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Scoping Summary for the Lower Three Runs Integrator Operable Unit
(Feasibility Study Scoping)

SEMS Number: 35

ERD-EN-2001-0061

April 2018 Final

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Printed in the United States of America

Prepared for
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1.0 PROJECT PHASE AND STATUS OF THE LOWER THREE RUNS INTEGRATOR OPERABLE UNIT

This scoping summary supports the development of a Feasibility Study (FS) for the Lower Three Runs (LTR) Integrator Operable Unit (IOU) (Figure 1). Scoping meetings in support of the FS were conducted on February 14, 2018 and March 5, 2018. This scoping summary incorporates the Core Team agreements from the February and March meetings to support a third FS scoping meeting scheduled for April 9, 2018. The FS evaluates potential remedies for the Upper subunit of the LTR IOU which includes PAR Pond, pre-cooler ponds, R-Reactor Discharge canal, and the canal system upgradient of PAR Pond dam (Figure 2). A Remedial Investigation/Baseline Risk Assessment (RI/BRA) was developed by the Department of Energy (DOE) and submitted to the South Carolina Department of Health and Environmental Control (SCDHEC) and the Environmental Protection Agency (EPA) in July 2017. Regulator comments on the Revision 0 RI/BRA have been addressed and the Revision 1 redline document was submitted on January 4, 2018 for regulatory review. The South Carolina Department of Health and Environmental Control (SCDHEC) provided approval on January 25, 2018, and the United States Environmental Protection Agency (EPA) provided approval on January 26, 2018.

To support the FS, seven likely response actions have been identified based on the problems warranting actions from the RI/BRA. Potential remedial technologies for each likely response action were screened with respect to their effectiveness, implementability, and estimated cost associated with each Exposure Area (EA) in the Upper subunit. The response actions will be evaluated during FS scoping and are summarized in this scoping summary.

2.0 BACKGROUND

LTR Watershed

The LTR IOU and its associated watershed are in the southeastern portion of the Savannah River Site (SRS) (Figure 1). LTR is a large blackwater stream that originates in the northeast portion of SRS and follows a southerly direction for approximately (~) 40 kilometers (km [24.5 miles {mi}]). LTR has an annual average discharge of 1.8 cubic meter (m^3)/sec (64 cubic feet [ft^3]/sec). The watershed

drains about 460 square kilometers (km^2 [180 square miles {mi^2}]) and includes two SRS Operable Units: P-Area Operable Unit (PAOU) including P Reactor (105-P), and R-Area Operable Unit (RAOU) including R Reactor (105-R).

Potential sources of contamination to LTR from its watershed have been evaluated and mitigated. Remedial actions for source units at RAOU and PAOU have been completed. Two units originally identified in the LTR IOU workplan, Dunbarton Railroad Yard and P-Area Groundwater, have subsequently been re-evaluated and administratively transferred to the Steel Creek watershed. All potential sources to the LTR IOU, except portions of the LTR IOU itself, have been mitigated or determined to require No Further Action. Table 1 provides the status of the potential sources of contamination to LTR IOU identified in the 2002 RI/FS Work Plan.

LTR IOU

The LTR IOU is defined as the LTR stream and its tributaries and impoundments, including surface water, sediment, floodplain soils (sediment/soil), and related biota in these water bodies and associated floodplains. The LTR IOU is divided into three subunits (Upper, Middle, and Lower) (Figure 1). The Upper portion of the LTR IOU, which is the subject of this scoping summary, contains a 1,068-hectare (ha [2,640-acre {ac}]) mainstream impoundment (PAR Pond), several smaller ponds (pre-cooler ponds), and canal systems including P-Area Discharge Canal and the Old R-Area Discharge Canal (Joyce Branch) (Figure 2). The middle and lower subunits of the LTR IOU are located below the PAR Pond dam and are not considered in the LTR IOU FS because a final remedy for these subunits has already been selected and implemented. The entire length of LTR IOU, but not the entirety of its watershed, is bounded by SRS.

Previous Actions

During an inspection of the PAR Pond Dam in March 1991, a small surface depression was noted on the downstream face which necessitated a detailed structural investigation and initiated a precautionary drawdown of the reservoir. From June through September 1991, the level of PAR Pond was lowered from 60 to 54.3 m (200 to 181 ft) mean sea level (msl) to reduce the risk and consequences

of an unlikely event of dam failure. A CERCLA IROD for PAR Pond was issued in 1995 to address potential exposure to contaminated sediments that were exposed following water level drawdown of the PAR Pond reservoir during repair of the PAR Pond dam. The interim remedy was to prevent exposure of contaminated shoreline sediments until a National Environmental Policy Act (NEPA) evaluation could be conducted. The NEPA Environmental Impact Statement (EIS) for the *Shutdown of the River Water System at the Savannah River Site* was used as the basis for the selection of the No Action alternative. The EIS, issued in 1998, documented continued operation of the river water system using a 5,000 gallon per minute (gpm) pump allowing PAR Pond reservoir water levels to continue to naturally fluctuate between 58.5 and 60 m (195 and 200 ft) msl, and required a minimum base discharge of 10 cubic feet/second (ft^3/sec) from the dam at PAR Pond to LTR. Under severe drought conditions, and if necessary, the River Water System could be used to maintain PAR Pond water levels. In 2009, a revised Finding of No Significant Impact (FONSI) reduced the base flow requirements from 10 ft^3/sec to 5.0 ft^3/sec for the PAR Pond dam. The effectiveness of this remedy is evaluated in the 2015 Five-Year Remedy Review (5YR). The next 5YR Report for the PAR Pond IROD is scheduled for issuance in 2020.

A Time Critical Removal Action (TCRA) was conducted in 2012 for the Lower and Middle LTR subunits downgradient of the PAR Pond dam. The action included excavation of Cs-137 sediment hot spots and land use controls (LUCs) (i.e., fencing and signage). An Explanation of Significant Difference (ESD) to the 1995 PAR Pond IROD was issued in 2012 that selected LUCs for the LTR IOU Lower and Middle subunits as the final remedy. The Time Critical Removal Action (TCRA) was designed to achieve an acceptable level of risk to the adolescent trespasser. The implemented remedy left hazardous substances in place that pose a potential future risk and will require land use restrictions until the concentrations of hazardous substances in the sediment are at levels that allow for unrestricted use. An Early Action Land Use Control Implementation Plan (EALUCIP) was prepared for the LTR IOU Middle and Lower subunits. The EALUCIP implements the LUCs selected as part of the remedial decision. The LUCs shall be maintained until the LTR IOU Lower subunit (tail portion) is suitable for unlimited exposure and unrestricted use. No additional data collection, risk assessment, or response evaluation is necessary to support the approved early action remedial decision for both the Lower and Middle subunits. Therefore, the final remedial action for the Lower and Middle subunits, documented in the ESD, is complete.

Characterization of the Upper LTR

Characterization of the LTR IOU indicates that Cs-137, a fission product of reactor operations, is the major contaminant in the system. Extensive sampling of the IOU was undertaken to augment existing data and ensure sufficient information would be available for evaluating risks to human and ecological receptors. Characterization was performed in accordance with an approved Sampling and Analysis Plan and included sampling within the canals, pre-cooler ponds, PAR Pond, and the stream channel/floodplain. With the exception of the larger ponds, the sampling plan design was based on evenly spaced transects. Field gamma measurements were augmented by sediment, sediment/soil, and surface water samples collected for laboratory analyses. Biological data (primarily fish) was collected from LTR subunits. Background samples were collected for all media.

3.0 LAND USE

Current land use in the LTR IOU is mixed. Industrial areas cover less than 10% of the SRS portion of the LTR watershed including PAOU and RAOU. The remainder of the watershed primarily consists of managed forests, wetlands/floodplain habitats, and surface water impoundments, and is no longer used for industrial purposes. No part of the LTR IOU will have residential or unrestricted use in the future. The Upper subunit (including ponds and canals) and Middle subunit of the LTR (below PAR Pond dam) are well within the SRS property boundary. The tail portion of LTR (Lower subunit) includes a strip of USDOE property on both sides of the stream which is bounded on both sides by private property, some of which includes residential parcels. The USDOE-owned tail is ~0.20- to 0.40-km (0.125- to 0.25-miles [mi]) wide; the DOE boundary is posted and trespassing is not allowed. There are four public road crossings, two power line crossings, and a railroad crossing along the tail portion of LTR.

Exposure Scenarios

Previous decisions for the Middle and Lower subunits of the LTR IOU were based on an adolescent trespasser exposure scenario. An "IOU onsite worker" scenario was determined to be the appropriate scenario for the Upper subunit of the LTR IOU baseline risk assessment. The IOU onsite worker is based on the most likely human receptor for the Upper subunit: an SRS worker/researcher (20 years, 150 days/year, 8 hours/day). The IOU onsite worker is also protective of a trespasser. Because it is known that some contaminants could bio-accumulate in fish, and fish are a mobile media, the evaluation of human exposure also included a hypothetical recreational fisherman scenario for the ingestion of fish (26 years, 350 days/year, 54 g/day).

4.0 SUBUNITS AND EXPOSURE AREAS

The LTR IOU is divided into three major subunits based on sub-watershed boundaries: Upper, Middle, and Lower (Figure 1). The Middle and Lower subunits are located below PAR Pond dam and include the narrow "Tail" portion of the IOU. For purposes of data evaluation, risk assessment, and response selection, the Upper Subunit has been further segregated into nine Exposure EAs (Figure 2). The nine EAs are identified in Section 4.2.

4.1 LOWER AND MIDDLE SUBUNITS (BELOW PAR POND DAM)

The remedial action for the Lower and Middle subunits, selected in the ESD, is complete. The clean-up level achieved is considered protective of human health and the environment, and will be documented in the final ROD.

4.2 UPPER SUBUNIT (ABOVE PAR POND DAM)

The Upper subunit has been divided into nine EAs as indicated on Figure 2. The individual EAs represent the following portions of the LTR IOU.

1. Exposure Area 1: Pond A – Including R Discharge Canal
2. Exposure Area 2: Canal from Pond A to Pond B
3. Exposure Area 3: Pond B – Including canal to Pond C
4. Exposure Area 4: Canal from Pond B to North Arm of PAR Pond
5. Exposure Area 5: Joyce Branch (Old Discharge Canal)
6. Exposure Area 6: PAR Pond
7. Exposure Area 7: Canal from P-Area to Ponds 4 and 5 – Including Pond 2
8. Exposure Area 8: Ponds 4 and 5 – Including canal from Ponds 4 and 5 to Pond C
9. Exposure Area 9: Pond C

Likely Response Actions

The No Action alternative is a remedy which does not involve any remedial action response. The No Action response does not involve any monitoring or reporting.

Land Use Controls (LUCs) with Monitored Natural Recovery (MNR) is a remedial action that allows contaminated media to remain in place. LUCs are used so human receptors are protected by signs, administrative procedures, and/or fencing. LUCs require site inspections and long-term reporting. MNR is a potential remedial action for contaminated sediment that uses ongoing, naturally occurring processes (i.e., biodegradation, sorption, sedimentation, radioactive decay) to contain, destroy, or reduce the bioavailability or toxicity of contaminants in sediment. MNR usually requires assessment, modeling, and long-term monitoring and reporting

In Situ Capping on PTSM Sediments (including consideration of a hybrid cap) is an in-situ remedial alternative that includes the addition of some type of barrier cap to contaminated media. The application of a cap readily limits exposure pathways by reducing the mobility and the bioavailability of the known contaminants. A hybrid cap would include placement of amendments in addition to the capping

material. Amendments or capping generally require confirmation sampling as well as long-term monitoring and reporting. Application of this likely response action is considered for the areas within each EA that have concentrations above PTSM thresholds.

The Maintain Water in Ponds alternative consists of maintaining water in Pond B, Pond C and PAR Pond which ensures that contaminated sediment is not exposed to human receptors. Maintaining water in the ponds, much like the MNR alternative, uses natural processes to allow for the decay of contamination in the sediment, but also shields receptors from the radioactive contaminated sediments. It also limits contaminated sediments from migrating off-SRS; mobility of contaminated media in the Upper subunit is restricted by the dam structures at Pond B (EA3), Pond C (EA9) and ultimately PAR Pond (EA6). This infrastructure serves as sedimentation barriers that retain and slow the movement of water and sediment within the system, restricting flow into PAR Pond. Similarly, the PAR Pond dam acts as a sedimentation barrier for the entire Upper subunit and limits contaminated sediments from migrating to the Middle and Lower subunits and potentially off SRS. This response requires site inspections, maintenance, and long-term monitoring and reporting.

Excavation/Disposal scenarios include the removal and disposal of contaminated media, generally to a specified clean-up level from the EA. This process involves extracting the contaminated media with specialized equipment and unique construction methods. The unit where the media was removed is often backfilled with clean fill. Excavation/Disposal requires assessment, modeling, confirmation sampling, long-term monitoring, and reporting. Application of this likely response action is considered for the areas within each EA that have concentrations above PTSM thresholds and is also evaluated for all contaminated sediments in the Upper Subunit as a bounding case.

Broadcast of Amendments to Limit Bioavailability of Contaminants is a response that broadcasts a reactive material over the pond system to limit the bioavailability of contaminants.

