



ANNUAL INTEGRATOR OPERABLE UNIT (IOU) PROGRAM UPDATE

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FACILITIES DISPOSITION & SITE REMEDIATION COMMITTEE
August 13, 2013

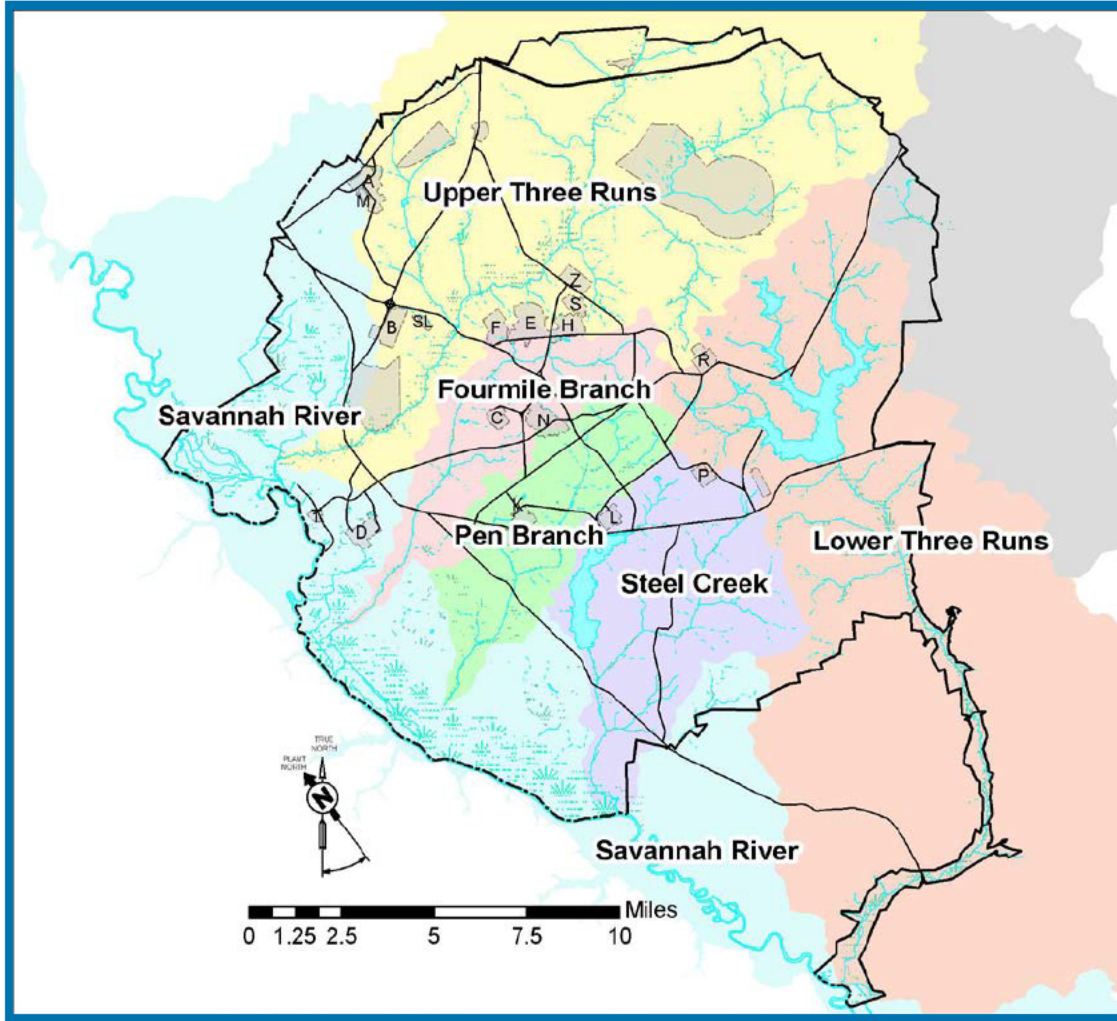


Purpose

Consistent with the Facilities Disposition and Site Remediation Committee's 2013 Work Plan:

