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VAPOR INTRUSION

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High Volume Sampling for Rapid Subsurface Investigation

presented by | Justin Knight, P.E.
Atlanta, GA

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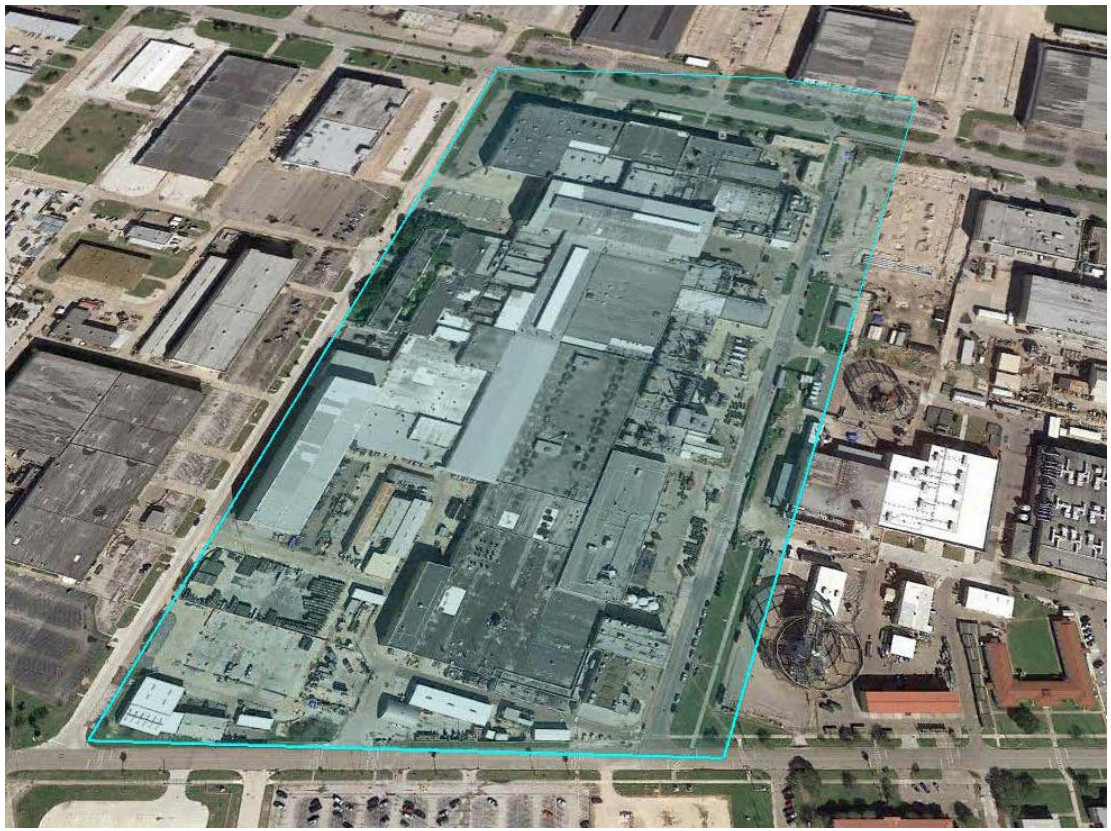
20-Acre Building: How many samples do I need?



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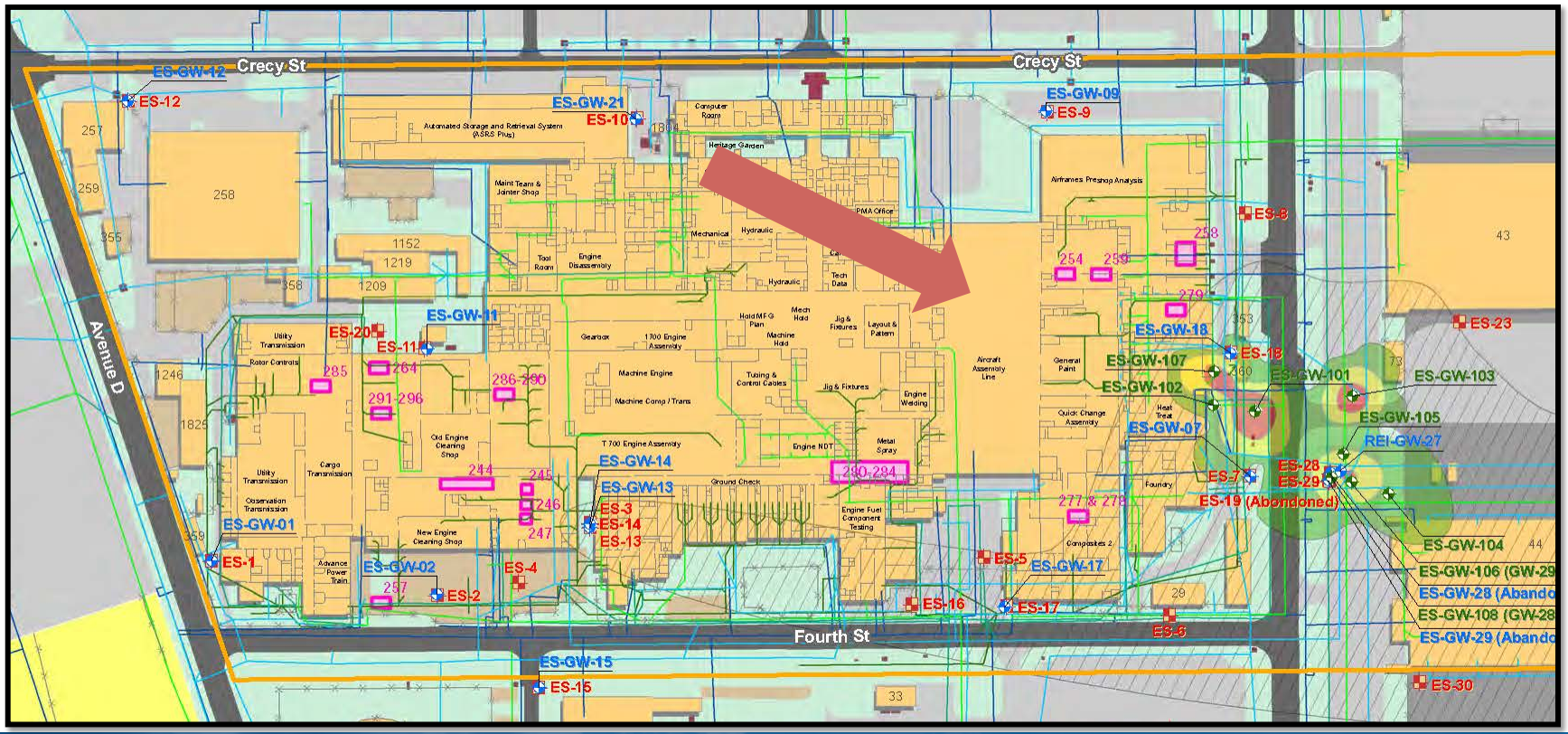
What We Know