4.2.1 Exposure Area 1: Pond A – Including R Discharge Canal (Figure 3)

Subunit Background

EA1 includes Pond A and the R-Area Discharge Canal. Pond A is ~2.6 ha (6.4 ac) and received water from the R-Area Discharge Canal and subsequently discharged to Pond B. Prior to construction of PAR Pond, the Discharge Canal effluent flowed into Lower Three Runs via Joyce Branch. Water levels in Pond A fluctuate from year to year. The canal from R-Reactor to Pond A is ~645-m (2,116.1-ft) long. The canal from the R-Discharge Canal to Joyce Branch is 233-m long. The canal flow area (i.e., where contaminants most likely have been deposited) is ~3.0-m (9.8-ft) across the base of the canal. EA1 contains one location, with five separate samples, where Cs-137 levels are above the PTSM threshold for the onsite worker. The maximum value of Cs-137 at this location is 685.8 pCi/g sampled on 4/11/2005. The decay adjusted value is 526.183 pCi/g as of January 1, 2017. The sample location lies within the R Discharge Canal along a Diversion Control Structure. The infrastructure serves as a sedimentation barrier for contaminated sediment transport into Pond A. Reported values further down the canal and within Pond A are incrementally lower. This Exposure Area does not contain any locations where Co-60 levels are above the PTSM threshold for the onsite worker. This location is monitored. EA1 is an active ecological research location. Land-altering response actions would impact short and long-term research that takes place in the area.

EA1 (Pond A - Including R Discharge Canal)			
Problem(s) Warranting Action	**Remedial Action Objectives**	**Scope of Problem(s)**	**Likely Response Actions**
• Cs-137 and Co-60 in sediments pose a Total Cumulative Risk [TCR] of $8.24x10^{-4}$ to the onsite worker (decay corrected to $6.4x10^{-4}$) - Cs-137: (EPC=148 pCi/g; risk to the onsite worker = $8.2x10^{-4}$; decay corrected to $6.4x10^{-4}$). - Co-60: (EPC=0.144 pCi/g; risk to the onsite worker = $1.7x10^{-6}$; decay corrected to $<1x10^{-6}$)	• Protect onsite workers from exposure to Cs-137 and Co-60 in sediment that exceed $1x10^{-6}$ risk threshold or background levels.	• Assuming 0.3-m (1.0-ft) depth of contaminated sediment and 3.0-m (9.8-ft) canal flow area, the maximum volume of contaminated sediment/soil in the canal system would be 658 m^3 (1,034.5 yd^3). • Contaminated sediment below the water surface in Pond A covers an area of ~25,900 m^2 (30,976.1 yd^2). Assuming a 0.3-m (1.0-ft) depth of contaminated sediment, the maximum volume of contaminated sediment in Pond A would be 7,770 m^3 (10,162.8 yd^3). • There is one location (R-1), with five separate samples, where Cs-137 levels are above the PTSM threshold for the onsite worker. • Approximately 10 m^3 (13.1 yd^3) > PTSM threshold	• No Action • LUCs with MNR • In Situ Capping of PTSM sediments (including consideration of a hybrid cap) • Excavation and Disposal of PTSM • Excavation and Disposal of All Contaminated Sediment
Uncertainties			
• None.			

Summary tables presenting the Likely Response Actions applicable for EA1 are in Section 4.3.

4.2.2 Exposure Area 2: Canal from Pond A to Pond B (Figure 4)

Subunit Background

EA2 includes the canal from Pond A to Pond B and is ~2,837-m (9,307.7-ft) long. Water levels fluctuate from year to year. The canal flow area (i.e., where contaminants most likely have been deposited) is ~3.0-m (9.8-ft) across the base of the canal. Based on the BRA, EA2 does not contain any locations where Cs-137 and Co-60 levels are above the PTSM threshold for the onsite worker.

EA2 (Canal from Pond A to Pond B)			
Problem(s) Warranting Action	**Remedial Action Objectives**	**Scope of Problem(s)**	**Likely Response Actions**
• Cs-137 in sediments (EPC=48.8 pCi/g) poses a $2.7x10^{-4}$ risk to the onsite worker (decay corrected to $2.3x10^{-4}$).	• Protect onsite workers from exposure to Cs-137 in sediments that exceed $1x10^{-6}$ risk threshold or background levels.	• Assuming 0.3-m (1.0-ft) depth of contaminated sediment and 3.0 m (9.8-ft) canal flow area, the maximum volume of contaminated sediment in the canal system would be 2,553 m^3. (3,339.2 yd^3)	• No Action • LUCs with MNR • Excavation and Disposal of All Contaminated Sediments
Uncertainties			
• None.			

Summary tables with the Likely Response Actions applicable for EA2 are presented in Section 4.3.

4.2.3 Exposure Area 3: Pond B – Including Canal to Pond C (Figure 5)

Subunit Background

EA3 includes Pond B and the overflow canal connecting Pond B to Pond C. Pond B is ~82.1 ha (202.8 ac) and received water from the R-Area and subsequently discharged to Pond C. Pond B generally maintains its water level from year to year. The canal from Pond B to Pond C is ~547-m (1,794.6-ft) long. The canal flow area (i.e., where contaminants most likely have been deposited) is ~3.0-m (9.8-ft) across the base of the canal. EA3 (Pond B – Including Canal to Pond C) contains two locations where Cs-137 levels are above the PTSM threshold for the onsite worker. The maximum value at each location is 456.763 pCi/g and 446.077 pCi/g sampled on September 14, 1994 and September 20, 1994, respectively. The decay adjusted values as of January 1, 2017 are 275.981 pCi/g and 269.625 pCi/g. The two sample locations are in Pond B, submerged below several feet of water. EA3 is an active ecological research location. Land altering response actions would impact short and long-term research that takes place in the area.

EA3 (Pond B - Including Canal to Pond C)			
Problem(s) Warranting Action	**Remedial Action Objectives**	**Scope of Problem(s)**	**Likely Response Actions**
• Cs-137 in sediments (EPC=98.3 pCi/g) poses a $5.5x10^{-4}$ risk to the onsite worker (decay corrected to $3.3x10^{-4}$).	• Protect onsite workers from exposure to Cs-137 in sediments that exceed $1x10^{-6}$ risk threshold or background levels.	• Assuming 0.3-m (1.0-ft) depth of contaminated sediment and 3.0-m (9.8-ft) canal flow area, the maximum volume of contaminated sediment in the canal system would be 492 m^3 (643.5 yd^3). • Contaminated sediment below the water surface in Pond B covers an area of ~820,703 m^2 (981,533 yd^2). Assuming a 0.3-m (1.0-ft) depth of contaminated sediment, the maximum volume of contaminated sediment in Pond B would be 246,211 m^3 (322,031.8 yd^3). • There are two locations in EA3 (SCB-29 and SCB-34) where measured concentrations of Cs-137 (circa 1994) exceeded PTSM thresholds for the onsite worker. • Approximately 200 m^3 (260.2 yd^3) > PTSM threshold	• No Action • LUCs with MNR • In Situ Capping of PTSM sediments (including consideration of a hybrid cap) • Excavation and Disposal of PTSM • Maintain Water in Pond • Excavation and Disposal of All Contaminated Sediment
• Cs-137 in fish tissue (Max=113 pCi/g; PRG=0.054 pCi/g) and Hg (Max=1.83mg/kg; RSL=0.154 mg/kg) exceeds risk based screening levels for the recreational fisherman.	• Protect recreational fisherman from exposure to contaminated fish.	• Contaminated fish have been detected in Pond B.	• No Action • LUCs with MNR • Broadcast of Amendments to Limit Bioavailability of Contaminants
Uncertainties			
• None.			

Summary tables with the applicable Likely Response Actions for EA3 are presented in Section 4.3.

4.2.4 Exposure Area 4: Canal from Pond B to North Arm of PAR Pond (Figure 6)

Subunit Background

EA4 includes the canal from Pond B to the North Arm of PAR Pond and is ~2,305-m (7,562.3-ft) long. The canal flow area (i.e., where contaminants most likely have been deposited) is ~3.0-m (9.8-ft) across the base of the canal. EA4 does not contain any locations where Cs-137 and Co-60 levels are above the PTSM threshold for the onsite worker.

EA4 (Canal from Pond B to North Arm of PAR Pond)			
Problem(s) Warranting Action	**Remedial Action Objectives**	**Scope of Problem(s)**	**Likely Response Actions**
• Cs-137 in sediments (EPC=18.3 pCi/g) poses a $1.0x10^{-4}$ risk to the onsite worker (decay corrected to $8.8x10^{-5}$).	• Protect onsite workers from exposure to Cs-137 in sediments that exceed $1x10^{-6}$ risk threshold or background levels.	• Assuming 0.3-m (1.0-ft) depth of contaminated sediment and 3.0-m (9.8-ft) canal flow area, the maximum volume of contaminated sediment in the canal system would be 2,075 m^3 (2,714.0 yd^3)	• No Action • LUCs with MNR • Excavation and Disposal of All Contaminated Sediments
Uncertainties			
• None.			

Summary tables with the applicable Likely Response Actions for EA4 are presented in Section 4.3.

4.2.5 Exposure Area 5: Joyce Branch (Old Discharge Canal) (Figure 7)

Subunit Background

EA5 is Joyce Branch (Old Discharge Canal). Joyce Branch is ~2,533-m (8,310.3-ft) long. The flow area is ~3.0-m (9.8-ft) across the base of the stream bed. EA5 contains two locations, with four separate samples, where Cs-137 levels are above the PTSM threshold for the onsite worker. The maximum value of Cs-137 at each location is 405 pCi/g and 388 pCi/g sampled on April 28, 2004. The decay adjusted value for both locations as of January 1, 2017 304.12 pCi/g and 291.35 pCi/g, respectively. The topography of the sample area could generate difficulties for various remedial alternatives as the sample location lies within a deep channel, approximately 20ft deep. EA5 does not contain any locations where Co-60 levels are above the PTSM threshold for the onsite worker.

EA5: Joyce Branch (Old Discharge Canal)			
Problem(s) Warranting Action	**Remedial Action Objectives**	**Scope of Problem(s)**	**Likely Response Actions**
• Cs-137 and Co-60 in sediments pose a TCR of $1.3x10^{-3}$ to the onsite worker (decay corrected to $9.4x10^{-4}$) - Cs-137:(EPC=228 pCi/g; risk to onsite worker = $1.3x10^{-3}$; decay corrected to $9.4x10^{-4}$). - Co-60: (EPC=0.76 pCi/g; risk to onsite worker = $9.1x10^{-6}$; decay corrected to $1.7x10^{-6}$)	• Protect onsite workers from exposure to Cs-137 and Co-60 in sediments that exceed $1x10^{-6}$ risk threshold or background levels.	• Assuming 0.3-m (1.0-ft) depth of contaminated sediment and 3.0-m (9.8-ft) canal flow area, the maximum volume of contaminated sediment in the canal system would be 2,280 m^3 (2,982.1 yd^3). • There are four samples total (two each) at two specific locations (LTR-02 and LTR-04) with measured levels (circa 2003-2004) above the PTSM threshold for Cs-137 for the onsite worker. • Approximately 20m^3 (26.2 yd^3) > PTSM threshold	• No Action • LUCs with MNR • In Situ Capping of PTSM sediments (including consideration of a hybrid cap) • Excavation and Disposal of PTSM • Excavation and Disposal of All Contaminated Sediments
Uncertainties			
• None			

Summary tables with the applicable Likely Response Actions for EA5 are presented in Section 4.3.

4.2.6 Exposure Area 6: PAR Pond (Figure 8)

Subunit Background

EA6 is PAR Pond. PAR Pond is ~1,068.3 ha (2,640 ac) and received water from the R-Area and P-Area discharges via Pond B and Pond C. In 1995 an Interim Record of Decision established a minimum water elevation (61 +/- 0.3-m [200 +/- 1-ft msl]) and LUCs to manage exposure to contaminated sediments. The subsequent NEPA document (ROD, Shutdown of the River Water System at the SRS, FR Vol. 63, No.18, 1/29/98) acknowledged PAR can naturally fluctuate between 195 and 200 ft msl and established a minimum water elevation of 195 ft msl. Additionally, minimum outflow of five cubic feet per second from PAR Pond has been established (per 2009 FONSI) to maintain downstream environments. EA 6 does not contain any locations where Cs-137 and Co-60 levels are above the PTSM threshold for the onsite worker. EA6 is an active ecological research location. Land-altering response actions could impact short and long-term research that takes place in the area.

