

# Remedial Action Plan Update

One Hour Martinizing  
1103 West Club Blvd  
Durham, Durham County, NC  
DSCA Site #32-0013

May 21, 2015



# Overview

- Remedial Action Plan (RAP) Goals
- RAP Components
- RAP Implementation Status
- Monitoring Results
- Next Steps/Schedule

# RAP Goals

- Primary Goal: Protect human health by reducing contaminant concentrations and associated vapors
- RAP Objective: Reduce soil and groundwater concentrations to levels that will reduce vapor exposure risk
  - PCE Soil Goal = 2.1 mg/kg
  - PCE Groundwater Goal = 2.5 mg/L

# RAP Components

## ■ Soil Remedial Action

- Excavate soil impacts exceeding 2.1 mg/kg PCE at source property
- Place DARAMEND in base of excavation to enhance bioremediation

## ■ Groundwater Remedial Action

- Inject EHC to reduce PCE in groundwater

## ■ Monitoring

- Indoor air, soil vapor, and groundwater sampling

# RAP Implementation Status

- Soil excavation completed in 2012
  - 3,850 tons PCE-impacted soil excavated



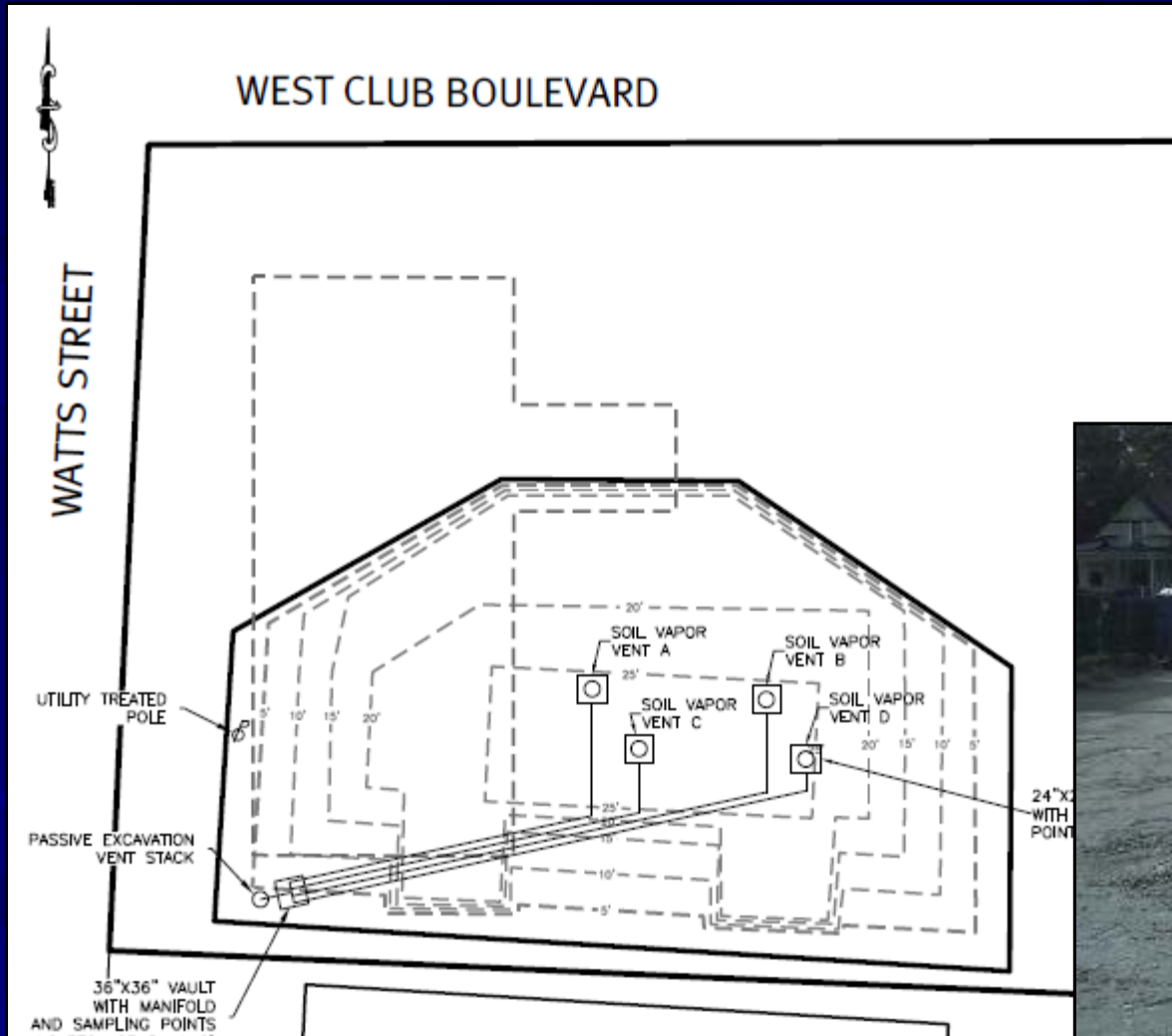
# RAP Implementation Status

- DARAMEND (12,000 lbs) placed in base of excavation



# RAP Implementation Status

- Excavation backfilled
- Passive soil vents installed



# RAP Implementation Status

- Groundwater EHC injection completed in Jan '14

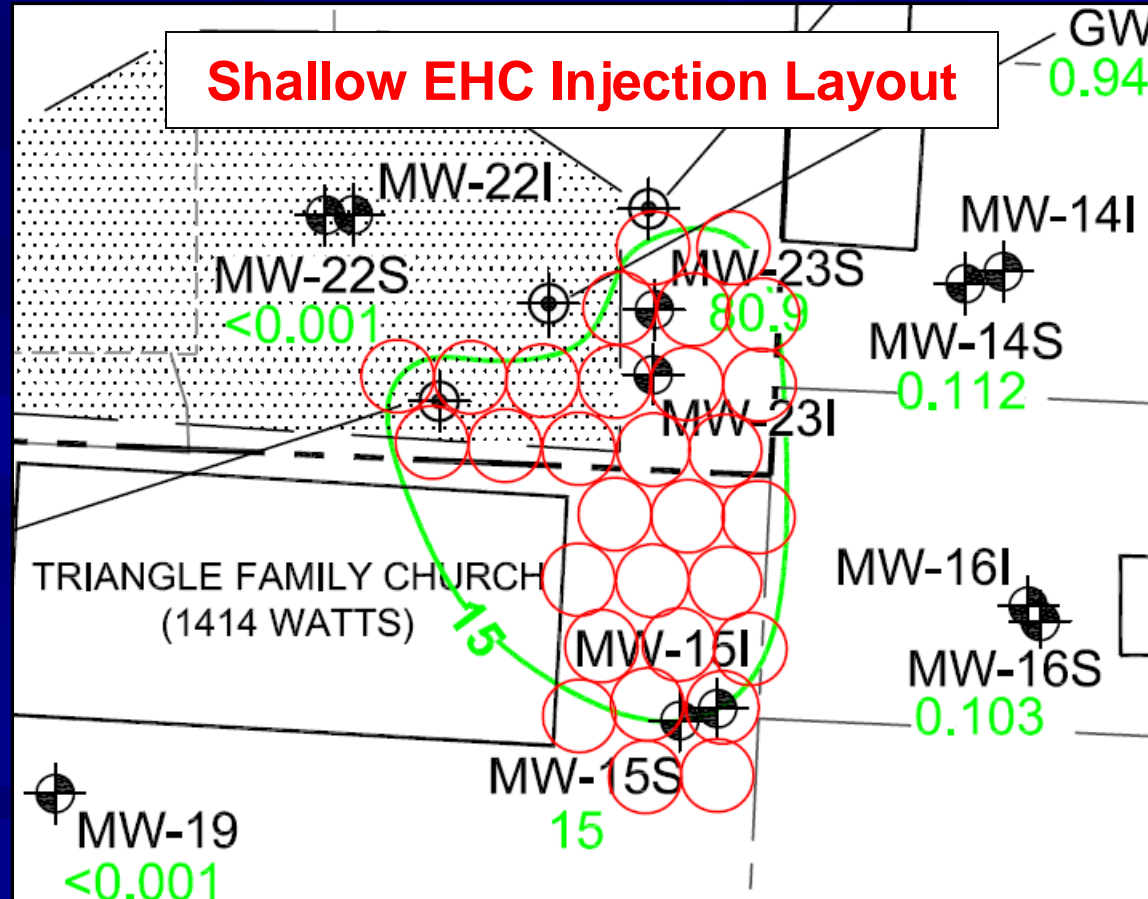




# RAP Implementation Status

## ■ Shallow EHC injection

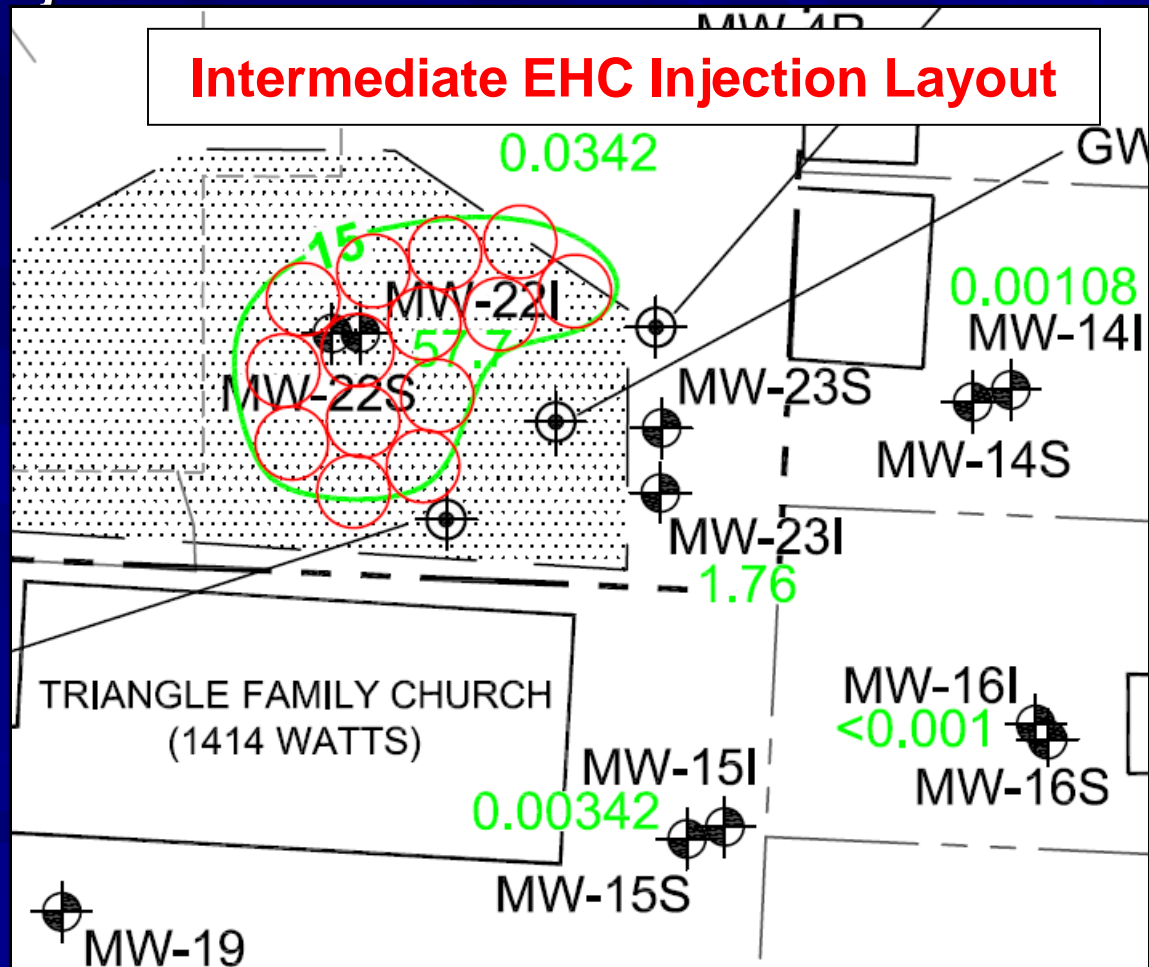
- 30 Injection Points
- Targeted water table
- Total of 15,560 lbs EHC injected



