

A Presentation to the

Savannah River Site
Citizens Advisory Board

Chemicals, Metals, and Pesticides (CMP) Pits

Electrical Resistance Heating (ERH) System

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March 23, 2010

Purpose

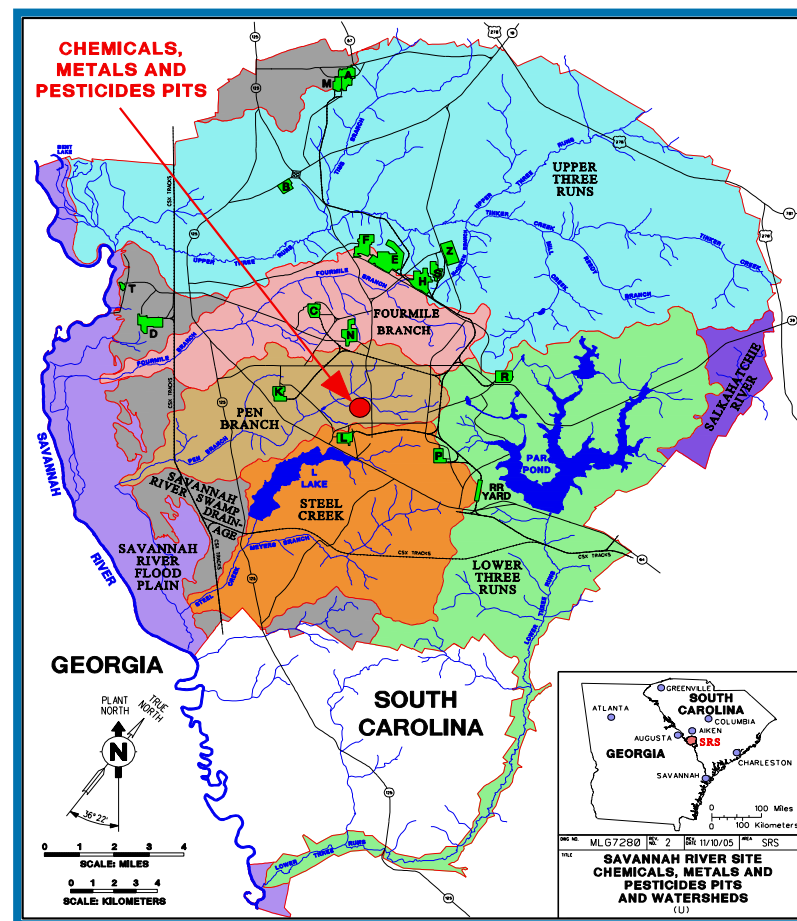
- **To provide the Facilities Disposition and Site Remediation Committee an update and the results of the Electrical Resistance Heating / Soil Vapor Extraction at the Chemical, Metals, and Pesticides Pits**
 - **Funding: Recovery Act Funded Since April 2009**
 - **Total ERH Project Costs: \$4.2 million**