EA6 (PAR Pond)			
Problem(s) Warranting Action	**Remedial Action Objectives**	**Scope of Problem(s)**	**Likely Response Actions**
• Cs-137 and Co-60 in sediments pose a TCR of $5.0x10^{-5}$ to the onsite worker (decay corrected to $2.9x10^{-5}$) - Cs-137:(EPC=8.82 pCi/g; risk to onsite worker = $4.9x10^{-5}$; decay corrected to $2.9x10^{-5}$). - Co-60: in sediment (EPC=0.097 pCi/g; risk to onsite worker = $1.2x10^{-6}$; decay corrected to $<1x10^{-6}$).	• Protect onsite workers from exposure to Cs-137 and Co-60 in sediments that exceed $1x10^{-6}$ risk threshold or background levels.	• Contaminated sediment below the water surface in PAR Pond covers an area of ~ 10,680,000 m^2 (10.68 km^2). Assuming 0.3-m (1.0-ft) depth of contaminated sediment the maximum volume of contaminated sediment under water in PAR Pond could be 3,257,400 m^3 (4,261,000 yd^3).	• No Action • LUCs with MNR • Maintain Water in Pond • Excavation and Disposal of All Contaminated Sediments
• Cs-137 (max.18.4 pCi/g; PRG=0.054 pCi/g) and Hg (max= 3.18 mg/kg; RSL=0.154 mg/kg) in fish tissue exceeds risk based screening levels for the recreational fisherman.	• Protect recreational fisherman from exposure to contaminated fish.	• Contaminated fish have been detected in PAR Pond.	• No Action • LUCs with MNR • Broadcast of Amendments to Limit Bioavailability of Contaminants
Uncertainties			
• **None.**			

Summary tables with the applicable Likely Response Actions for EA6 are presented in Section 4.3.

4.2.7 Exposure Area 7: Canal from P-Area to Ponds 4 and 5 – Including Pond 2 (Figure 9)

Subunit Background

EA7 includes Pond 2 and the canal from P-Area to Ponds 4/5. Pond 2 is ~7.9 ha (19.6) ac and received water from the P-Area and subsequently discharged to Ponds 4/5. The canal from P-Area to Pond 2 is ~3,582-m (11,751.9-ft) long. The canal from the Pond 2 to Ponds 4/5 is ~2,081-m (6,827.4-ft) long. The canal flow area (i.e., where contaminants most likely have been deposited) is ~3.0-m (9.8-ft) across the base of the canal. EA7 does not contain any locations where Cs-137 and Co-60 levels are above the PTSM threshold for the onsite worker.

EA7 (Canal from P-Area to Ponds 4 and 5 - Including Pond 2)			
Problem(s) Warranting Action	**Remedial Action Objectives**	**Scope of Problem(s)**	**Likely Response Actions**
• Cs-137 and Co-60 in sediments pose a TCR of $7.8x10^{-4}$ to the onsite worker (decay corrected = $4.5x10^{-4}$) - Cs-137: (EPC=139 pCi/g; risk to onsite worker = $7.7x10^{-4;}$ decay corrected to $4.5x10^{-4}$). - Co-60: (EPC=0.802 pCi/g; risk to onsite worker = 9.6 $x10^{-6}$; decay corrected to 1.0 $x10^{-6}$).	• Protect onsite workers from exposure to Cs-137 and Co-60 in sediments that exceed $1x10^{-6}$ risk threshold or background levels.	• Assuming 0.3-m (1.0-ft) depth of contaminated sediment and 3.0-m (9.8-ft) canal flow area, the maximum volume of contaminated sediment in the canal system would be 5,097 m^3 (6,666.6 yd^3). • Contaminated sediment below the water surface in Pond 2 covers an area of ~79,318 m^2 (94,863.54 yd^2). Assuming a 0.3-m (1.0-ft) depth of contaminated sediment, the maximum volume of contaminated sediment in Pond 2 would be 23,796 m^3 (31,123.9 yd^3).	• No Action • LUCs with MNR • Excavation and Disposal of All Contaminated Sediments
Uncertainties			
• None.			

Summary tables of applicable Likely Response Actions for EA7 are presented in Section 4.3.

4.2.8 Exposure Area 8: Ponds 4 and 5 – Including Canal from Ponds 4 and 5 to Pond C (Figure 10)

EA8 includes Ponds 4 and 5 and the canal to Pond C. Pond 4 is ~14.3 ha (35.3 ac) and received water from the P-Area and subsequently discharged to Pond 5. Pond 5 is ~4.0 ha (9.9 ac) and received water from Pond 4 and subsequently discharged to Pond C via a 1,887-m (6,190.9-ft) long canal. The canal flow area (i.e., where contaminants most likely have been deposited) is ~3.0-m (9.8-ft) across the base of the canal. EA8 does not contain any locations where Cs-137 levels are above the PTSM threshold for the onsite worker.

EA8 (Ponds 4 and 5 - Including Canal from Ponds 4 and 5 to Pond C)			
Problem(s) Warranting Action	**Remedial Action Objectives**	**Scope of Problem(s)**	**Likely Response Actions**
• Cs-137 in sediments (EPC=50.3 pCi/g) poses a $2.8x10^{-4}$ risk to the onsite worker (decay corrected to $1.9x10^{-4}$).	• Protect onsite workers from exposure to Cs-137 in sediments that exceed $1x10^{-6}$ risk threshold or background levels.	• Assuming 0.3-m (1.0-ft) depth of contaminated surface soil/sediment and 3.0-m (9.8-ft) canal flow area, the maximum volume of contaminated sediment in the canal system would be 1,698 m^3 (2,220.9 yd^3). • Contaminated sediment below the water surface in Pond 4 and 5 covers a combined area of ~182,918 m^2 (218,768.1 yd^2). Assuming 0.3-m (1.0-ft) depth of contaminated sediment the maximum volume of contaminated sediment under water in Ponds 4 and 5 combined could be 54,875 m^3 (71,773.8 yd^3).	• No Action • LUCs with MNR • Excavation and Disposal of All Contaminated Sediments
Uncertainties			
• None.			

Summary tables with the applicable Likely Response Actions for EA8 are presented in Section 4.3.

4.2.9 Exposure Area 9: Pond C (Figure 11)

Subunit Background

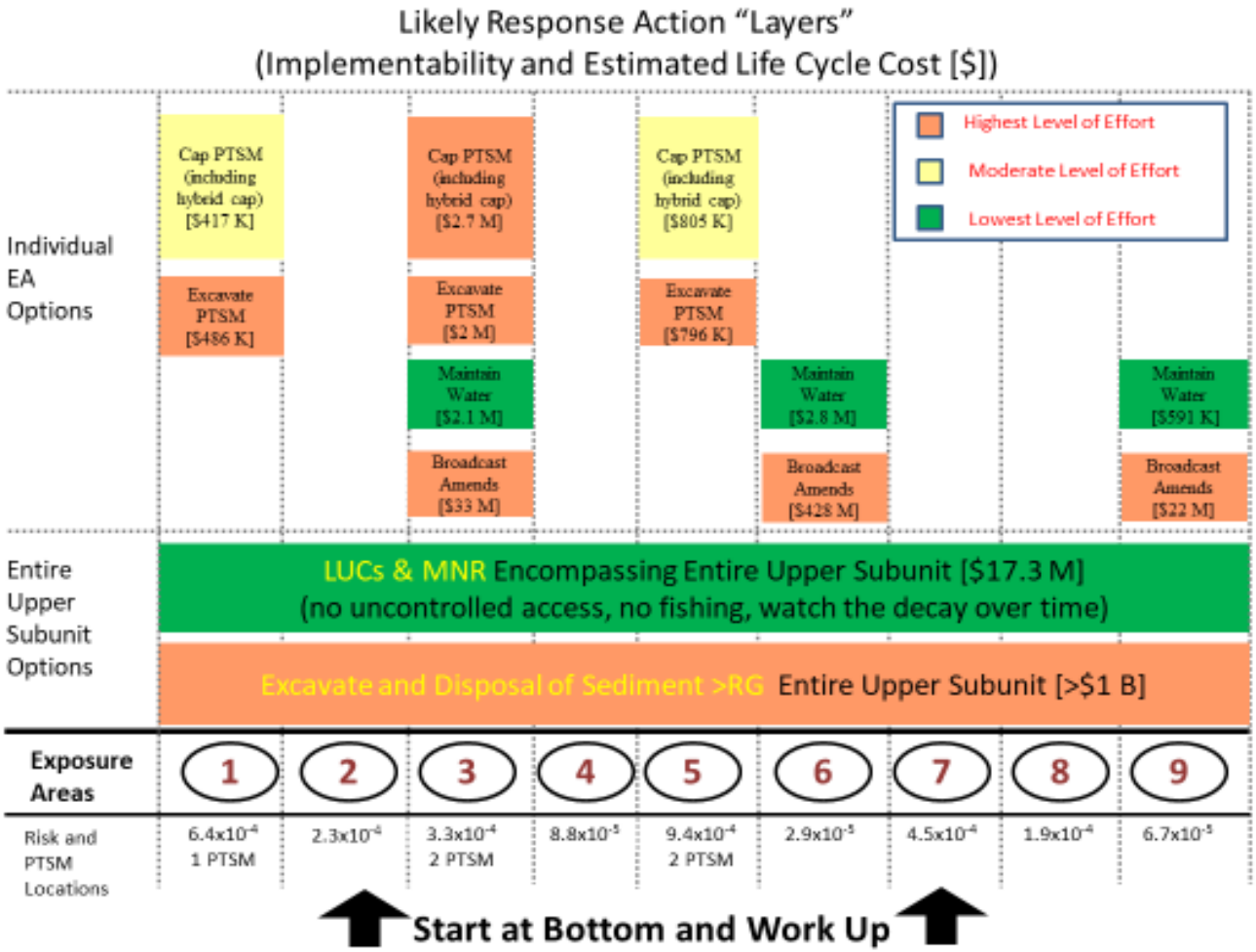
EA9 includes Pond C. Pond C is ~53.5 ha (132.4 ac) and received water from the R-Area and P-Area discharged via Joyce Branch, Pond B, and Ponds 4/5. Pond C maintains its water level from year to year and is hydraulically connected to PAR Pond through the Bubble Up Pipe at the dam between PAR and Pond C. EA9 does not contain any locations where Cs-137 and Co-60 levels are above the PTSM threshold for the onsite worker.

EA9 (Pond C)			
Problem(s) Warranting Action	**Remedial Action Objectives**	**Scope of Problem(s)**	**Likely Response Actions**
• Cs-137 and Co-60 in sediments pose a TCR of $1.2x10^{-4}$ to the onsite worker (decay corrected = $6.7x10^{-5}$) - Cs-137: (EPC=20.9 pCi/g; risk to onsite worker = $1.2x10^{-4}$; decay corrected to $6.7x10^{-5}$). - Co-60: (EPC=0.114 pCi/g; risk to onsite worker =$1.4x10^{-6}$; decay corrected to $<1x10^{-6}$).	• Protect onsite workers from exposure to Cs-137 and Co-60 in sediments that exceed $1x10^{-6}$ risk threshold or background levels.	• Contaminated sediment below the water surface in Pond C covers a combined area of ~535,800 m^2 (640,800 yd^2). Assuming 0.3-m (1.0-ft) depth of contaminated sediment the maximum volume of contaminated sediment under water in Pond C could be 163,419 m^3 (213,700 yd^3).	• No Action • LUCs with MNR • Maintain Water in Pond • Excavation and Disposal of All Contaminated Sediments
• Cs-137 (max 42.5 pCi/g; PRG=0.054 pCi/g) and Hg (max 0.214 mg/kg; RSL=0.154 mg/kg) in fish tissue exceeds risk based screening levels for the recreational fisherman.	• Protect recreational fisherman from exposure to contaminated fish.	• Contaminated fish have been detected in Pond C.	• No Action • LUCs with MNR • Broadcast of Amendments to Limit Bioavailability of Contaminants
Uncertainties			
• None.			

Summary tables with the applicable Likely Response Actions for EA9 are presented in Section 4.3.

4.3 SUMMARY OF ALTERNATIVE SCREENING

The following tables provide a summary of alternative screening for each EA and identify which remedial alternatives will be evaluated in the FS.



