Air & Waste Management Association, Vapor Intrusion Specialty Conference

Soil Vapor Migration Through Subsurface Utilities

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Presentation Outline

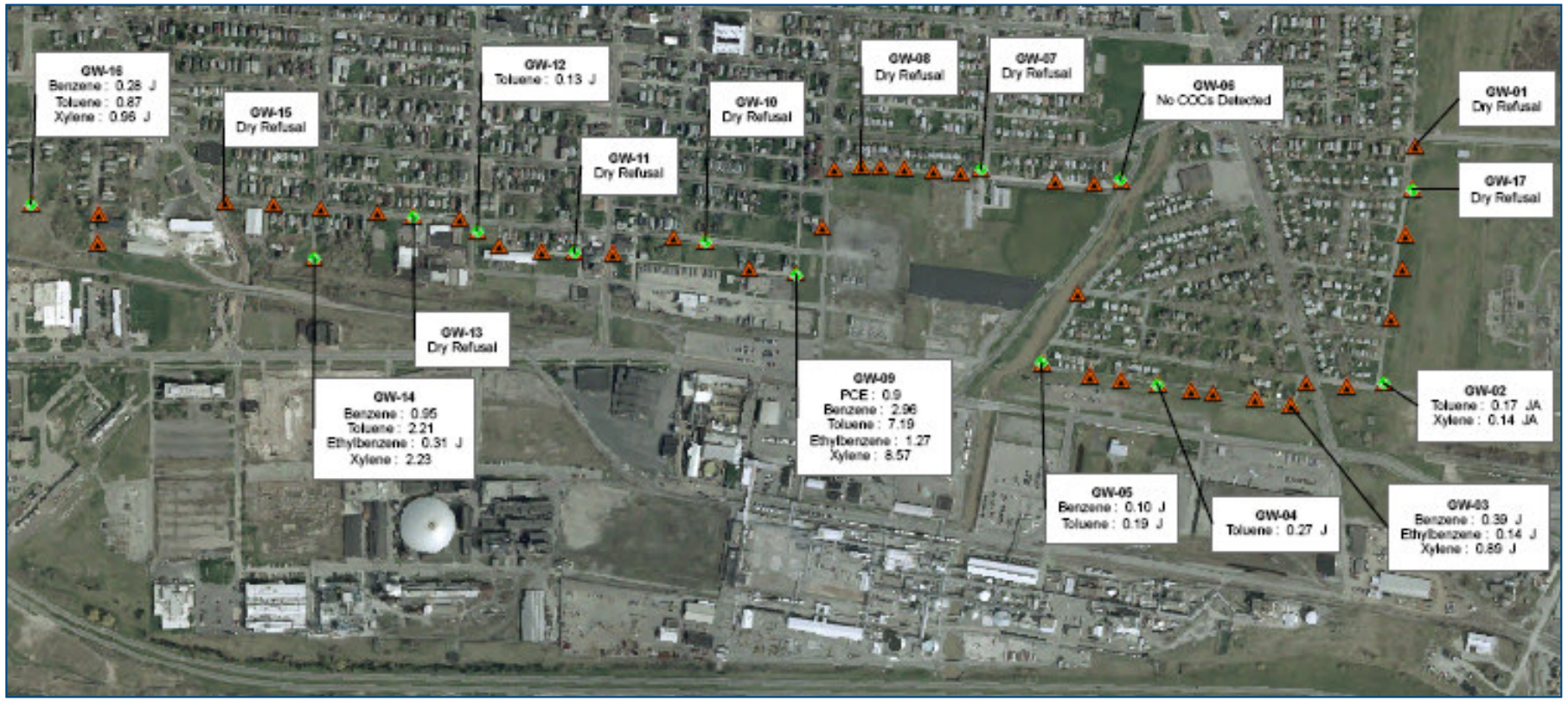
- Initial Investigation
- Investigation Area
- Subsequent Investigation
  - Approach
  - Results

Initial Investigation

- State agency initial investigation
  - Residential area adjacent to industrial area

Initial Investigation (cont'd)