# RAP Implementation Status

## ■ Intermediate EHC injection

- 14 Injection Points
- Targeted intermediate depth below water table
- Total of 4,100 lbs EHC injected



# Post-Injection Monitoring

## ■ Groundwater

- Monthly sampling for 3 months, then quarterly through Jan '15

## ■ Soil Vapor Field Screening

- Monthly screening through July 2014, then quarterly through Jan '15

## ■ Soil Vapor Sampling

- Monthly sampling for 3 months, then quarterly through Jan '15

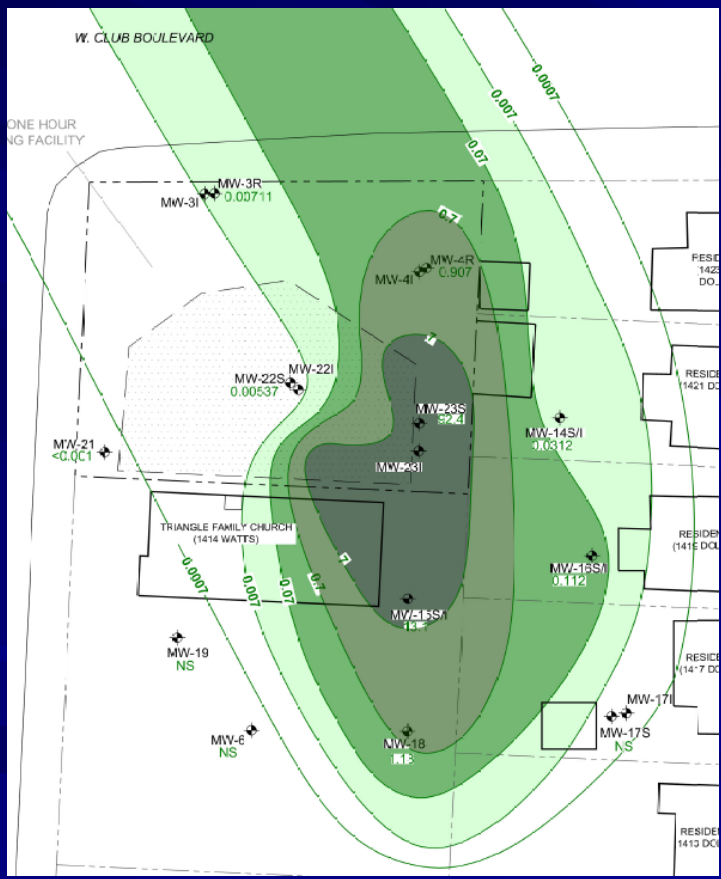
## ■ Indoor Air (1419 and 1421 Dollar Ave & 1414 Watts St)

