

Coordinating an Off-site Vapor Investigation & Removal

Sterling Dry Cleaners, Appleton, WI

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Wisconsin's Vapor Intrusion Guidance
FET – March 2011

304 W Wisconsin Ave, Appleton



Basic Site Information

- WDNR Site Name: So's Dry Cleaners (former)
- WDNR BRRTS #: 02-45-522133
- Current operation: Sterling Dry Cleaners
- Soil – clay
- Water table – 3-5 ft bgs
- Flow direction – variable
- Gradient – approx. 0.01 ft/ft

Site Chronology

- Dry cleaning facility from prior to 1995 to present (active)
- Jan 1998 – facility fire (arson)
- May 1999 – Phase II ESA (not reported) – shows CVOCs & PVOCs in soil & gw
- June 1999 – Sherriff's Auction & Spill
- June 2008 – Owner contacts DNR re: DERP sunset date (8/30/08)

Step 1 – Gather Information

- DNR staff involved in 1999 spill
- Property owner in 1999
- Current property owner
- US Oil responder in 1999
- Appleton Fire Department
- Local consultant
- County Register of Deeds & Treasurer
- County GIS

How It Looked June 2008



How It Looked June 2008



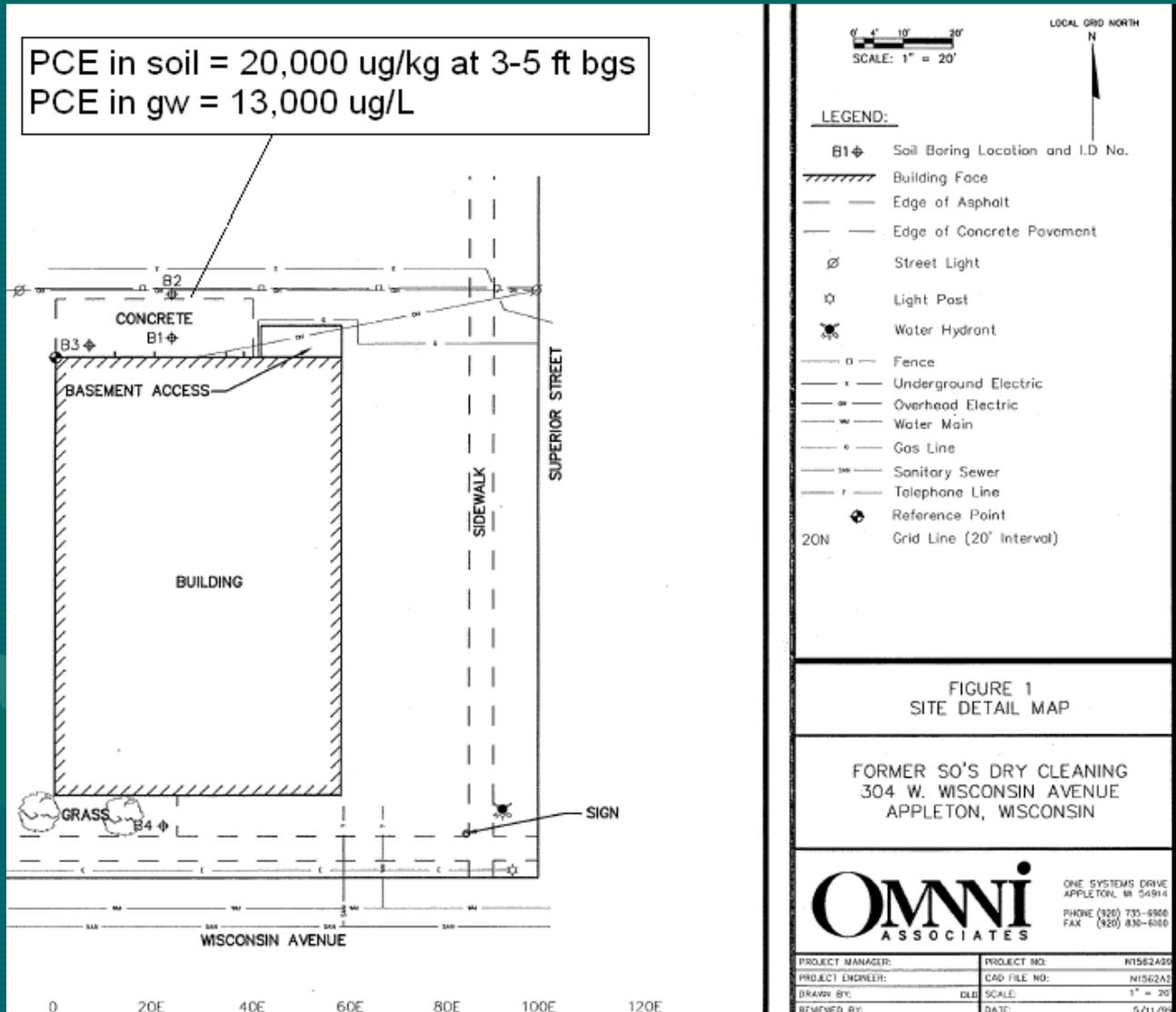
Jan 1998 - Appleton Fire Dept Photos



Jan 1998 - Appleton Fire Dept Photos



May 1999 – Environmental Site Assessment (ESA) Phase II Map



0 20E 40E 60E 80E 100E 120E

1999 Spill File

*6-16-99 Incident – 55 gal drum spilled (20-30 gal), found AM
by construction contractor hired to renovate building
Cleanup method – excavation by US Oil & ONYX*

*FRONT Soil sample (no depth) – PCE = 15,000,000 µg/kg
SIDE Soil sample (no depth) – PCE = 5,300,000 µg/kg*

DERP / Enforcement / EPA

- RP (owner) accepted into DERP - 8/08
- RP selected consultant for SI - 9/08
- RP submitted three denials for funding - 5/09
- DNR filed an enforcement affidavit - 7/09
- DNR requested EPA assistance for SI & possible Removal – 1/10
- EPA approved request same day
- EPA Action Memo eventually approved

Step 2 – Develop Your Team(*) & Identify the Stake-holders

- *EPA – On-Scene Coordinator
- DNR
 - *RR Supervisor
 - *State-EPA Removals Liaison
 - Regional DERP Team member
 - State DERP Team Leader
 - Regional Public Outreach
 - State-EPA Outreach Liaison
- *DHS