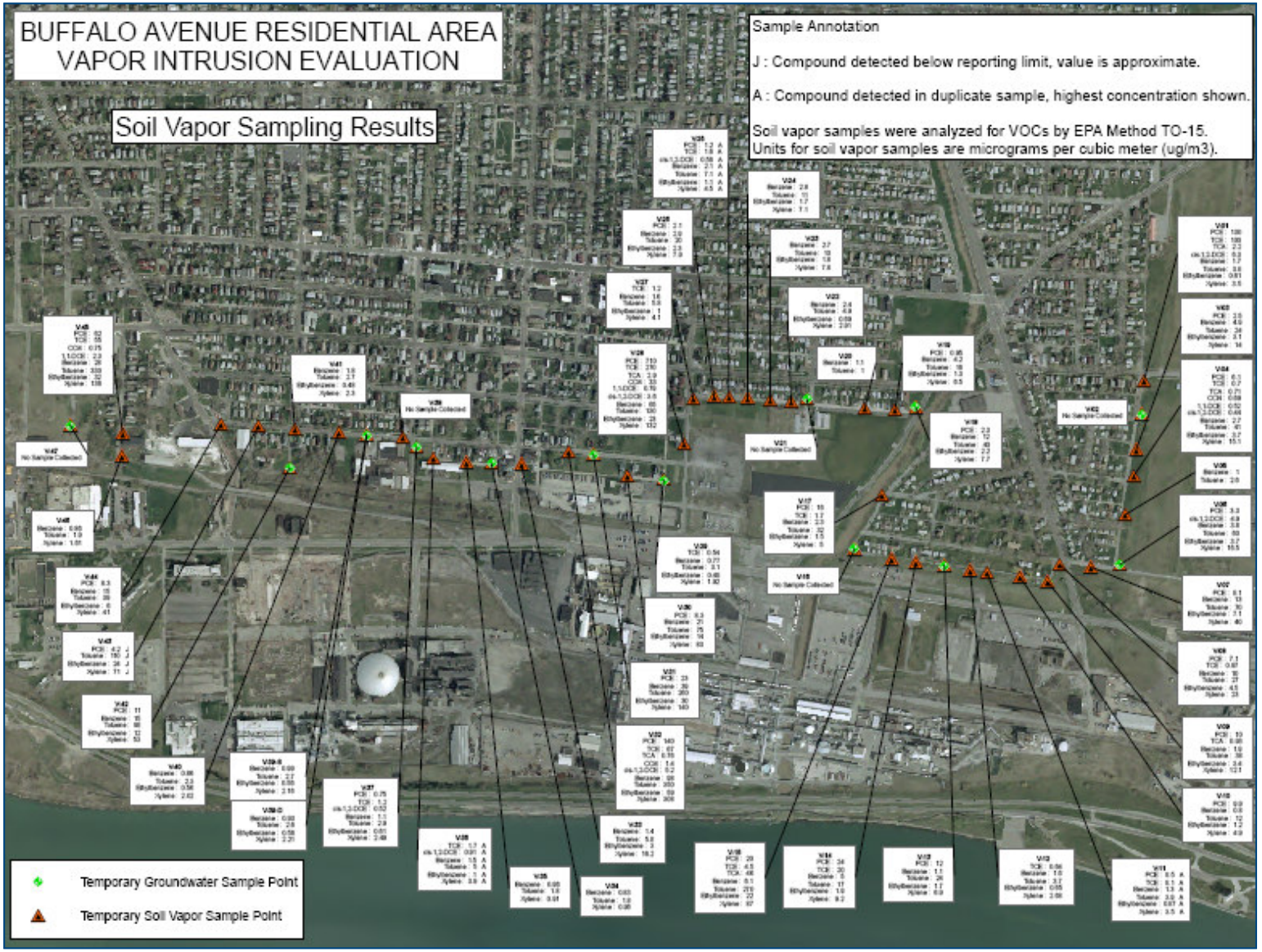
- Limited detections of PCE and TCE in shallow groundwater
  - No detections in 7 of 9 wells
  - BTEX (low levels) found in 8 of 9 wells



Initial Investigation (cont'd)

- Sporadic detections of PCE and TCE in soil vapor
  - PCE in 26 of 43 sample points (3 >100 µg/m^3)
  - TCE in 16 of 43 sample points (4 >50 µg/m^3)

Initial Investigation (cont'd)