Lower Three Runs Upper Subunit Likely Response Actions

Likely Response Actions	Description	Applicable EAs	Key Scope/Cost Assumptions	Evaluation Considerations	Retain
1) No Action	All media is left in place untouched and unprotected.	1 through 9	- No scope or cost assumed.	- Alternative is required by National Contingency Plan.	YES
2) Land Use Controls (LUCs) with Monitored Natural Recovery (MNR) Component	LUCs (i.e., Institutional Controls [administrative] and engineering controls [signs]) to limit or prevent on-site exposure. Additional monitoring of environmental media to document decay of Cs-137.	1 through 9	- Single comprehensive plan to be developed for entire Upper LTR Subunit; - Compliance with Site Use Program and other associated procedures; - Signs at access points as needed; - Inspections every 5 years until unlimited use and unrestricted exposure levels are achieved; - MNR monitoring of sediment and biota at a 10-year frequency (alternating remote sensing and ground truthing surveys at 5 year intervals) at 10 locations until decayed below PTSM value (~50 Years); - Five Year Remedy Review.	- LUCs very effective within SRS boundaries; - Does not actively address PTSM; - MNR component to be evaluated at Five Year Remedy Reviews as detailed in the Proposed Plan and ROD; - Monitoring to include remote sensing with periodic ground truthing; - Re-evaluate MNR component every 5 years until Cs-137 concentrations decay below PTSM levels; - Does not reduce toxicity or mobility through treatment.	YES
3) In Situ Capping on PTSM Sediments (including consideration of a hybrid cap)	Barrier material placed to prevent inadvertent exposure to PTSM sediments and limit mobility of PTSM. Hybrid cap includes placement of amendments.	1, 3, and 5	- EA2 not considered since decay value of Cs-137 at the RA start date (September 28, 2021) would be below the PTSM threshold; - Placement of capping barrier (sand and gravel) below water requires specialized equipment; - Bathymetric survey required for EA 3 (Pond B); - Inspection to confirm placement of material at time of implementation; - Inspection of capping barrier at a five-year frequency until concentrations are below PTSM level; - Site treatability study/cap design may be required; - Five Year Remedy Review.	- Has been effectively applied at other Superfund sites; - Placement of capping barriers below water has not been demonstrated at SRS; - Does not reduce toxicity through treatment.	YES
4) Broadcast of Amendments to Limit Bioavailability of Contaminants	Reactive material is broadcasted to pond system to limit bioavailability of contaminants.	3, 6 and 9	- Broadcast of amendments where habitat could support a recreational fishing scenario (only Pond B [EA3], Pond C [EA9] and PAR Pond [EA6]); - Site specific treatability study is required; - ~~Further research~~Treatability study required on how to deliver amendments; - Monitoring of effectiveness every 5 years; - Five Year Remedy Review.	- Uncertainty in the effectiveness of broadcasting amendments to limit bioavailability; - Significant cost in application to entire pond system (> $480 M); - Does not reduce toxicity through treatment.	NO
5) Excavation and Disposal of PTSM	Excavation and disposal of sediments in designated PTSM locations.	1, 3, and 5	- EA2 not considered since decay value of Cs-137 at the RA start date (September 28, 2021) would be below the PTSM threshold; - Excavation requires specialized equipment (varies depending on location); - Dewatering would be implemented as necessary to meet disposal facility WAC; - Disposal would be at the E-Area Low-Level Waste Facility; - Pre-excavation and post-excavation sampling – minimum 2 samples every 10m^2; - Five Year Remedy Review.	- Excavation would disturb subsurface requiring sediment control; - Process to excavate sediment from below water surface expected to be more difficult than stream banks. - Does not reduces toxicity and mobility through treatment.	YES
6) Maintain Water in Ponds	Water minimizes access and limits exposure to contaminated sediments. PAR Pond dam structure (EA6) acts as a sedimentation barrier for the entire Upper subunit and limits contaminated sediments from migrating to Middle and Lower subunits and potentially off-SRS.	3, 6 and 9	- Monitoring of dam structures and water levels per SRS procedure; - Natural fluctuation of water levels in ponds is expected; - Annual inspections and periodic maintenance of physical attributes that make water retention viable (i.e., dams, weirs, control gates, etc.); - ~~Cost estimate to include 1 repair for each of the 3 dam structures over a ~50 year period;~~ - Five Year Remedy Review.	- Standing water provides effective shielding of radiation from sediments as well as an impediment to access; - Maintenance and inspection of water detention structures would be re-evaluated after Cs-137 concentrations drop below PTSM levels. - Does not reduce toxicity through treatment.	YES

Likely Response Actions	Description	Applicable EAs	Key Scope/Cost Assumptions	Evaluation Considerations	Retain
7) Excavation and Disposal of All Contaminated Sediments	Excavation and disposal of all contaminated sediments	1 through 9	- Excavation requires specialized equipment (varies depending on location); - Dewatering would be implemented as necessary to meet disposal facility WAC; - Disposal would be at the E-Area Low-Level Waste Facility; - Cost assumed ~~on~~ an average rate of disposal at E-Area Low-Level Waste Facility - Pre-excavation sampling to confirm extent; - Confirmation sampling	- As a bounding case, a total excavation of all canals and cooler ponds will be estimated; - Projected removal of over 4.85 million yards of sediment; - No MNR, LUCs, or Five Year Remedy Review required. - Does not reduce toxicity and mobility through treatment.	NO

EA1: Pond A – Including R Discharge Canal
EA2: Canal from Pond A to Pond B
EA3: Pond B – Including canal to Pond C
EA4: Canal from Pond B to North Arm of PAR Pond
EA 5: Joyce Branch
EA6: PAR Pond
EA7: Canal from P-Area to Ponds 4 and 5 – Including Pond 2
EA8: Ponds 4 and 5 – Including canal from Ponds 4 and 5 to Pond C
EA9: Pond C

5.0 IOU STRATEGY

The final ROD for the LTR IOU is scheduled for issuance in March 2020. The key milestones leading up to the ROD include:

~~July~~ August 2018	Submit Rev. 0, Feasibility Study
~~October~~February 201~~8~~	Feasibility Study Approved
February 2019	Submit Rev. 0, Proposed Plan
July 2019	Proposed Plan Approved
October 2019	Submit Rev. 0, ROD

SRS proposes to submit an FS that evaluates alternatives for remediation at nine exposure areas in the Upper subunit of the LTR IOU.

6.0 RECORD OF CORE TEAM AGREEMENTS AND KEY CHANGES

Record of Key Agreements[1]	
Date	**Description of Agreement**
6/10/2015	The Core Team agreed that the on-site worker was the appropriate human health receptor for the Upper Subunit of the LTR IOU.
10/29/2015	The Core Team agreed that the EAs presented are appropriate for the risk assessment, with the exception of EA6 (PAR Pond and Pond C). Based on the January 2016 data review, the Core Team will evaluate whether EA6 should include both PAR Pond and Pond C or if two separate EAs are needed.
10/29/2015	With the exception of PAR Pond, the 2009/2010 data will be used for the exposure point concentration assessment. All other data will be used as lines of evidence as part of the uncertainty evaluation.
1/28/2016	For EA6 (PAR Pond and Pond C), the Core Team agreed that the sediment data identified as high and medium pedigree is sufficient for the risk assessment. However, there needs to be a solid discussion in the RI/BRA of why the older 1995 and 2001 data (i.e., high pedigree rating) is adequate for the risk assessment. Project Team will acknowledge availability of low pedigree data in the RI/BRA report and explain why low pedigree data will not be used.
1/28/2016	The Core Team agreed that radionuclide concentrations (as reported) would be used in the risk assessment and radionuclide decay will generally be applied as part of the weight of evidence (i.e., uncertainty discussion).
1/28/2016	The Core Team agreed that high and medium pedigree data will be used for the Principal Threat Source Material evaluation for the onsite worker and decay corrected for the weight-of-evidence discussion.
1/28/2016	The Core Team agreed that high and medium pedigree data for surface water was adequate for Pond C but not PAR pond. Additional surface water samples (both filtered and unfiltered) are needed in PAR Pond in approximately 14 locations. An additional 3 sediment samples will be considered. The Core Team agreed that an Addendum to the 2009/2010 would be adequate for formal approval of the additional surface water and sediment samples.
1/28/2016	The Core Team agreed that the high and medium pedigree fish data for Pond C and PAR pond are sufficient for the risk assessment. Because high pedigree data is limited, the medium data needs to be leveraged in the RI/BRA to establish that it is in the representative range with the high pedigree data. Data summary information should communicate the range and mean for each medium quality data set as well as the range and mean for the entire medium quality data set.

[1] Core team agreements will be documented at each scoping phase and should be retained for each successive phase to maintain a comprehensive list for the life of the project.

Record of Key Agreements (*Continued*)	
Date	**Description of Agreement**
7/20/2016	1. The Core Team agrees to integrate the medium with the high pedigree data for calculation of risk. Accounting for radiological physical/ecological half- life will be addressed on the COCs (risk drivers) in the RI/BRA uncertainty discussion. 2. The Core Team agrees to combine sediment and sediment/soil as a single media (to be called "sediment/soil" and defined in the RI/BRA) for all evaluations (ecological, human health, and PTSM). A qualitative discussion of contaminant migration will support development of the conceptual site model. 3. The risk screening will be based on conservative thresholds representing the lower of sediment and "soil" benchmarks for the ecological assessment. 4. The uncertainty discussion will discuss the medium (sediment or sediment/soil) data associated with constituents that fail screening and require further assessment/evaluation. 5. The human health assessment for sediment/soil will be based on USEPA soil RSLs (for non- radionuclides) and PRGs (for radionuclides) to calculate risk. Exposure media will be based on 0- to 0.5-ft sediment, 0- to 1-ft sediment and 0- to 1-ft sediment/soil data combined for each EA. 6. The surface water human health assessment will be based on MCLs or the lowest of the RSL/PRG or promulgated AWQCs (Federal/State) if MCLs are not available. 7. The human health assessment for ingestion of fish will be based on the recreational fisherman scenario. Results of fish tissue analyses will be compared to RSLs/PRGs. 8. The ecological assessment will be based on: (a) the primary screening will be based on EPA Region IV NOAELs for soil, as available, otherwise use levels derived from the ECORISK tool from LANL. The secondary soil screening will be based on LANL LOAELs; (b) use LANL for sediment values for wildlife receptors and aquatic community receptors; (c) the SW threshold will be based on the lowest of the community or wildlife receptors based on LANL, SCDHEC Water Classifications and Standards (chronic values), or EPA Region IV values; (d) use LANL for radionuclides for all media; (e) the COPCs will be further evaluated by biological data, trophic modeling (using LANL TRVs), and other biological data, to determine ecological COCs. 9. The Core Team agreed to address Pond C and PAR Pond as separate EAs. 10. The Core Team agreed the existing data are sufficient to proceed with the RI/BRA with the inclusion of the additional data collected in 2016 for PAR Pond (sediment and surface water) for initial screening.

Record of Key Agreements (*Continued/End*)

Date	Description of Agreement
2/8/2017	1. The Core Team agreed that Fish Tissue Data collected in the four EAs (EA 3, 6, 8, and 9) would be representative of the fish in each EA where no fish data were collected (EA 1, 2, 4, 5 and 7). As part of that agreement, a problem statement was added for EA 1, 2, 4, 5 and 7 stating that Hg and Cs-137 are problems warranting action for the recreational fisherman based on the adjoining EAs. 2. The Core Team agreed that the most recent PRG calculator information from the EPA website would be used in the Uncertainty discussions for those constituents that have changed since the October 2016 tables were developed (emphasis on the Cs-137 PRG). 3. The Core Team agreed that tritium is not a surface water RCOC for the onsite worker in EA1. 4. The Core Team agreed that DDT and mercury are not ecological RCOPCs in surface water for any EA. 5. The Core Team agreed that Bismuth-214 is a common natural decay product in surface water and is not an RCOC in any EA. 6. The Core Team agreed that Pb-212, Tl, and Th-234 are natural constituents and are not RCOCs for surface water within EA6. 7. The Core Team agreed that Cr, Fe, Mn, and Pb-212 are natural constituents in surface water in EA7 and are not RCOCs for the onsite worker. 8. The Core Team agreed that Al is not an ecological RCOPC for surface water in EA7. 9. The Core Team agreed that Cr, K-40, and Th-232 are not RCOCs in sediment for the onsite worker in EA8.
2/14/2018 & 3/5/2018	1. Core Team agreed that the remedial alternative selected for the Lower and Middle subunits, documented in the ESD, is complete. The cleanup level achieved is considered protective of human health and the environment and will be documented in the final ROD. 2. The updated Cs-137 PRG (0.144 pCi/g) will be used to establish the PTSM threshold of 144 pCi/g; this activity will be applied as the RGO to determine PTSM extent (including an excavation scenario) in the FS. 3. Core Team agreed that overflight data to monitor Cs-137 in areas not inundated with water could be incorporated into the monitoring plan along with ground truth sampling at a determined frequency. 4. Core Team agreed that LUCs for any EA was not acceptable as a stand alone remedy. 5. Core Team agreed that MNR to address characterization uncertainties and LUCs would be applied to the Upper subunit as a whole (inclusive of all EAs). The MNR threshold is achieved when contaminant levels decay below PTSM levels, throughout the Upper subunit. 6. Core Team agreed that remedial actions for the Recreational Fisherman scenario are only applicable to the credible fishing areas of Pond B, Pond C, and PAR Pond. 7. Core Team agreed that broadcasting of amendments for the Recreational Fisherman scenario would be considered in the screening of remedial alternatives but not carried forward as a viable remedy for the detailed analysis. 8. Core Team agreed that maintaining water levels addresses the general exposure to contaminated media, not just PTSM. 9. Core Team agreed that excavation of all contamination in all EAs would be considered in the screening of remedial alternatives as a bounding point of comparison in the FS but not carried forward as a viable remedy for the detailed analysis. Excavation of PTSM will be carried forward for detailed analysis.
4/9/18	1. Core Team agreed to combine In Situ Capping of PTSM Sediments alternative and In Situ Amendments on PTSM Sediments alternative into a single alternative titled In Situ Capping of PTSM Sediments (Including Consideration of Hybrid Cap). The actual cap material and consideration of amendments would be determined in the design for the applicable EAs.

Record of Key Changes to Scoping Summary[2]			
Date	**Section**	**Description of Change**	**Rationale for Change**
April 9, 2018	ALL	Updated all sections of scoping summary to implement Core Team agreements from the 2/14/2018 and 3/5/2018 scoping meetings.	Scoping summary revised to support LTR FS.

[2] The purpose of the "Key Changes" table is to identify significant changes from the previous scoping version and eliminates the need for redline formatting. The Key Changes table is not a comprehensive list and is updated each time the scoping summary is revised.