- Monthly sampling for 3 months, then quarterly through Jan '15

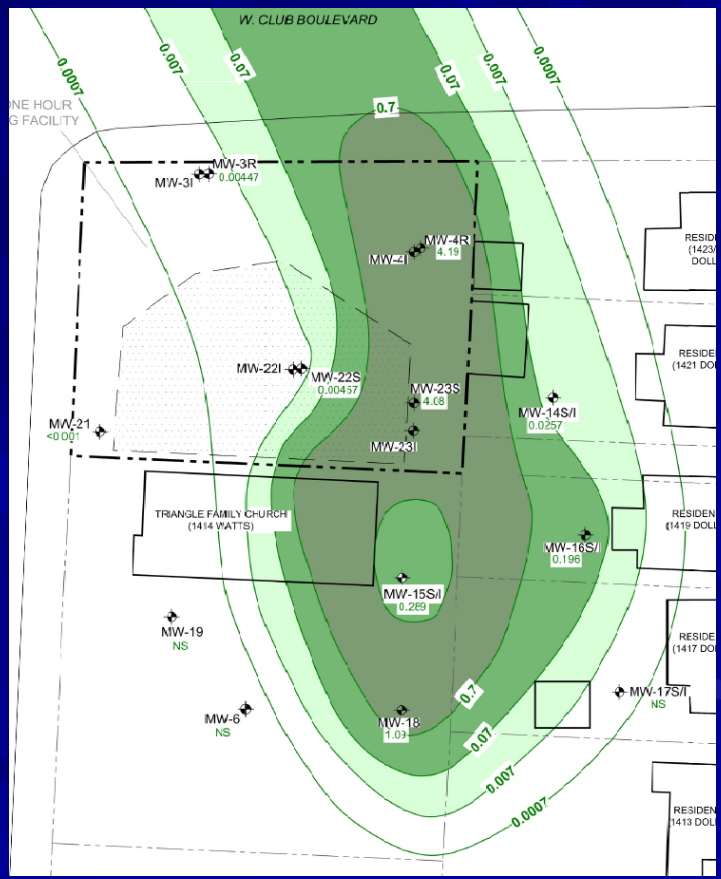
# Post-Injection Monitoring Results

## Groundwater – Shallow PCE Results

**Pre-Injection**



**15 Months Post-Injection**

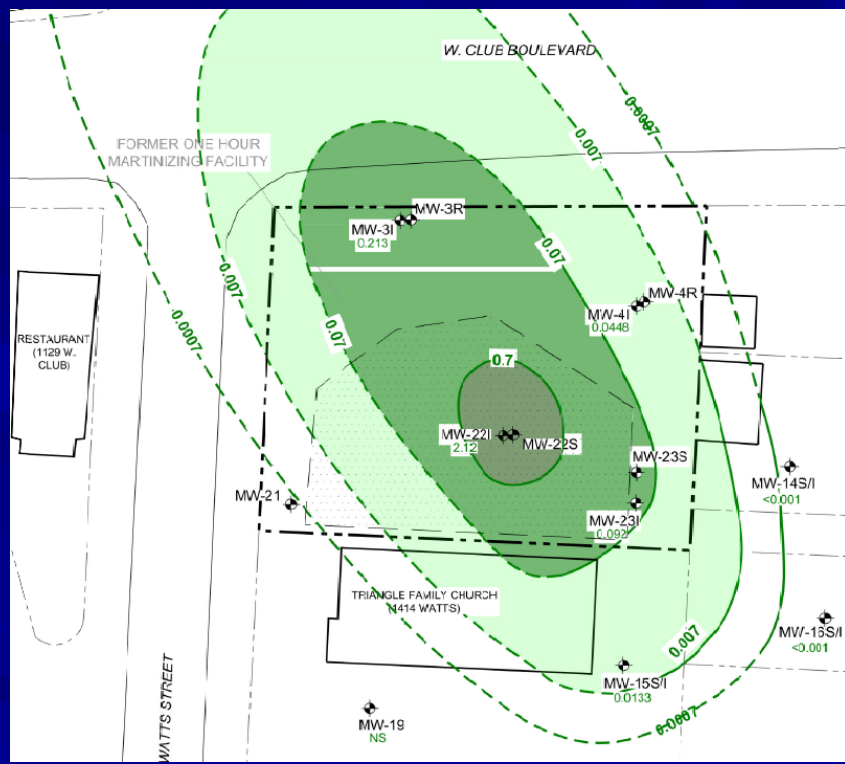
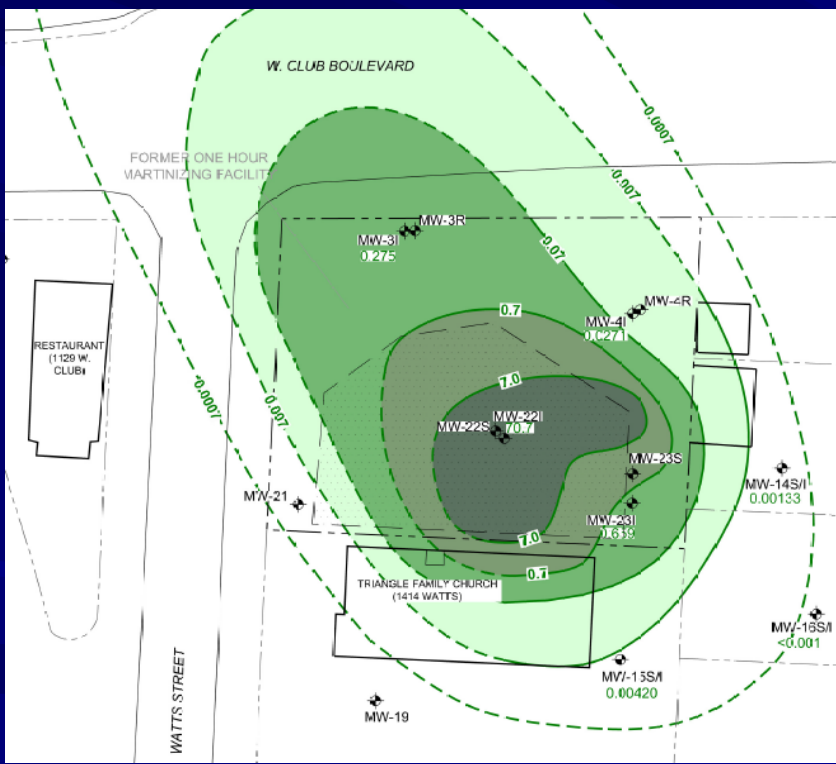