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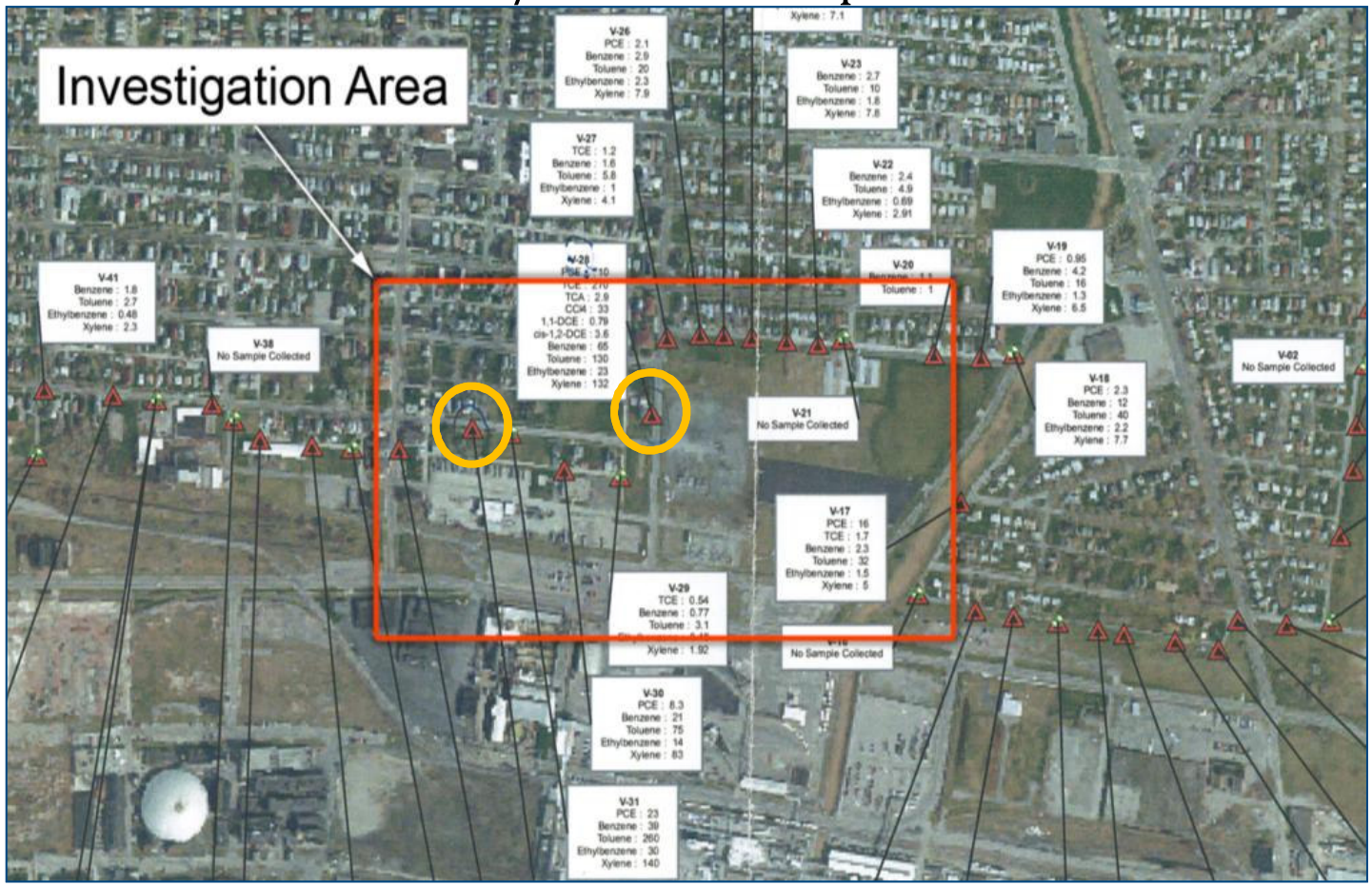