- Provide brief description of the Integrator Operable Unit (IOU) Program
- Present an update on:
 - Steel Creek IOU - Wetland Area at Dunbarton Bay
- Outline Path Forward for the IOU Program





- SRS streams were added to the Federal Facility Agreement (FFA) in FY 1997
- IOU includes surface water, sediment, floodplain soils, and biota (plants and animals)

IOU Program's Purpose

- **Evaluate contaminants in SRS stream systems**
 - Evaluate human health risk in stream corridors
 - Assess the health of the stream system
 - Monitor contaminant levels based on IOU and other data
- **Determine whether early cleanup actions are needed**
- **Final IOU cleanup decision is made upon completing all Operable Unit actions within the watershed**



- IOU Phase II Receptors

- Human Health

- *On-site Worker*
- *Adolescent Trespasser*
- *Potential Resident*
- *Fisherman (subsistence level - meat consumption only from fish)*
- *Recreational Hunter*

- Ecological

- *Benchmark screening and biological data*

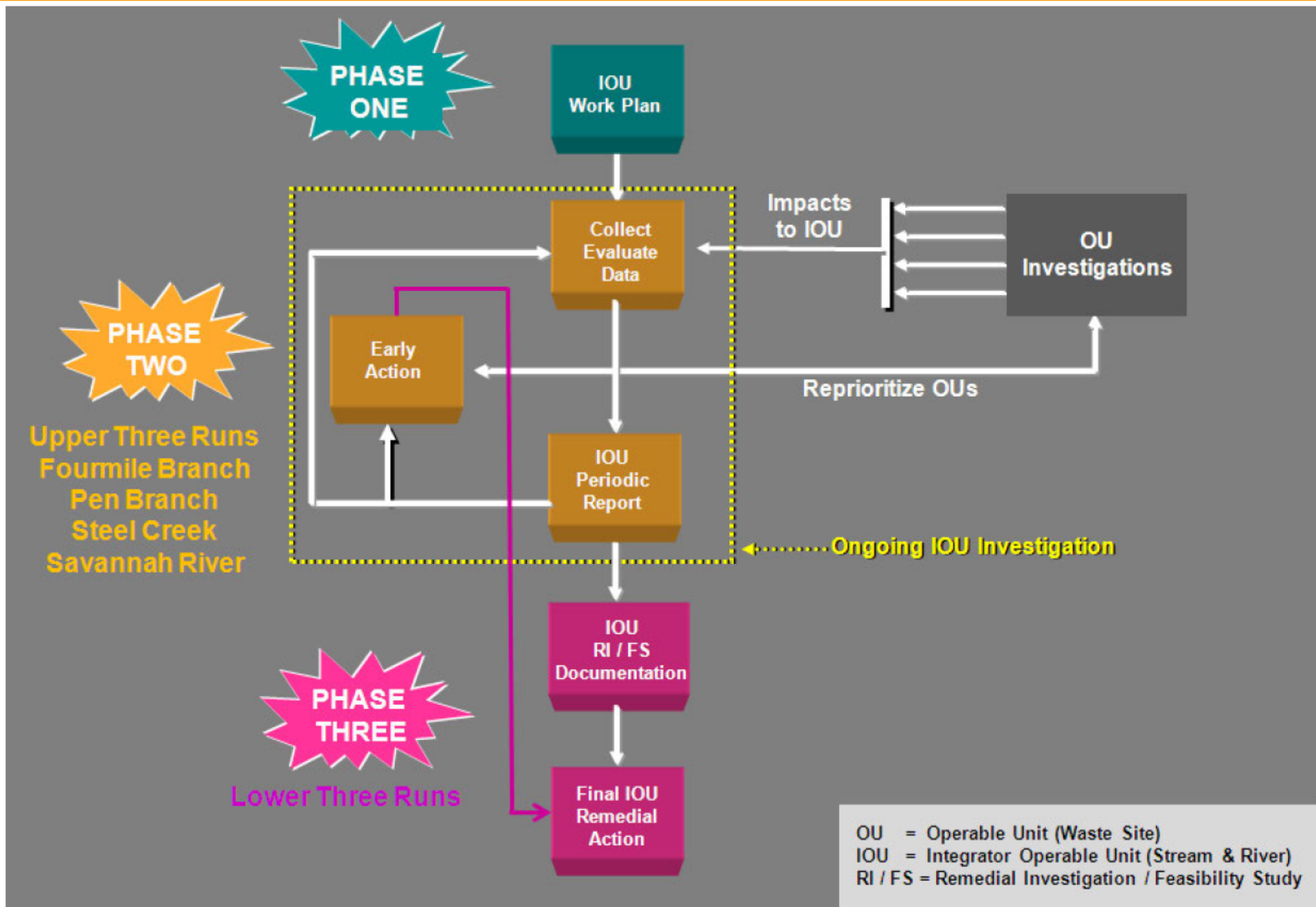
Human Health Screening Level

1 in 10,000 **cancer** risk level (10^{-4})

- or -

3 x greater than **non-cancer** threshold
(Hazard Quotient = 3)