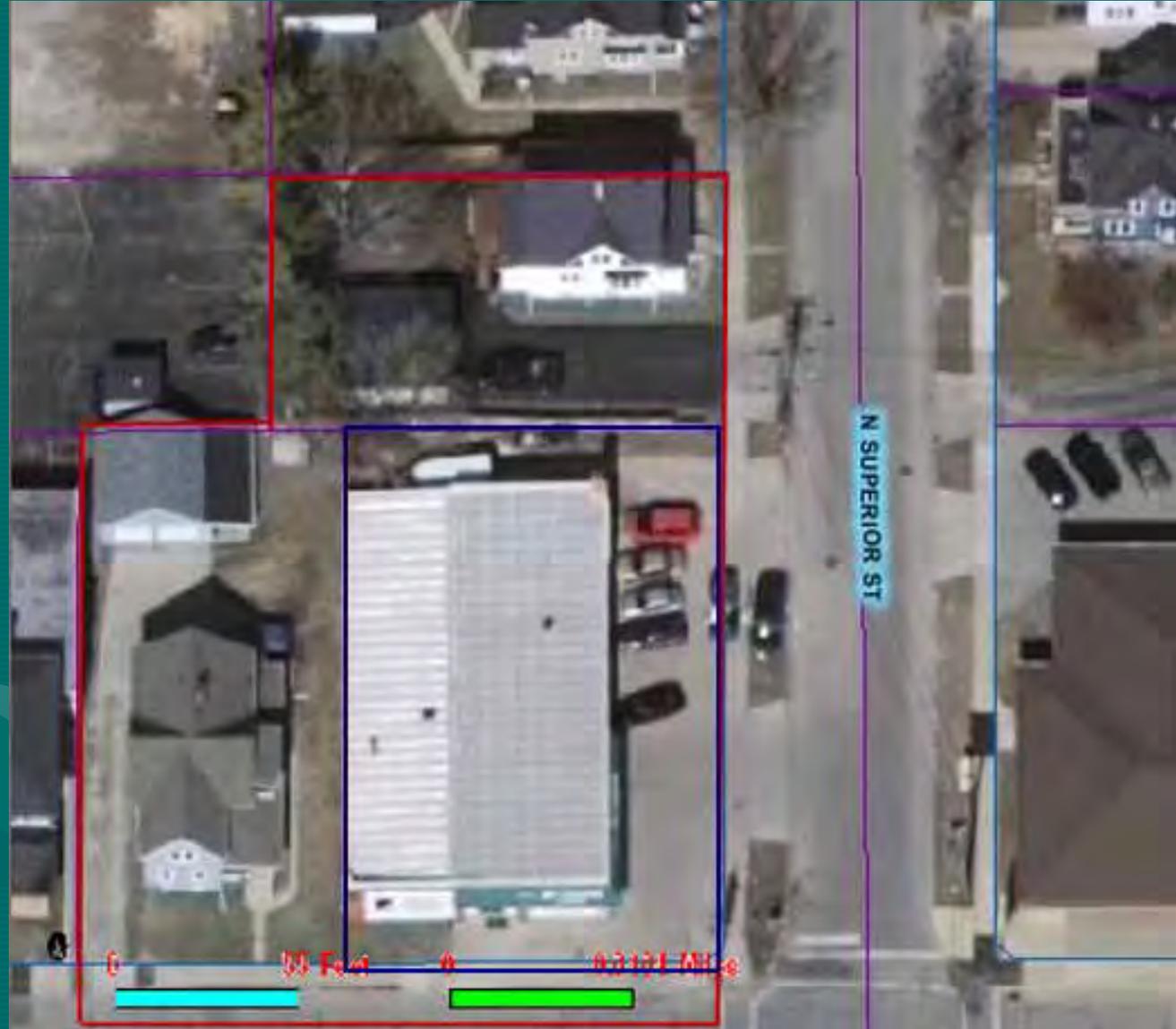
Team(*) & Stake-holders continued

- *Local Health Department (& DPW)
- Alderperson
- Local Fire Department (road closing)
- Mortgage Holder
- Responsible Party (property owner)
- Outagamie County Emergency Management

Step 3 – Prepare Your Approach

- How much of the neighborhood should be contacted?
- How will you distribute information?
- Is proactive media outreach necessary?
- What are the best and worst-case scenarios?
- Plan for safety

Environmental Study (ES) – Phase 1



Step 4 – ES1 –Approach Residents

- First mobilization – 2 homes
 - 1 owner occupied
 - 1 tenant occupied – owner in Black Creek
- Landlord/owners, tenants, attorneys
- Meet at their home or other location?
- Access agreement needed? (EPA in this case)

Step 5 – ES1 – Prepare Residents & Neighbors – March 2010

- Intermittents letters
- Access to locations
- Utility markers
- Info flyer
- Sub-slab vapor point installation

ES1 – Interferents

White out

Spray dust off for computer key boards

Gun cleaners, recently cleaned guns

Spray on (window) snow

Any items dry cleaned within the last two months

Metal polish

Boot sealant

Leather tanning products (Not quick Tan)

Stain removers

Degreasers (not Dawn)