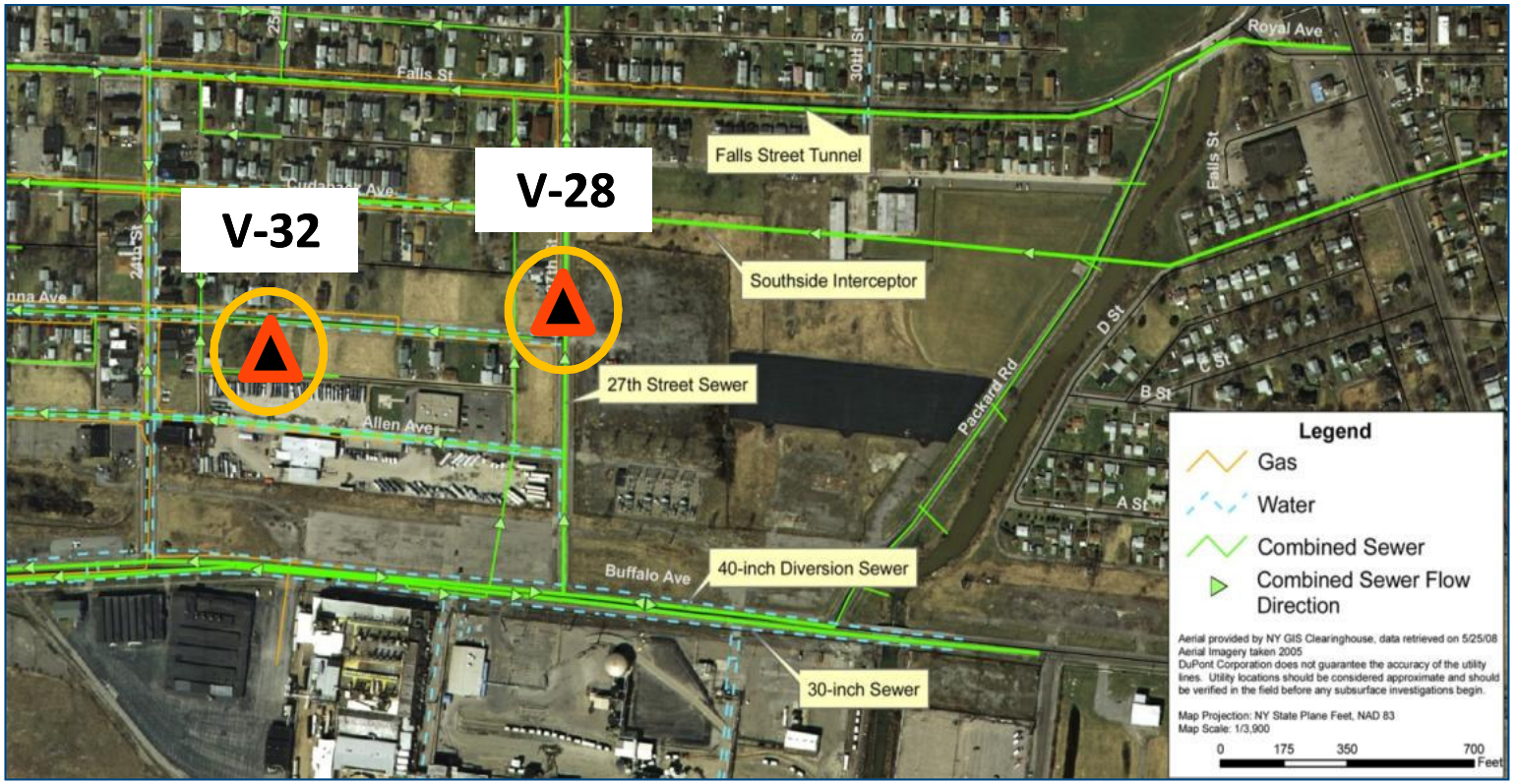
Subsequent Investigation Objective

