROD for DAOU, SRNS-RP-2010-00162, Rev 1.1, June 2011.
2. Second EA ROD for DAOU, SRNS-RP-2018-00461, Rev 1, July 2020, subunits in **bold** font are the subject of this document.

Table 2. Detailed Listing of Administrative Paths for Subunits and Areas for the DAOU Early Actions

SUBUNIT/AREA	ADMINISTRATIVE PATH					
	EA ROD[1]	Second[2] EA ROD	Final ROD	IOU	GW OU	Remedial Decision
Ash Basin (488-D)						Geosynthetic Cover/GW Monitoring/ LUCs (DEXOU ROD 2004)
Ash Basin (488-1D) (including Inlet Basins)		X				LUCs; No Action for the Inlet Basins portion
Ash Basin (488-2D)		X				LUCs
Ash Basin (488-4D)		X				LUCs
Powerhouse Subunit			X			
489-D CPRB - Northern 25%	X					LUCs
489-D CPRB - Southern 75%		X				No Action
484-D Powerhouse Building			X			
484-10D WOF Building			X			
484-10D WOF Environmental Media			X			
Ash Sluice Lines			X			
D-Area Coal Storage Area (484-17D)[3]			X			
483-D Combined Spills			X			
Bubble Tower Subunit	X					LUCs
Moderator Processing Subunit	X					LUCs
Miscellaneous Units						
D-01 Outfall					X	
D-06 Outfall (Petroleum Release Site)				X		
904-50G Outfall	X					No Action
D-Area Asbestos Pit (80-20G)	X					LUCs
DIPSLs	X					LUCs
Electrical Transformers	X					No Action
Miscellaneous Buildings	X					No Action
D-Area Rubble Pit (431-2D)						LUCs (DEXOU ROD 2004)
D-Area Oil Seepage Basin						GW Monitoring/LUCs (DAOSB ROD 1998)
D Area Groundwater					X	
Ash Area Adjacent to and Easterly of D-Area Ash Basins 488-1D and 488-2D				X		

1. EA ROD for DAOU, SRNS-RP-2010-00162, Rev 1.1, June 2011.
2. Second EA ROD for DAOU, SRNS-RP-2018-00461, Rev 1, July 2020, subunits in **bold** font are the subject of this document.
3. D-Area Coal Storage Area (484-17D) also referred to as D-Area Coal Pile in SRS documentation

Table 3. Events/Dates

Description of Activity	Date
REGULATORY ACTIVITIES	
Final inspection walkdowns for 488-2D and 488-4D	November 3, 2016
EPA Approval of 488-2D and 488-4D Removal Action Report	November 17, 2017
SCDHEC approval of 488-2D and 488-4D Removal Action Report	Mach 14, 2018
Final inspection walkdowns for 488-1D and 489-D	October 29, 2018
Installation of warning signs	November 1, 2018
EPA Approval of 488-1D and 489-D Removal Action Report	September 30, 2019
SCDHEC approval of 488-1D and 489-D Removal Action Report	October 22, 2019
Second Early Action ROD for the D-Area Operable Unit (Regulatory Approval) (Revision 1)	August 21, 2020
Second Early Action Land Use Control Implementation Plan (Regulatory Approval) (Revision 0)	November 24, 2020
Field Inspection Checklist	November 11, 2021
Professional Land Survey	March 29, 2022
488-1D, -2D and -4D Land Use Controls Completion Walkdown	TBD

Table 4. Final Remedial Action Project Cost Comparison

	EARODEstimate	IncurredCost	DeltaCost
Capital Costs:			
Direct Capital Costs			
Land Use Controls			
Posting of Warning Signs 10 ea.	$1000	$1200	
Land Use Control Implementation Plan 1 ea.....	$7500	$25,041	
Deed Restrictions 1 ea.	$7500	$0	
Mobilization/Demobilization	$4000	$4831	
Site Preparation/Site Restoration	$4000	$4831	
Total Direct Capital Cost	$24,000	$35,904	
Indirect Capital Costs:	$23,520	$15,467	
Sub Total:	**$47,520**	**$51,372**	**+8%**
Operations and Maintenance (O&M) Costs:			
Direct O&M Costs	$4,244,267	TBD	TBD
Indirect O&M Costs	$5,602,432		
Sub Total:	**$9,846,699**	**TBD**	**TBD**