And WD-40

Utility / Access Concerns



Step 6 – ES1 –Collect Data



ES1 – Collect Data



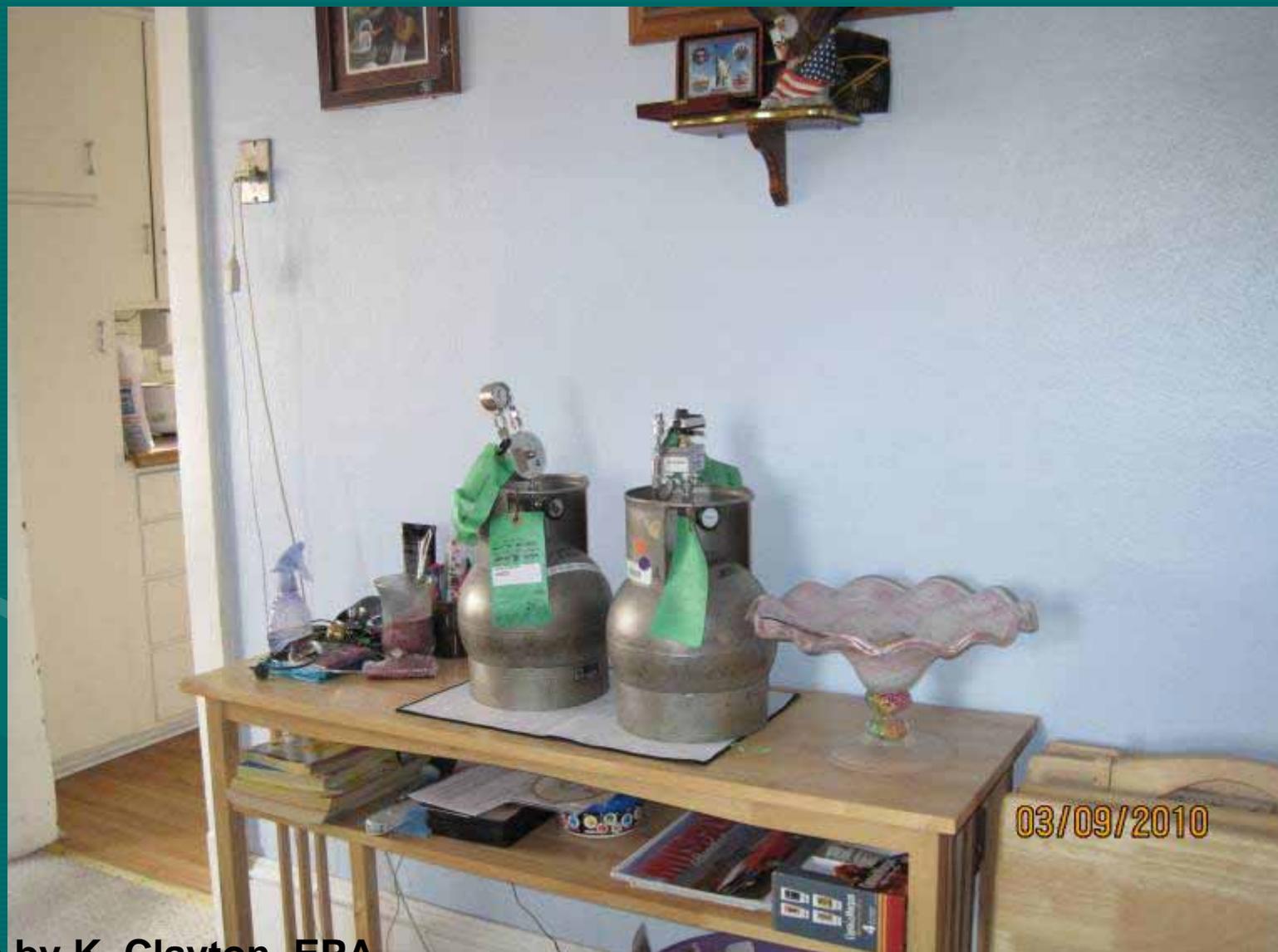
ES1 – Collect Data



ES1 – Collect Data



ES1 – Collect Data



ES1 – Collect Data



ES1 – Soil & GW Locations



ES1 – Soil Results

PCE = 228,000 $\mu\text{g}/\text{kg}$

TCE = 155,000 $\mu\text{g}/\text{kg}$

Cis,1-2 DCE = 7,180 $\mu\text{g}/\text{kg}$

ES1 – Groundwater Results

PCE = 36,600 $\mu\text{g/L}$

TCE = 17,400 $\mu\text{g/L}$

Cis-1,2-DCE = 26,900 $\mu\text{g/L}$

ES1 – Air Locations



ES1 – Air Results

Unit 002 –

- 1st floor - **PCE = 15.1/15.7 µg/m³**
(exceeds WDNR Vapor Action Level of 4.1 µg/m³)
- Basement – **PCE = 24.1 µg/m³**
(exceeds WDNR VAL)
- sub-slab - water in sample port (gw > ES adj. to home)
- Ambient – PCE = 7.05 µg/m³

