

A Presentation to the
SRS Citizens Advisory Board
Facilities Disposition and Site Remediation Committee

Integrator Operable Unit (IOU) Program Overview

Presenter:

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Department of Energy, Savannah River Operations Office

December 15, 2010

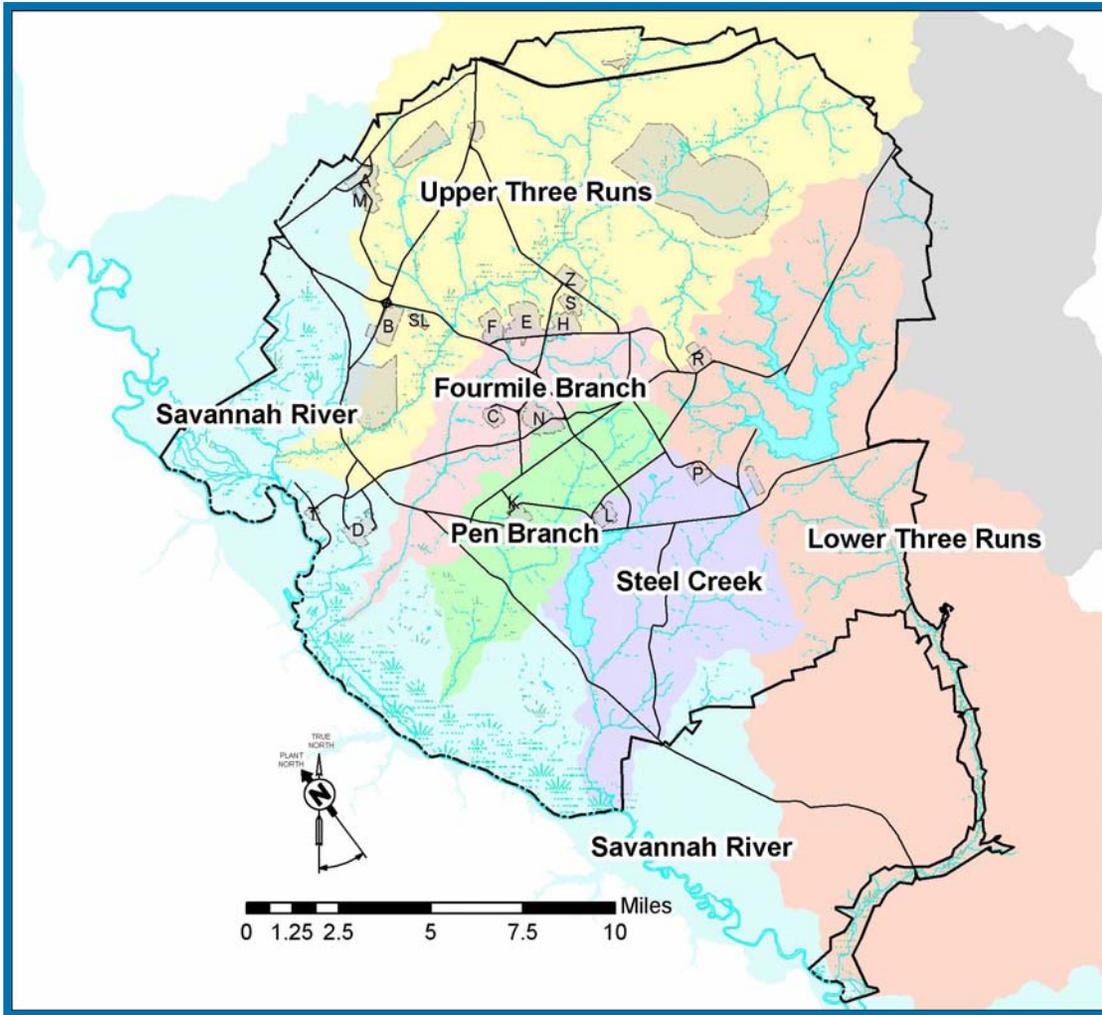
Acronyms

CAB	Citizens Advisory Board
Cs-137	Radioisotope of Cesium - atomic mass 137
DOE	Department of Energy
EPA	Environmental Protection Agency
FFA	Federal Facility Agreement
FY	Fiscal Year
GA DNR	Georgia Department of Natural Resources
IOU	Integrator Operable Unit
LaBr	Lanthanum Bromide field detector
LTR	Lower Three Runs
NEPA	National Environmental Policy Act
NRT	Natural Resource Trustee(s)
OU	Operable Unit
PB	Pen Branch
PR	Periodic Report
RI / FS	Remedial Investigation / Feasibility Study
ROD	Record of Decision
SC	Steel Creek
SCDHEC	South Carolina Department of Health and Environmental Control
SRS	Savannah River Site

Purpose

- **Provide brief description of the IOU Program**
- **Provide status of the IOU Program**
- **Present an update on:**
 - **Steel Creek IOU**
 - **Pen Branch IOU**
 - **Lower Three Runs IOU**
- **Path Forward for the IOU Program**