# Post-Injection Monitoring Results

## Groundwater – Intermediate PCE Results

**Pre-Injection**

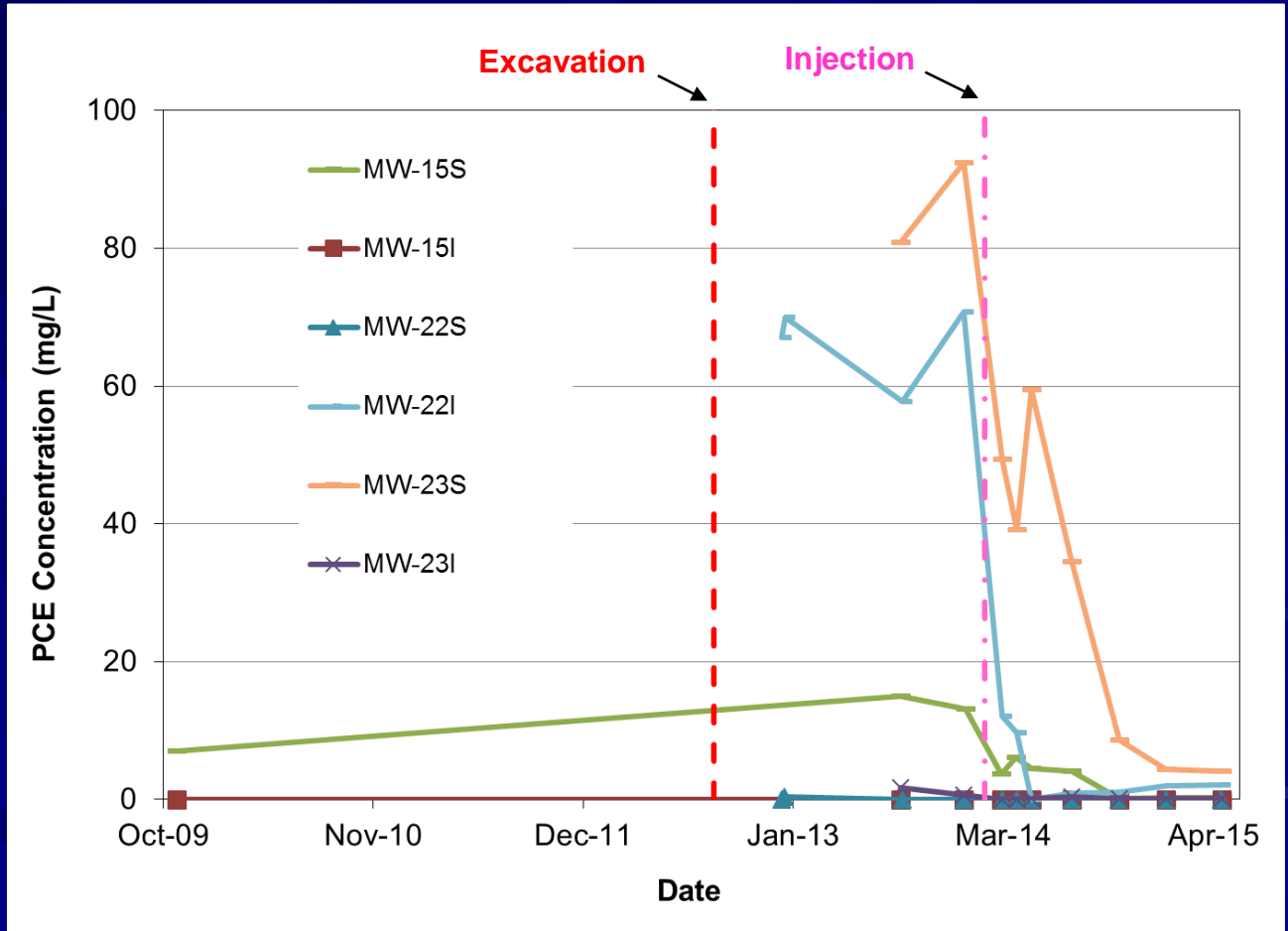
**15 Months Post-Injection**



# Post-Injection Monitoring Results

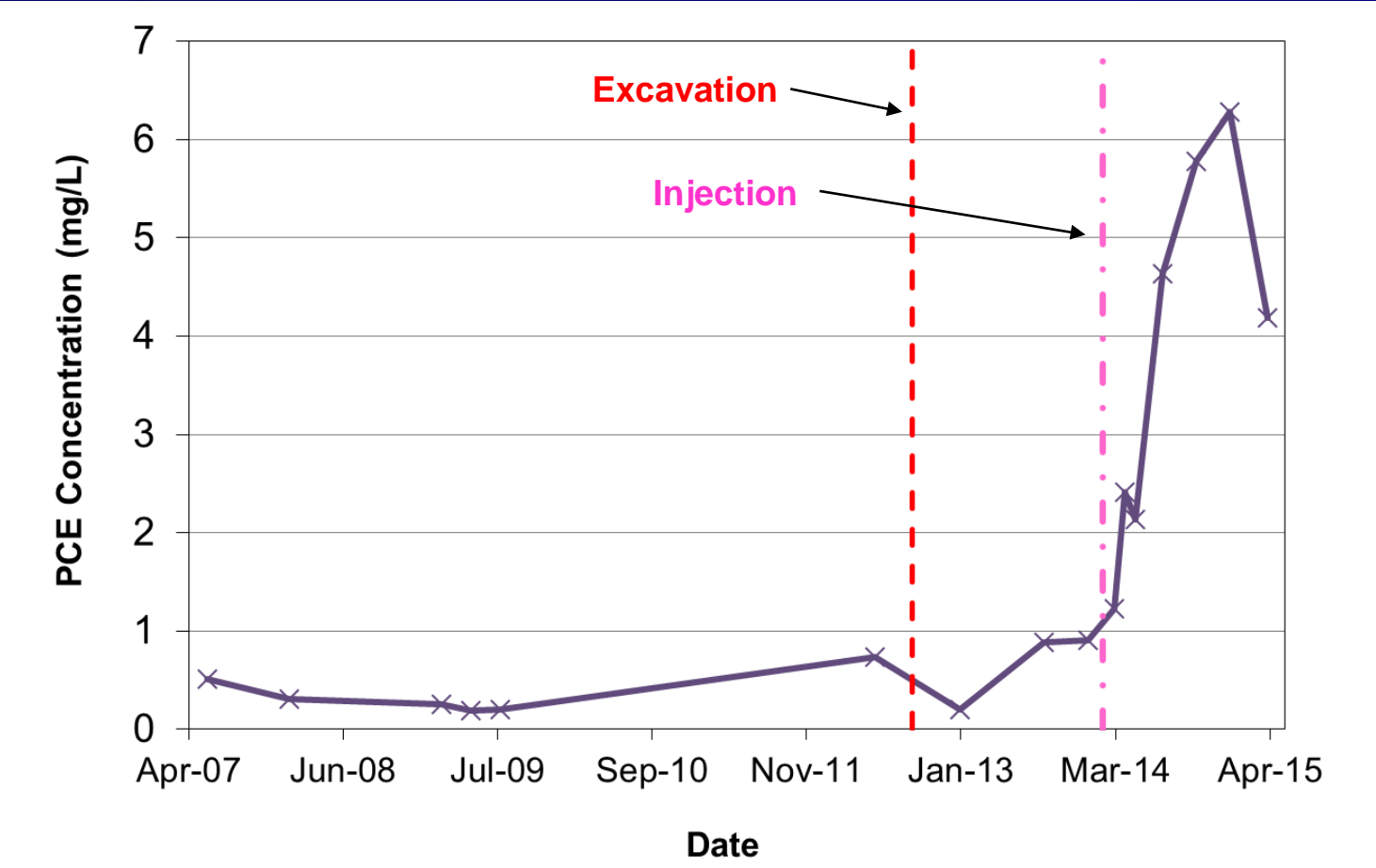
## Groundwater –PCE Results within Injection Area

- MW-15S  
98% reduction
- MW-23S  
96% reduction
- MW-22I  
97% reduction