ES1 – Air Locations



ES1 – Air Results

*Sampled by DHS & analyzed at State Lab of Hygiene

Unit 004 – inconclusive – ambient higher than IA –
no sub-slab - need full column

- * 1st floor – **PCE = 5.4 ppbV**
(exceeds WDNR VAL of 0.603 ppbV)
- * Basement – **PCE = 5.3 ppbV**
(exceeds WDNR VAL)
- sub-slab - Not Sampled (no on-site soil or gw data)
- Soil gas – PCE = 0.615 ppbV
(below WDNR Screening Level of 60.3 ppbV)
- * Ambient – **PCE = 29 ppbV** (higher than IA)

Step 7 – ES1 – Communicate Results

- DNR, DHS & AHD team
- Source property owner
- Owner-occupied (face-to-face)
- Tenant-occupied (letter to owner only)
- Other stake-holders (e-mail)

Decision:

4/12/10 – DNR requested additional EPA Assessment, Removal Action & Sub-slab Depressurization System Install (SSDS)

Step 8 - Expand & Repeat

- Select homes
- Re-visit approach
- What are new best and worst-case scenarios?

Environmental Study (ES) – Phase 2



Step 4R – ES2 – Approach Residents

- Second mobilization – 10 homes, 2 businesses
 - 9 owner-occupied (4 homes agreed)
 - 1 tenant-occupied (Unit 004)
 - 2 commercial – tenant business-occupied
- Landlord/owners, tenants, attorneys
- Initial letter, public meeting, follow-up letter & door-to-door
- Access agreements needed?

Step 5R – ES2 – Prepare Residents & Neighbors – August 2010

- Intermittents letters
- Access to locations (incl. road closure)
- Utility markers
- Info flyer
- Sub-slab vapor point installation

Step 6R - ES2 – Field Work



ES2 – Soil Gas Results

- Utility in road adjacent to dry cleaner –
PCE ranged 38.0 – 2.92 $\mu\text{g}/\text{m}^3$ (south-north)
(below WDNR Screening Level of 410 $\mu\text{g}/\text{m}^3$)
- Soil gas on properties –
PCE ranged 13.1 – 0.94 $\mu\text{g}/\text{m}^3$ (south-north)

ES2 – Air Results (8/10)

Unit 005 – inconclusive - 1st floor higher than basement - need resampling of full column

- 1st floor – PCE = 43.6 $\mu\text{g}/\text{m}^3$
(exceeds WDNR Vapor Action Level of 4.1 $\mu\text{g}/\text{m}^3$)
- Basement – PCE = 2.41 $\mu\text{g}/\text{m}^3$
- sub-slab - PCE = 9.16 $\mu\text{g}/\text{m}^3$
(WDNR sub-slab SL of 41 $\mu\text{g}/\text{m}^3$ not exceeded)
- Ambient – PCE < 0.203 $\mu\text{g}/\text{m}^3$

Units 006, 007 & 008 – low impact

ES2 Resampling– Air Results (9/10)

Unit 005 – inconclusive – 1st floor still higher than basement & water in sub-slab port - need resampling of full column

- 1st floor – PCE = 2.82 $\mu\text{g}/\text{m}^3$
(WDNR VAL of 4.1 $\mu\text{g}/\text{m}^3$ not exceeded)
- Basement (on stool) – PCE = 1.41 $\mu\text{g}/\text{m}^3$
- Basement (on floor) – PCE = 1.40 $\mu\text{g}/\text{m}^3$
- sub-slab - water in sample port