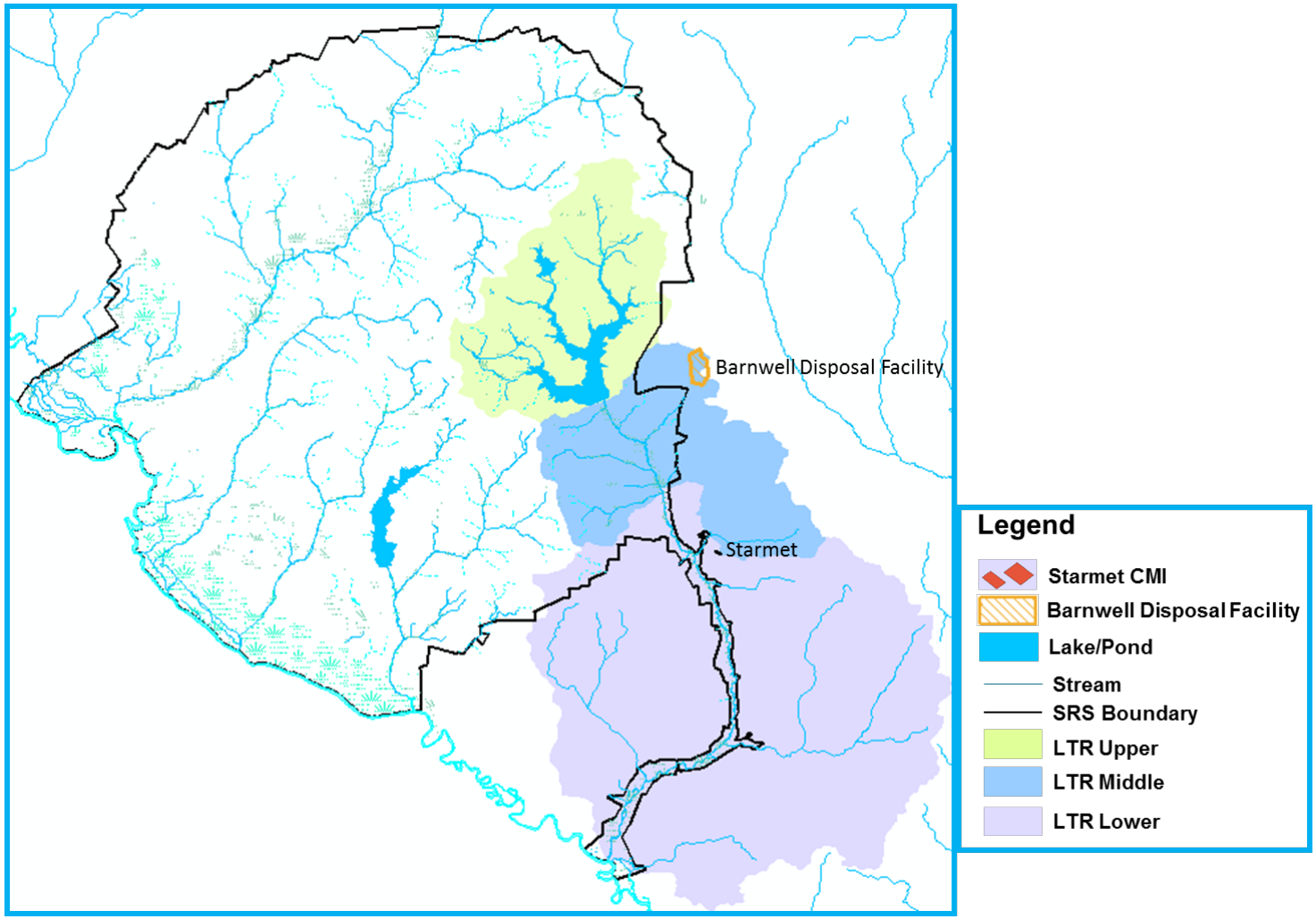


Figure 1. LTR IOU of the SRS.

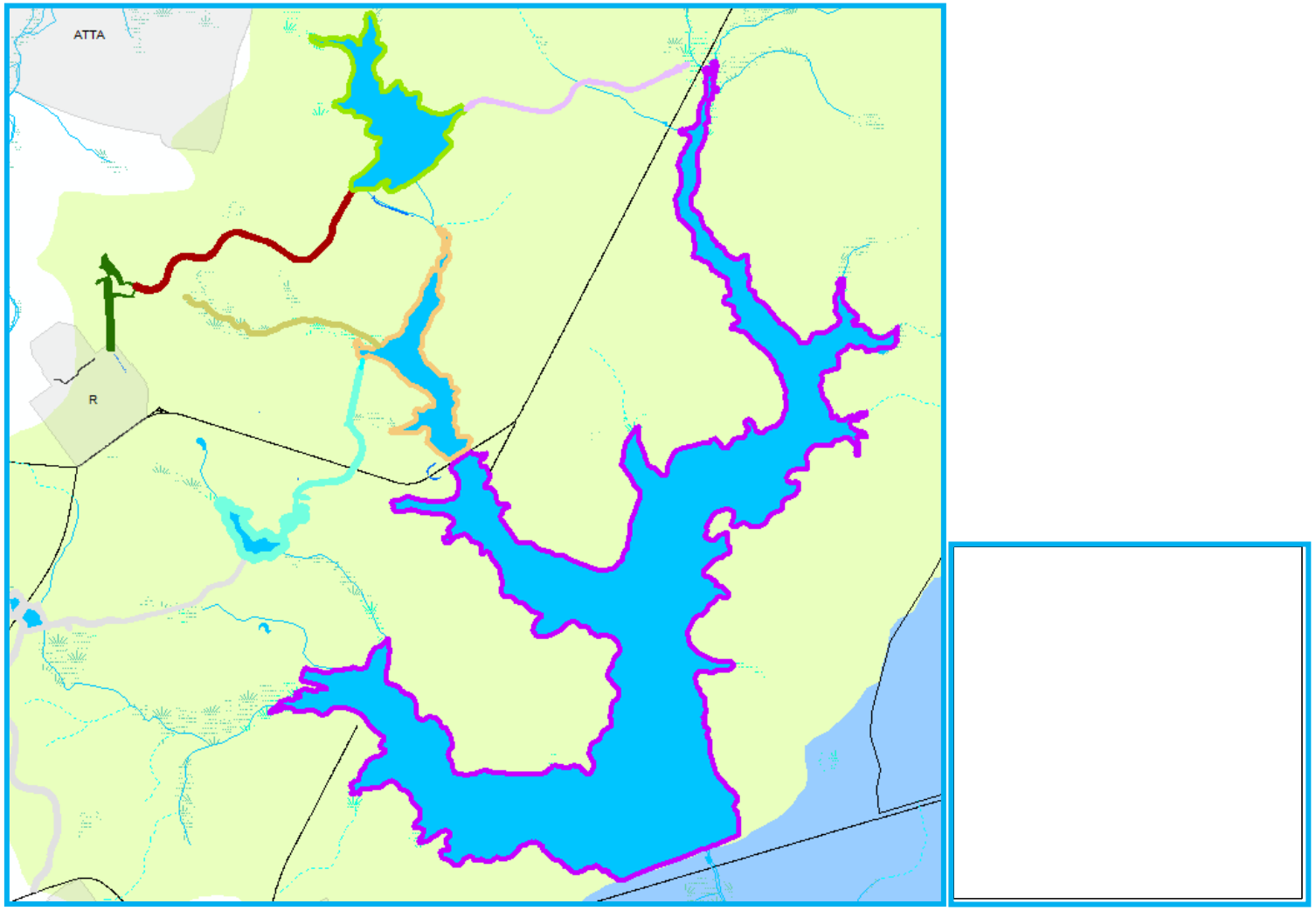


Figure 2. LTR IOU Upper Subunit (Pond and Canal System) is divided into nine Exposure Areas.

