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

Chemicals, Metals, and Pesticides (CMP) Pits

Electrical Resistance Heating (ERH) System

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Purpose

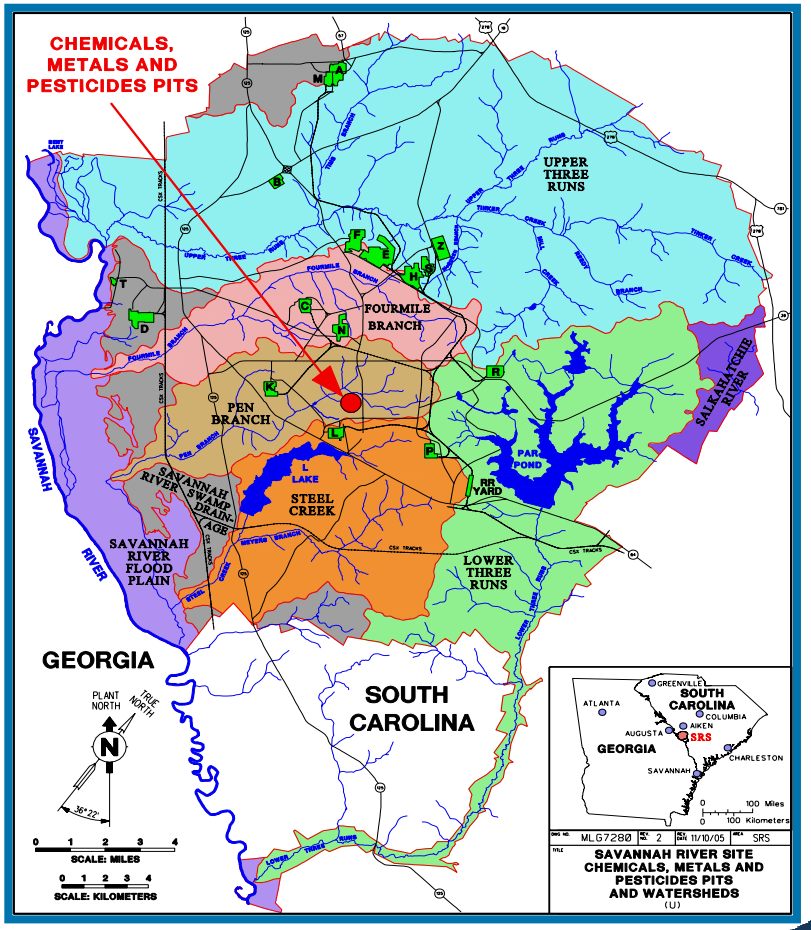
- **To provide the Facilities Disposition and Site Remediation Committee an update and the results of the Electrical Resistance Heating / Soil Vapor Extraction at the Chemical, Metals, and Pesticides Pits**
  - **Funding: Recovery Act Funded Since 2009**
  - **Total ERH Project Costs: $4.2 million**

Acronyms

- **bls** — **Below Land Surface**
- **CERCLA** — **Comprehensive Environmental Compensation and Liability Act**
- **CMP** — **Chemicals Metals and Pesticides**
- **COCs** — **Contaminations of Concern**
- **DCM** — **Dichloromethane**
- **DNAPL** — **Dense Non-Aqueous Phase Liquid**
- **ERH** — **Electrical Resistance Heating**
- **mg / kg** — **Milligram / Kilogram**
- **MNA** — **Monitored Natural Attenuation**
- **MSL** — **Mean Sea Level**
- **PCB** — **Polychlorinated Biphenyl**
- **PCE** — **Tetrachloroethylene**
- **RCRA** — **Resource Conservation and Recovery Act**
- **RG** — **Remedial Goal**
- **SRS** — **Savannah River Site**
- **SVE** — **Soil Vapor Extraction**
- **SVEU** — **Soil Vapor Extraction Unit**
- **TCE** — **Trichloroethylene**
- **VOCs** — **Volatile Organic Compounds**