Step 7R – ES2 – Communicate Results

- DNR, DHS & AHD team
- Source property owner
- Owner-occupied w/ exceedance (face-to-face)
- Owner-occupied w/o exceedance (letter only)
- Update Alderperson & DPW

Step 9 – Coordinate Removal

- Assist EPA OSC
- Note site restrictions: fence, overhead lines, utilities, ingress & egress
- Access agreements
- Road closure
- Utilities
- Pathway for haz waste transport
- Coordinate space (excavation, roll-offs, equipment, backfill, customers, etc)

Step 10 – Prepare for Removal and Vapor Mitigation – Sept 2010

- Informational flyer for distribution
- Clear space
- Road closure

Removal Preparations - Utilities



Removal Preparations - Utilities



Removal Preparations - Utilities



Removal Preparations - Utilities



Removal Preparations – Road Closure / Parking Restrictions



Step 11 - Removal – Excavation



Removal – Excavation



ES-Phase 1 – Field Work



**Active gas line
not marked!!**

Removal – Excavation



Removal – Excavation



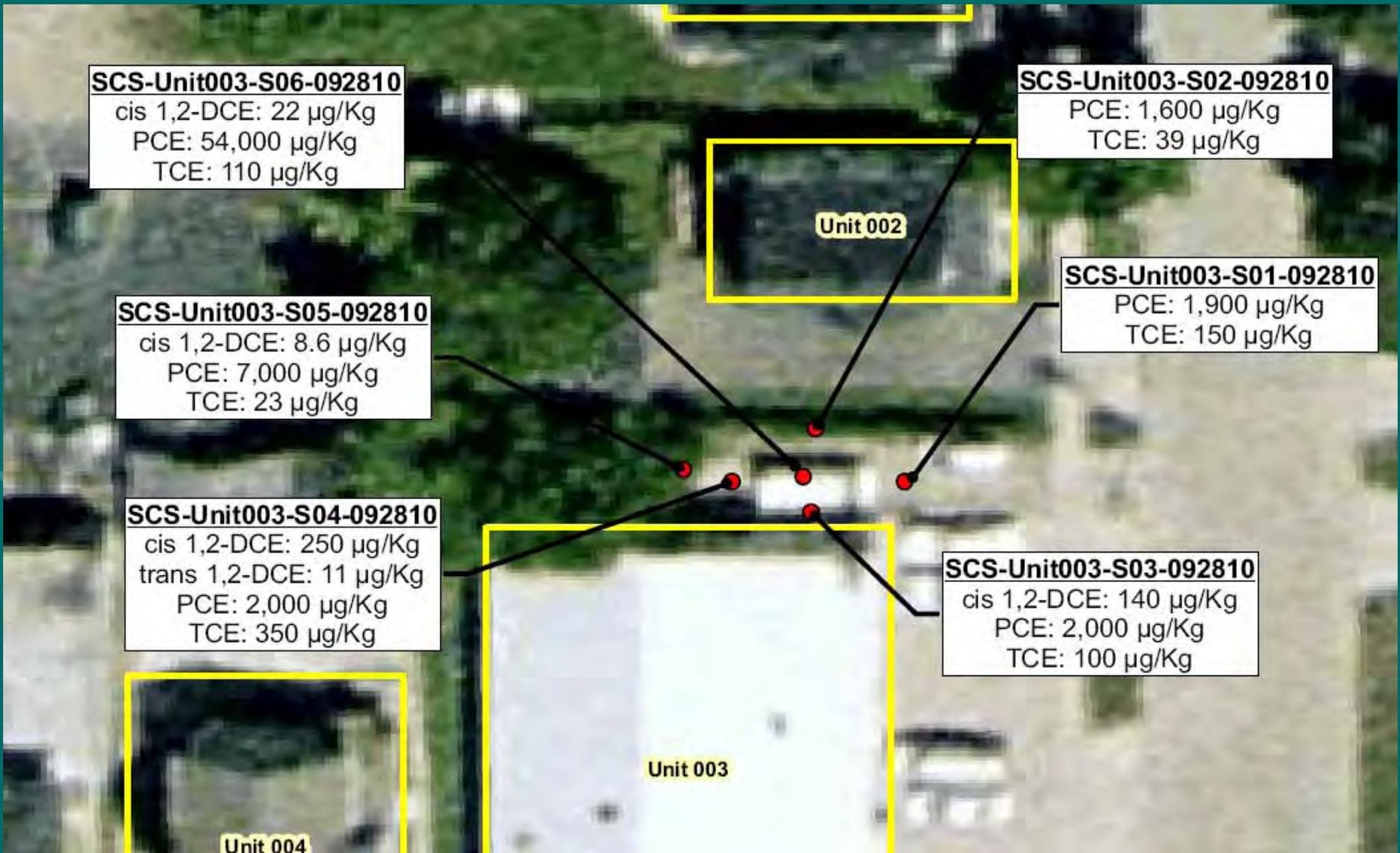
Removal – Hydrogen Releasing Compound (HRC)-Extended(X)