- Further investigation required by State agency
  - In area of 3 highest PCE and TCE soil vapor results
  - What is source of PCE / TCE in soil vapor ?



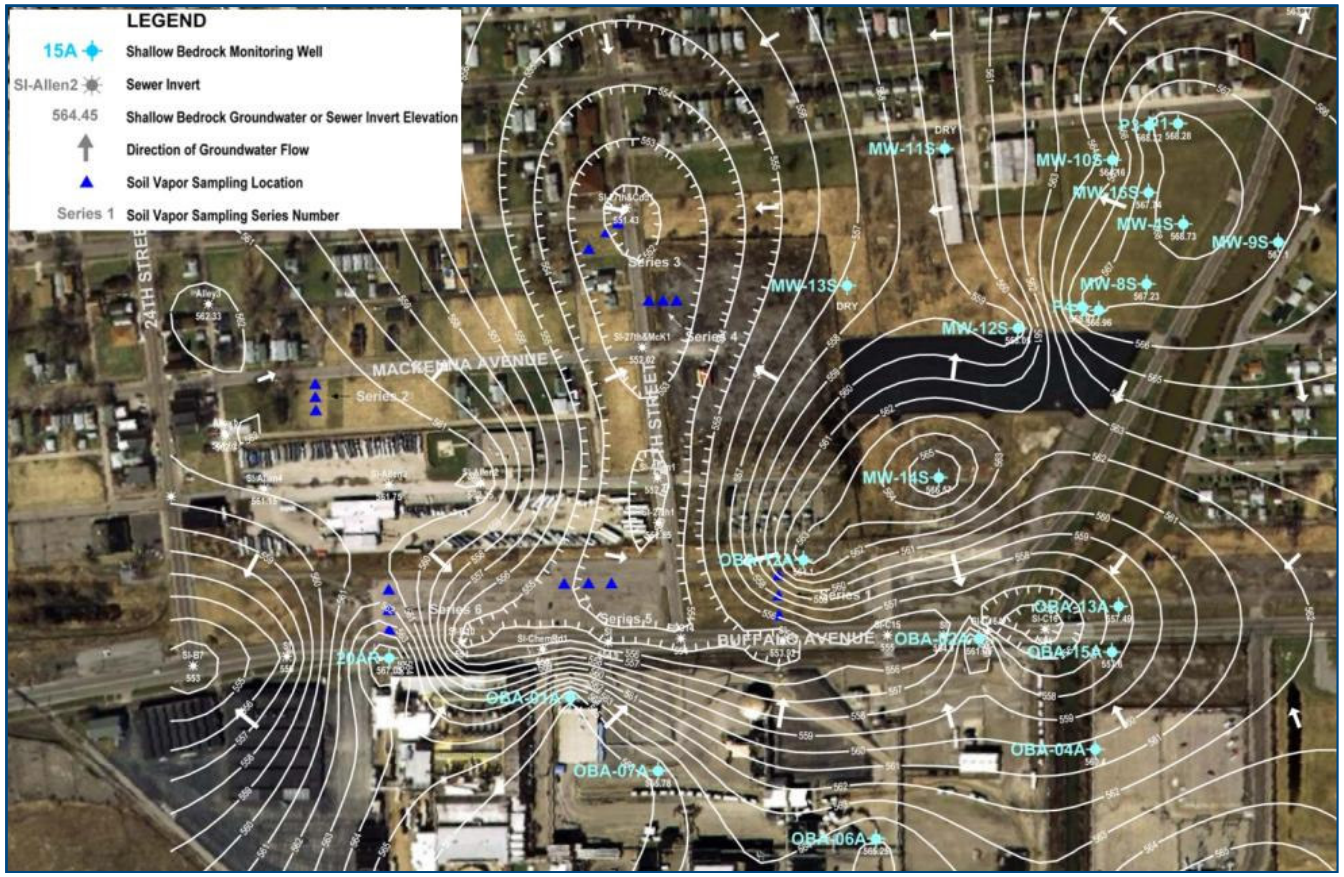
Investigation Area

- Geology
  - 4-10 foot clay / glacial till overburden on top of bedrock
- Subsurface utilities
  - Under most streets, incised in bedrock, 8-13 bgs



Investigation Area (cont'd)

- Hydrogeology
  - 2-6 feet bgs
  - Shall flow vertically downward and toward incised sewers