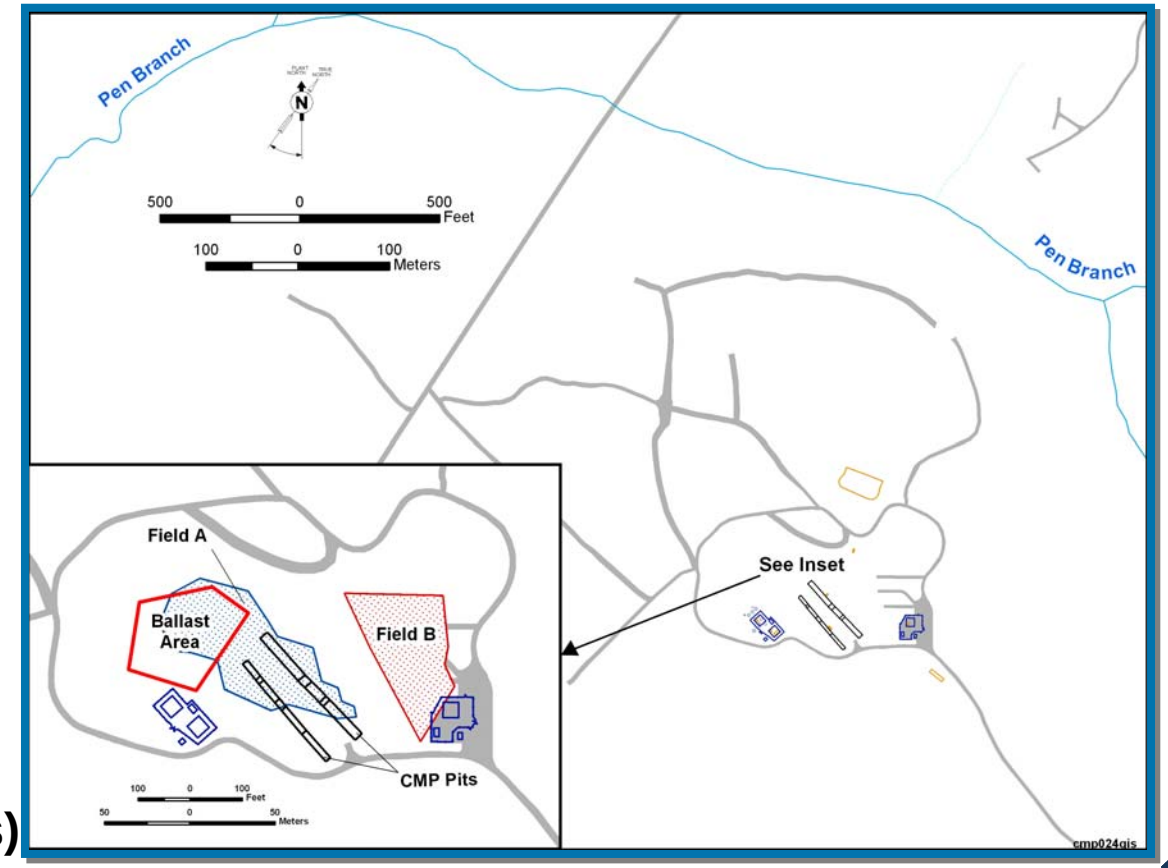
Location of the CMP Pits

- Located in the central portion of SRS
- Approximately one mile north of L Reactor
- Remote location