Removal – HRC-X



Post-Removal Soil Results



SCS-Unit003-S06-092810

cis 1,2-DCE: 22 µg/Kg
PCE: 54,000 µg/Kg
TCE: 110 µg/Kg

SCS-Unit003-S02-092810

PCE: 1,600 µg/Kg
TCE: 39 µg/Kg

Unit 002

SCS-Unit003-S05-092810

cis 1,2-DCE: 8.6 µg/Kg
PCE: 7,000 µg/Kg
TCE: 23 µg/Kg

SCS-Unit003-S01-092810

PCE: 1,900 µg/Kg
TCE: 150 µg/Kg

SCS-Unit003-S04-092810

cis 1,2-DCE: 250 µg/Kg
trans 1,2-DCE: 11 µg/Kg
PCE: 2,000 µg/Kg
TCE: 350 µg/Kg

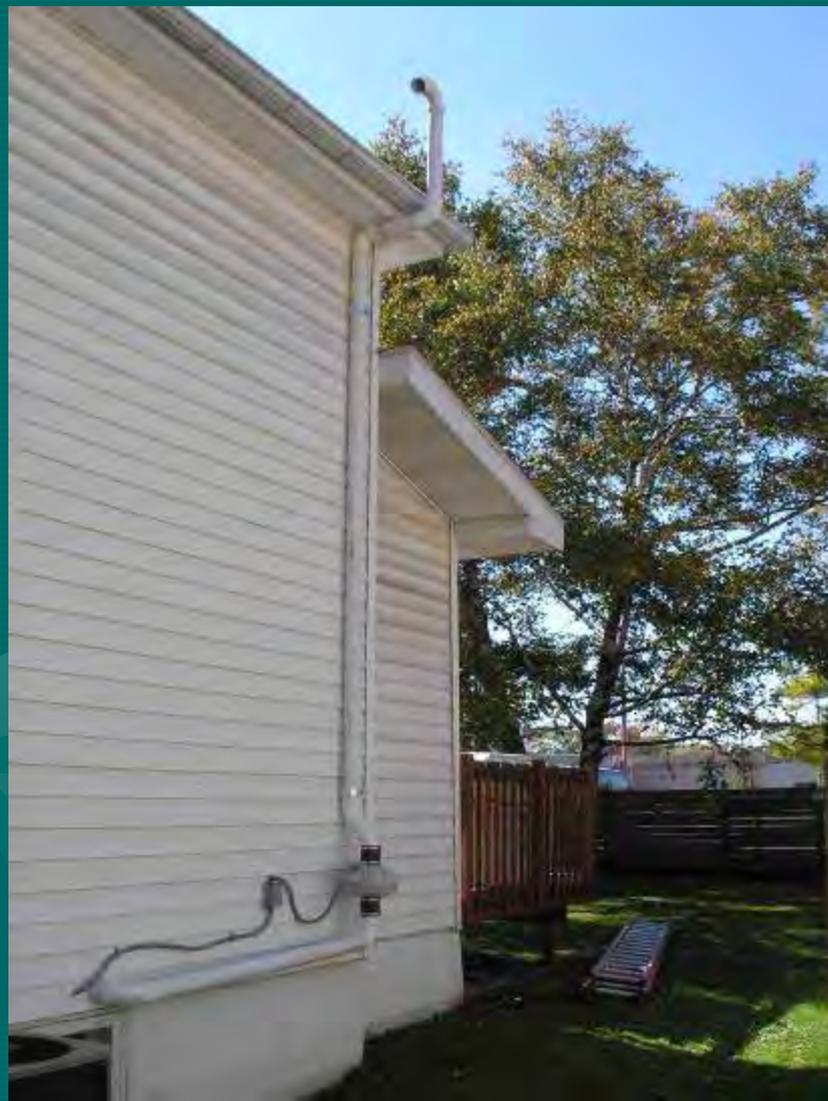
SCS-Unit003-S03-092810

cis 1,2-DCE: 140 µg/Kg
PCE: 2,000 µg/Kg
TCE: 100 µg/Kg

Unit 003

Unit 004

Vapor Mitigation – Install Sub-Slab Depressurization System (SSDS)



Vapor Mitigation – Install SSDS



Vapor Mitigation – Install SSDS



Step 12 – Identify Future Actions

- ✓ Continue full-column sampling at inconclusive residence (Unit 005)
- ✓ Vapor mitigation performance sampling at 30-days & 90-days at home with SSDS (Unit 002)
- EPA soil performance sampling in spring 2011
- DNR monitoring well installation in spring 2011
- EPA – Possible re-application of HRC-X or other in-situ treatment
- DNR – Eventual off-site soil delineation at Unit 004 & Long-Term Monitoring (LTM)

30-Day Vapor Mitigation Performance Sampling – Unit 002 (11/10)

- 1st floor - **PCE = 9.22/9.29 μg/m³**
(exceeds WDNR Vapor Action Level of 4.1 μg/m³)
- Basement – **PCE = 9.16 μg/m³**
(exceeds WDNR VAL)
- sub-slab - water in sample port
(gw > ES adj. to home)
- Ambient – PCE = 2.49 μg/m³

90-Day Vapor Mitigation Performance Sampling – Unit 002 (2/11)