APPENDIX A

Figure A-1.
Land Use Control Implementation Plan Survey Plat of the DAOU (OU) Second Early Action

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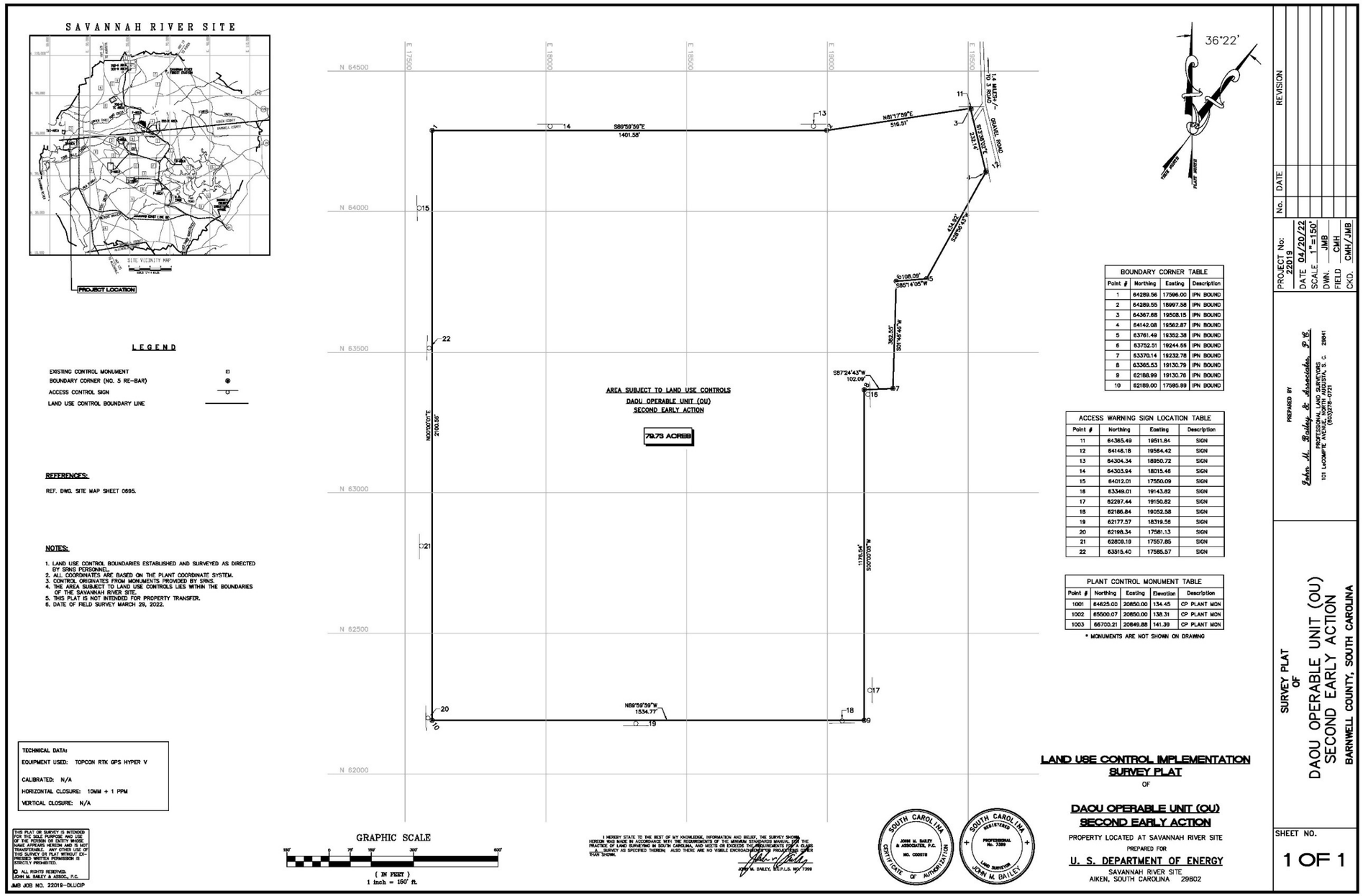