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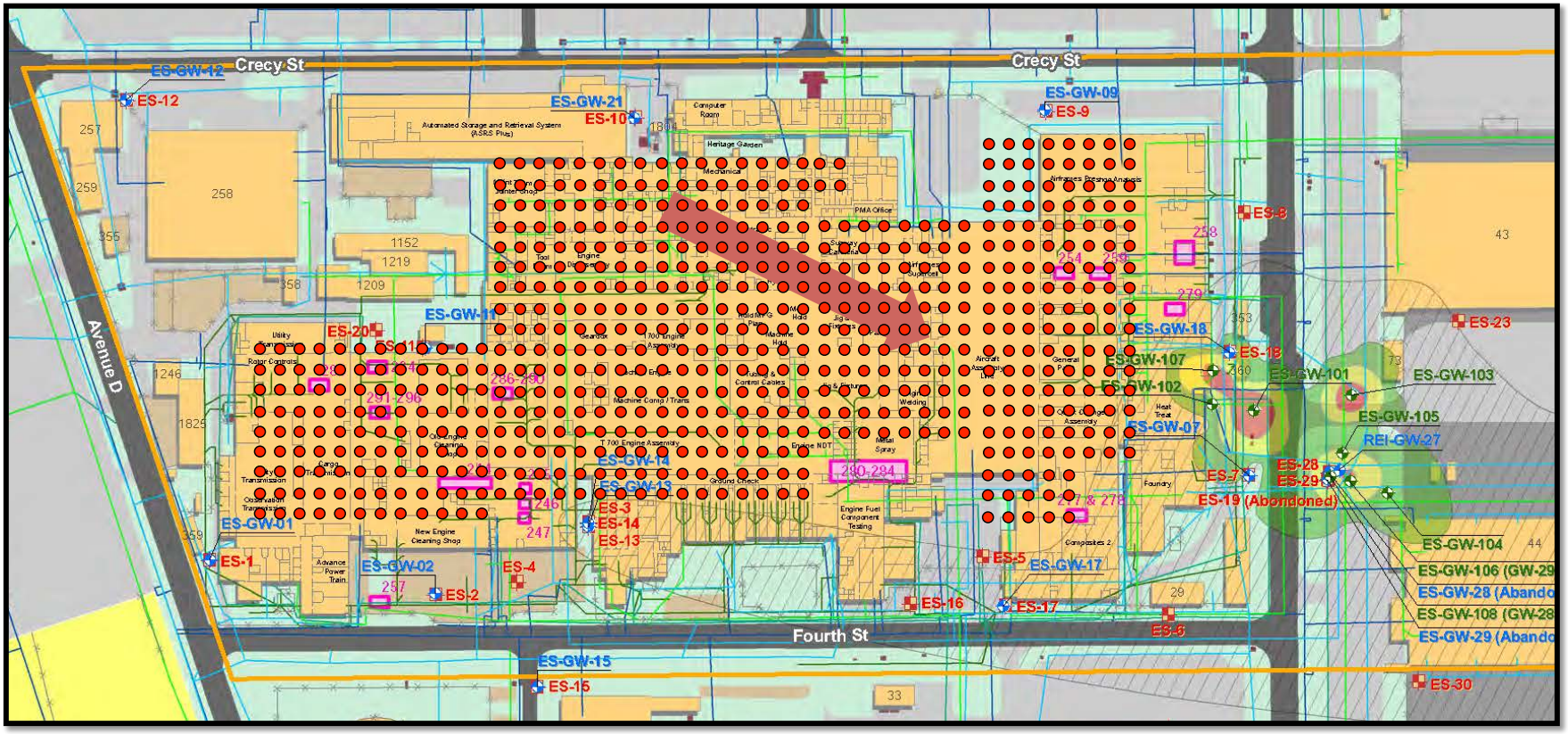
Challenge: Spatial Variability in Sub-slab Soil Gas



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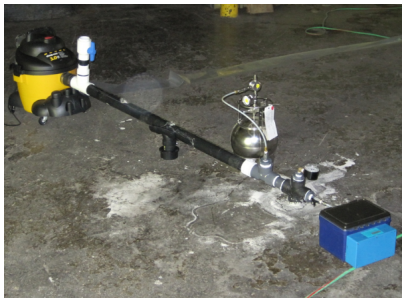
Managing Uncertainty in VI Data

	Discrete	Integrated
Temporal Variability	8 to 24-Hour Time Weighted Average 	30-day Time Weighted Average 
Spatial Variability	1-Liter Volume Weighted Average 	High Volume Sampling 

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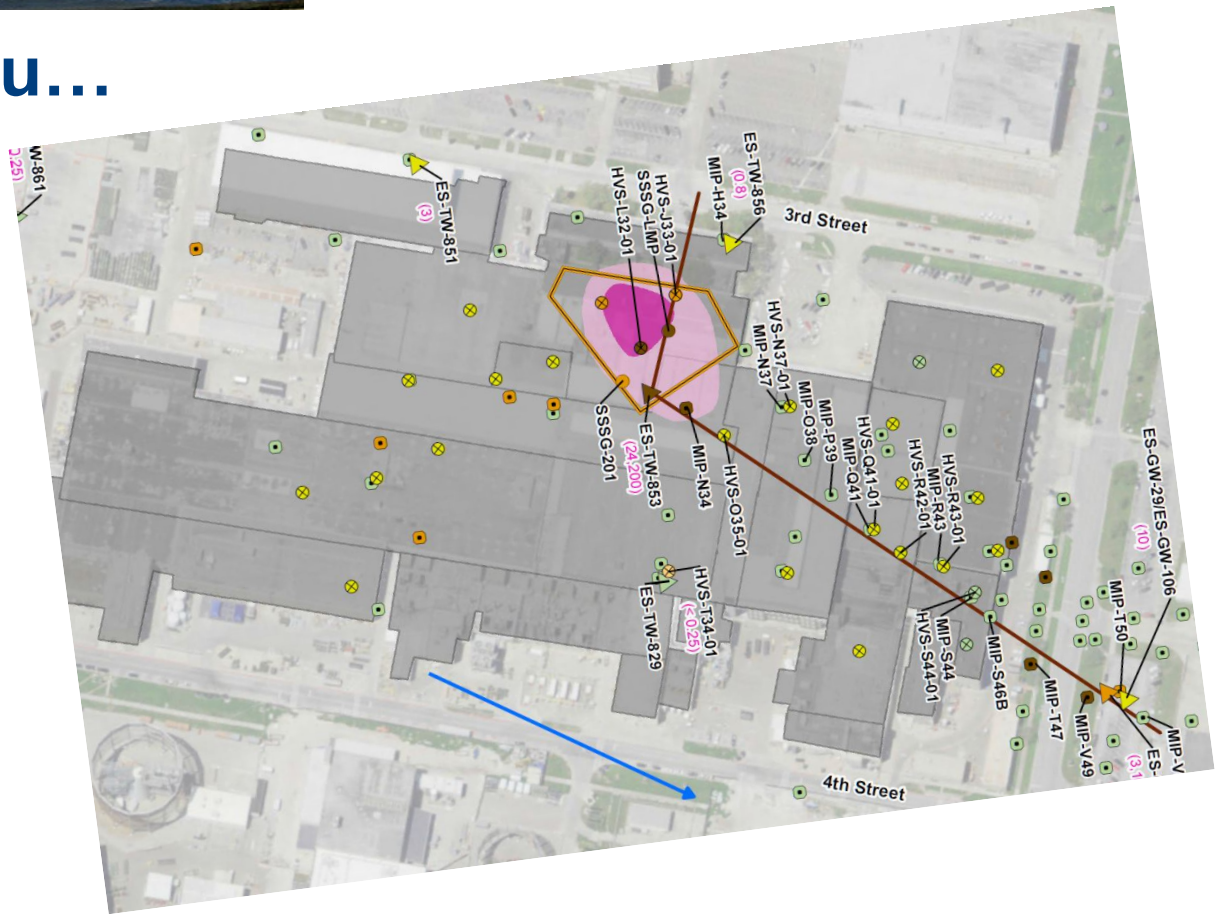
What if I told you…