CMP Pits Layout

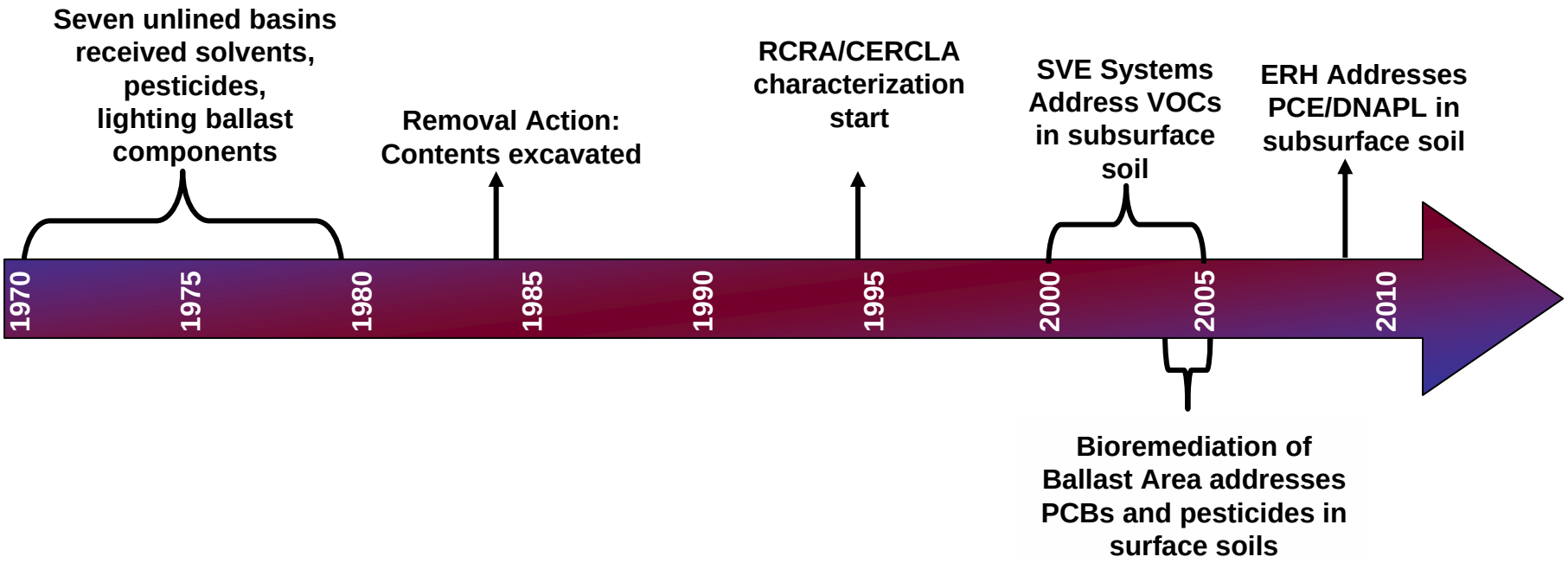
- Located 1500 feet from Pen Branch
- Located on top of knoll; 310 feet msl
- 90 feet in depth to groundwater
- Includes Subunits:
  - Pits soil (1 acre)
  - Ballast Area soil (0.7 acres)
  - Groundwater (50 acres)
  - Surface water



Primary Contaminants of Concern (COCs)