IOU Program

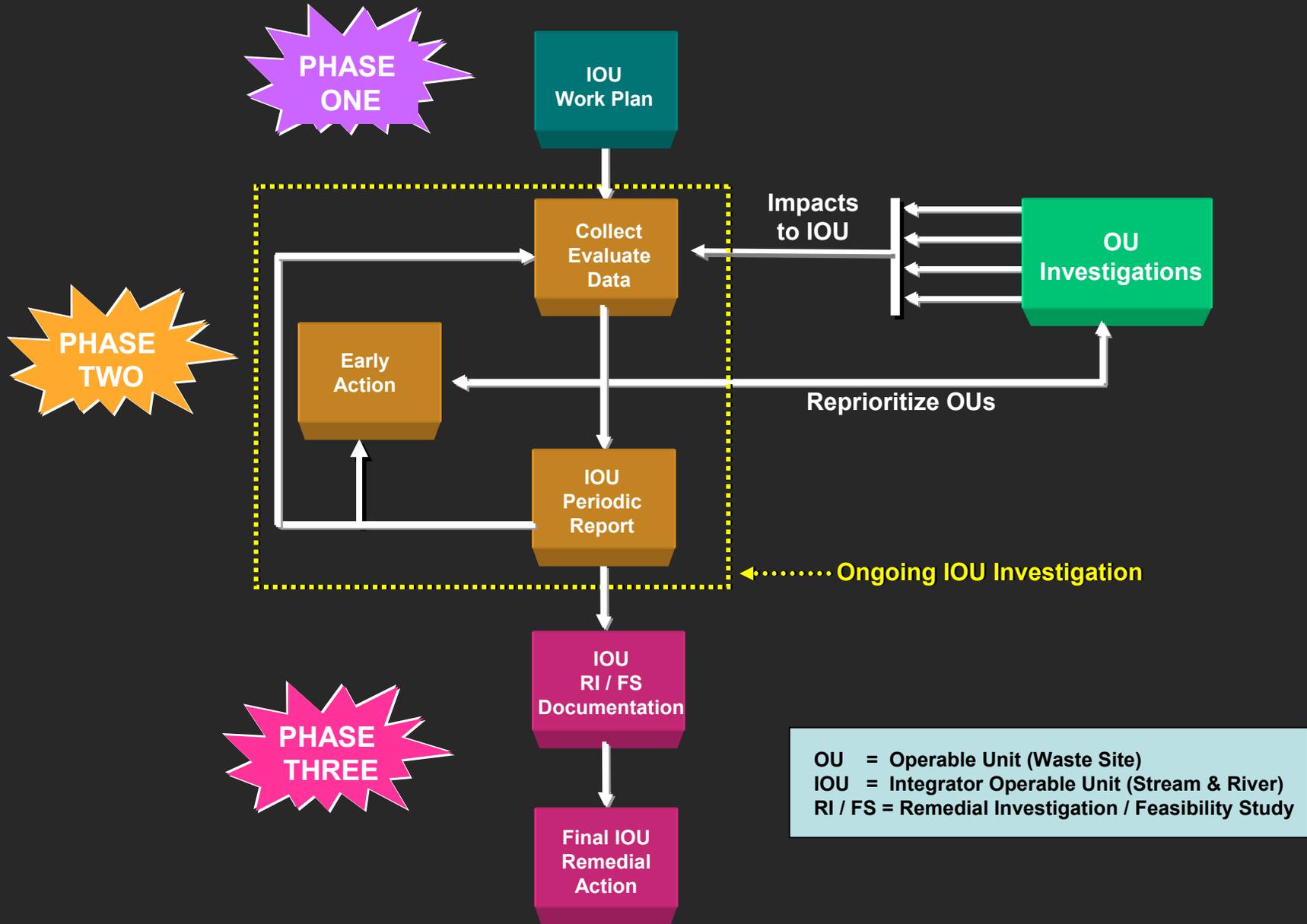


- SRS streams added to the FFA in FY 1997
- IOU includes surface water, sediment, soil / sediment, and biota (plants and animals) associated with stream and its floodplain—*not the entire watershed*

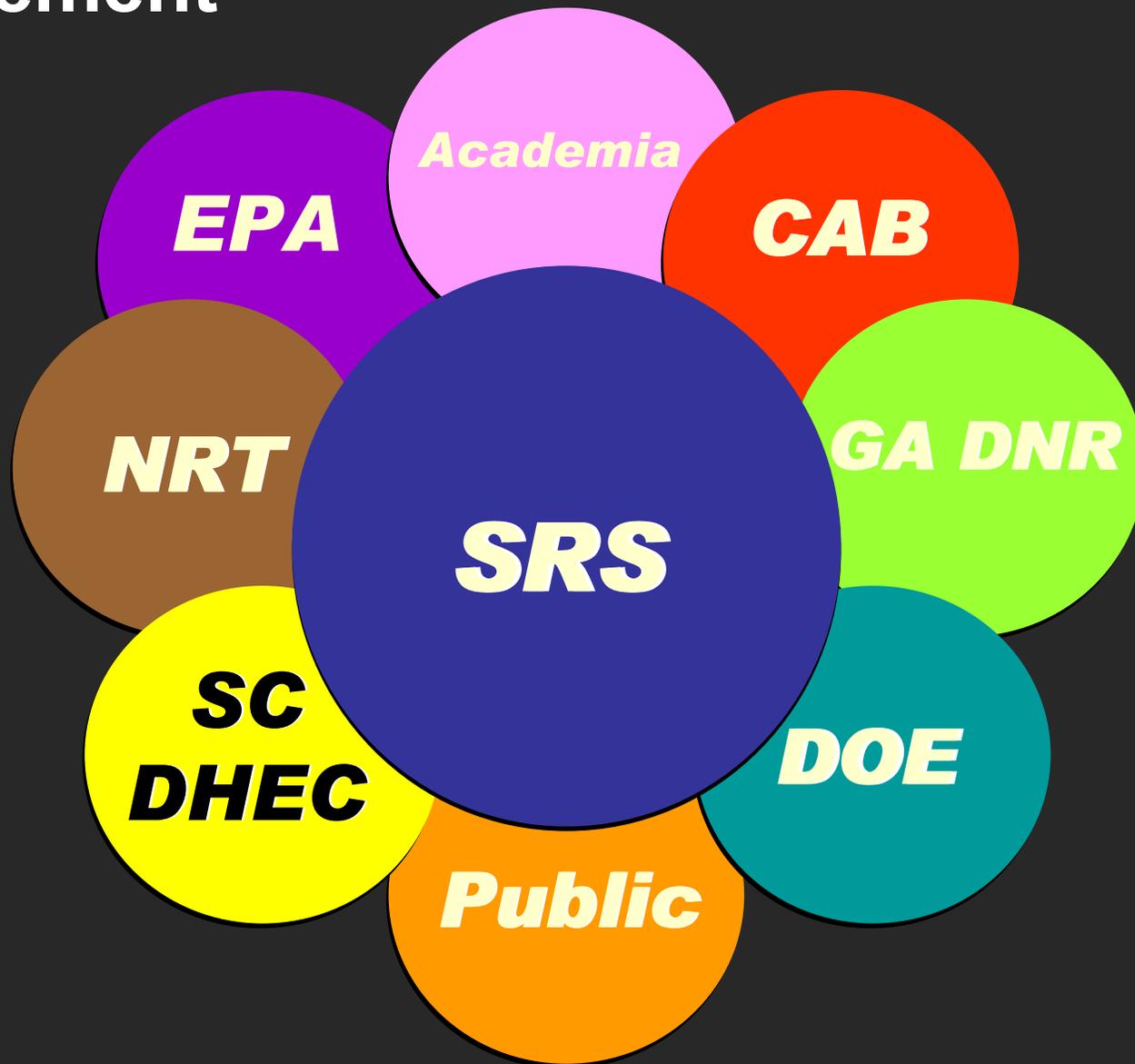
Integrator Operable Unit Purpose

- **Determine and monitor contaminants in SRS streams**
- **Assess the health (i.e., habitat quality) of the stream systems**
- **Evaluate human health risk in stream corridors**
- **Determine whether early actions are needed**
- **Make final IOU cleanup decisions after operations have ceased and as OU cleanup decisions are completed**