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

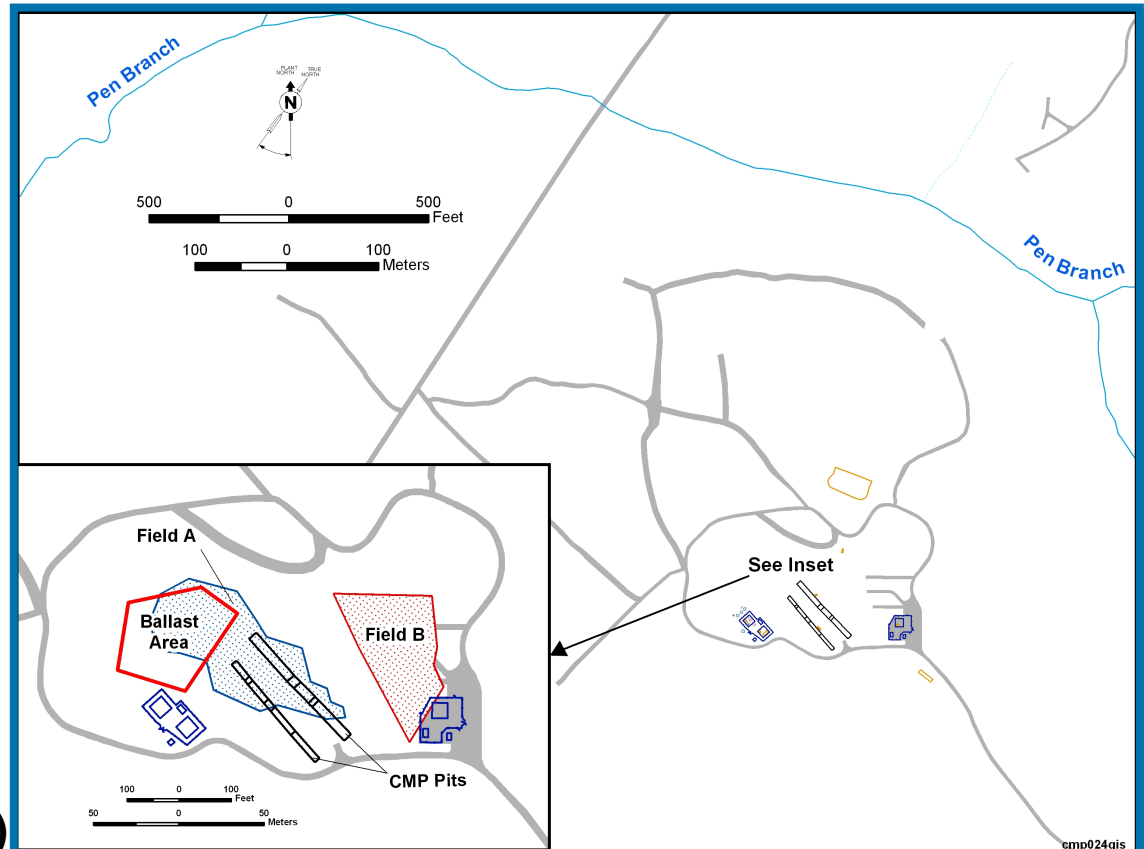
Location of the CMP Pits

- 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

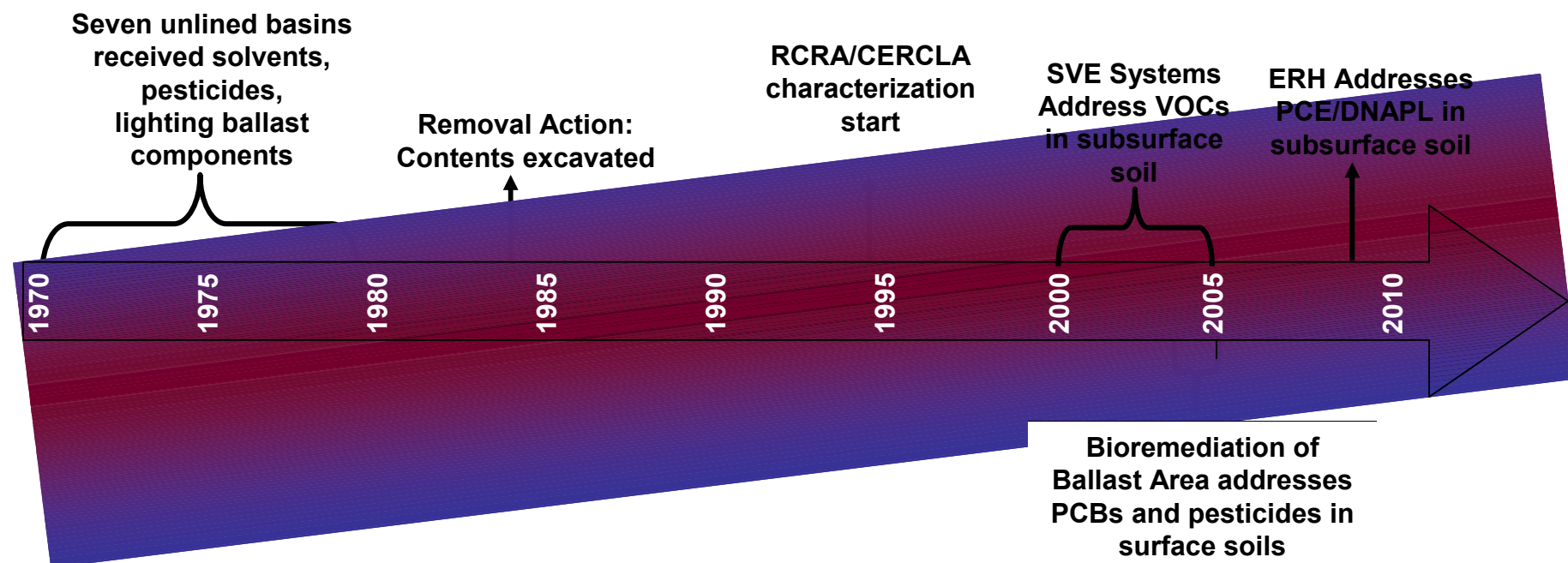




Primary Contaminants of Concern (COCs)