- 1st floor - **PCE = 6.58/6.73 $\mu\text{g}/\text{m}^3$**
(exceeds WDNR Vapor Action Level of 4.1 $\mu\text{g}/\text{m}^3$)
- Basement – **PCE = 6.61 $\mu\text{g}/\text{m}^3$**
(exceeds WDNR VAL)
- sub-slab - water in sample port
(gw > ES adj. to home)
- Ambient – PCE < 0.203 $\mu\text{g}/\text{m}^3$
- Next event scheduled for May 2011

Resampling Unit 005– Air Results

(2/11)

- 1st floor – PCE = $0.395 \text{ } \underline{\mu\text{g}/\text{m}^3}$
(WDNR VAL of $4.1 \text{ } \underline{\mu\text{g}/\text{m}^3}$ not exceeded)
- Basement (on stool) – PCE = $0.316 \text{ } \underline{\mu\text{g}/\text{m}^3}$
- Basement (on floor) – PCE = $0.311 \text{ } \underline{\mu\text{g}/\text{m}^3}$
- sub-slab - water in sample port
- Ambient – PCE < $0.203 \text{ } \underline{\mu\text{g}/\text{m}^3}$
- No further sampling planned

Points of Interest for Study, Removal & Mitigation

- Off-site participation of air study voluntary in this scenario
- Off-site exemption does not apply to air
- Plan for best & worst-case contingencies early in process (i.e. no sub-slab data)
- Local stake-holders involvement critical

Summary of Coordination

1. Gather information
2. Develop your team & identify stakeholders
3. Prepare your approach
4. Approach residents
5. Prepare site, residents & neighbors
6. Collect data
7. Communicate results
8. Expand and repeat process if necessary
9. Coordinate Removal and/or Vapor Mitigation
10. Prepare site, residents & neighbors
11. Perform Removal and/or Vapor Mitigation
12. Identify future actions

Questions?