- 27 locations
- 2 weekends of work
- Demonstrated absence of sources
- Focused attention where needed
- No interruption to operations



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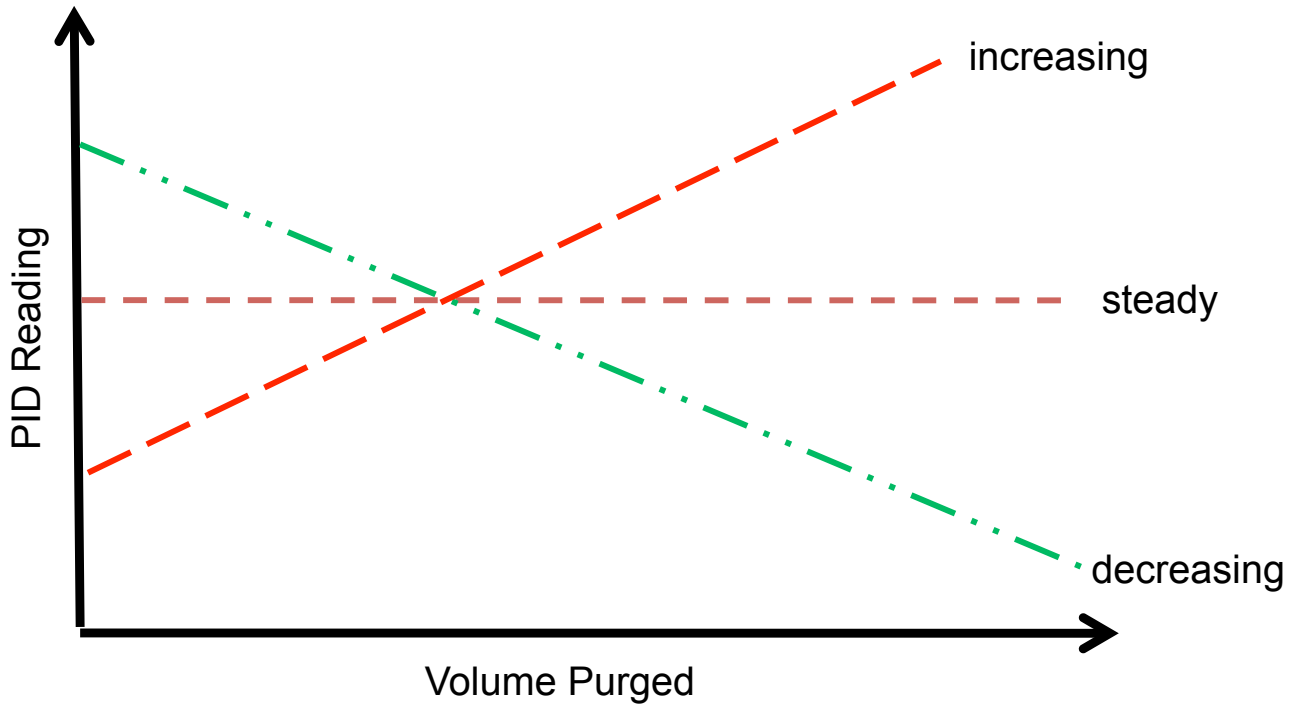
Managing Spatial Variability: High Volume Sub-Slab Sampling (HVS)