# Post-Injection Monitoring Results

■ Groundwater –PCE Results Downgradient (MW-4R)



# Post-Injection Monitoring Results

## ■ Soil Vapor Screening Results – Methane

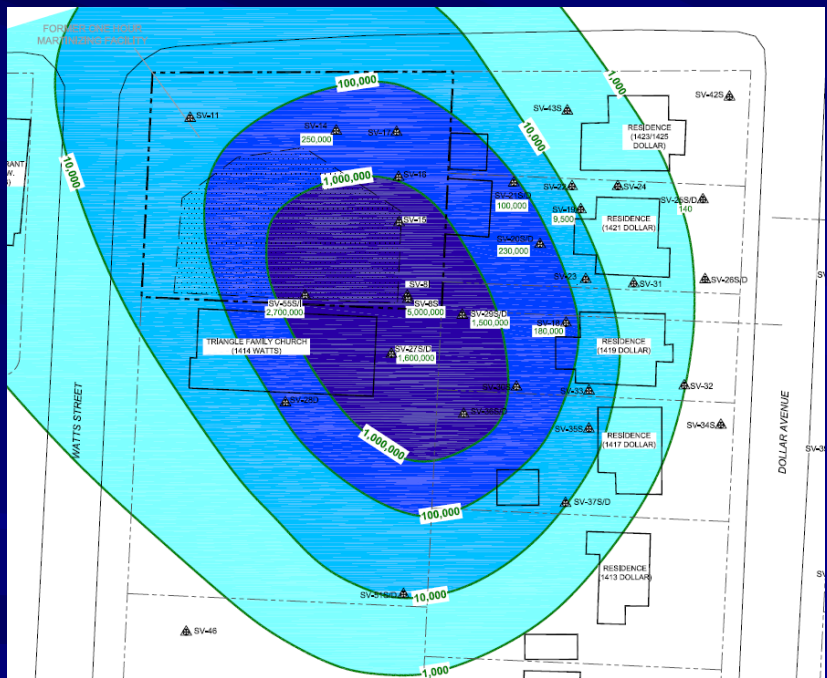
- Only detected at low levels (0.1 to 0.4% by volume)
- Only detected near source area
- Higher levels (up to 23.2% by volume) in passive exhaust vent
- Not detected in sub-slab depressurization system at 1414 Watts St