BOUNDARY CORNER TABLE			
Point #	Northing	Easting	Description
1	64289.56	17596.00	IPN BOUND
2	64289.55	18997.58	IPN BOUND
3	64367.68	19508.15	IPN BOUND
4	64142.08	19562.87	IPN BOUND
5	63761.49	19352.38	IPN BOUND
6	63752.51	19244.55	IPN BOUND
7	63370.14	19232.78	IPN BOUND
8	63365.53	19130.79	IPN BOUND
9	62188.99	19130.78	IPN BOUND
10	62189.00	17595.99	IPN BOUND

ACCESS WARNING SIGN LOCATION TABLE			
Point #	Northing	Easting	Description
11	64365.49	19511.84	SIGN
12	64146.18	19564.42	SIGN
13	64304.34	18950.72	SIGN
14	64303.94	18015.46	SIGN
15	64012.01	17550.09	SIGN
16	63349.01	19143.82	SIGN
17	62297.44	19150.82	SIGN
18	62186.84	19052.58	SIGN
19	62177.57	18319.58	SIGN
20	62198.34	17581.13	SIGN
21	62809.19	17557.85	SIGN
22	63515.40	17585.57	SIGN

PLANT CONTROL MONUMENT TABLE				
Point #	Northing	Easting	Elevation	Description
1001	64625.00	20850.00	134.45	CP PLANT MON
1002	65500.07	20850.00	138.31	CP PLANT MON
1003	66700.21	20849.88	141.39	CP PLANT MON

* MONUMENTS ARE NOT SHOWN ON DRAWING

Figure A-1. Land Use Control Implementation Plan Survey Plat of the DAOU (OU) Second Early Action

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APPENDIX B

Access Control Warnings Signs

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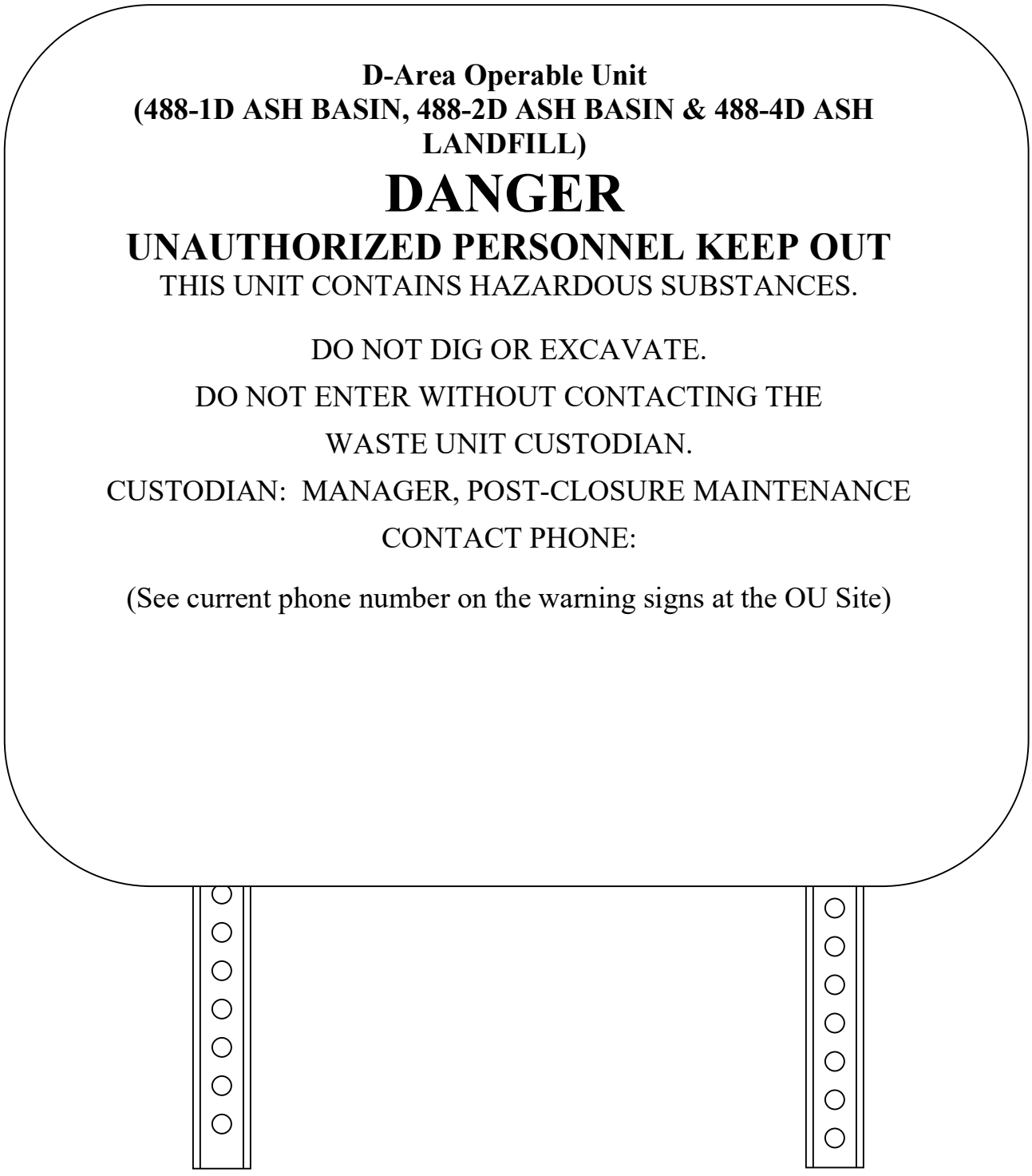