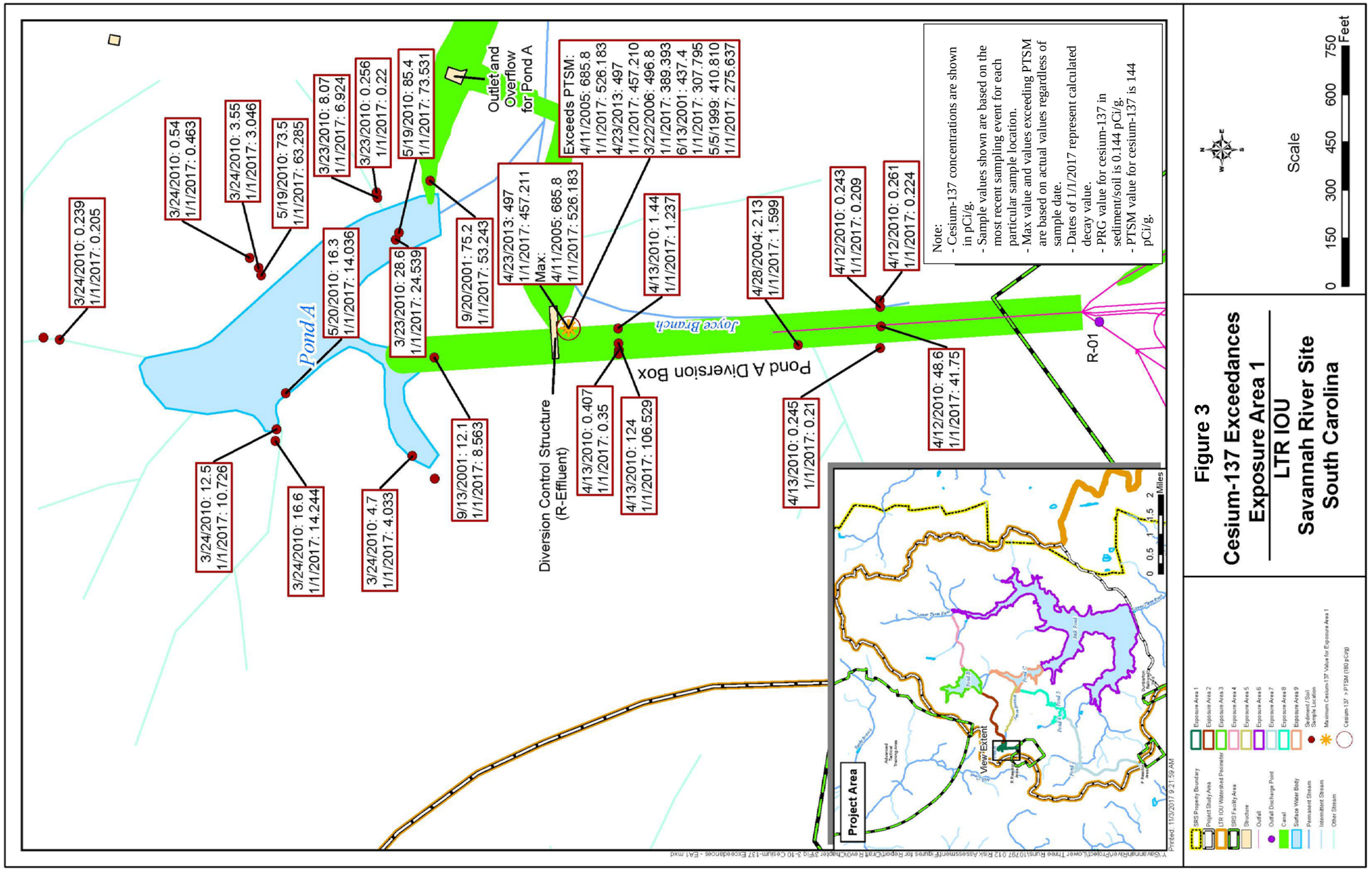


Figure 3. Cesium-137 Exceedances Exposure Area 1

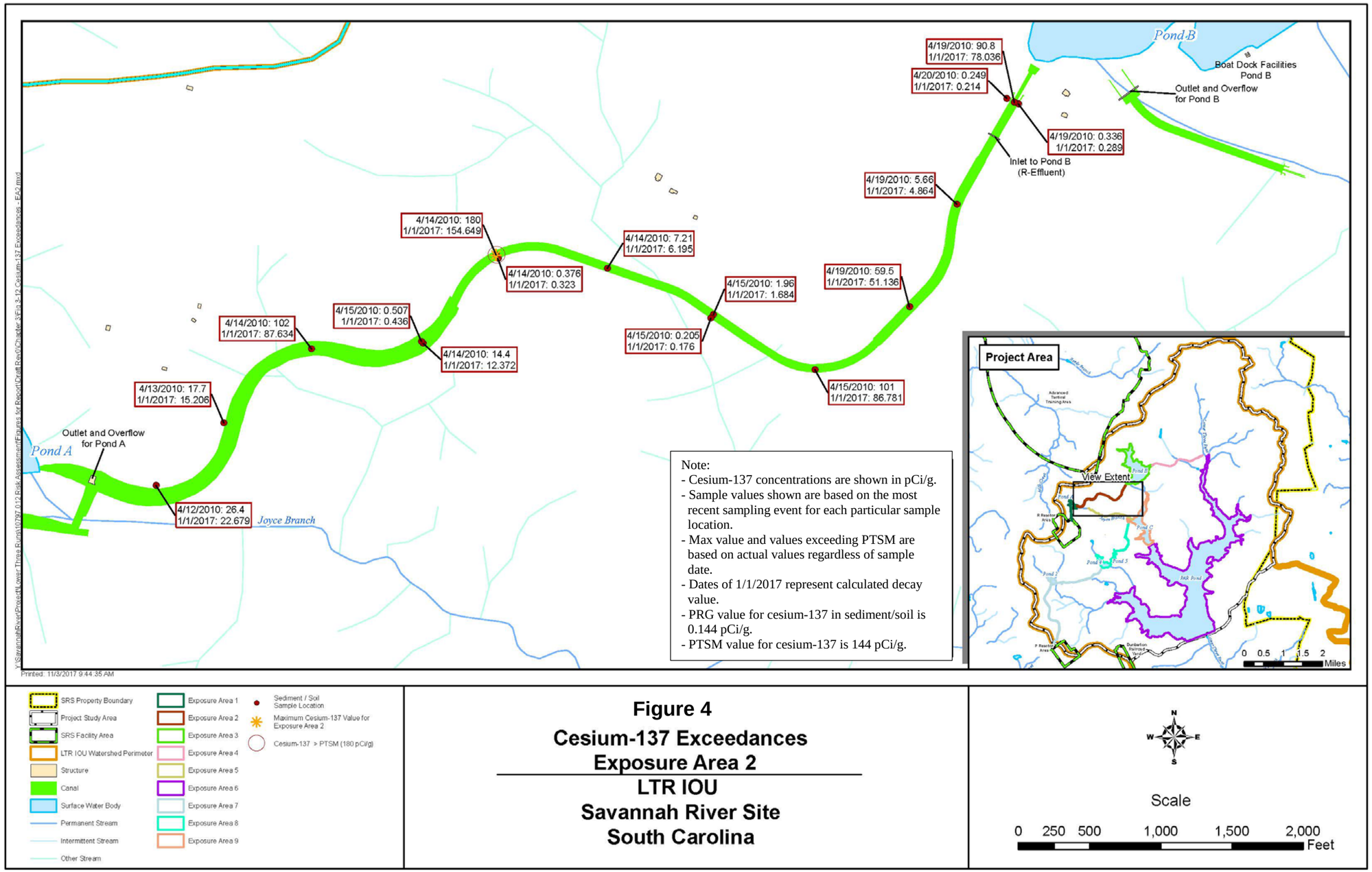


Figure 4. Cesium-137 Exceedances Exposure Area 2

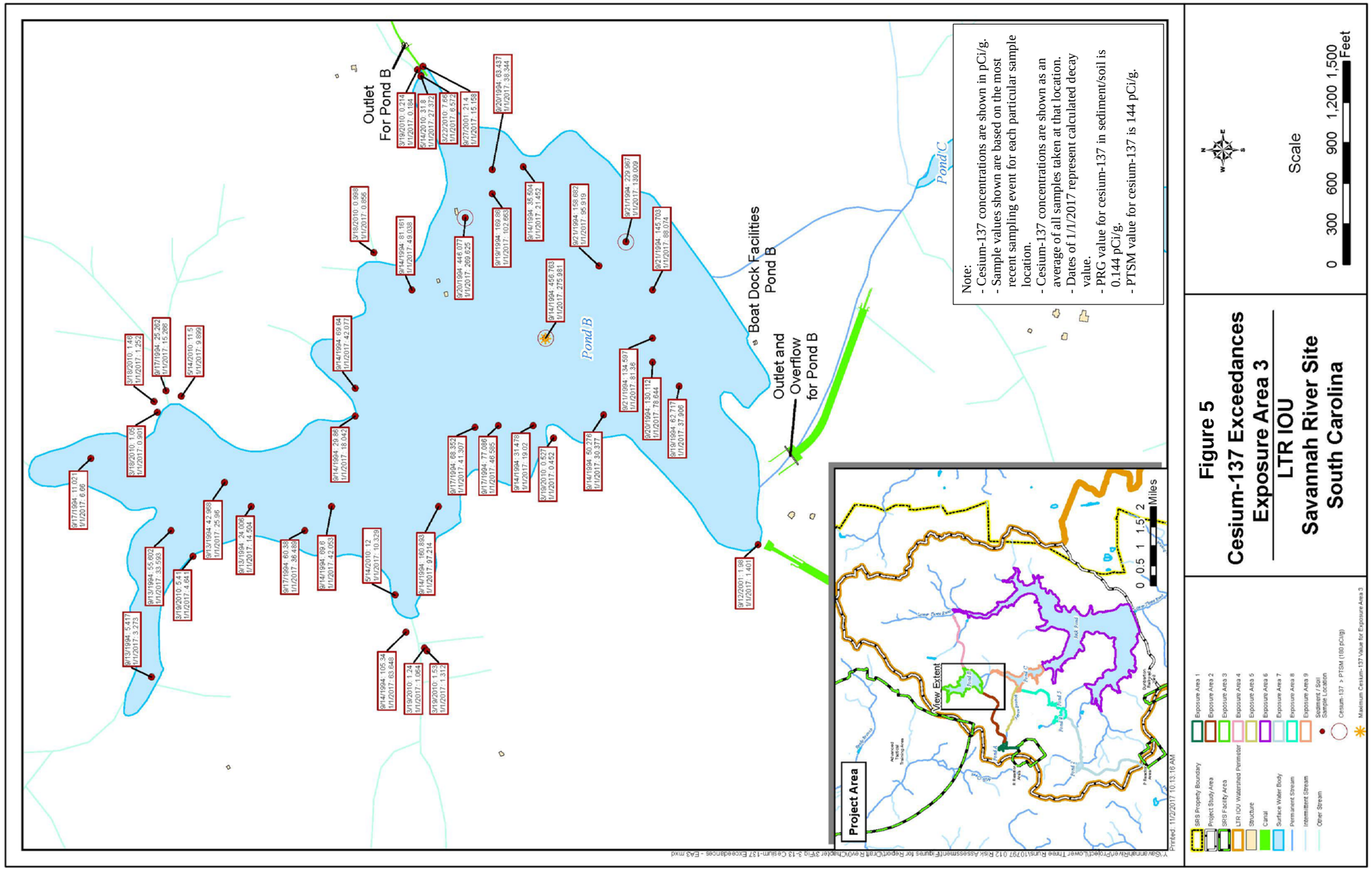


Figure 5. Cesium-137 Exceedances Exposure Area 3

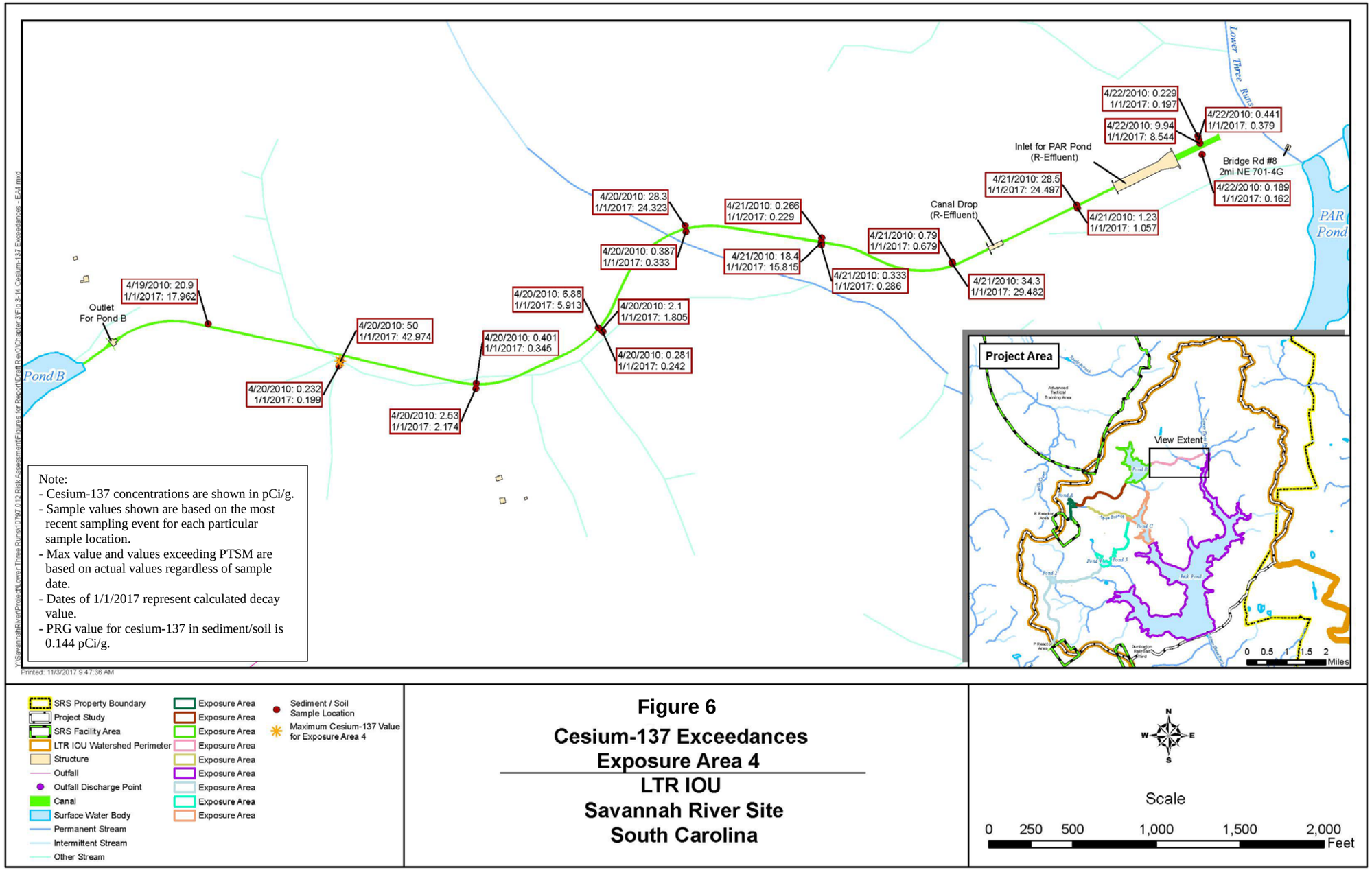


Figure 6. Cesium-137 Exceedances Exposure Area 4

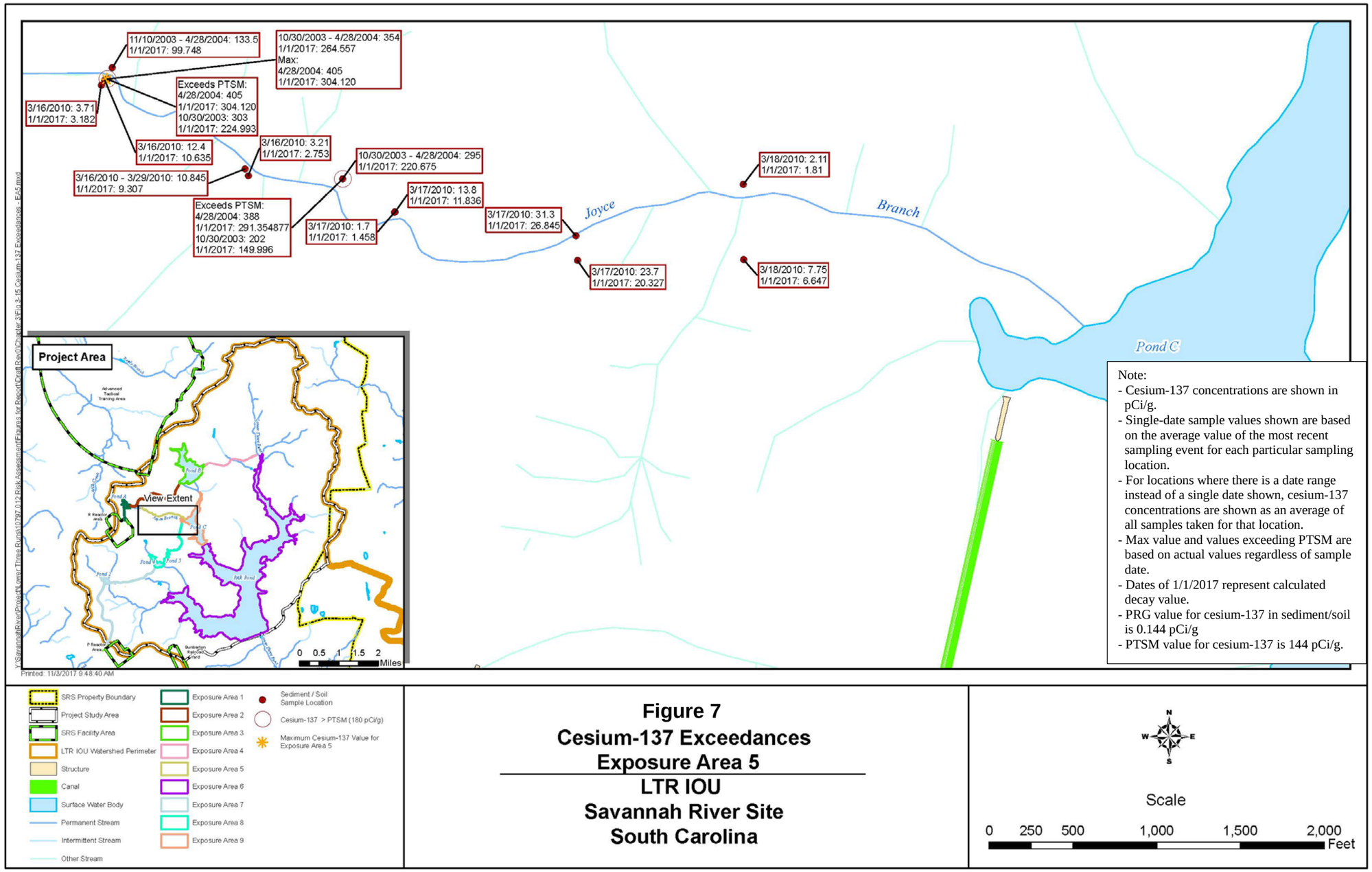


Figure 7. Cesium-137 Exceedances Exposure Area 5

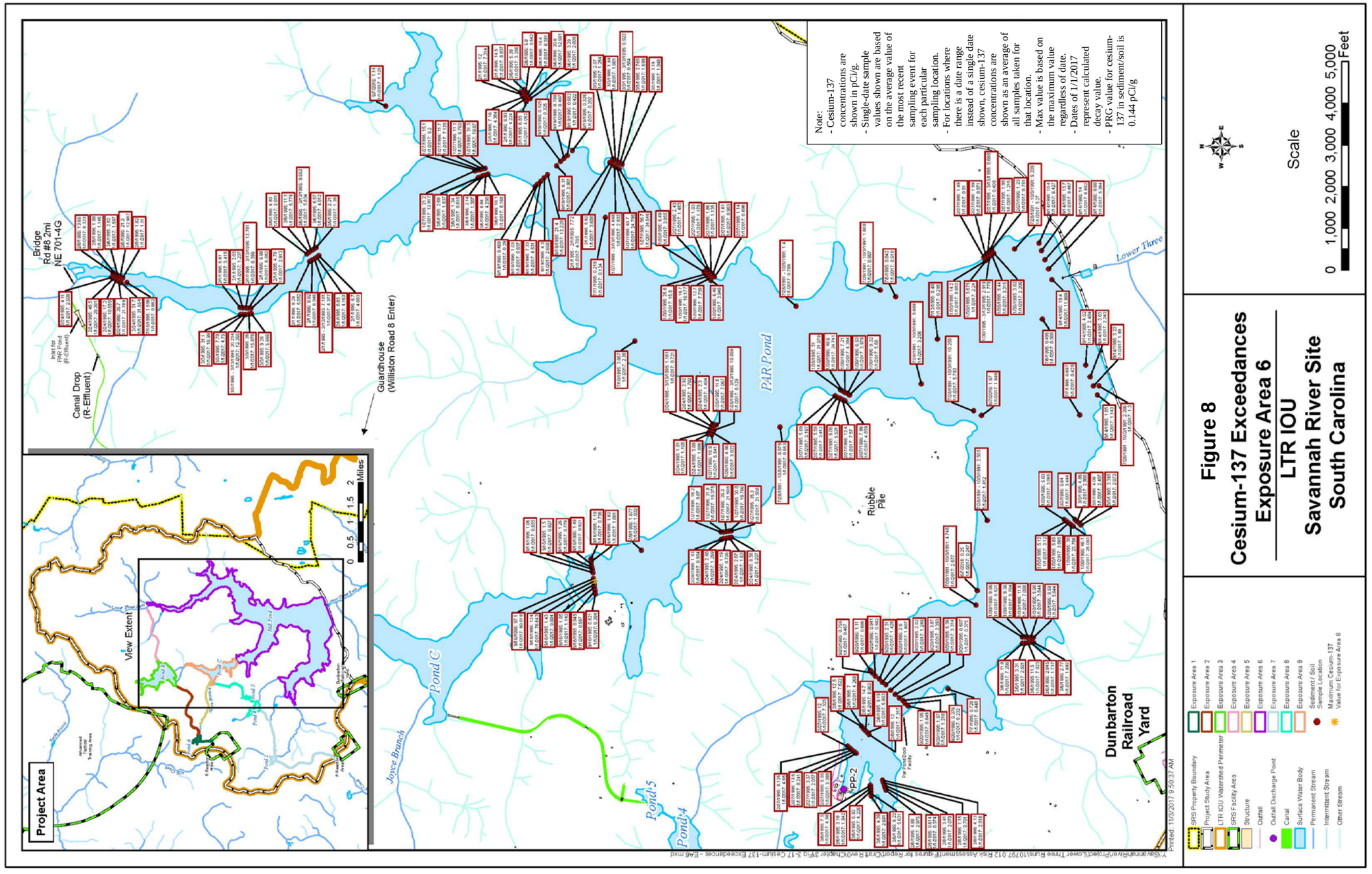


Figure 8. Cesium-137 Exceedances Exposure Area 6

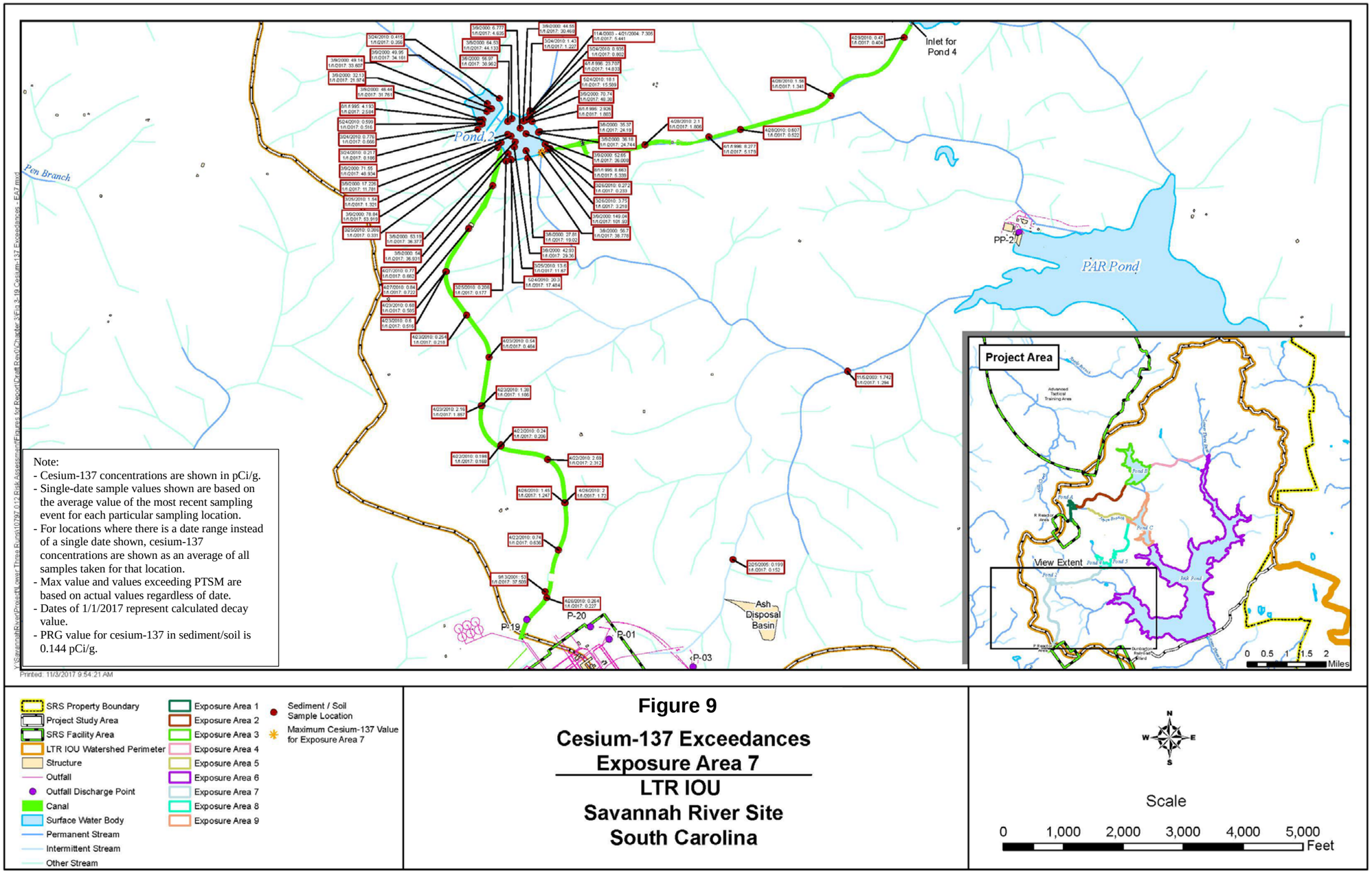


Figure 9. Cesium-137 Exceedances Exposure Area 7

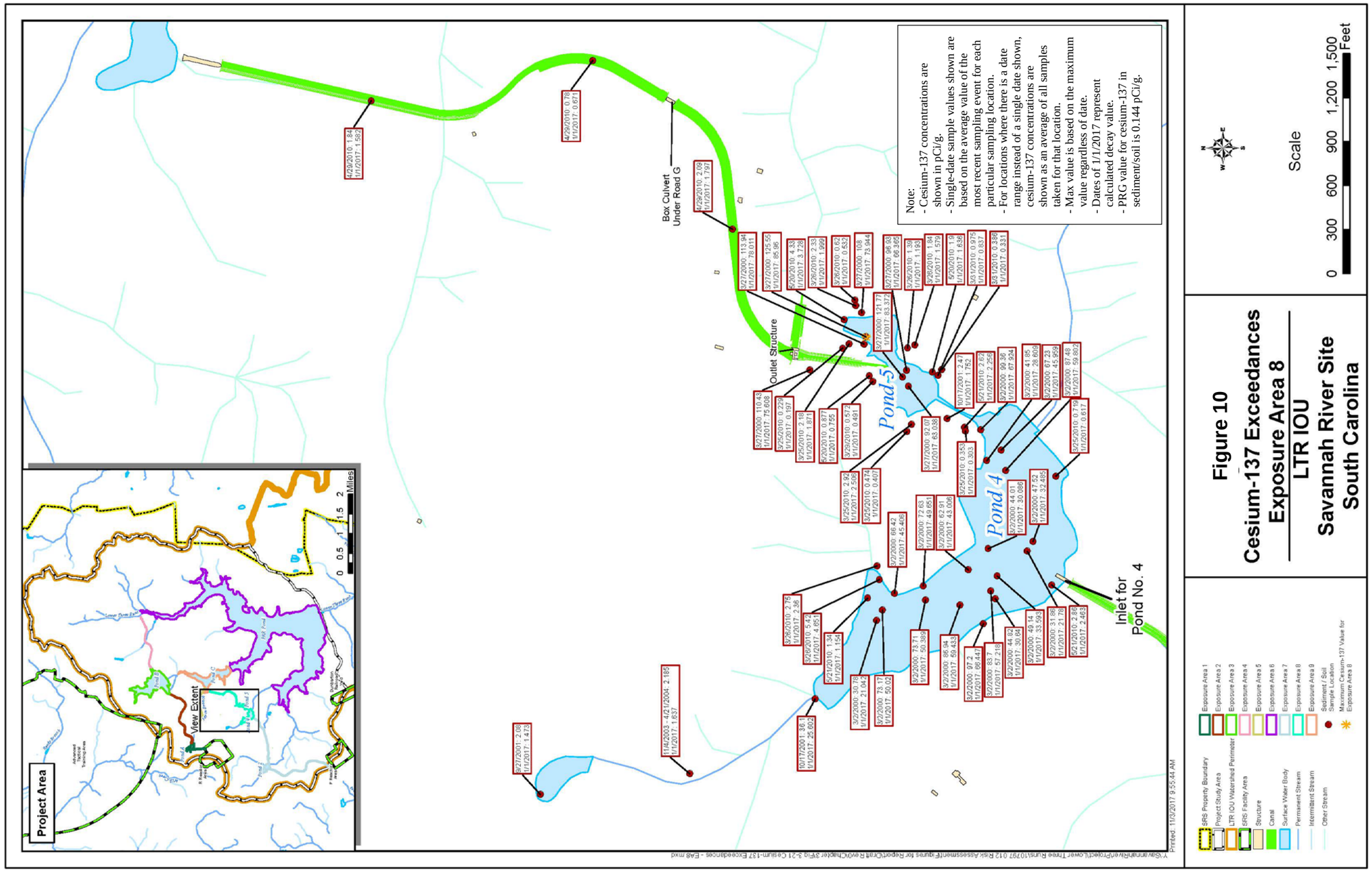


Figure 10. Cesium-137 Exceedances Exposure Area 8

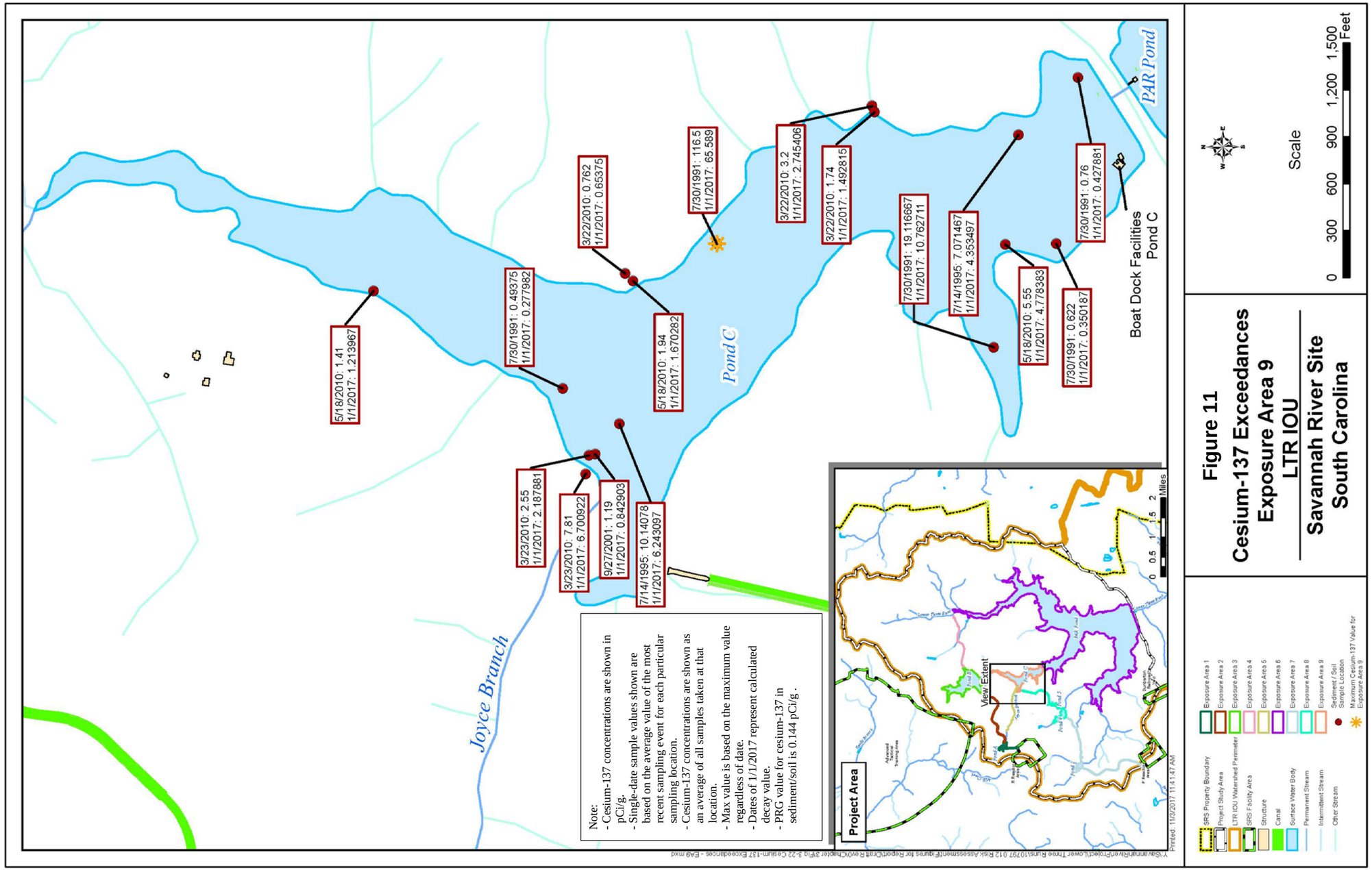


Figure 11. Cesium-137 Exceedances Exposure Area 9

Table 1. Summary of Disposition of LTR IOU Source Waste Sites

Area	Unit ID	Unit Name	Unit Status	Response Selected/ Implemented
G	39	Gunsite 218 Rubble Pile, 631-23G	ROD (No Action) issued November 3, 2010	Yes
G	110	PAR Pond (Including The Pre-Cooler Ponds and Canals), 685-G	Part of the LTR IOU	No
G	111	PAR Pond Sludge Land Application Site, 761-5G	No Action Approved	Yes
G	152	Second PAR Pond Site, 761-8G	NFA Approved	Yes
G	163	Gunsite 012 Rubble Pile, NBN	Combined with ECODS G-3, Rubble Pile across from Gunsite 012. ROD for LUCs, LUCIP approved by SCDHEC 8/2011 & USEPA 9/2011.	Yes
G	172	Miscellaneous Rubble Pile at Dunbarton, NBN	NFA Approved	Yes
G	173	Miscellaneous Trash at Snapp, NBN	NFA Approved	Yes
G	177	Pond B Dam Rubble Pile, NBN	NFA Approved	Yes
G	321	Patterson Mill Road Rubble Pile, NBN	NFA Approved	Yes
G	337	Rubble Pile across from Gunsite 012, NBN	Combined with ECODS G-3, Gunsite 012 Rubble Pile. ROD for LUCs, LUCIP approved by SCDHEC Aug 2011 & USEPA Sept 2011.	Yes
G	455	Stadia Lights With Poles, NBN	NFA Approved	Yes
G	505	Lower Three Runs Integrator Operable Unit	Phase III of the IOU program.	No
G	544	ECODS G-3 (Adjacent To Gunsite 012, NBN)	Combined with Rubble Pile Across from Gunsite 012, Gunsite 012 Rubble Pile. ROD for LUCs, LUCIP approved by SCDHEC Aug 2011 and USEPA Sept 2011.	Yes
G		General Area Outfalls GS-012	Deactivated as part of Gunsite 12 Project	Yes
G		Par Pond Outfalls PP-1, PP-2	Outfalls retired, no longer discharging.	Yes
G	546	Dunbarton Railroad Yard, NBN; Outfalls Y-003 and Y-004	FFA Field Start/Site Evaluation Report date of December 2035. Part of the Steel Creek IOU.	No
P	17	P-Area Acid/Caustic Basin, 904-78G	NFA Approved	Yes
P	107	P-Area Bingham Pump Outage Pit, 643-4G	NFA Approved	Yes
P	143	P-Area Groundwater	RCRA/CERCLA unit, March 2020 FFA ROD Issuance. Part of -the Steel Creek IOU	No
P	221	Sandblast Area CMP-003	NFA Approved	Yes