PID Reading vs. Volume Purged



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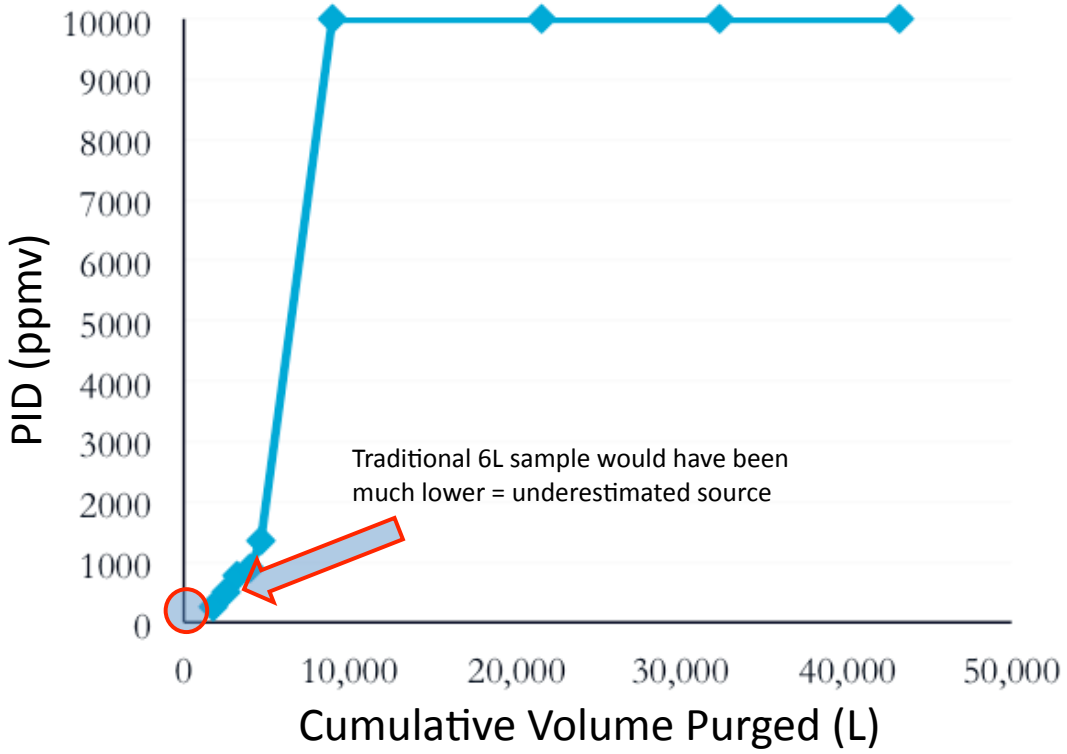
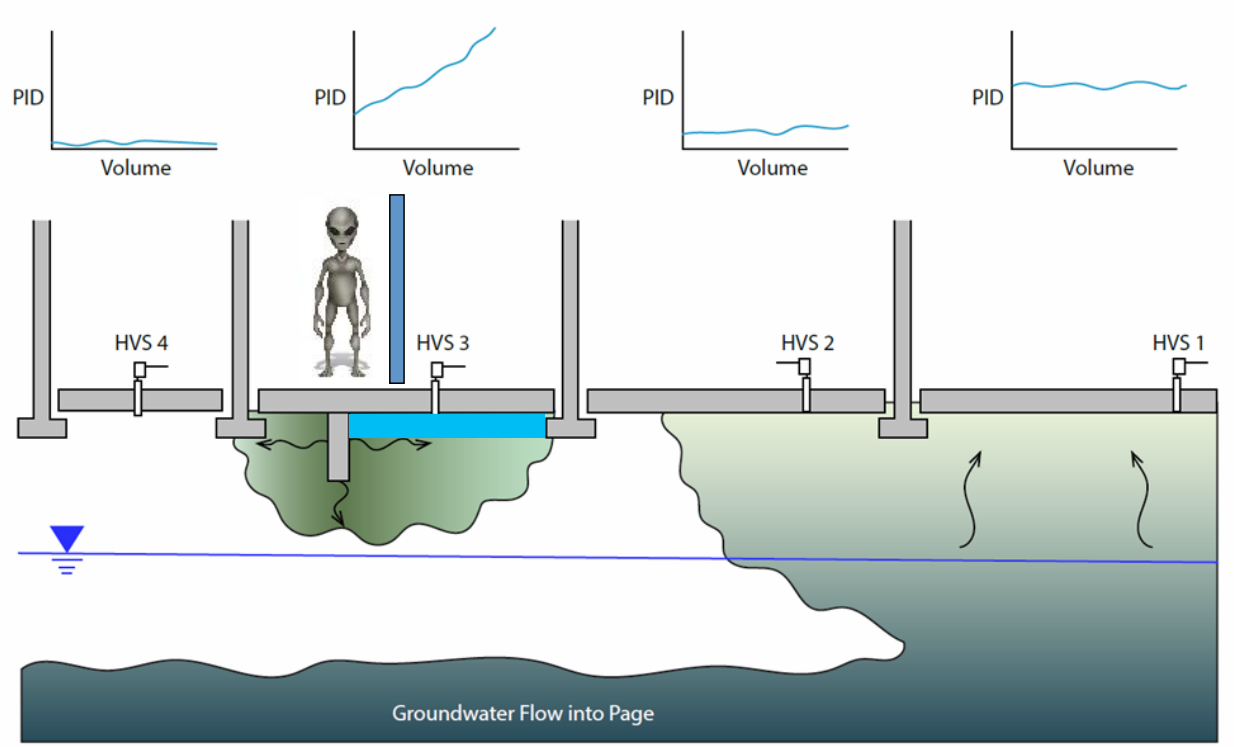
What does this tell us?



HVS: Relating Field Data to Source Geometry



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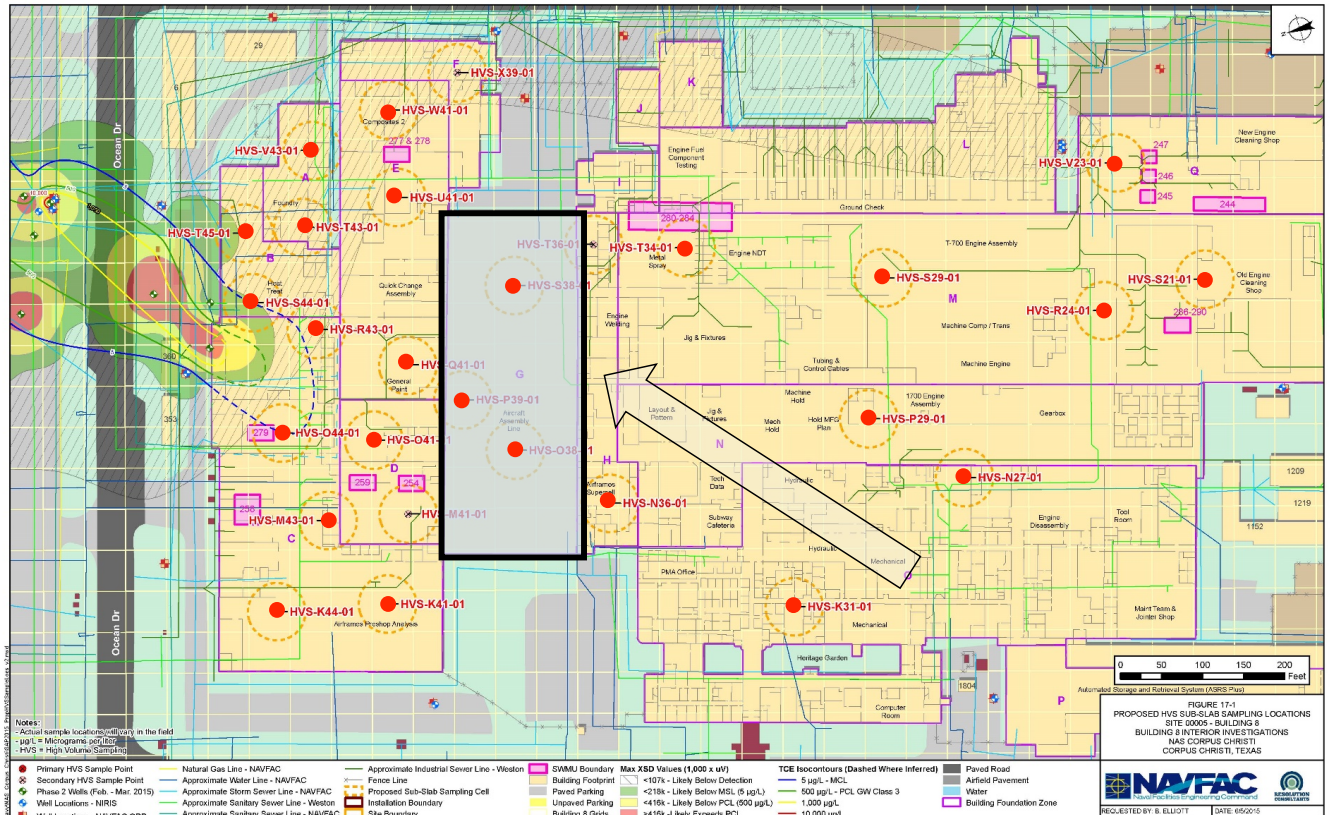
Locating HVS Locations