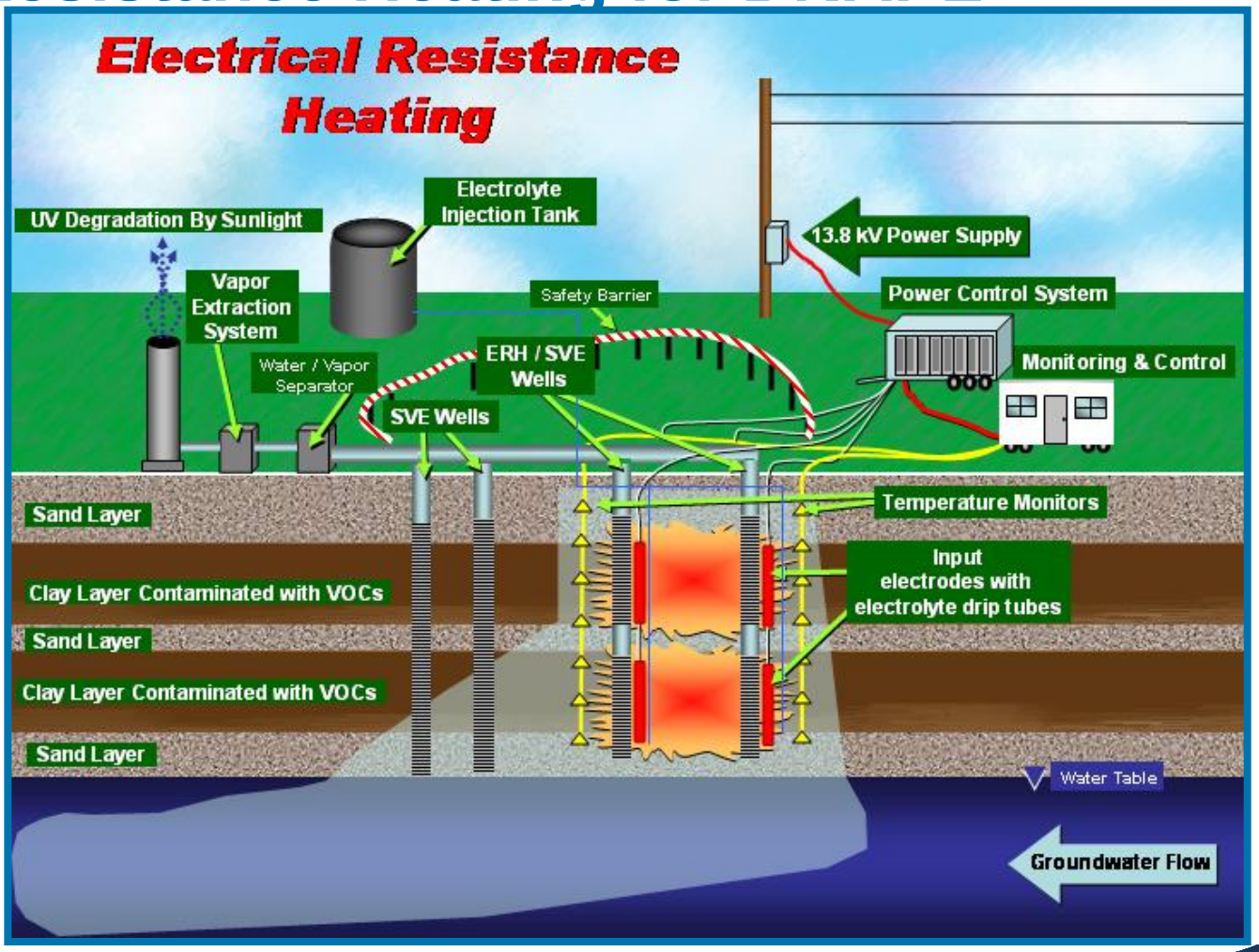
- **Surface Soil – PCBs and Pesticides (Ballast Area)**
- **Subsurface Soil – PCE and DCM (groundwater source term)**
- **Groundwater – VOCs and pesticides**
- **Surface water - none**

Chronology of Activities at the CMP Pits



Electrical Resistance Heating for DNAPL Removal

- Voltage was supplied to electrodes
- Current traveled through soil
- Soil heated and contaminants volatilized
- Soil Vapor Extraction (SVE) System extracted contaminants