P	259	Combined Spills from 183-2P, NBN	NFA Approved	Yes
P	287	P-Area Acid/Caustic Basin (Groundwater)	NFA Approved	Yes

Table 1. Summary of Disposition of LTR IOU Source Waste Sites *(Continued)*

Area	Unit ID	Unit Name	Unit Status	Response Selected/ Implemented
P	314	Potential Release from P-Area Disassembly Basin, 105-P	ROD issued 7/22/2011 for PAOU with LUCs, remediation complete.	Yes
P	316	Potential Release From The P-Area Reactor Cooling Water System, 186/190-P	ROD issued 7/22/2011 for PAOU with LUCs, remediation complete.	Yes
P	428	Spill on 05/24/82 of 10 gal of 31.5% Acid from 183-P, NBN	NFA Approved	Yes
P	439	Spill on 06/26/86 of 1 gal of Tritiated Waste Oil from 110-P, NBN	NFA Approved	Yes
P	477	P Reactor Area: P-Area Reactor Area Cask Car Railroad Tracks As Abandoned, NBN	ROD issued 7/22/2011 for PAOU with LUCs, remediation complete.	Yes
P	498	Sandblast Area CMP-002, NBN	NFA Approved	Yes
P	557	P-Area Process Sewer Lines As Abandoned, NBN	ROD issued 7/22/2011 for PAOU with LUCs, remediation complete.	Yes
P	587	P-Area Operable Unit	ROD issued 7/22/2011 for PAOU with LUCs, remediation complete except PSA-3A and PSA-3B ongoing soil vapor extraction. April 2013 PER report documented completion of soil vapor extraction.	Yes
P		P-Area Production Area Incidents and Unplanned Releases	All potential sources address under PAOU Completion.	Yes
P		P-Area Outfalls P-1, P-2, P-3, P-4, P-19, P-14	Outfalls retired. All potential sources address under PAOU completion.	Yes
R	42	108-4R Overflow Basin, 108-4R	NFA Approved	Yes
R	112	R-Area Acid/Caustic Basin, 904-77G	NFA Approved	Yes
R	113	R-Area Bingham Pump Outage Pits, 643-10G	Final Remediation Report Approved, LUCs	Yes
R	114	R-Area Bingham Pump Outage Pits, 643-8G	Final Remediation Report Approved, LUCs	Yes
R	115	R-Area Bingham Pump Outage Pits, 643-9G	Final Remediation Report Approved, LUCs	Yes
R	116	R-Area Burning/Rubble Pits, 131-1R	ROD Submittal 5/1/04 /RA Complete/ LUCs	Yes
R	117	R-Area Burning/Rubble Pits, 131-R	ROD Submittal 5/1/04 /RA Complete/ Continue Post-Closure Maintenance Activities	Yes
R	118	R-Area Rubble Pile, 631-25G	ROD Submittal 5/1/04 /RA Complete/ Continue Post-Closure Maintenance Activities	Yes
R	119	R-Area Reactor Seepage Basins, 904-103G	Biennial Groundwater Mixing Zone Reporting/ RA Complete	Yes

Table 1. Summary of Disposition of LTR IOU Source Waste Sites *(Continued)*

Area	Unit ID	Unit Name	Unit Status	Response Selected/ Implemented
R	120	R-Area Reactor Seepage Basins, 904-104G	Biennial Groundwater Mixing Zone Reporting/ RA Complete	Yes
R	121	R-Area Reactor Seepage Basins, 904-57G	Biennial Groundwater Mixing Zone Reporting/ RA Complete	Yes