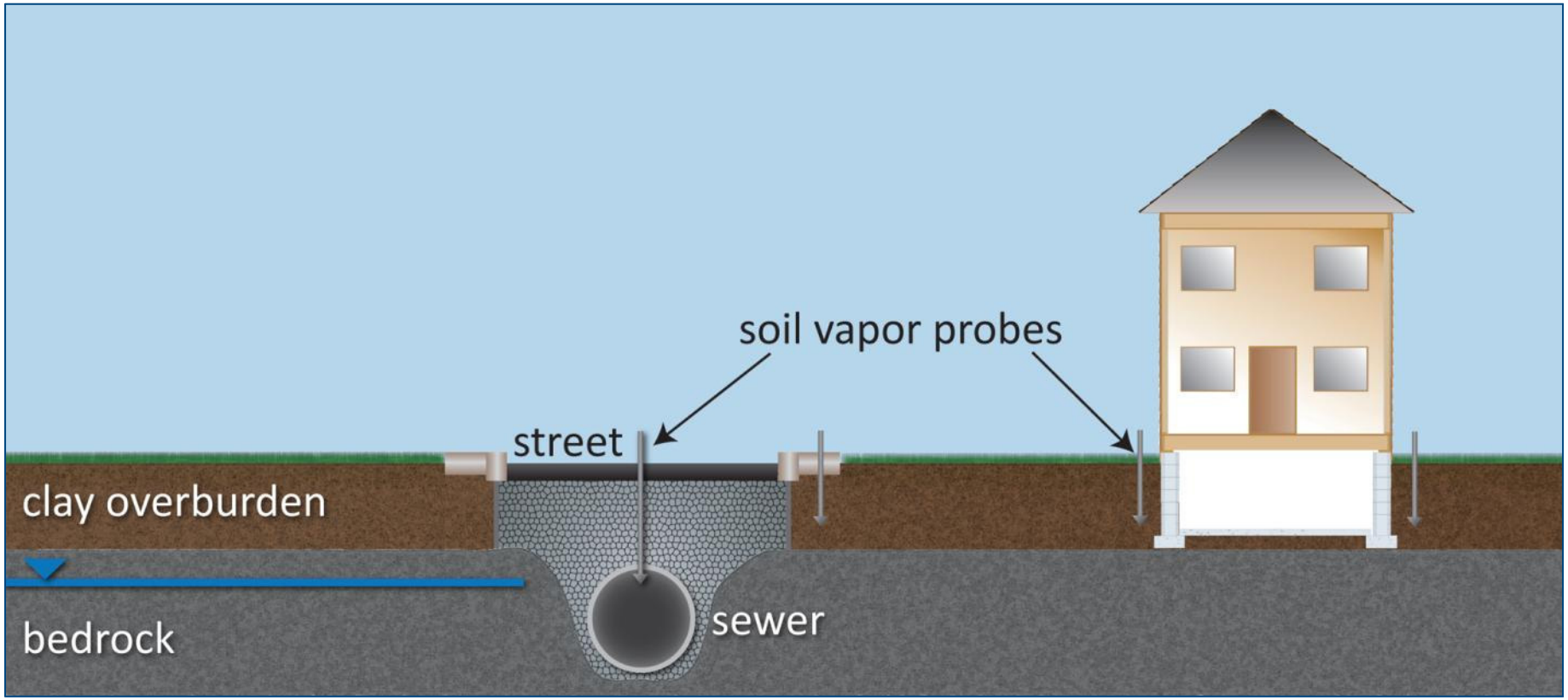
Investigation Goals

1. **Develop soil vapor conceptual model**
   - Groundwater plume
     - Lack of GW detections
     - Sporadic soil vapor detections
   - Vadose zone migration
     - Shallow and low porosity vadose zone
     - Significant distance between industrial area and soil vapor detections
   - Subsurface utility migration
     - Sewers within residential area and between industrial area
2. **Assess potential of SVI**

Field Investigation

- **Sampling objectives**
  - Evaluate SV migration from sewers
  - Evaluate the potential for migration to buildings
- **Sampling approach**
  - Soil vapor
    - 6 series of 3 sample points
    - Each series at increasing distances from respective sewer
      - 1 – near sewer
      - 2 – represent front house setback
      - 3 – represent back of house setback
  - Sewer vapor
  - Lateral utility