IOU Program



Involvement



IOU Schedule

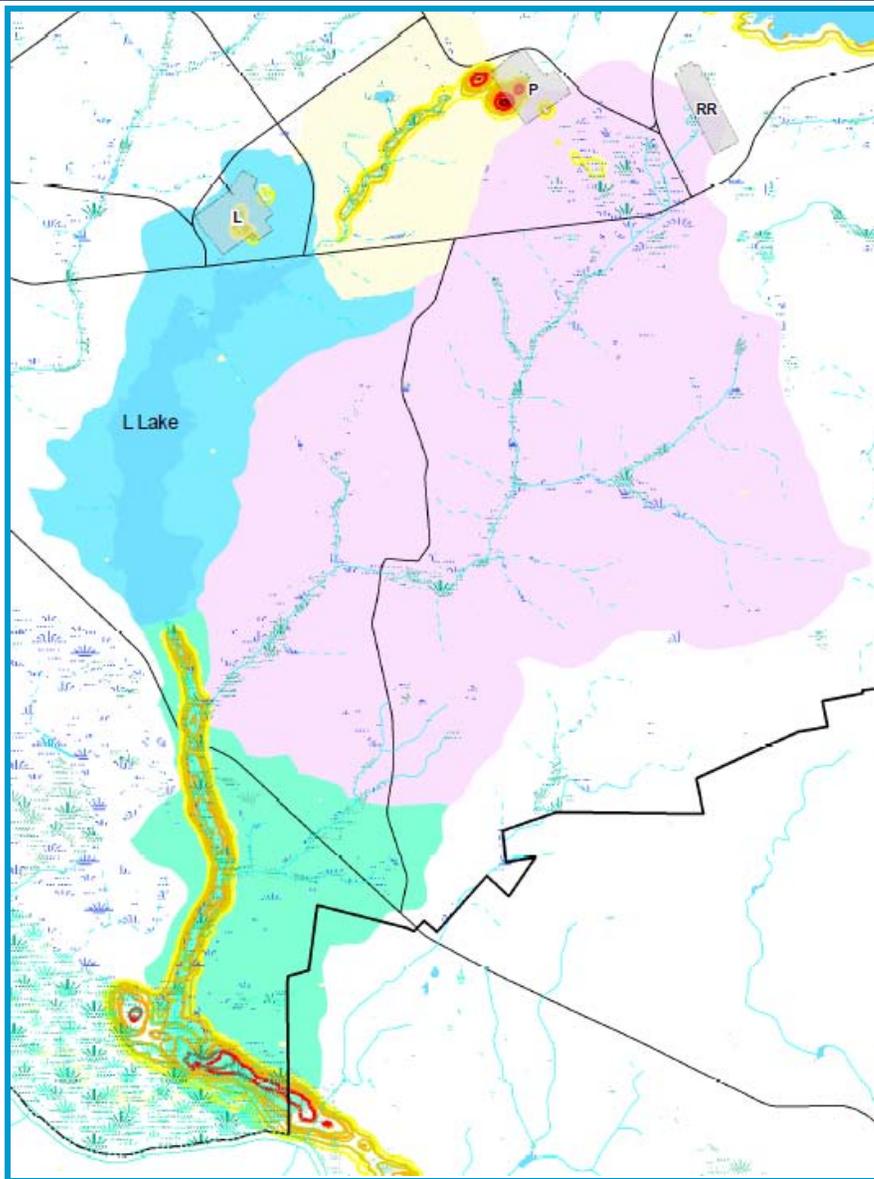
IOU	Phase II Began	Phase III	ROD
Steel Creek	May 2000	May 2024	March 2030
Savannah River / Floodplain Swamp	May 2001	December 2024	March 2028
Fourmile Branch	August 2001	November 2024	June 2030
Lower Three Runs	November 2001	March 2013	March 2020
Pen Branch	June 2002	January 2024	June 2030
Upper Three Runs	January 2003	June 2022	March 2028

IOU Documents

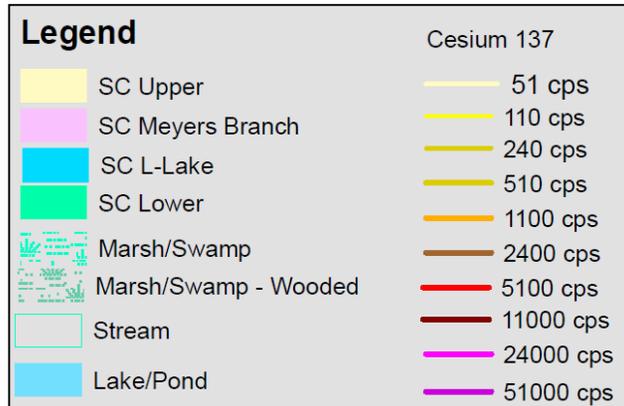
IOU	Remedial Investigation Work Plan Approved	Periodic Report No. 1 Approved	Periodic Report No. 2 Approved	Periodic Report No. 3 Approved	Periodic Report No. 4 Approved
Upper Three Runs	May 2003	April 2006	April 2008	Rev. 0 Due August 2011	Rev. 0 Due August 2016
Fourmile Branch	March 2002	July 2003	January 2006	November 2008	Rev. 0 Due October 2011
Pen Branch IOU	November 2002	November 2004	November 2007	Rev. 0 Submitted June 2010	Rev. 0 Due July 2015
Steel Creek	September 2000	December 2002	September 2004	May 2007	May 2010
Lower Three Runs	March 2002	February 2005	April 2007	December 2009	Rev. 0 Due January 2012
Savannah River / Floodplain Swamp	May 2003	October 2006	Rev. 0 Submitted August 2009	Rev. 0 Due May 2012	Rev. 0 Due February 2017

Status

- **Steel Creek PR 4 (approved May 2010)**
 - **No constituents were retained for early action consideration based on the human health or ecological evaluation**
 - **No additional early actions were identified**
 - **Ecological data need: Conduct trophic modeling to assess threats of metal contaminants (in sediment and surface water) to the river otter and belted kingfisher**