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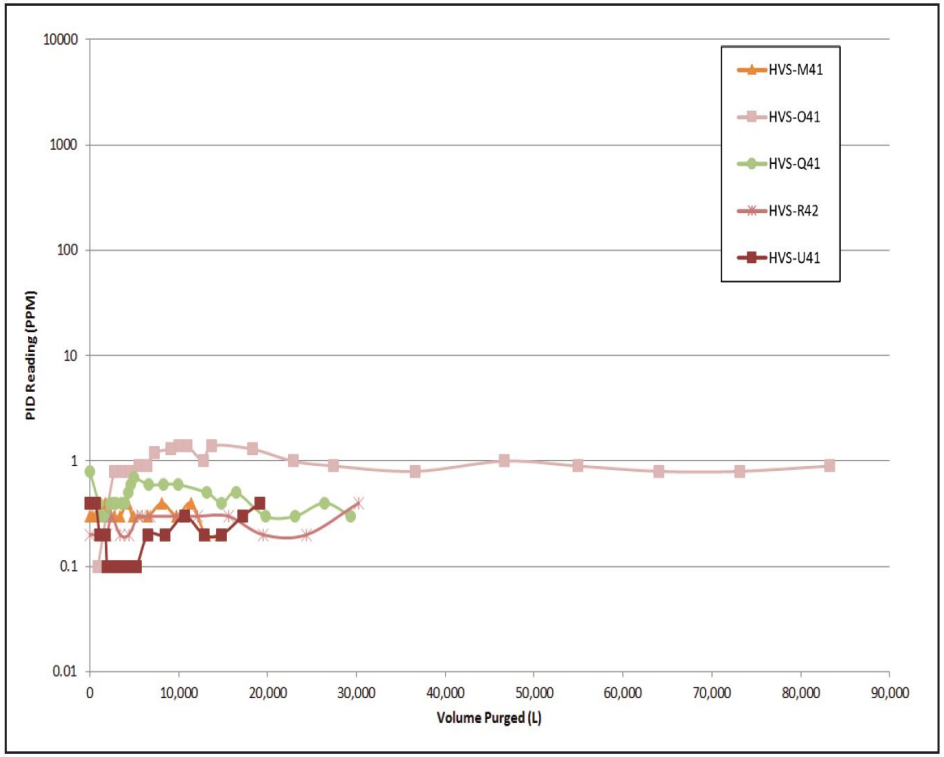
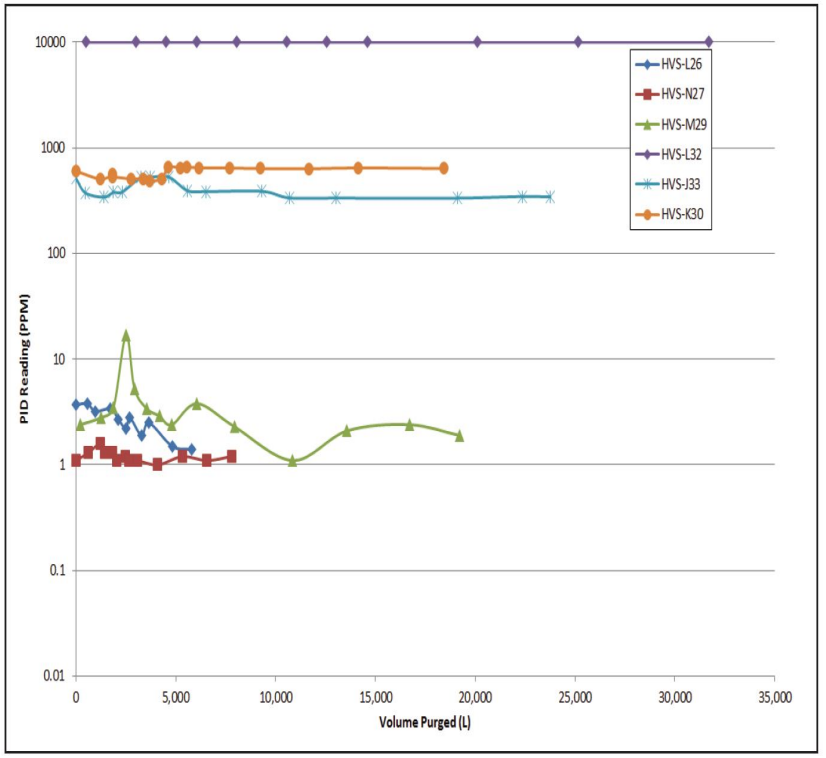
Total Organic Vapor v. Volume Purged