R	122	R-Area Reactor Seepage Basins, 904-58G	Biennial Groundwater Mixing Zone Reporting/ RA Complete	Yes
R	123	R-Area Reactor Seepage Basins, 904-59G	Biennial Groundwater Mixing Zone Reporting/ RA Complete	Yes
R	124	R-Area Reactor Seepage Basins, 904-60G	Biennial Groundwater Mixing Zone Reporting/ RA Complete	Yes
R	178	R-Area Asbestos Pit, 080-01R	NFA Approved	Yes
R	179	R-Area Rubble Pit, 131-2R	NFA Approved	Yes
R	230	Potential Release from the R-Area Concrete Lake, 183-1R/186R	NFA Approved	Yes
R	231	Area on the North Side of Building 105-R, NBN	ROD issued for RAOU 4/10/2011 with LUCs; remediation complete	Yes
R	233	Laydown Area North of 105-R, NBN	ROD issued for RAOU 4/10/2011 with LUCs; remediation complete	Yes
R	271	Cooling Water Effluent Sump, 107-R	ROD issued for RAOU 4/10/2011 with LUCs; remediation complete	Yes
R	288	R-Area Groundwater, NBN	ROD issued for RAOU 4/10/2011 with LUCs; MNA for Groundwater	Yes
R	312	Old R-Area Discharge Canal, NBN	Part of the LTR IOU. Also known as Joyce Branch.	No
R	324	Potential Release of $NaOH/H_2$ SO_4 from 183-2R, NBN	ROD issued for RAOU 4/10/2011 with LUCs; remediation complete	Yes
R	328	Purge Water Storage Basin, 109-R	D&D Unit #1924 – part of RAOU – no longer a source.	Yes
R	329	R-Area Ash Basin, 188-0R	ROD issued for RAOU 4/10/2011 with LUCs; remediation complete	Yes
R	330	Potential Release from R-Area Disassembly Basin, 105-R	ROD issued for RAOU 4/10/2011 with LUCs; remediation complete	Yes
R	478	R Reactor Area: R-Area Reactor Area Cask Car Railroad Tracks As Abandoned, NBN	ROD issued for RAOU 4/10/2011 with LUCs; remediation complete	Yes
R	513	Release from the Decontamination of R-Area Reactor Disassembly Basin, NBN	ROD issued for RAOU 4/10/2011 with LUCs; remediation complete	Yes
R	517	Combined Spills North of Building 105-R, NBN	ROD issued for RAOU 4/10/2011 with LUCs; remediation complete	Yes
R	540	ECODS R-1A, -1B, -1C (East of R Reactor)	CMIR/RACR documenting completion of RA for closure approved by USEPA (4/13/2011) and SCDHEC (3/30/2011)	Yes
R	550	R-Area Unknown Pit #1 (Runk-1), NBN	ROD Approved	Yes
R	551	R-Area Unknown Pit #2 (Runk-2), NBN	ROD Approved	Yes

Table 1. Summary of Disposition of LTR IOU Source Waste Sites *(Continued/End)*

Area	Unit ID	Unit Name	Unit Status	Response Selected/ Implemented
R	552	R-Area Unknown Pit #3 (Runk-3), NBN	ROD Approved	Yes
R	556	R-Area Process Sewer Lines As Abandoned, NBN	ROD issued for RAOU 4/10/2011 with LUCs; remediation complete	Yes
R	588	R-Area Operable Unit	ROD issued for RAOU 4/10/2011 with LUCs; remediation complete	Yes
R		R-Area Incidents and Unplanned Releases	All potential sources addressed under RAOU completion.	Yes
R		R-Area Outfalls R-1 through R-4	Outfalls retired. R-4 has no discharge (basin is capped).	Yes