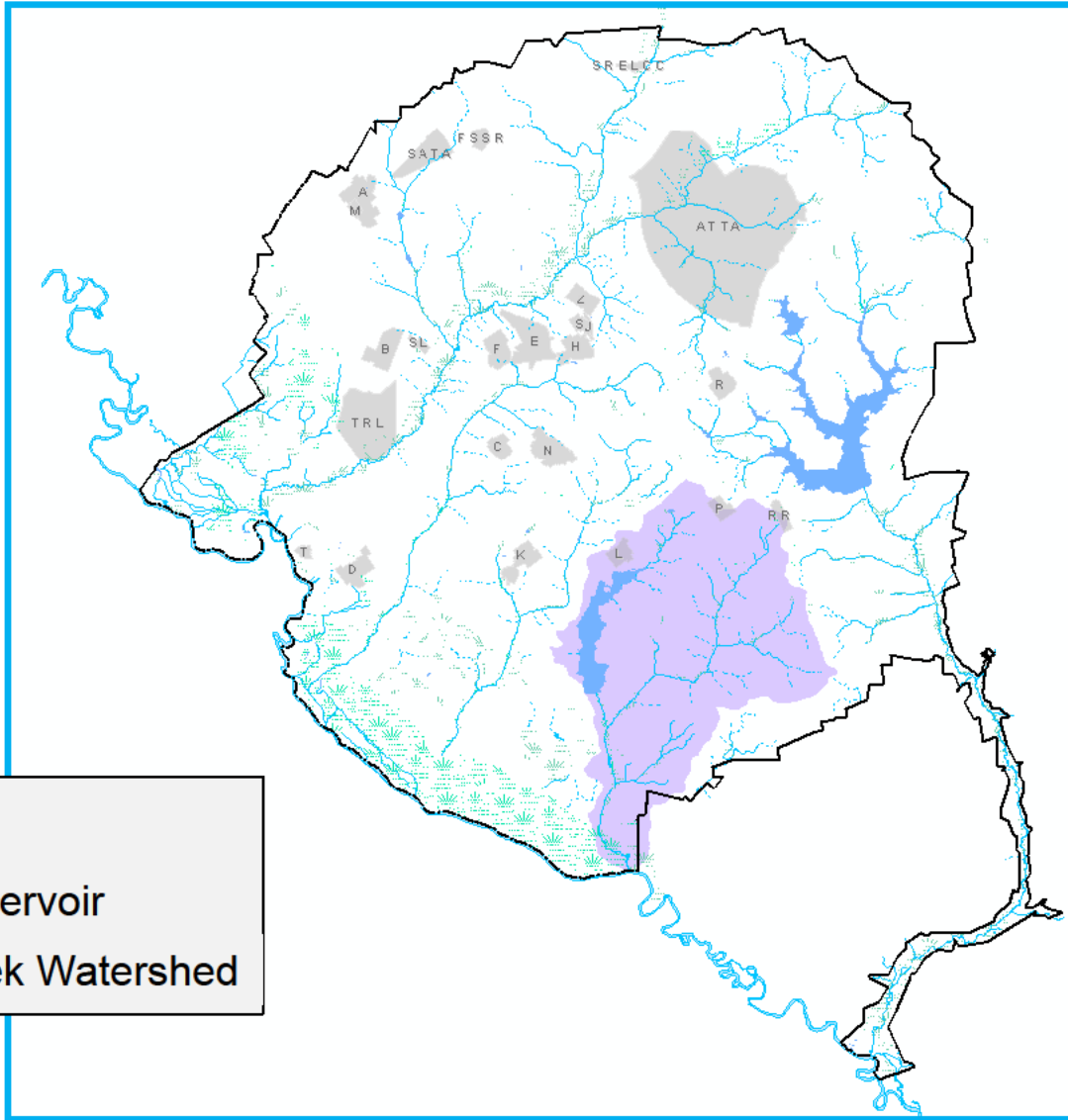
IOU Program



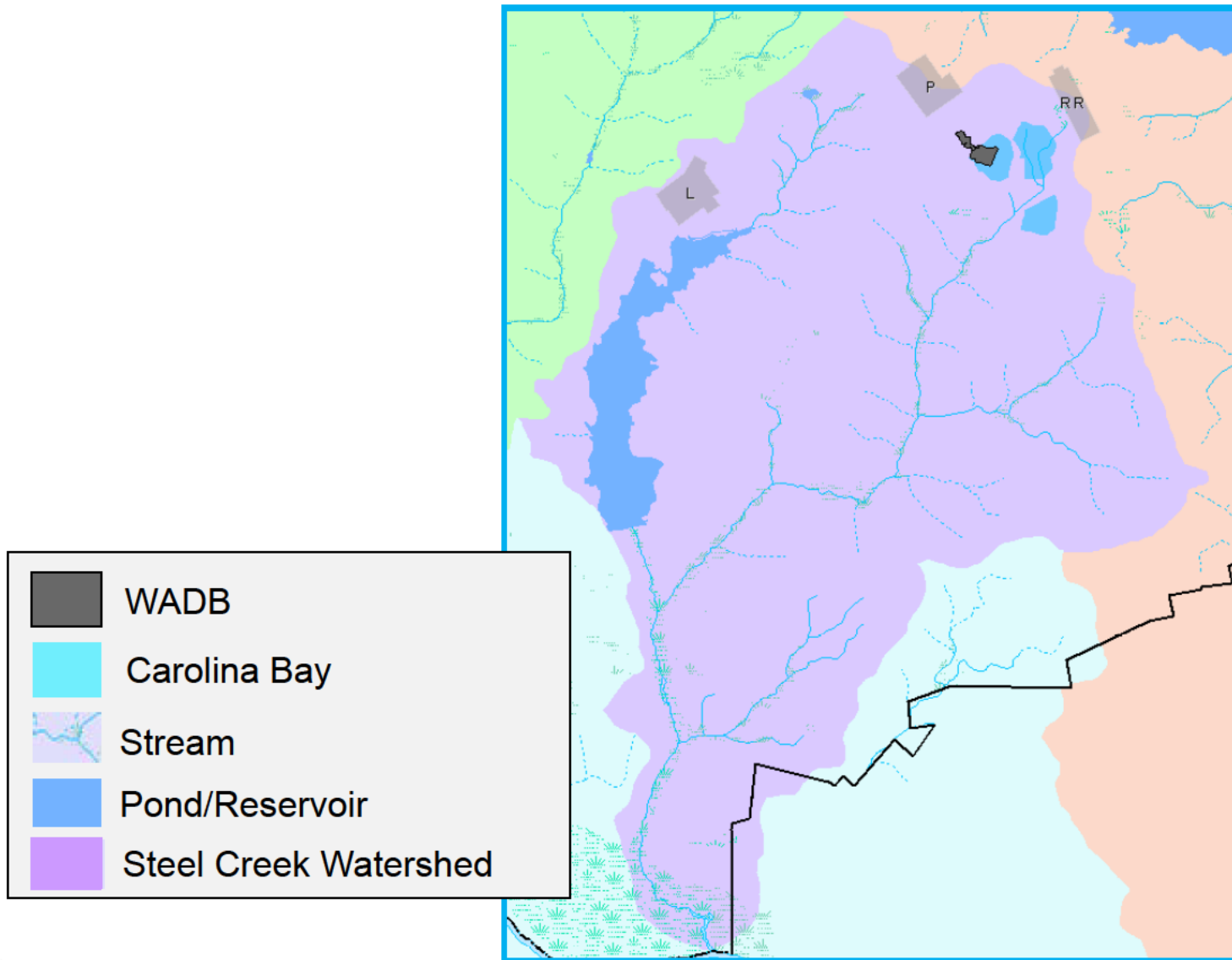
Program Involvement (Savannah River Site – Department of Energy)