Figure B-1. ***EXAMPLE*** **— Access Control Warning Sign As-Built Drawings**

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APPENDIX C

USDOE Submittal of the Completion Status of the Project

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ARF-020897

Department of Energy
Savannah River Operations Office
P.O. Box A
Aiken, South Carolina 29802

NOV 22 2016

Ms. Susan Fulmer, P. G., Manager
Federal Remediation Section
Division of Site Assessment, Remediation and Revitalization
Bureau of Land and Waste Management
South Carolina Department of Health and Environmental Control
2600 Bull Street
Columbia, South Carolina 29201

Mr. Robert H. Pope
Savannah River Site Remedial Project Manager
Superfund Division
U. S. Environmental Protection Agency, Region 4
61 Forsyth Street, SW
Atlanta, Georgia 30303

Dear Ms. Fulmer and Mr. Pope:

SUBJECT: November 2016 Completion Status of the D-Area Ash Basin Project, CERCLIS Number: 63

The U.S. Department of Energy (DOE) is submitting this letter to document the status and completion of various construction activities in accordance with the selected removal actions defined in the following documents:

- *Removal Site Evaluation Report (RSER) for the D-Area Ash Basin (488-2D) (U)* (SRNS-RP-2013-00825, Revision 1, September 2014) CERCLIS Number: 63
- *Removal Site Evaluation Report / Engineering Evaluation / Cost Analysis (RSER/EE/CA) for the D-Area Ash Landfill (488-4D) (U)* (SRNS-RP-2014-00001, Revision 1, June 2014) CERCLIS Number: 63
- *Removal Site Evaluation Report / Engineering Evaluation / Cost Analysis (RSER/EE/CA) for the D-Area Ash Basin (488-1D) (U)* (SRNS-RP-2015-00490, Revision 1, June 2016) CERCLIS Number: 63
- *Revision 3 Action Memorandum for the Non-Time Critical Removal Action for the D-Area Coal Pile Runoff Basin (489-D), CERCLIS Number: 63* (IACD-15-168, dated August 11, 2015)

To observe the status and completion of these construction activities, a field visit by DOE, South Carolina Department of Health and Environmental Control (SCDHEC), and U.S. Environmental Protection Agency (EPA) personnel (Enclosure 1) was conducted on November 3, 2016. Savannah River Nuclear Solutions, LLC (SRNS) personnel participated in the field visit (Enclosure 1) to lead the tour and discussions. The personnel present observed and discussed the construction activities within the 488-2D Ash Basin, the 488-4D Ash Landfill, the 488-1D Ash Basin, the 489-D Coal Pile Runoff Basin, and the new borrow pit. To assist in the discussions, the handouts included as Enclosure 2 were provided to all individuals present. Highlights from the field visit are provided below.