CMP Pits ERH / SVE Construction

Permit Compliance

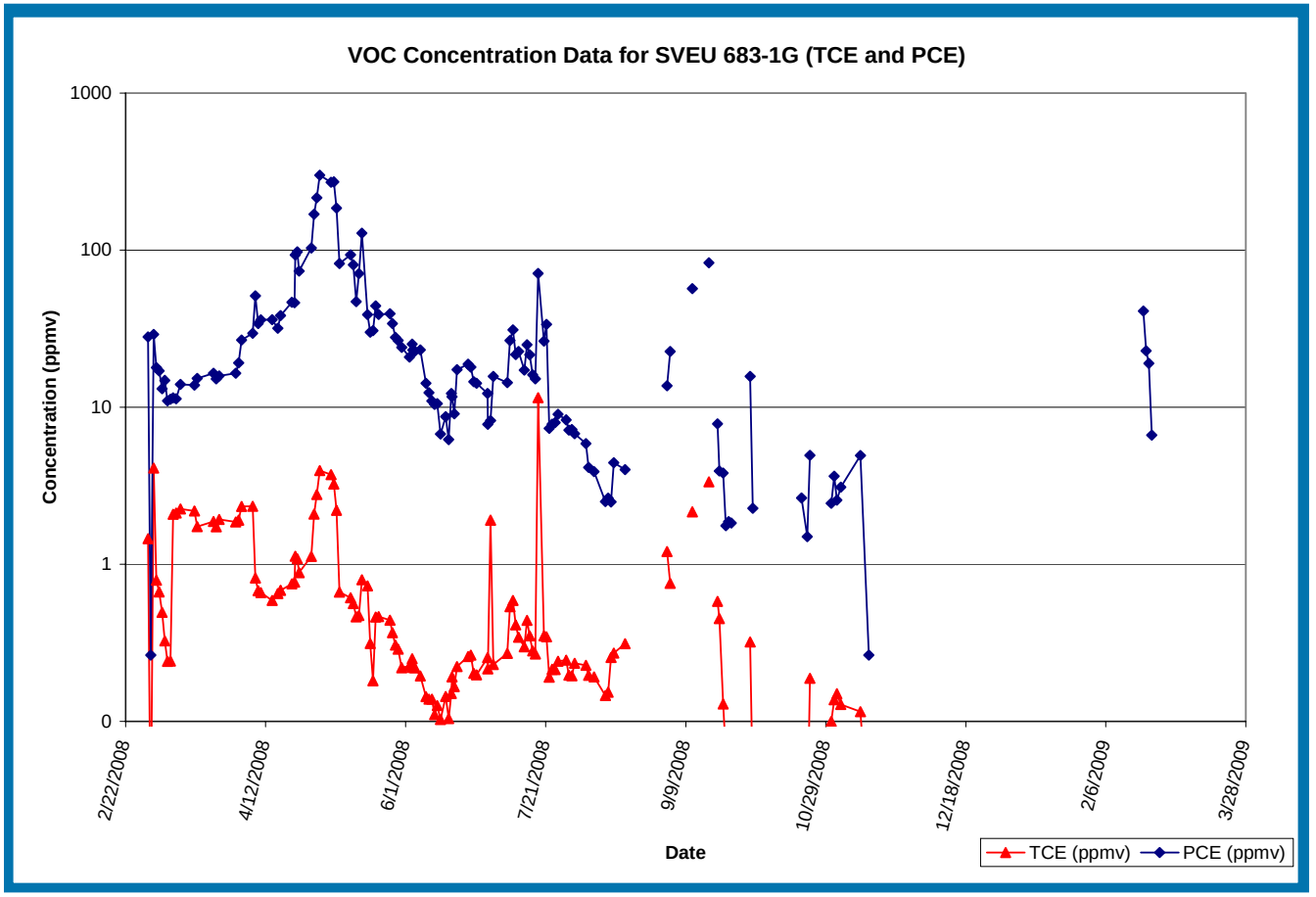
- Industrial Wastewater Treatment Permit: for Condensate Treatment
- Land Application Permit: treated condensate was sprayed to the ground
- Air Quality Control Permit: for Volatile Organic Compound (VOC) stack emissions from two SVE Units (SVEUs)
- Underground Injection Permit: for electrolyte injection

CMP Pits ERH / SVE Construction Complete

(continued)