Steel Creek IOU



Steel Creek IOU and the Wetland Area at Dunbarton Bay (WADB)

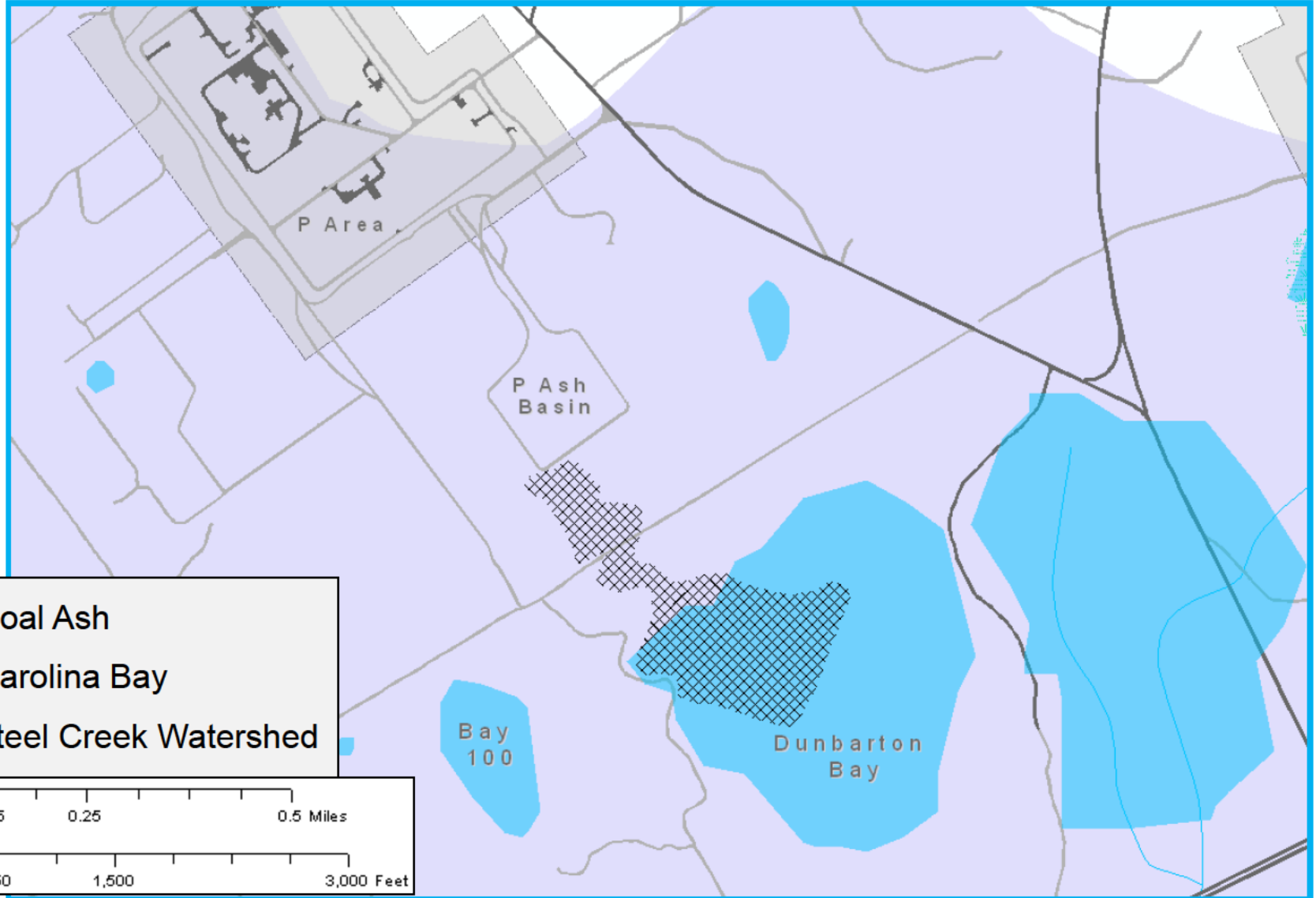


Status (Wetland Area at Dunbarton Bay – Sampling)

- In 2010, coal ash was discovered in the Wetland Area at Dunbarton Bay
 - Historical overflow from P-Area Ash Basin
 - Deposits cover 38 acres; ash 1-3 feet in depth
- **Media Sampled**
 - Ash/Soil
 - Surface Water
 - Groundwater
 - Biota (plants & animals)
 - Reference site (Bay 100) sampled primarily for ecological comparisons

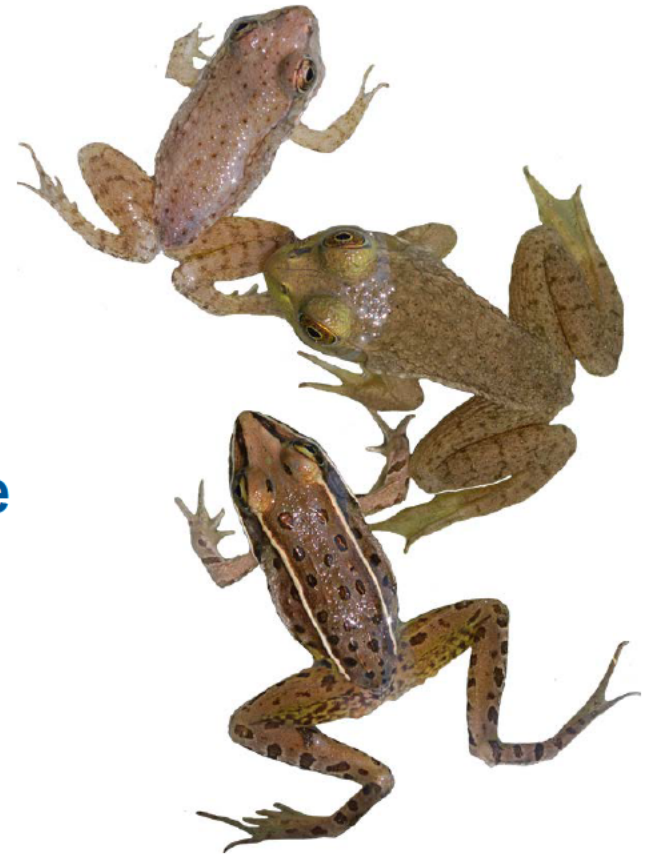


Wetland Area at Dunbarton Bay



Status (WADB)

- The prominent feature of the WADB is Dunbarton Bay - a Carolina bay that includes cypress/tupelo habitat
- Carolina bays are an important land feature providing valuable wetland habitat to a variety of organisms
- Amphibians, in particular, can be sensitive to elevated metals in coal combustion ash



Three Species of the
Genus Rana (True Frogs)
Green Frog, Bullfrog, and Leopard
Frog
(shown top to bottom)

Dunbarton Bay (Transitioning to Cypress/Tupelo Habitat)



Bay 100 (Reference Bay to the WADB)



U.S. DEPARTMENT OF
ENERGY



enterprise **srs**

Drift Fence Used to Collect the Majority of Biota Samples



“Capture” bucket



Human Health and Ecological Screening (WADB)

- Final action determination supports the Steel Creek IOU
- IOU Receptors
 - Ecological
 - *Contaminant screening*
 - *Biological data*
 - *Trophic modeling*
 - Human Health
 - *On-site Worker*

