



Navy Vapor Intrusion Evaluation Tool

EMDQ 2012 Workshop

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Why Navy Developed VI Evaluation Tool

- 116 potential VI sites across Navy
 - ~ 85% chlorinated groundwater plumes
 - ~ 28% NAPL present
 - ~ 75% of the sites for current buildings
- Consistent and efficient VI evaluations in Restoration Program
- VI information overload and variability in VI guidance
 - Break information into manageable components
 - Customize the information for conceptual site model (CSM)

EPA Web Site, Workshops, Presentations

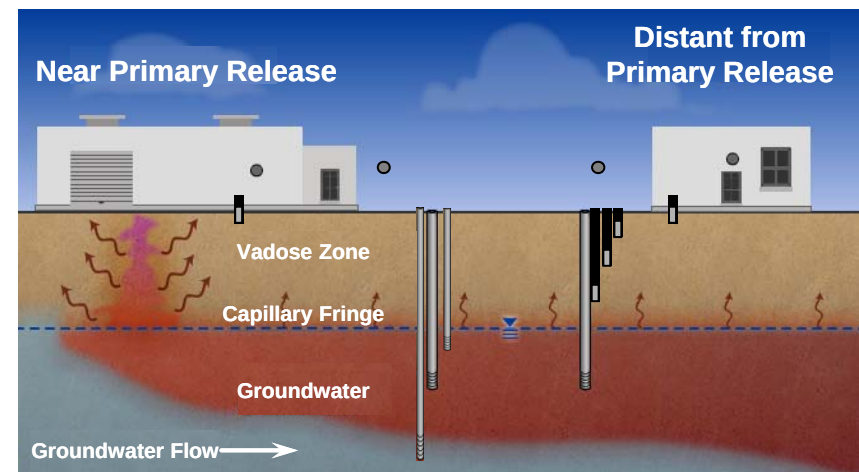
2002	2008
OSWER Draft Guidance for Evaluating the VI	U.S. EPA's Vapor Intrusion Database
2010	R5 2010
Review of EPA Draft VI Guidance	EPA/NOAA VI Guidebook

ITRC, DoD, State, VI Conferences, Literature

ITRC VI Pathway: A Practical Guideline	DoD Vapor Intrusion Handbook Jan. 2009	Guidance Evaluating VI New York Oct. 2006
VI Guidance, New Jersey Oct. 2006	AWMA VI Conference, Sep. 2010	NAVFAC Background Guidance VI

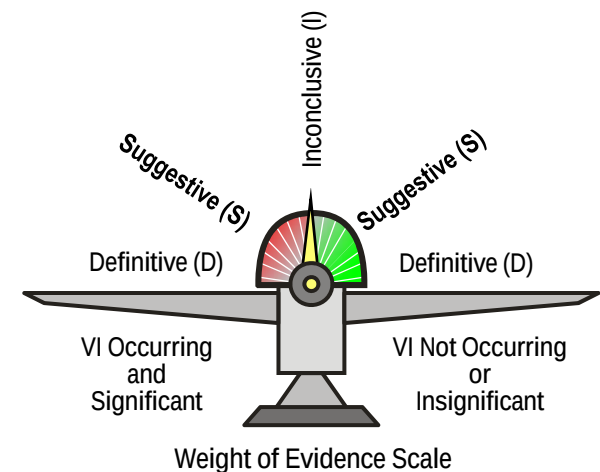
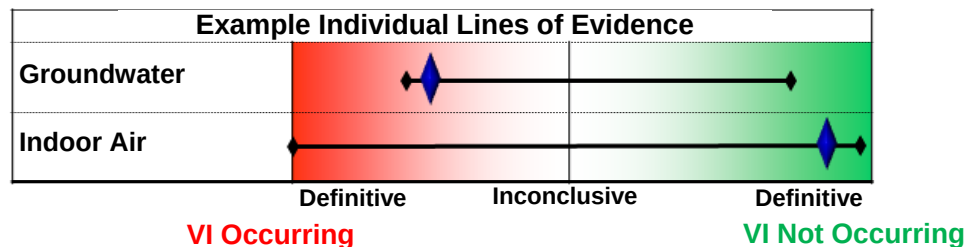
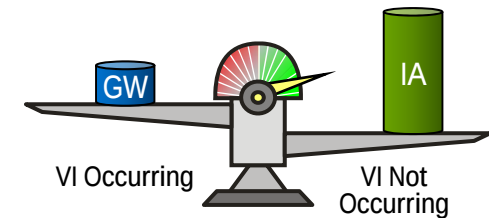
Why Navy Developed VI Evaluation Tool