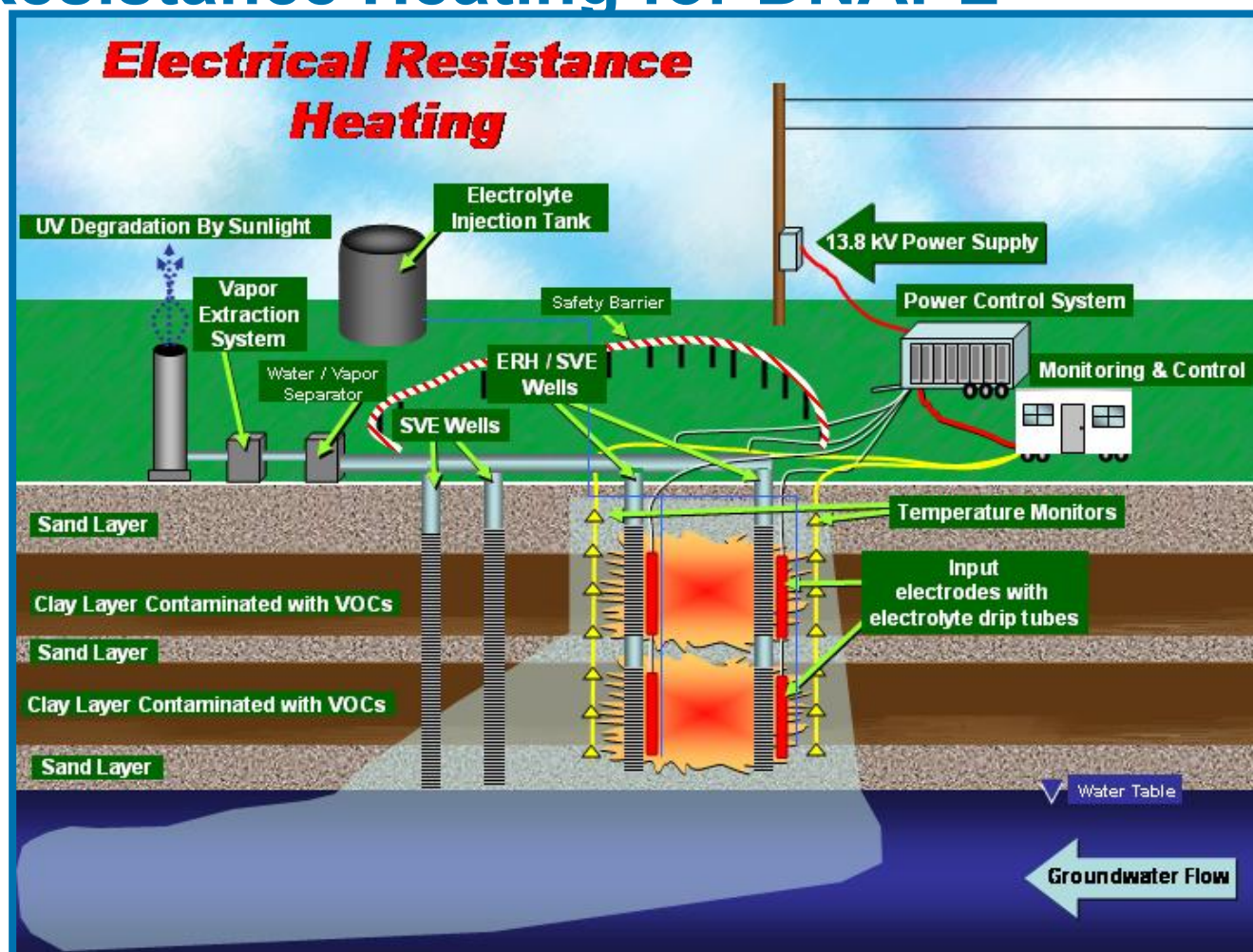
- **Surface Soil – PCBs and Pesticides (Ballast Area)**
- **Subsurface Soil – PCE and DCM (groundwater source term)**
- **Groundwater – VOCs and pesticides**
- **Surface water - none**