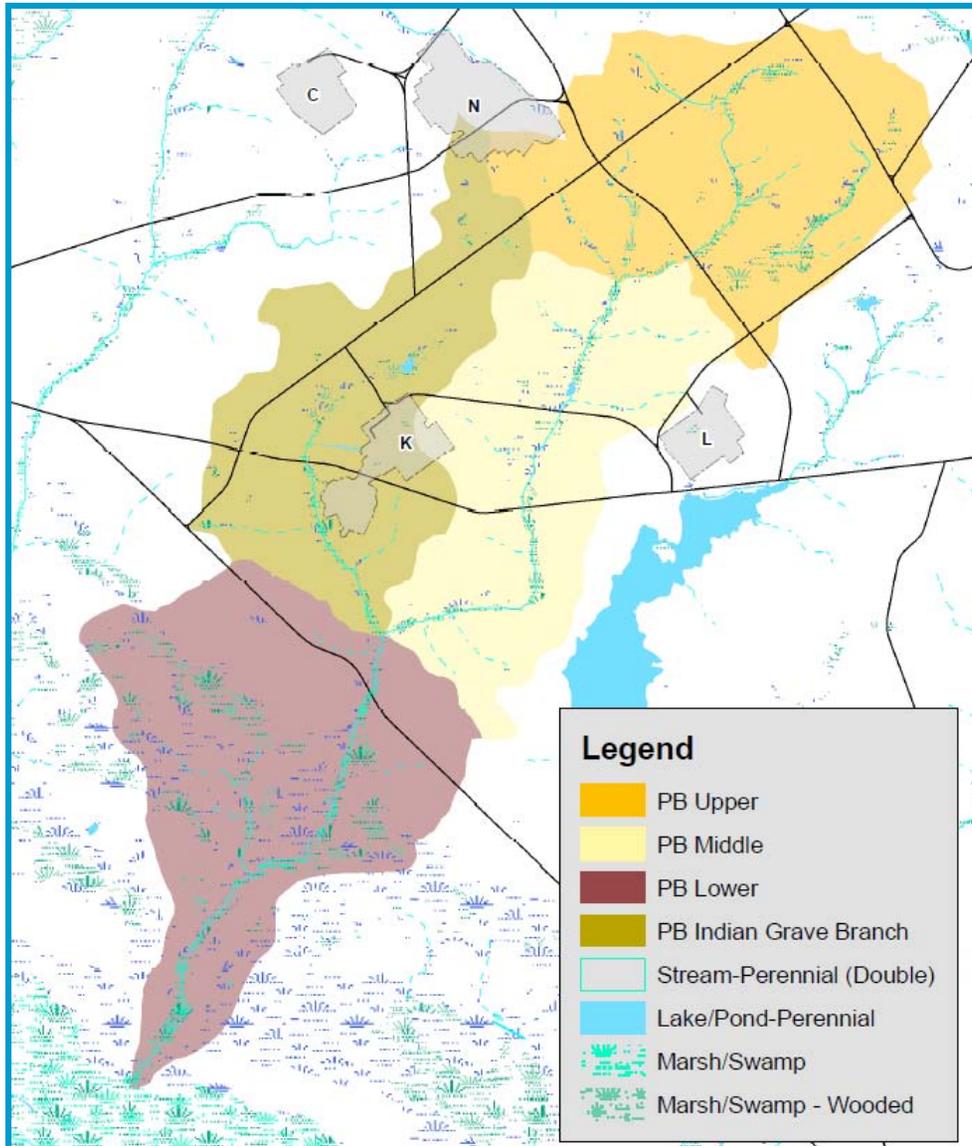


Steel Creek IOU Subunits



Status

- **Pen Branch PR 3 Rev. 0 June 2010**
 - **Most recent PR - Rev. 1 redline submitted (November 2010)**
 - **No constituents were retained for early action consideration based on the human health or ecological evaluation**
 - **Ecological data need: Collection of biological tissue samples to support trophic modeling (kingfisher / river otter)**



Pen Branch IOU Subunits

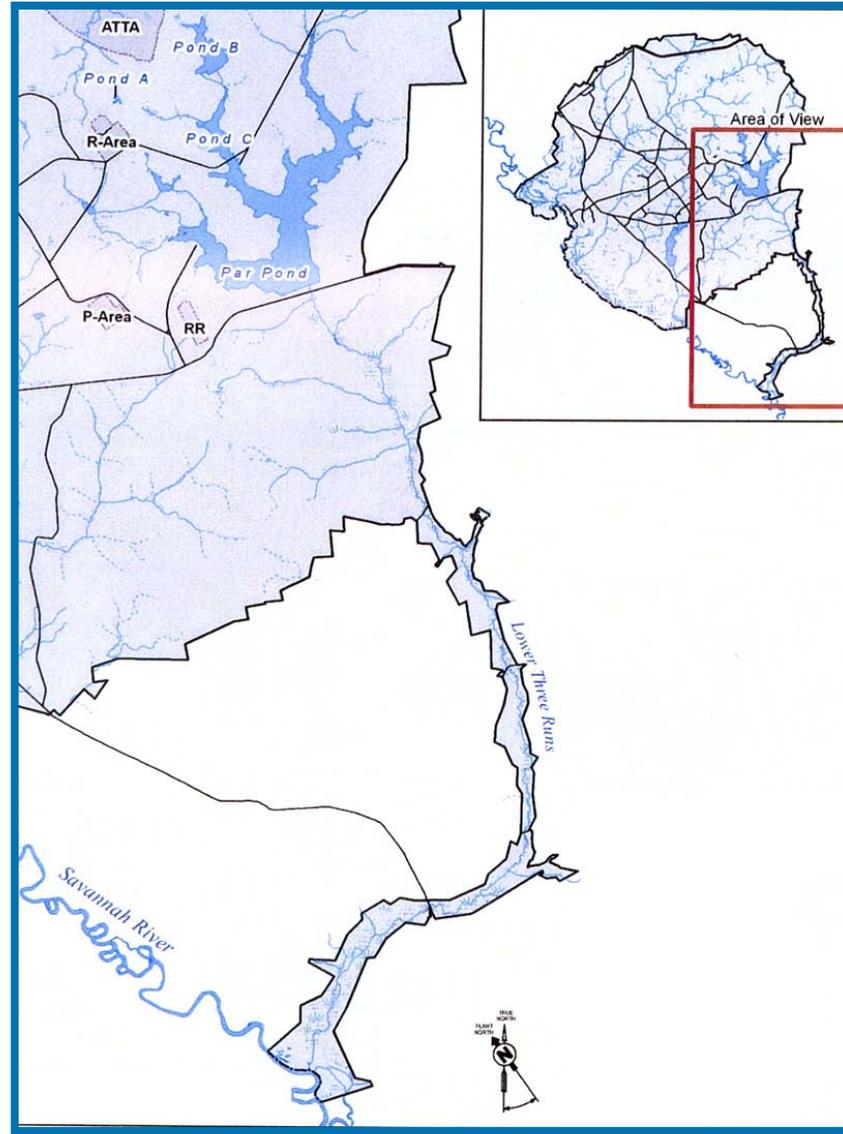
Status

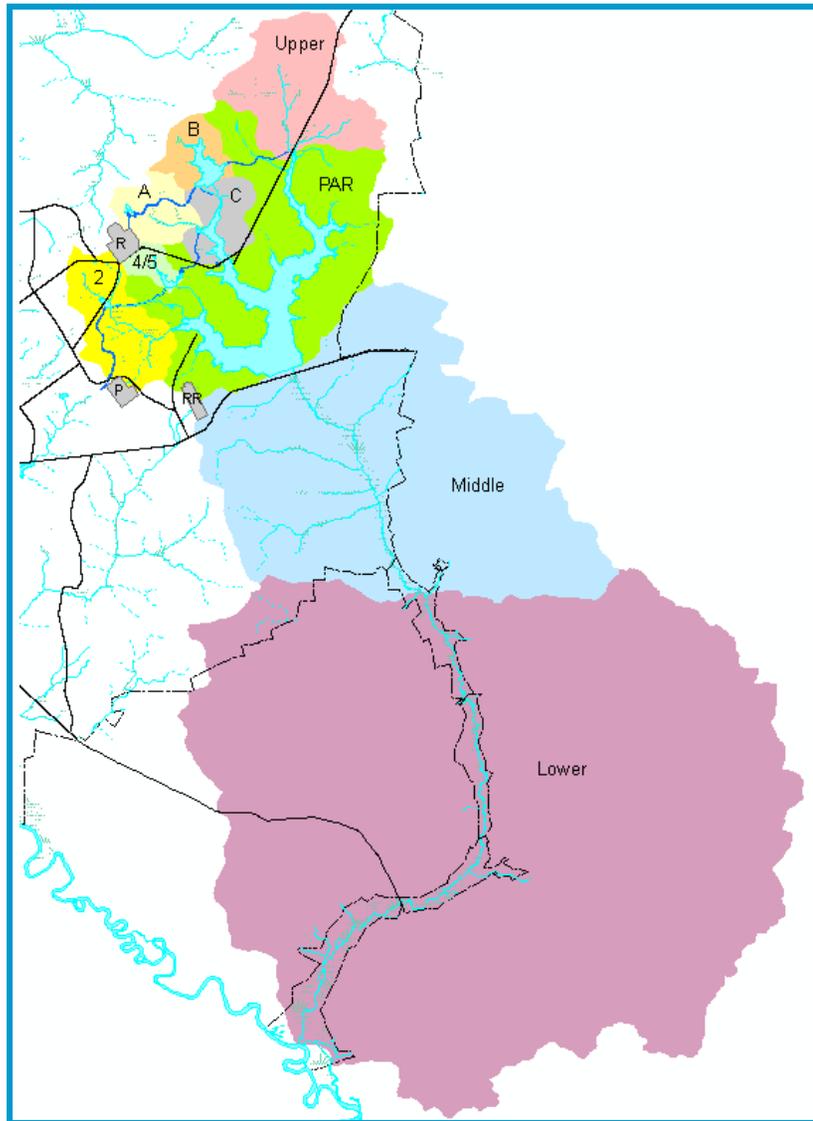
- **Lower Three Runs PR 3 (December 2009)**
 - **Human Health Evaluation**
 - **Subsistence fisherman: Cs-137 (*arsenic, thallium*) exceeds IOU risk benchmark (assuming daily consumption for 30 years)**
 - **Data Need: Additional background data (*arsenic, thallium*)**
 - **Ecological Evaluation Data Needs**
 - **Fish tissue data for pond systems**
 - **Filtered / unfiltered surface water to assess bioavailability**
 - **No additional early actions were identified**

