EPA SUPERFUND

Site Assessment Case Study:
Armen Cleaners
Ann Arbor, MI

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Region 5
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The Site
Purpose of Investigation

- Assist MDCH in Evaluating Indoor Air Quality of Residences for the Presence of VOCs Associated with a Historical Release of PCE from a Dry Cleaning Facility
Physical Setting

• Operating dry cleaner since early 1950’s in residential neighborhood
• Historical releases to subsurface
• Shallow groundwater (<10 feet)
• Complex geology (sands, silts, clays)
Project Challenges

- Limited hydrogeological data available
- Shallow groundwater
- “Source for vapor and groundwater contamination” still present
- Complex geology
- Residences in close proximity (20 feet) to dry cleaner
- Armen Cleaners - still active
Historical Data
Team Members

- EPA (ERB, ERT, TIO) and their contractors
- State (MDCH, MDEQ)
- County (Washtenaw)
- Local (City of Ann Arbor)
Goals of Investigation

1) Evaluate for VOCs in the subsurface
   • “Source and Extent of Contamination Investigation”
Goals of Investigation (continued)

2) Evaluate for the presence of VOCs in ambient air
Goals of Investigation (continued)

3) Evaluate for the presence of VOCs in indoor air of nearby residences
Investigation Overview (continued)

Approach

1. MIP borings advanced in “study area”
   - Locations based on 50’ x 50’ grid
   - Final locations based on site conditions
   - Locations added/subtracted based on real-time data - “Data Driven”

2. Install soil gas probes
   - Around residences – based on MIP data (bag samples)
   - Basements in residences (bag samples)
Investigation Overview (continued)

Approach (continued)

3. Indoor ambient air sampling
   • Summa and real-time using TAGA

4. Outdoor ambient air sampling
   • Summa and real-time using TAGA

5. Plot data (GIS)

6. Develop final report
   • ERB, ERT & TIO
Investigation Overview (continued)

- Scope allowed “snapshot” of the full vapor intrusion pathway
  - Groundwater - soil vapor – sub slab - indoor air - ambient air
  - Use of “real-time” data collection techniques and application off Triad
  - Results driven approach
Preliminary Findings

1. Source area still believed to be present in subsurface around dry cleaners
2. PCE in excess of soil saturation concentration believed to be present
3. Good correlation between MIP data and soil vapor concentrations
Preliminary Findings

4. PCE identified in indoor air of the houses around dry cleaner
5. Background VOCs still detected in indoor air samples
ECD Detector
PID Detector
Soil Vapor Plume

Legend

Vapor Point and Sub Slab PCE Results
- (Non-Detect 4.0 ppbv Report Limit)
- 4.01 - 10.00 ppbv
- 10.01 - 100.00 ppbv
- 100.01 - 1,000.00 ppbv
- 1,000.01 - 10,000.00 ppbv
- 10,000.01 - 100,000.00 ppbv
- 100,000.01 - 550,000.00 ppbv

PCE Contours
- (Non-Detect 4.0 ppbv Report Limit)
- 4.1 - 10 ppbv
- 10.1 - 100 ppbv
- 100.1 - 1,000 ppbv
- 1,000.1 - 10,000 ppbv
- 10,000.1 - 100,000 ppbv
- 100,000.1 - 550,000 ppbv

Area of Concern
Parcel Boundary
Building
Road Boundary

Note: PCE Contour surface was created using the method called inverse distance weighted with a power of 2, a variable search radius, and with points of 0.
Ambient Air Results

Legend
- PCE results from TAGA samples
  - Non-Detect (4.0 ppbv Report Limit)
  - 4.01 - 10.00 ppbv
  - 10.01 - 100.00 ppbv
  - 100.01 - 1000.00 ppbv
  - 1000.01 - 5000.00 ppbv
  - 5000.01 - 10000 ppbv

- Road Boundary
- Area of Concern
- Parcel Boundary
- Building

Interpolation of PCE TAGA results
- Non-Detect
- 4.01 - 10 ppbv
- 10.01 - 100 ppbv
- 100.01 - 300 ppbv
- 300.01 - 600 ppbv
- 600.01 - 900 ppbv
- 900.01 - 1,000 ppbv

Note: PCE Contour surface was created using the method called Inverse Distance Weighted with a power of 2, a variable search radius, and with points of 12.

Figure 20
Ambient Air PCE Plume Based on TAGA Results

Prepared for: SEPA
Results Summary
Questions?