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

January
2007



Utilized Parts from the C-Area ERH System

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



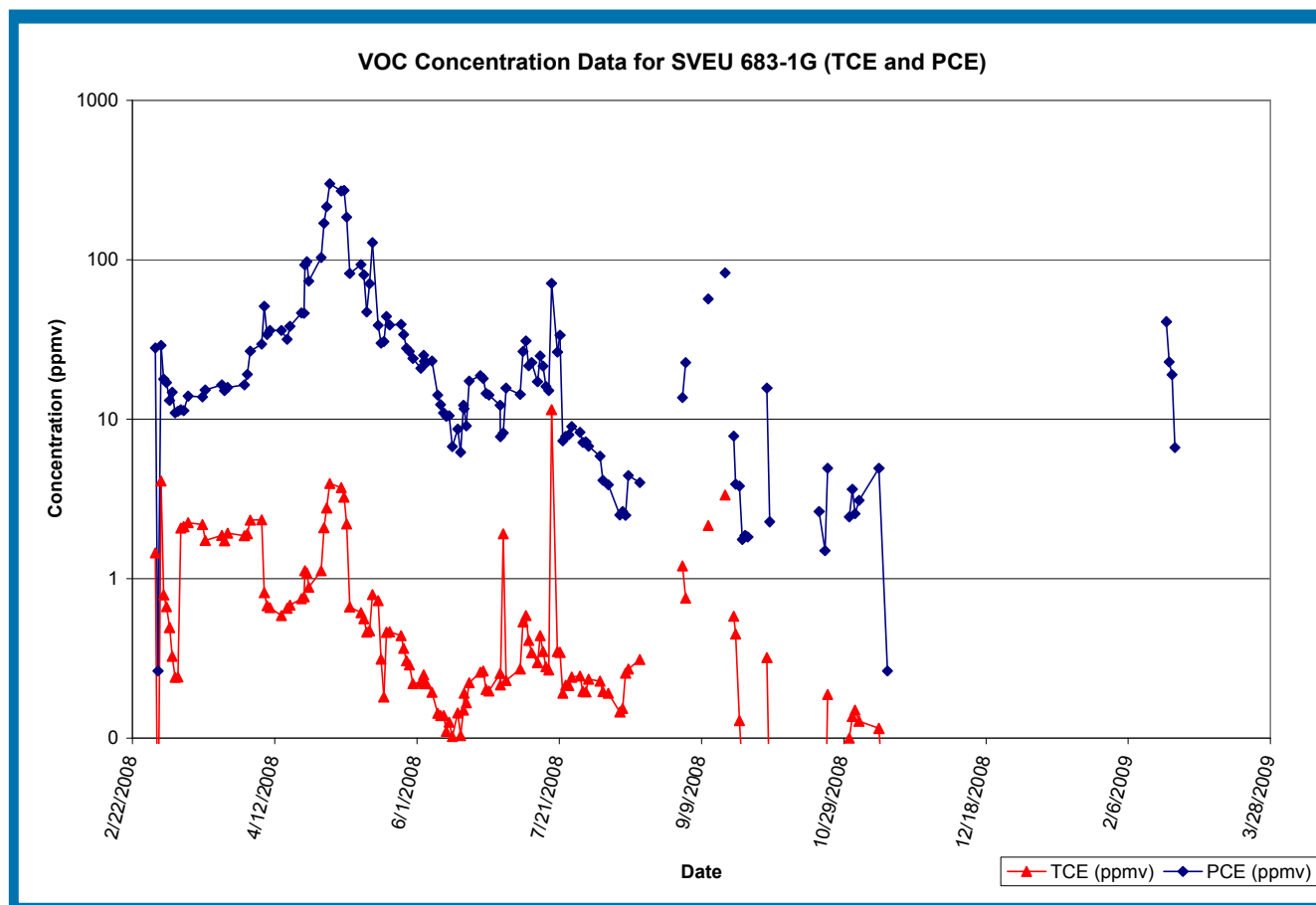
CMP Pits ERH / SVE Construction Complete