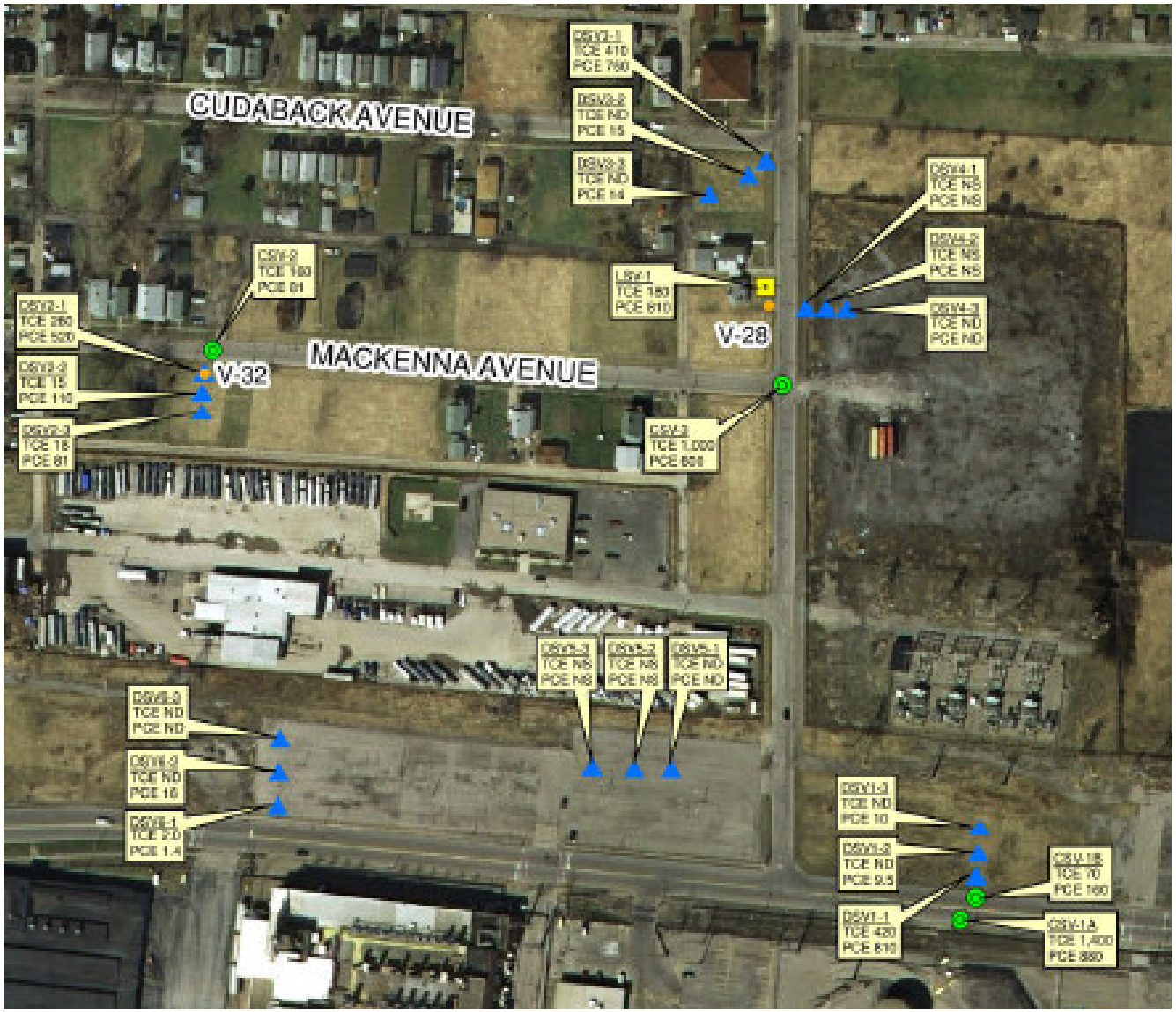
Conceptual Elevation Schematic



Soil Vapor Sampling

Soil Vapor Sampling

Sample Results



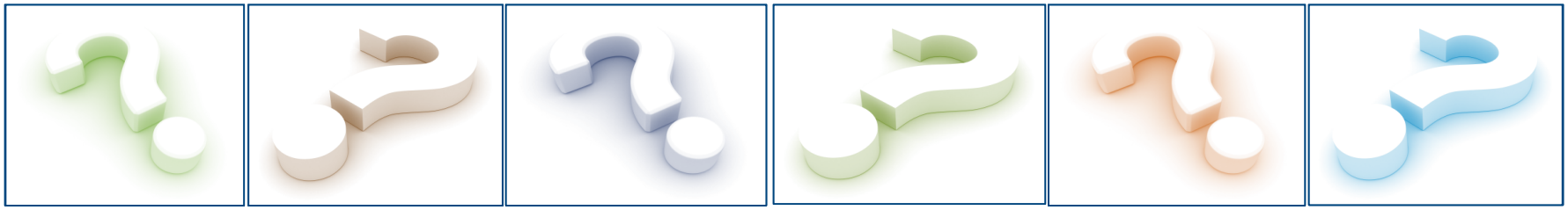
Sampling Results

		PCE	TCE
Series	Point	µg/m³	µg/m³
1	S	160-880	70 -1400
	1	810	420
	2	10	ND
	3	10	ND
2	S	81	160
	1	520	260
	2	110	15
	3	81	18
3	S	600	1000
	1	750	410
	2	15	ND
	3	14	ND

Conclusions

- TCE / PCE present or migrating through utility corridor
- Soil vapor diffusion in overburden is limited
- Primary industrial discharge along Buffalo Ave./27th Street may be contributing to soil vapor in the utility corridor

QUESTIONS?



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THANK YOU

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