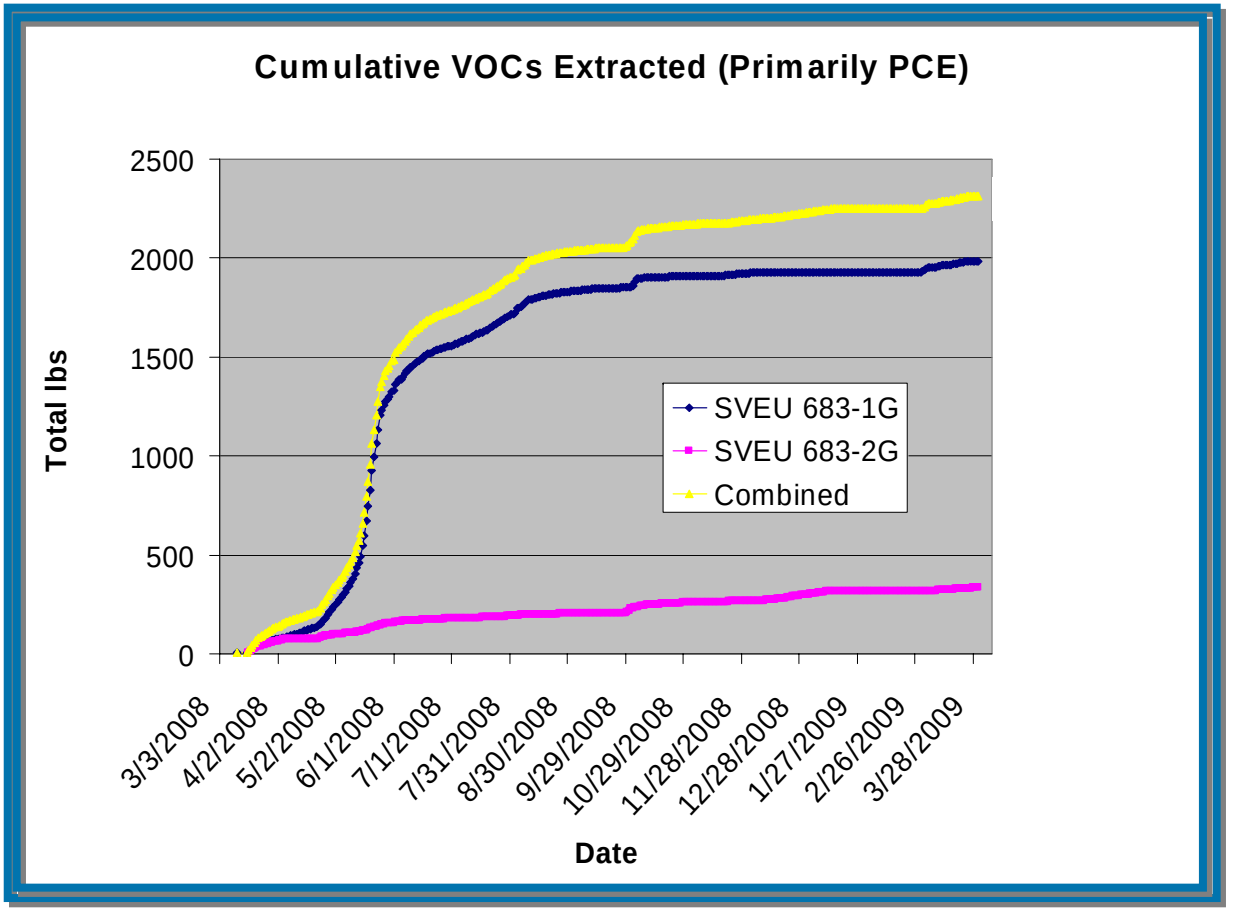
Performance Monitoring

VOC Concentrations were measured from the SVEU stack to measure performance during ERH