Lower Three Runs

- **SRS initiated an extensive characterization effort**
 - Sediment, sediment / soil, surface water, biota
- **Recovery Act activities through 2011 included:**
 - Extensive characterization of LTR tail portion
 - Extensive characterization of R-Area and P-Area Discharge Canals and Pre-cooler Ponds
 - PAR Pond not included (already well characterized, very large)

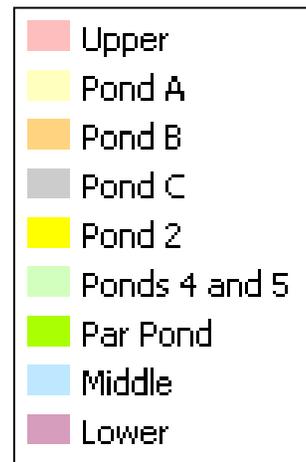
Location of Lower Three Runs





Lower Three Runs IOU Subunits

IOU Subunits

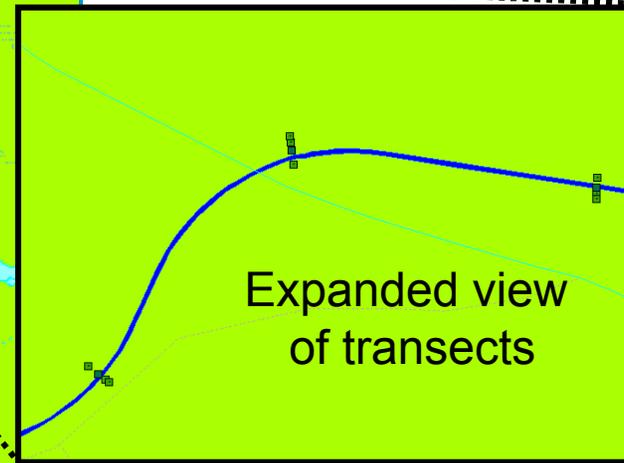
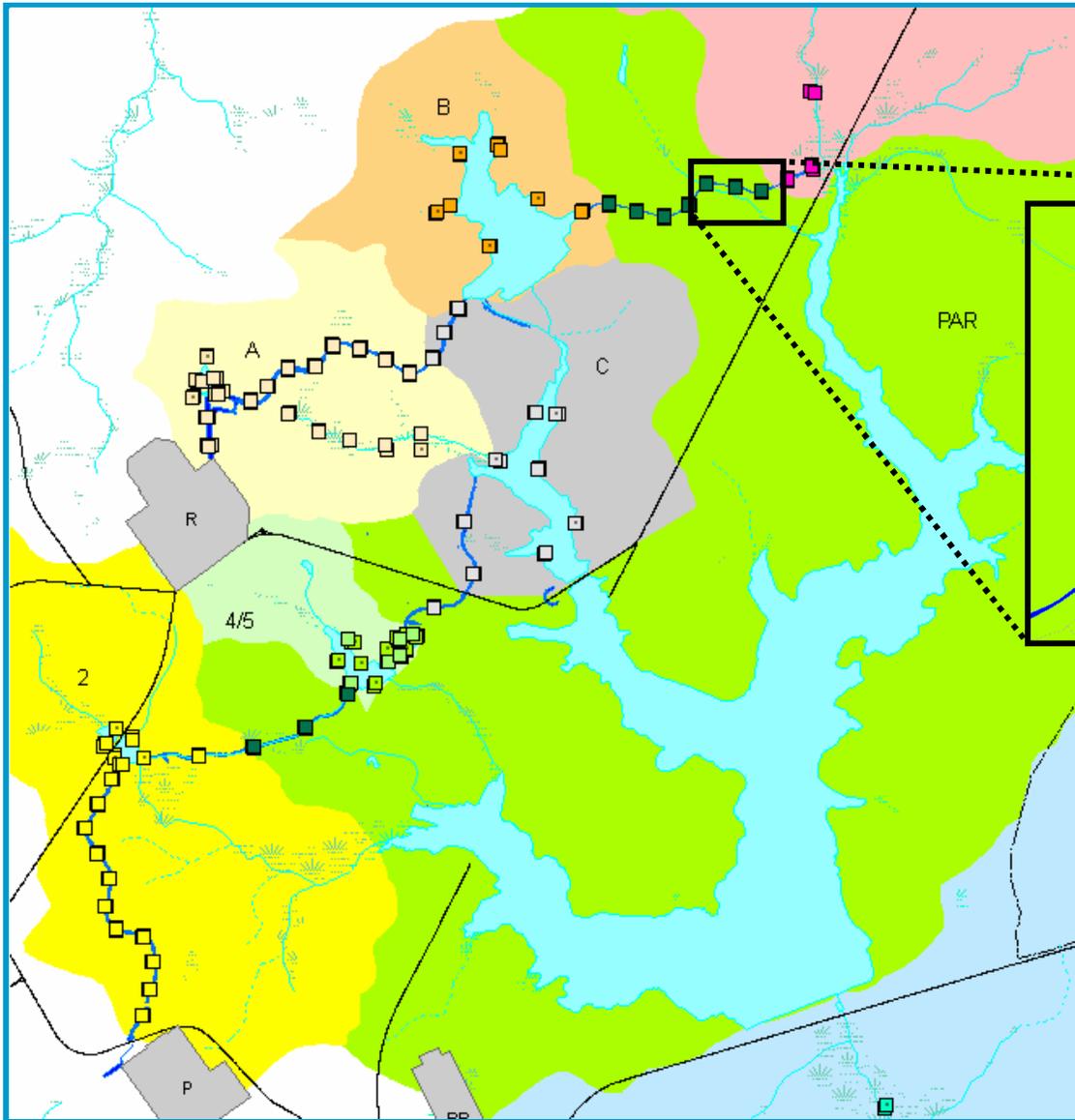


2009-2010 Expanded Characterization

Media	Data Records (# Samples/Analyses)	Date
Sediment	424 / 6274	2/8/10 - 6/28/10
Sediment / Soil LaBr	517 / 33,587 343 / 343	2/24/10 - 5/12/10
Surface Water	129 / 16,666	2/24/10 - 5/24/10
Fish	24 / 1000	7/27/09 - 6/27/10
Total Samples / Analyses	1437 / 57,870	7/27/09 – 6/28/10