Human Health Screening Level

1 in 1,000,000 **cancer** risk level (10^{-6})

- or -

Greater than **non-cancer** threshold
(Hazard Quotient = 1)

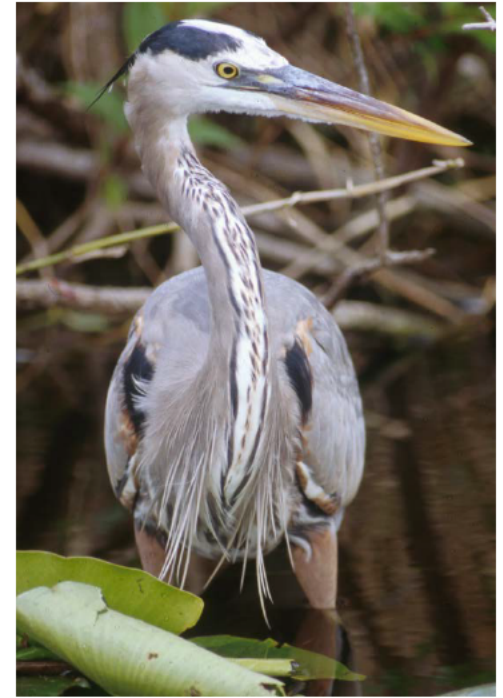


- **Results of Savannah River Ecology Lab study**
 - Levels of arsenic, selenium, and strontium, and also copper, nickel, and uranium in tissue were elevated in the WADB when compared to the reference site
 - The number of species in the WADB was comparable to the reference bay indicating that the ash is not adversely impacting the biodiversity of *herpetofauna* (reptiles & amphibians)

Southern toad
(*Bufo terrestris*)
the most common
species at both
WADB and Bay 100



- **Ecological Risk Assessment (continued)**
 - Trophic modeling assessed the potential threat of metals to the raccoon and great blue heron
 - Aluminum in soil/ash exceeded the lowest observed adverse effect level (LOAEL) for the raccoon at WADB and the reference bay due to incidental soil ingestion.
 - Levels of aluminum were *higher* at Bay 100, representing naturally high aluminum levels in soils, not unit-related



Great blue heron
Ardea herodias

Status (WADB - Risk Determinations)