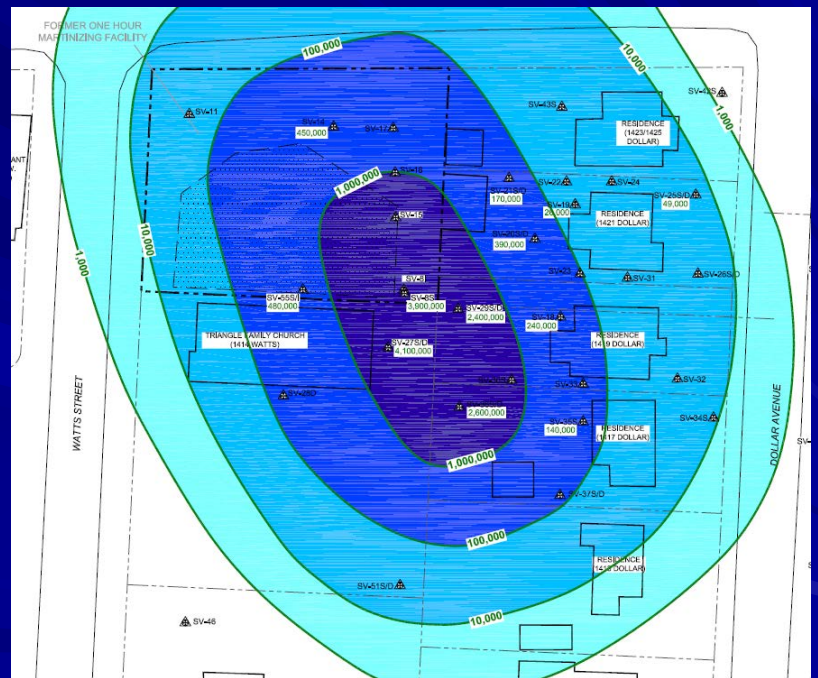
# Post-Injection Monitoring Results

## Soil Vapor Sampling – Shallow PCE

**Pre-Injection**



**1-Year Post-Injection**



# Post-Injection Monitoring Results

## ■ Indoor Air

### – 1414 Watts St (Triangle Family Church)

- PCE = 11 to 280  $\mu\text{g}/\text{m}^3$  (Dec '13 – Apr '14)
- Additional mitigation completed in May '14
- PCE = 0.98 to 4.1  $\mu\text{g}/\text{m}^3$  (May '14 – Jan '15)
- Risk levels acceptable for each post-injection sample

### – 1419 Dollar Ave (residence)

- PCE = 2.0 to 24  $\mu\text{g}/\text{m}^3$ ; TCE detected in 3 samples = 0.88 to 1.4  $\mu\text{g}/\text{m}^3$  (Dec '13 – Apr '14)
- Additional mitigation completed in May '14
- PCE = 0.28 to 3.5  $\mu\text{g}/\text{m}^3$  and no TCE detected (May '14 – Jan '15)
- Risk levels acceptable for each post-injection sample

# Post-Injection Monitoring Results

## ■ Indoor Air

### – 1421 Dollar Ave (residence)

- PCE = 0.41 to 27  $\mu\text{g}/\text{m}^3$ ; TCE detected in 3 first floor samples from 0.47 to 1.0  $\mu\text{g}/\text{m}^3$  and 1 basement sample at 26  $\mu\text{g}/\text{m}^3$  (Dec '13 – Apr '14)
- Additional mitigation completed in May '14
- PCE = 0.36 to 18  $\mu\text{g}/\text{m}^3$  ;TCE detected in only one first floor sample at 0.75  $\mu\text{g}/\text{m}^3$  (May '14 – Jan '15)
- Risk levels acceptable for each post-injection sample, except the March 2014 basement sample

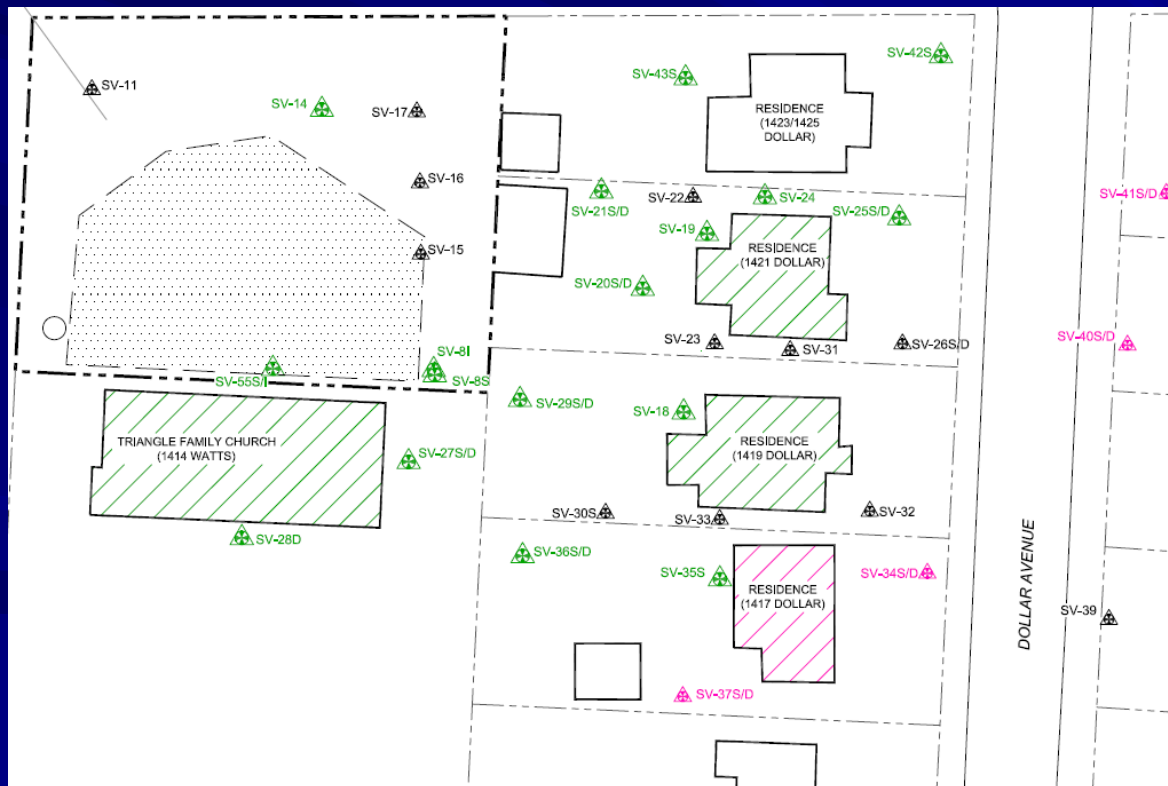
# Supplemental Monitoring

## ■ Soil Vapor Sampling

- Additional limited sampling completed in March 2015

## ■ Indoor Air Sampling

- 1417 and 1421 Dollar Ave sampled in April 2015



# Future Monitoring

## ■ Groundwater

- Quarterly sampling of EHC injection through January 2016 per UIC permit requirements