Did not include PAR Pond: Under a NEPA (Interim Action) ROD Jan. 1995 to maintain water levels (limits exposure to sediments). LaBr = Lanthanum Bromide field detector

Sediment and Sediment / Soil Sampling Locations Pond and Canal System

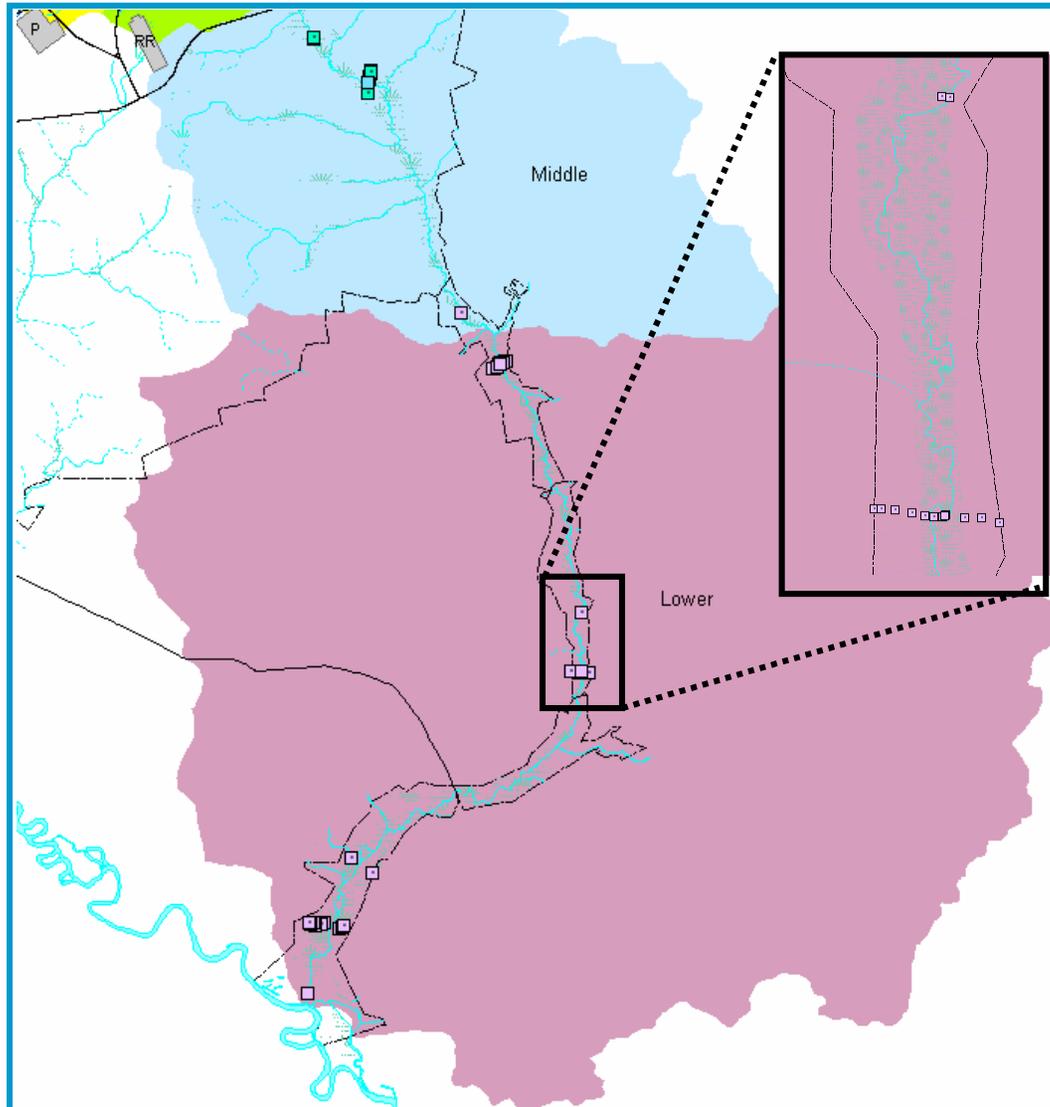


Sediment Data

■	LTR Upper
■	LTR Pond A
■	LTR Pond B
■	LTR Pond C
■	LTR Pond 2
■	LTR Ponds 4_5
■	LTR Par Pond
■	LTR Middle
■	LTR Lower

Sediment / Soils Data

■	LTR Upper
■	LTR Pond A
■	LTR Pond B
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■	LTR Par Pond
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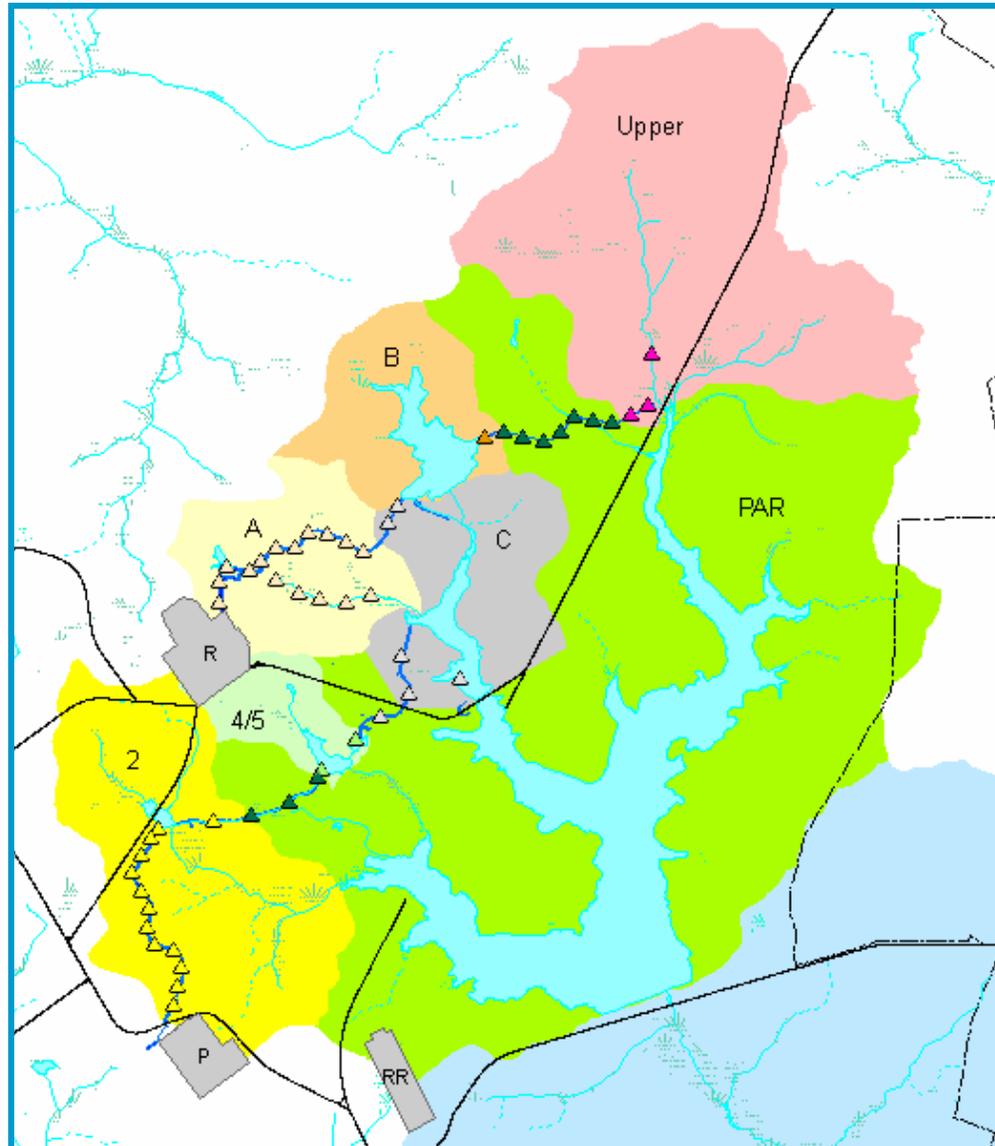
Sediment and Sediment / Soil Sampling Locations Middle and Lower Subunit