488-4D ASH LANDFILL

- All ash within the scope of the 488-2D and 488-4D RSER/EE/CA has been consolidated and placed within 488-4D Ash Landfill. No additional ash will be placed within this permitted facility and it is closed for any further waste disposal.
- All construction activities for the installation of the SCDHEC Class Three Landfill cover have been completed for this landfill per the *Removal Action Design Plan (RADP) for the 488-4D Ash Landfill and 488-2D Ash Basin (U)* (SRNS-RP-2014-00459, Revision 1.1, March 2015) CERCLIS Number: 63.
- The location of the four groundwater monitoring wells (one up gradient and three down gradient) were identified along with the schedule for installation. Installation is scheduled to begin in 4QCY2016.
- The SCDHEC Bureau of Land and Waste Management (Justin Koon) and other participants observed the subgrade design within the active storm sewer manhole located off the northeast corner of 488-4D Ash Landfill to confirm proper installation.
- The removal action for the 488-4D Ash Landfill is complete. The Removal Action Report for the 488-2D Ash Basin and the 488-4D Ash Landfill (Revision 0) is scheduled to be submitted by March 30, 2017.

488-2D ASH BASIN

- Ash within the 488-2D Ash Basin bottom has been completely removed from the basin.
- Confirmatory sampling has been completed and all data has been incorporated into the *Human Health and Ecological Evaluation for Confirmation Sampling at the 488-2D Ash Basin (U)* (ERD-EN-2015-0053, Revision 1, October 2016) CERCLIS Number: 63.
- Soil cover and sod installation have been completed per the *Removal Action Design Plan (RADP) for the 488-4D Ash Landfill and 488-2D Ash Basin (U)* (SRNS-RP-2014-00459, Revision 1.1, March 2015) CERCLIS Number: 63. The 488-2D Ash Basin now functions as a detention basin.
- Sediment control floats will remain on the discharge structures throughout the 488-1D Ash Basin construction project. Floats will be removed upon completion of the 488-1D Ash Basin project.
- The removal action for the 488-2D Ash Basin is complete. The Removal Action Report for the 488-2D Ash Basin and the 488-4D Ash Landfill (Revision 0) is scheduled to be submitted by March 30, 2017.

488-1D ASH BASIN

- Removal of vegetative cover is progressing rapidly. All root balls containing ash are being managed as CERCLA waste and are being disposed at Three Rivers Landfill. All overburden vegetation free of ash is being chipped/slashed and relocated off the construction site.
- The 489-D Coal Pile Runoff coal residue and soils have been relocated into the 488-1D Ash Basin.
- Excavation of the ash located along the west end of the landfill has been initiated to design drainage channels within this area of the basin.
- Basin is relatively free of standing water.
- Collected storm water within the North Inlet Basin is being used for irrigation purposes on the 488-D Ash Basin and 488-4D Ash Basin covers.

Ms. Susan Fulmer
Mr. Robert Pope

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489-D COAL PILE RUNOFF BASIN

- All coal fines have been removed from the basin bottom. The majority of the coal fines have been transported to the 488-1D Ash Basin. One small pile remains within the basin area to be transported to 488-1D Ash Basin in the very near future.
- Twelve inches of under burden soil has been stripped from the basin bottom and is in the process of being placed within the 488-1D Ash Basin. Some soil piles remained at the time of the November 3, 2016 tour.
- Non-hazardous waste determination has been completed for all material within this basin based on sample results in conjunction with process knowledge. No material within this basin is determined to be characteristically hazardous.
- Confirmation sampling has been initiated for this basin. Additional sampling will be necessary to confirm the absence of the coal residue in the areas of the stock piled soils/coal residues. Back filling to final grade and sodding will occur upon removal of all excavated basin bottoms.
- With the removal of the coal residues and the twelve inches of under burden soils, current storm water management compliance will shift from the National Pollutant Discharge Elimination System General Permit for Storm Water Discharges Associated with Industrial Activities (Except Construction), SCR000000, Section 1.1.2 (Runoff from coal storage piles at steam electric generating facilities) to the compliance requirements defined within the project specific Storm Water Pollution Prevention Plan (SWPPP). All water will be pumped through a SWPPP Best Management Practice and discharged to the D-Area Discharge Canal.

Based on this review and walk down, the DOE, SCDHEC, and EPA personnel present agreed that there were no deficiencies observed with the completed field activities for the completed removal actions associated with 488-4D Ash Landfill and 488-2D Ash Basin. In addition, these personnel also agreed that construction activities associated with the removal actions specific to the 488-1D Ash Basin and the 489-D Coal Pile Runoff Basin are progressing satisfactorily.

Questions from you or your staff may be directed to me at (803) 952-8365, or the DOE Federal Project Director, Ms. Karen Adams, at (803) 952-7871.