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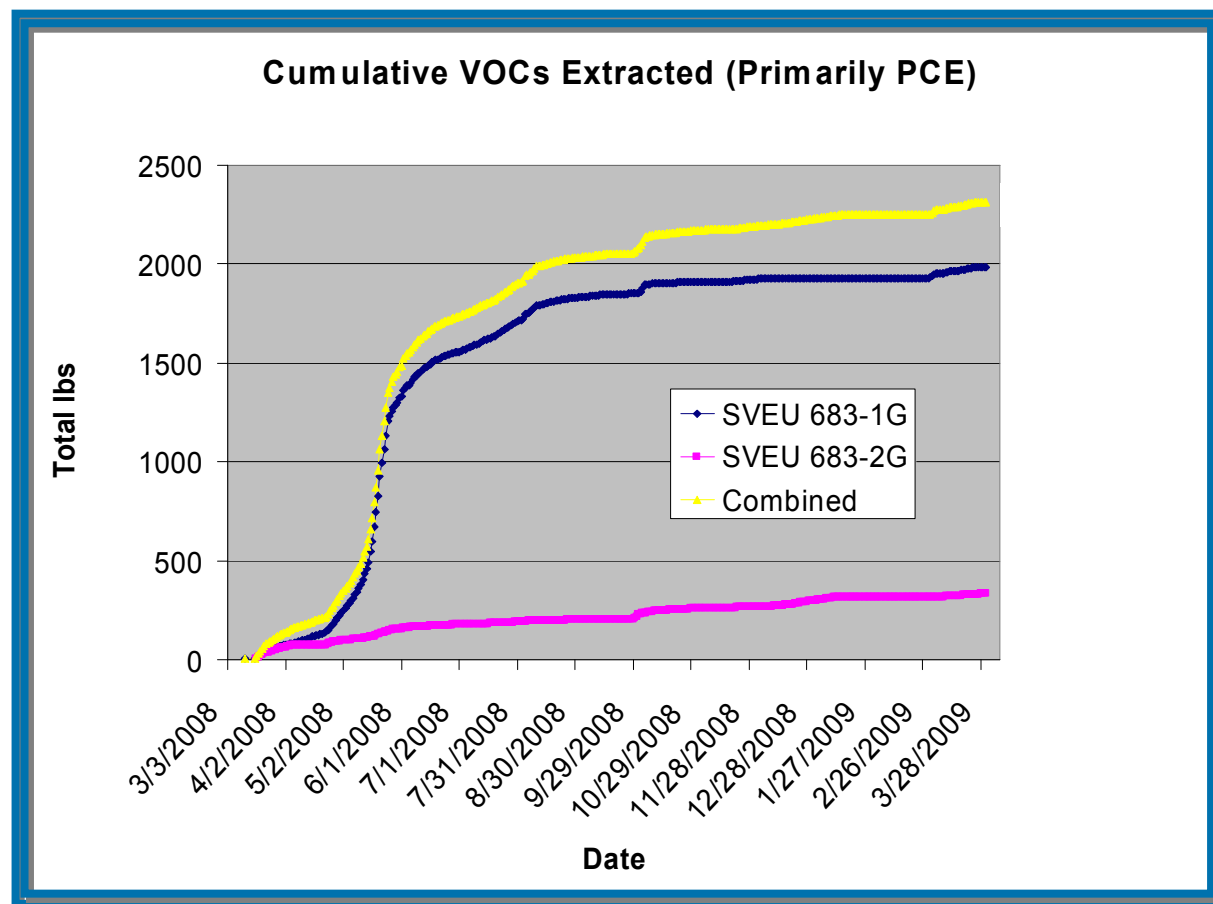
Performance Monitoring