Sediment Data

- LTR Upper
- LTR Pond A
- LTR Pond B
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- LTR Pond 2
- LTR Ponds 4_5
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- LTR Middle
- LTR Lower

Sediment / Soils Data

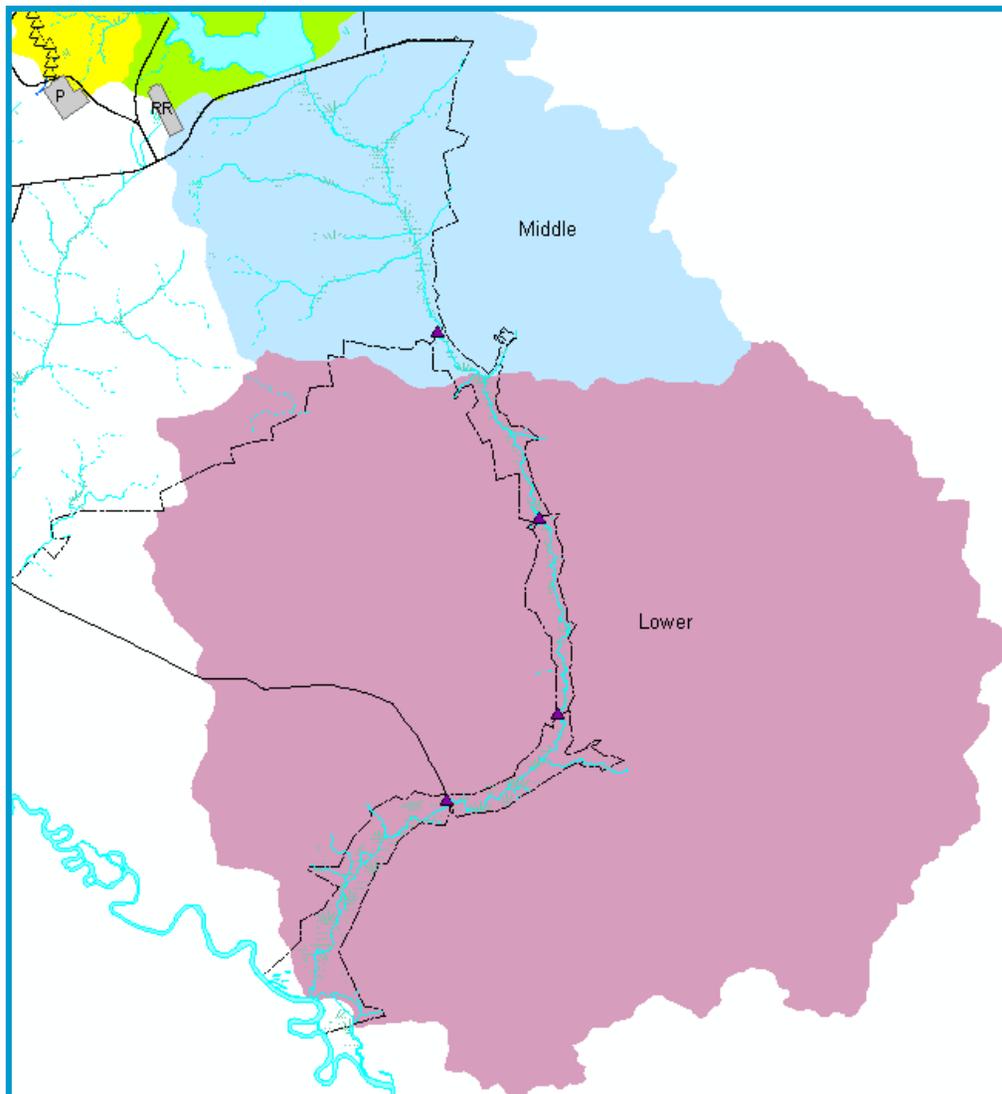
- LTR Upper
- LTR Pond A
- LTR Pond B
- LTR Pond C
- LTR Pond 2
- LTR Ponds 4_5
- LTR Par Pond
- LTR Middle
- LTR Lower



Surface Water Sampling Locations Pond and Canal System

Surface Water Data

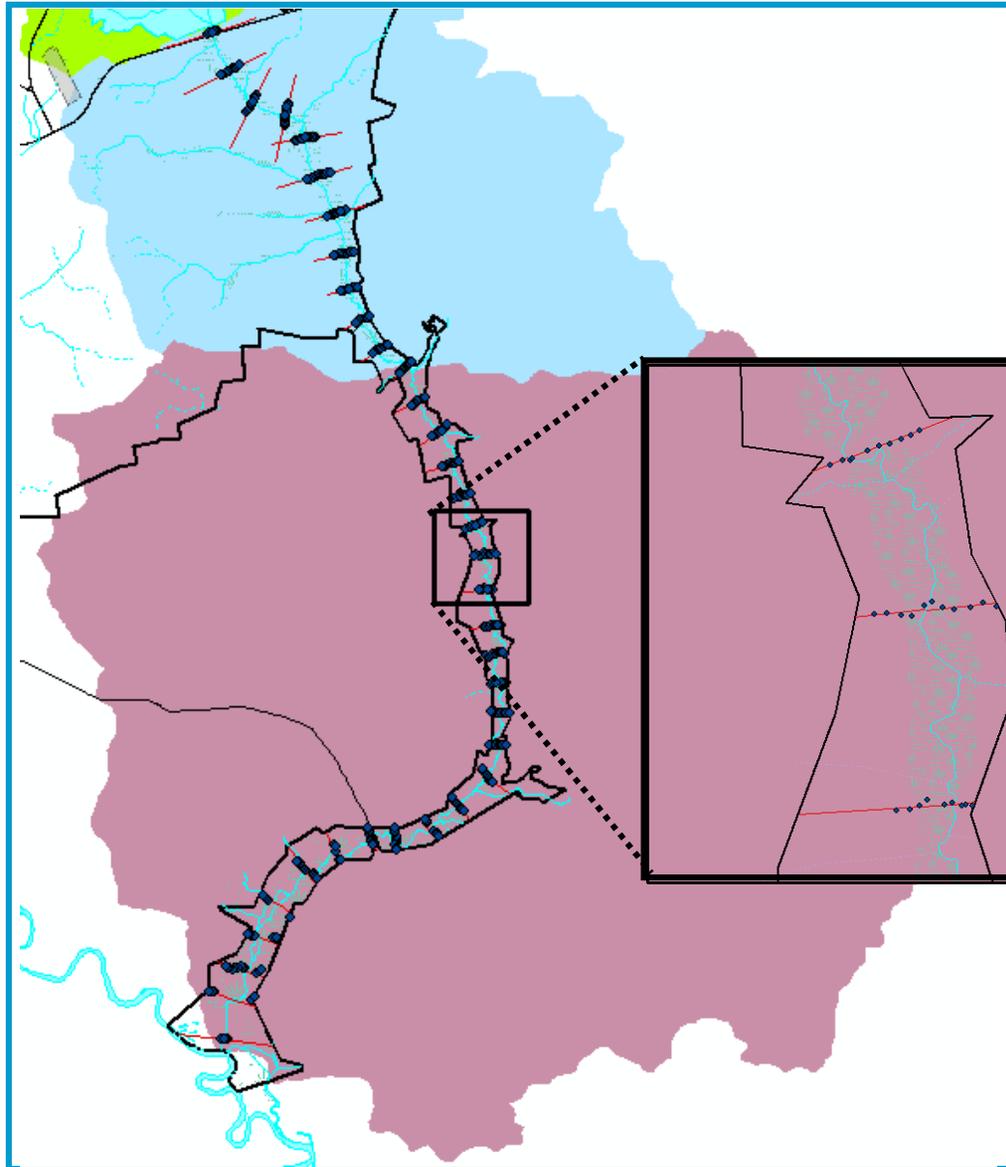
-  LTR Upper
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-  LTR Pond C
-  LTR Pond 2
-  LTR Ponds 4_5
-  LTR Par Pond
-  LTR Lower