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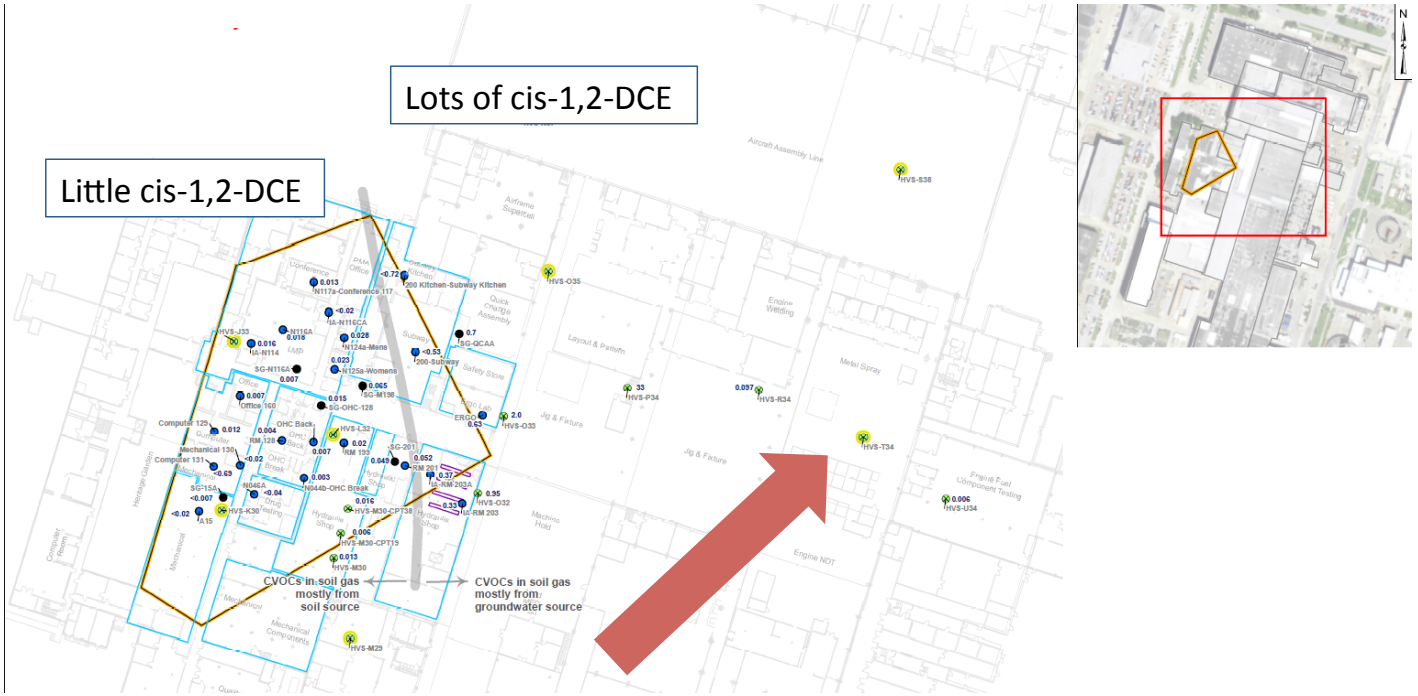
Cis-1,2-DCE / TCE ratios:
Using lab results to refine the CSM



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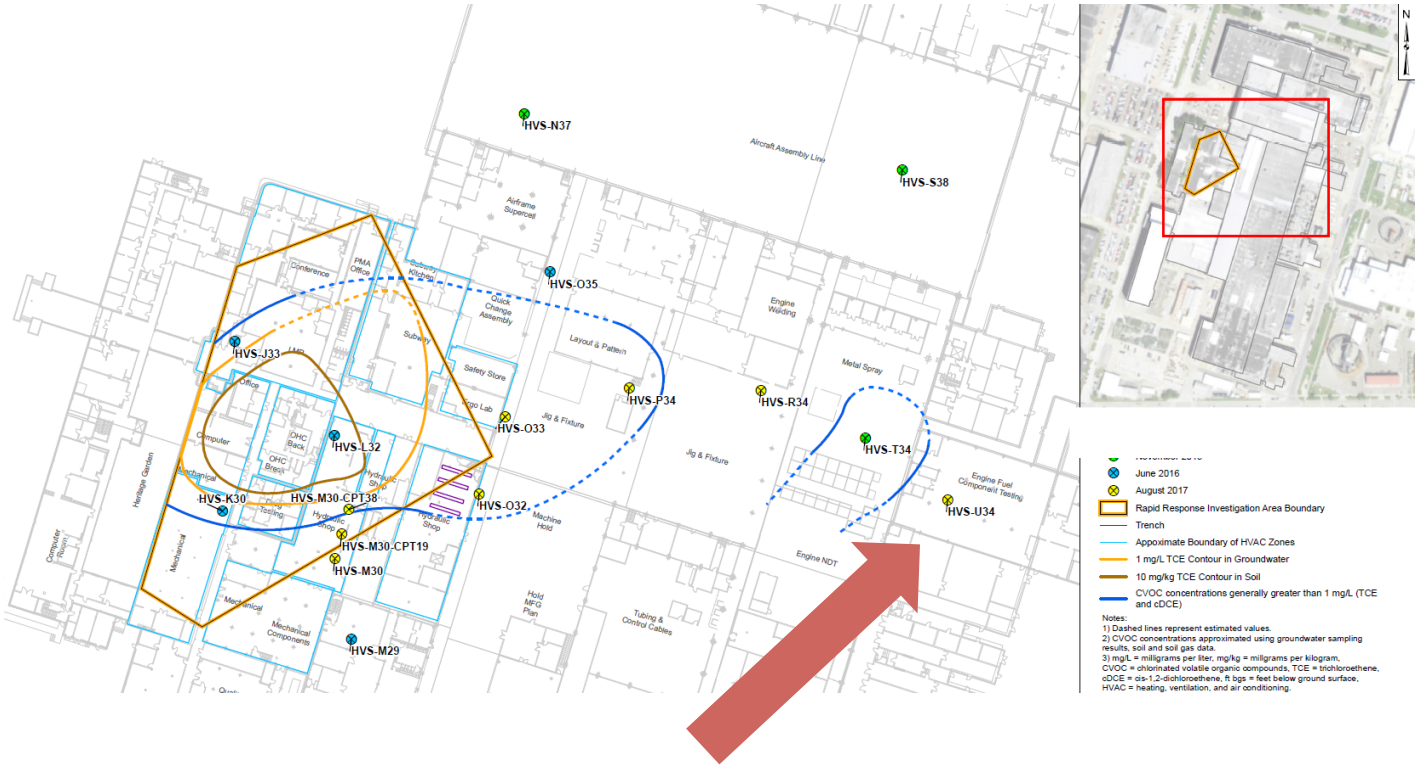
Layer in Soil and Groundwater data to Refine CSM