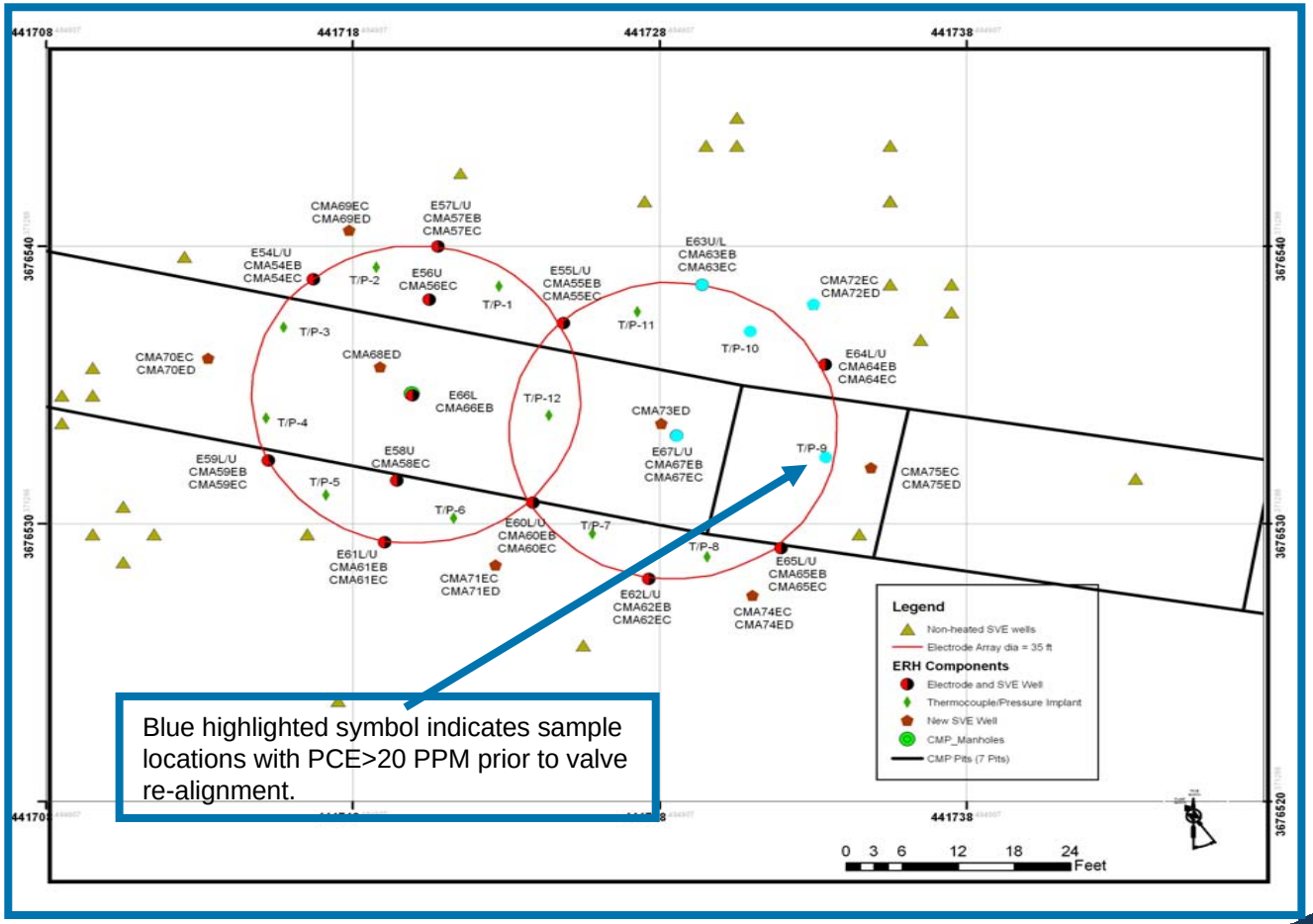
VOCs Extracted During ERH

2,300 pounds of VOCs were extracted during the ERH Process



Vapor Sampling Prior to SVE Shutdown

All SVE Wells (red shapes) and pressure implants (green diamonds) were sampled to ensure no "pockets" of VOCs remained



Final Remedial Action

ERH / SVE Schedule:

- Winter 2007: Construction completed
- March 2008: Operation began

ERH / SVE Project Duration:

- November 2008: Heating ceased
- March 2009: SVE ceased

Confirmation Soil Sampling

- December 2009: 65 soil samples taken from three locations (20-70 feet bls)
  - Sampling Plan - agreed to by SCDHEC, EPA and DOE

CMP Pits ERH / SVE – A Success

- **Summary statistics**
  - **Remediation conducted safely**
  - **Initial soil maximum PCE concentration 9,800 mg/kg**
  - **Remedial goal - 30 mg/kg – as specified in the Record of Decision**
  - **ERH/SVE extracted 2,300 pounds PCE**
  - **Confirmation soil maximum PCE concentration (after ERH/SVE) 1.8 mg/kg**

1.8 mg/kg<<<30 mg/kg

What's Next

- **Complete equipment removal by April 2010**
- **Disposition soil on windrows**
- **Effectiveness Monitoring Report due in June 2010**
  - **Soil Results**
  - **MNA Monitoring Results**