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



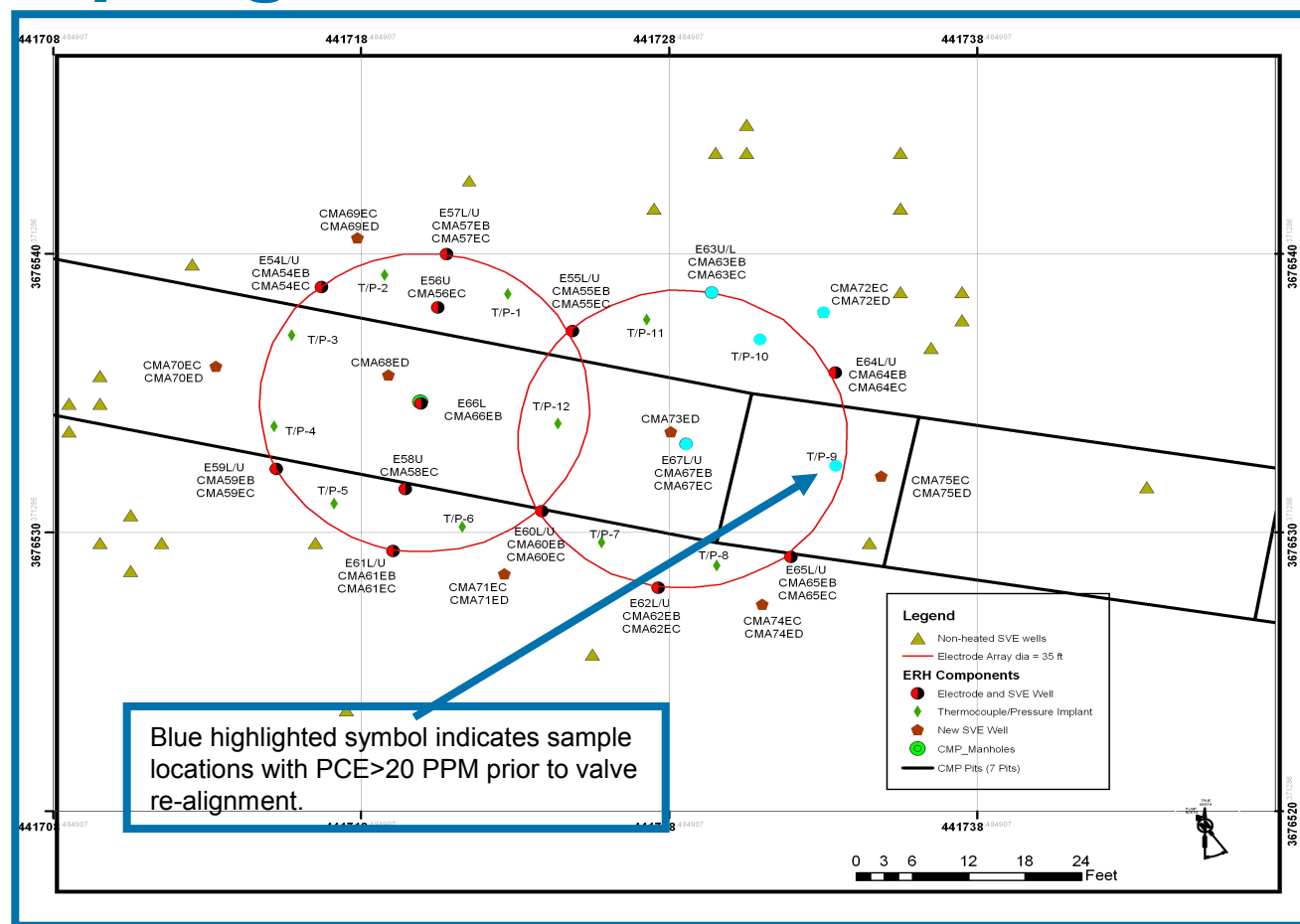
VOCs Extracted During ERH

**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**