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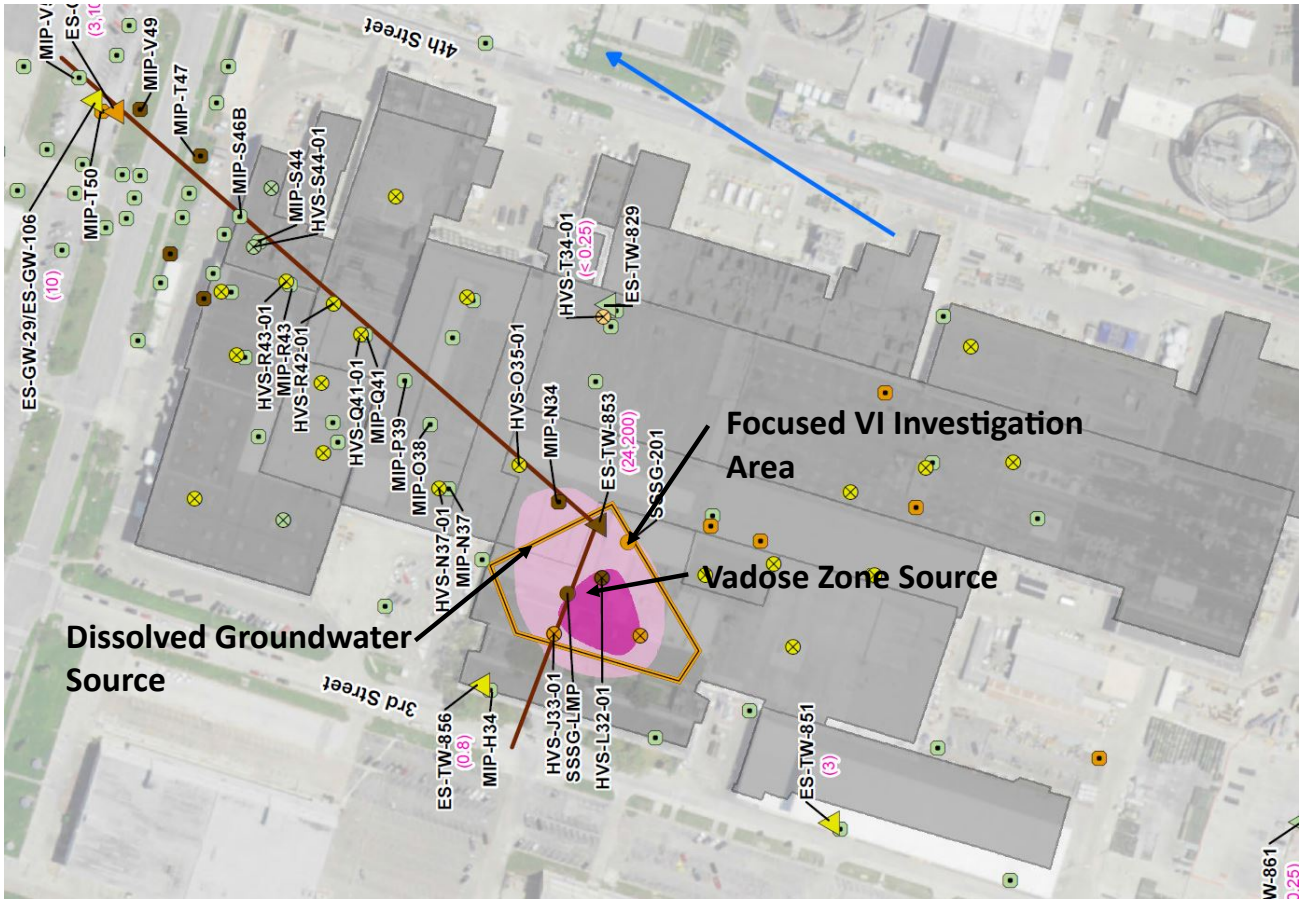
Results



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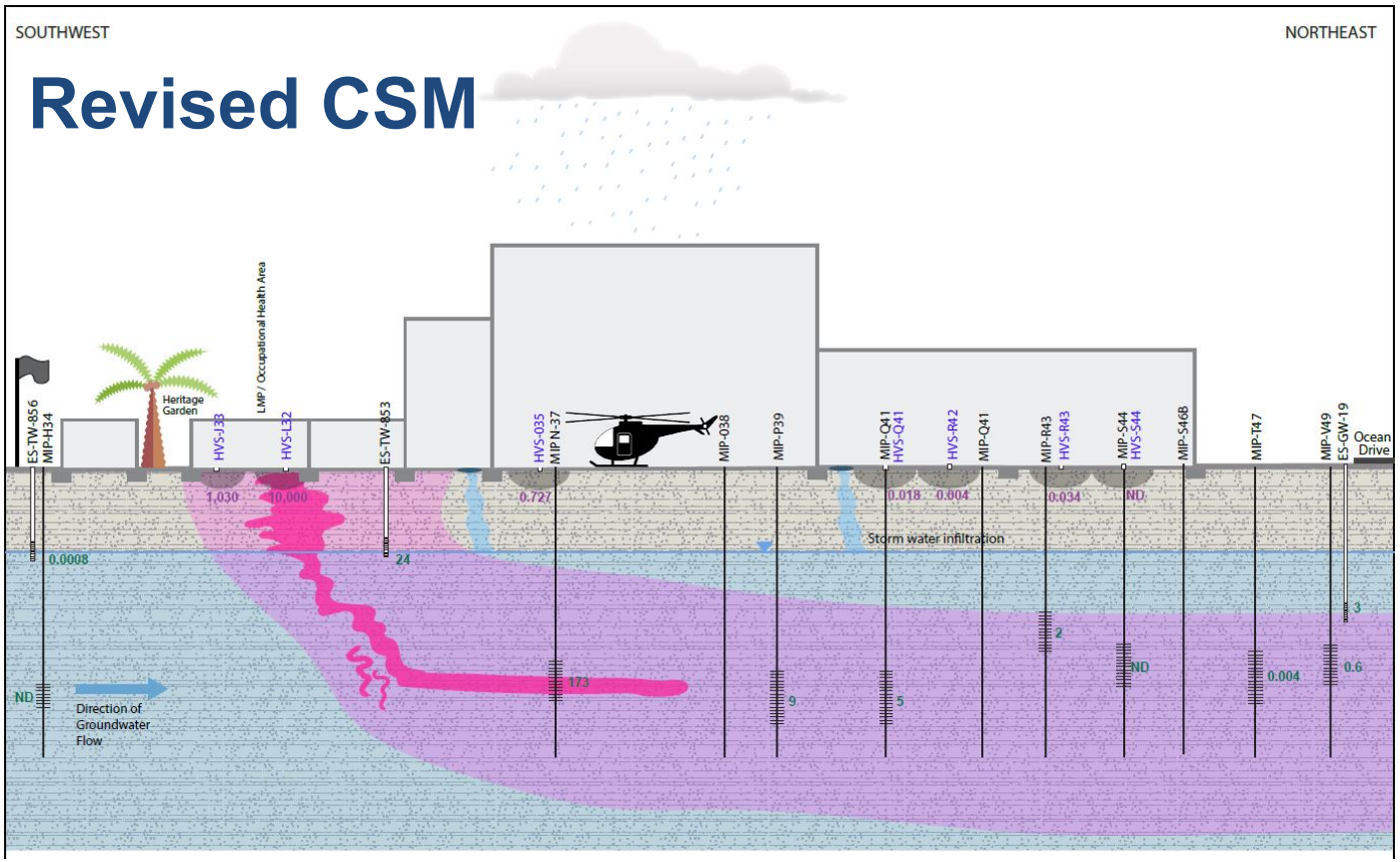
Revised CSM