## ■ Soil Vapor Field Screening

- Methane consistently low and only detected in a few locations for one-year of post-injection screening
- Future limited field screening may be conducted, if deemed warranted based on groundwater data

## ■ Soil Vapor Sampling

- Future limited vapor sampling may be conducted, if deemed warranted based on groundwater data

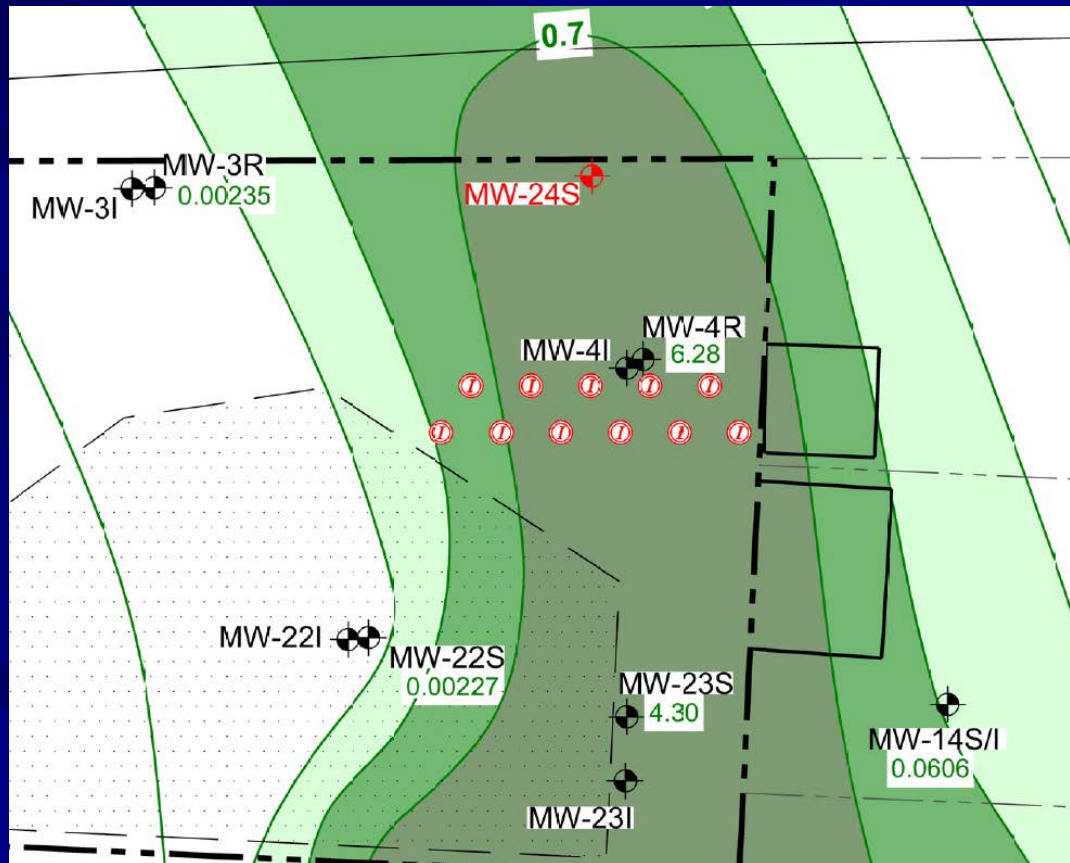
# Future Monitoring

- Indoor Air (1419 Dollar Ave & 1414 Watts St)
  - Mitigation systems with telemetry systems are in place
  - Consistent low concentrations post-mitigation
  - No additional indoor air sampling currently planned
  
- Indoor Air (1421 Dollar Ave)
  - Mitigation system with telemetry system is in place
  - Variable concentrations post-mitigation
  - Re-sample indoor air in April 2015, then determine future monitoring schedule

# Future Activities

## ■ Groundwater

- Conduct limited injection to address increasing concentrations in MW-4R and limit further plume migration



# Future Activities

## ■ Groundwater

- Plan to inject PlumeStop™ (by Regenesis)
  - Highly dispersible, fast-acting reagent
  - Sorption-based technology captures contaminants and quickly reduces concentrations
  - Provides matrix for enhanced biodegradation
  - Designed to stop migrating plumes and eliminate rebound





# Schedule

## ■ June 2015

- Install additional monitoring well (MW-24S)
- Conduct PlumeStop™ pre-injection sampling

## ■ July 2015

- Complete PlumeStop™ injection
- Conduct EHC post-injection quarterly groundwater sampling

## ■ August 2015

- Complete PlumeStop™ post-injection groundwater sampling

## ■ October 2015

- Complete PlumeStop™ and EHC post-injection quarterly groundwater sampling

**Questions??**

# Contact Information

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