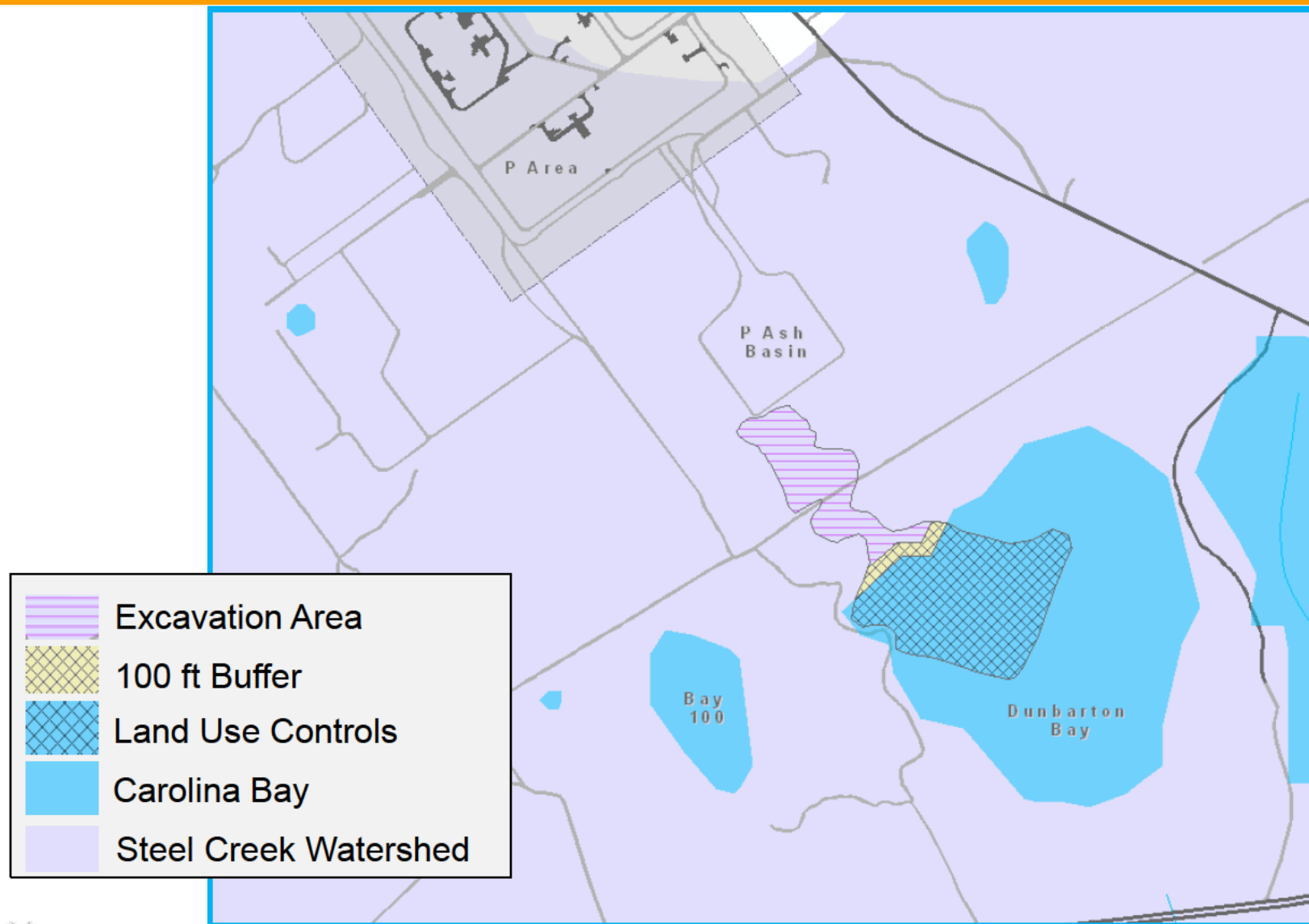
- **Ecological Risk Assessment**
 - No problems warranting action
- **Human Health Risk Assessment**
 - Arsenic and cesium-137 exceeded the $1.0E10-06$ risk level for the on-site worker in surface ash/soil
 - Risk = $9.9E-05$
- ***Total surface soil area warranting action is 38 acres***
 - Volume of ash is 80,220 cubic yards (yd^3)



- **Preferred Alternative**

- Excavating 13 acres (22,000 yd³) of ash/soil to the edge of the 100 ft (30-m) buffer at Dunbarton Bay
- Transporting the waste to an approved ex situ containment facility located off-SRS (likely: Three Rivers Landfill)
- Land Use Controls (LUCs) for 25 acres since some material will be left in place
- Estimated cost for completion is \$11 million

Wetland Area at Dunbarton Bay



Status (WADB – Land Use Controls)

- **Land Use Controls include:**
 - **Warning signs at the subunit boundary where ash remains**
 - **Notify the Environmental Protection Agency and SC Department of Health and Environmental Control in advance of any major changes in land use that would necessitate re-evaluation of the remedy**
 - **Institutional controls (administrative controls) and use restrictions for on-site workers (Site Use/Site Clearance Program) and work controls (worker training and briefings)**



- **Wetland at Dunbarton Bay**
 - **Statement of Basis/Proposed Plan was submitted in May 2013**
 - **Issue Record of Decision (ROD) for WADB: August 2014**
 - **Remedial Action start: by November 2015**



Path Forward for the IOU Program (continued)

IOU	FY12	FY13	FY14	FY15	FY16	FY17
Upper Three Runs			PR4			
Fourmile Branch					PR 5	
Pen Branch				PR 4		
Steel Creek		PR 5				
Lower Three Runs	PR 4 <i>complete</i>					BRA*
Savannah River and Floodplain Swamp	PR 3 <i>complete</i>					PR4

* Baseline Risk Assessment supporting Phase III of the IOU program
(ROD will be issued March 2020)