Sincerely,

Brian T. Hennessey
SRS Remedial Project Manager
Infrastructure and Area Completion Division

IACD-17-111

Department of Energy
Savannah River Operations Office
P.O. Box A
Aiken, South Carolina 29802

NOV - 8 2018

Ms. Susan Fulmer, P. G., Manager
Federal Remediation Section
Division of Site Assessment, Remediation and Revitalization
Bureau of Land and Waste Management
South Carolina Department of Health and Environmental Control
2600 Bull Street
Columbia, South Carolina 29201

Mr. Jon Richards
Acting Savannah River Site Remedial Project Manager
Superfund Division
U. S. Environmental Protection Agency, Region 4
61 Forsyth Street, SW
Atlanta, Georgia 30303

Dear Ms. Fulmer and Mr. Richards:

SUBJECT: October 2018 Completion Status of the D-Area Ash Project, SEMS Number: 63

The U.S. Department of Energy (DOE) is submitting this letter to document the status and completion of construction activities in accordance with the selected removal actions defined in the following documents:

- *Removal Site Evaluation Report / Engineering Evaluation / Cost Analysis (RSER/EE/CA) for the D-Area Ash Basin (488-1D) (U)* (SRNS-RP-2015-00490, Revision 1, June 2016) CERCLIS Number: 63
- *Revision 3 Action Memorandum for the Non-Time Critical Removal Action for the D-Area Coal Pile Runoff Basin (489-D), CERCLIS Number: 63* (IACD-15-168, dated August 11, 2015)
- *Removal Action Design Plan (RADP) for the 488-1D Ash Basin and the 489-D Coal Pile Runoff Basin (U)* (SRNS-RP-2015-00196, Revision 1, May 2016) CERCLIS Number: 63
- *Minor Design Change to the Removal Action Design Plan (RADP) for the 488-1D Ash Basin and 489-D Coal Pile Runoff Basin (U) (SRNS-RP-2015-00196, Revision 1, May 2016) CERCLIS Number: 63* (IACD-17-159, dated September 14, 2017)

To observe and discuss the status and completion of the removal action construction activities for the D-Area Ash Basin (488-1D) and D-Area Coal Pile Runoff Basin (489-D) (CPRB), a field visit by DOE, South Carolina Department of Health and Environmental Control (SCDHEC), and U.S. Environmental Protection Agency (EPA) personnel was conducted on October 29, 2018. Savannah River Nuclear Solutions, LLC (SRNS) personnel participated in the field visit to lead the tour and discussions. Table 1 provides a list of the attendees. The visual confirmation from the field visit included:

- The 488-1D North and South Inlet Basins have been eliminated. The 488-1D Ash Basin area has been graded to design elevations and sodded.
- All ash has been consolidated within 488-1D Ash Basin and the installation of the SCDHEC Class Three Landfill cover have been completed at 488-1D per the regulatory approved RADP and minor design change listed above.

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Ms. Susan Fulmer
Mr. Jon Richards

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- The location and schedule for installation of the two groundwater monitoring wells (DCB081 and DCB082) at the west end of 488-1D were discussed. The installation of the wells was completed on November 1, 2018.
- Visual observation of the 489-D CPRB area to confirm the storm water retention basin is functioning as designed.

Based on this review and walk down, the DOE, SCDHEC, and EPA personnel present agreed that there were no deficiencies observed with the completed field activities for the removal actions associated with 488-1D Ash Basin and 489-D CPRB. In addition, the SCDHEC Industrial Wastewater Treatment Permit #7295 should qualify for closure along with the associated National Pollutant Discharge Elimination System Permits for Outfalls D-01, D-01B, D-01C.

Questions from you or your staff may be directed to me at (803) 952-8365, or the DOE Federal Project Director, Ms. Karen Adams, at (803) 952-7871.

Sincerely,

Brian T. Hennessey
SRS Remedial Project Manager
Infrastructure and Area Completion Division

IACD-19-111

cc:
D. Scaturo, SCDHEC-Columbia
S. French, SCDHEC-Columbia
M. D. Wilson, SCDHEC-Columbia
G. K. Taylor, SCDHEC-Columbia
G. O'Quinn, SCDHEC–Aiken Environmental Affairs Office
R. H. Pope, EPA-Atlanta
D. Lloyd, EPA-Atlanta
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