Surface Water Sampling Locations Middle and Lower Subunits

Surface Water Data

- ▲ LTR Upper
- ▲ LTR Pond A
- ▲ LTR Pond B
- ▲ LTR Pond C
- ▲ LTR Pond 2
- ▲ LTR Ponds 4_5
- ▲ LTR Par Pond
- ▲ LTR Lower



LaBr Sampling Locations Middle and Lower Subunits

Transect Sample Lines

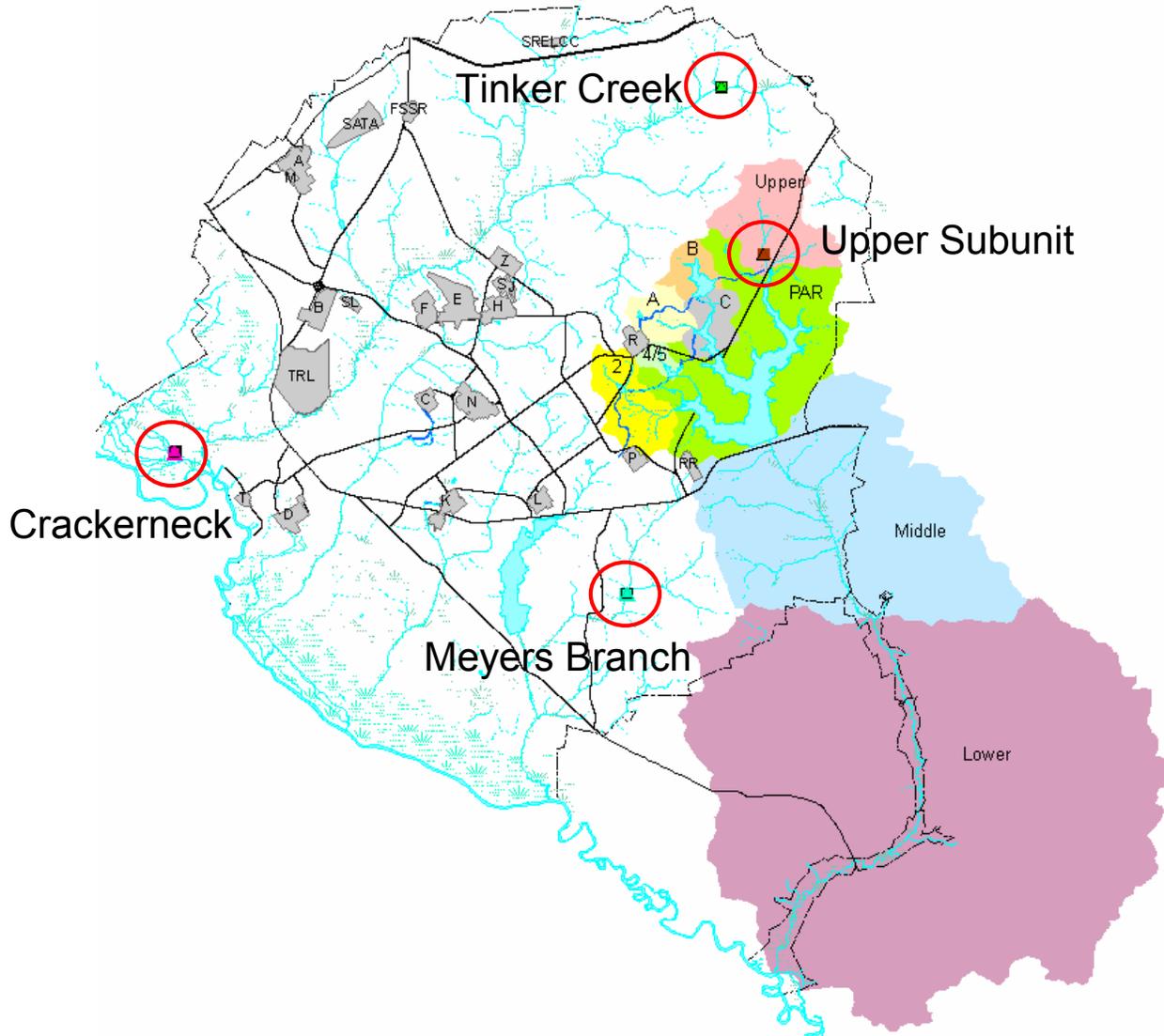


LaBr Monitoring Location



Fish Sampling Locations

- **Pond A**
- **Pond B**
- **Pond C**
- **Ponds 4 / 5**
- **PAR Pond**
- **Upper Subunit (upgradient of canal system)**
- **Background Locations: Tinker Creek, Meyers Branch, Crackerneck**



**Background
Sampling Locations
(sediment, surface
water, fish)**



Stream and floodplain environment



**Field monitoring
along tail
(gamma survey
using LaBr
detector)**



Swamp Habitats



Soil Augering and Compositing



U.S. DEPARTMENT OF
ENERGY

Savannah River Site



**Friendly
Field
Observer**

Status

- **Savannah River and Floodplain Swamp IOU**
 - **Game data is evaluated in Savannah River Forest Service Periodic Reports**
 - **Deer study assessing background levels of Cs-137 in SRS deer is complete (due December 2010)**
 - **Provides options for a background screening level to evaluate Cs-137 deer / game data**





Path Forward

- **Lower Three Runs IOU**
 - Incorporate LTR expanded characterization data (and other available data) into PR 4 (Rev. 0 due January 2012)
- **Upper Three Runs IOU**
 - PR 3 due August 2011 (Rev. 0)
- **Fourmile Branch IOU**
 - PR 3 due October 2011 (Rev. 0)