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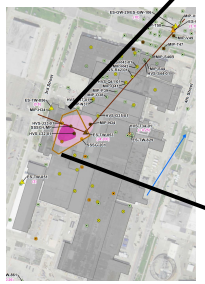
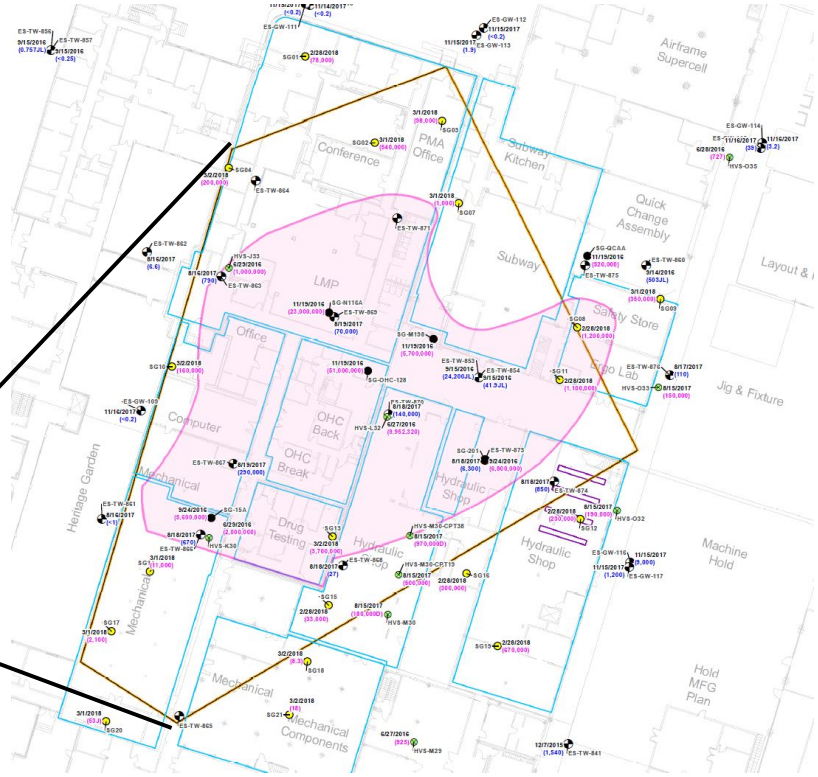
Focused Follow-up

- Traditional Sub-slab Soil Gas & Indoor Air Sampling
- Delineate to 1,000,000 $\mu g/m^3$
  - ID footers
  - ID soil gas entry points





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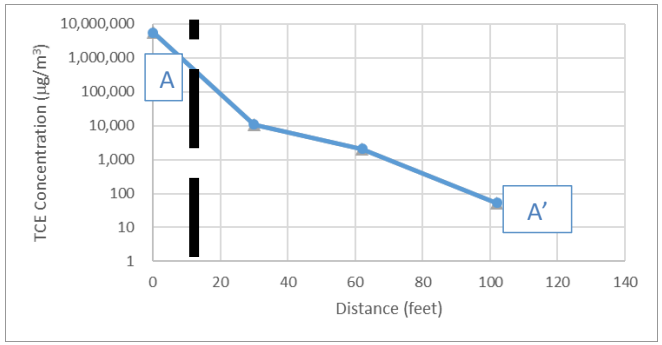
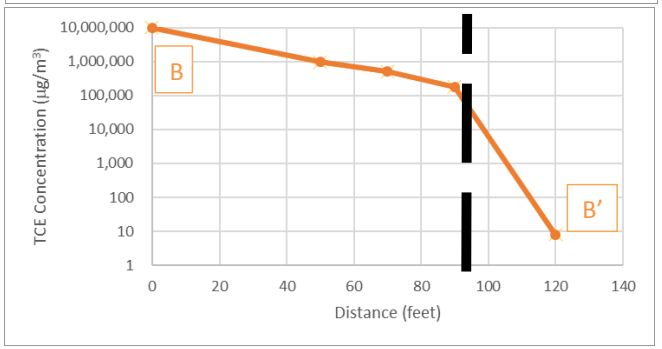
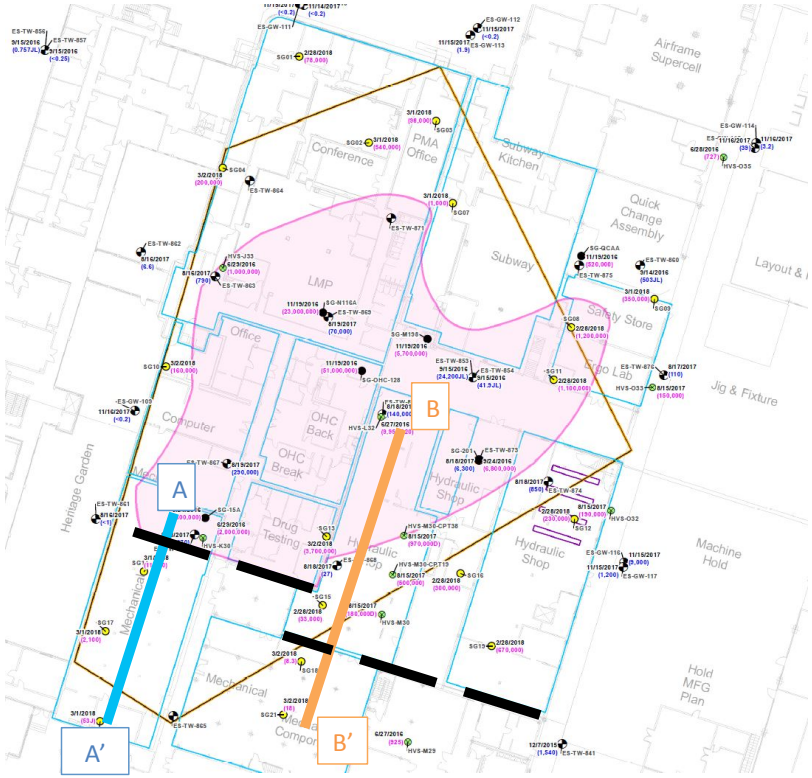
Footers Obstruct Migration







Why Use High Volume Sampling?

- HVS assesses a relatively large volume of soil gas
  - HVS can extracts soil gas from a radius of 10 to 20 meters.
  - Extraction time 1 to 2 hours
  - Likely to meet or exceed the minimum necessary samp… support (cost savings)
  - Minimizes the risk of f… identify contamination t… exist between sample loc…tions

BENEFITS
– When time is short
– Large buildings

- HVS can be used to evaluate:
  - T… spatial distribution of vapor …ntrations
  - …ith limited access
  - …ervative estimate of leakage through …e slab (slab integrity)
  - Distance to which vapors are extracted
  - Provides information for interpreting concentration vs. volume
  - Critical design parameters for mitigation measures

HVS IS NOT JUST A VI TOOL…IT IS A CSM TOOL!!

THANK YOU!

Justin Knight, P.E.
Senior Engineer
Geosyntec Consultants
jknight@geosyntec.com
678-202-9580