- Understand and manage VI challenges
 - Spatial/temporal variability of data
 - Background sources (indoor and outdoor)
 - Determining the significance of the evidence
- Document VI decision process
- Provide one-stop shopping VI resource
- Track magnitude of Navy VI impacts & costs



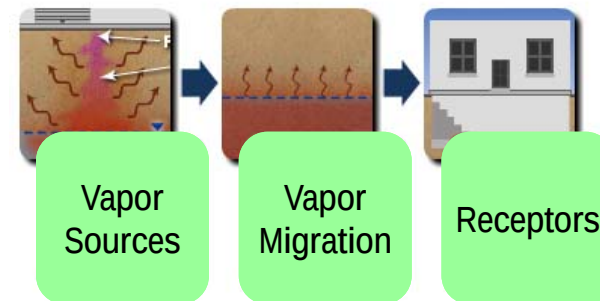
Why Navy Developed VI Evaluation Tool

- Understand strength and weakness of multiple lines of evidence
- Not all lines of evidence are created equal
- Strength of evidence depends on CSM



Conceptual Site Model

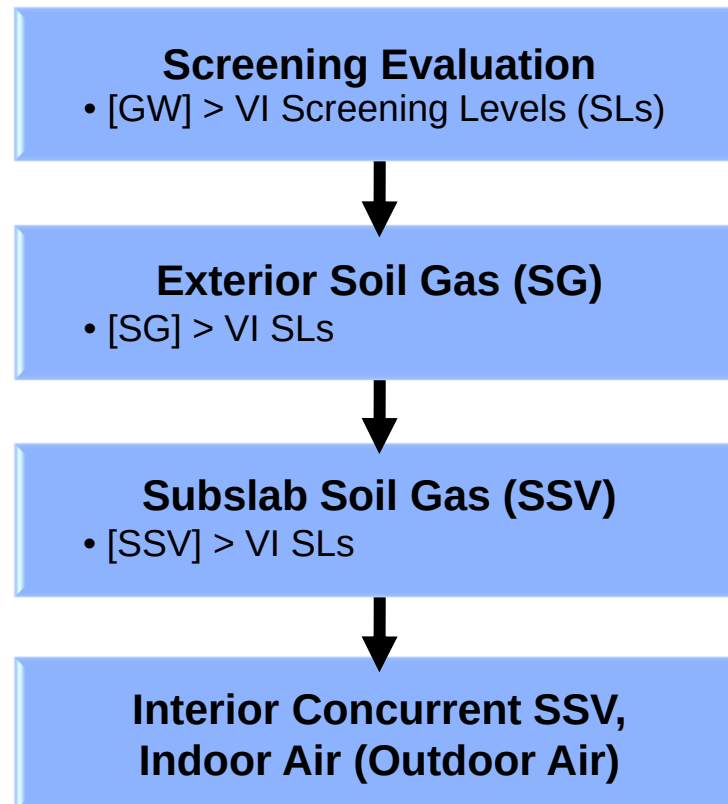
- Vapor sources
 - Presence/absence of non-aqueous-phase liquid (NAPL)
 - Composition, concentration, and distribution
- Factors Controlling Migration
 - Building characteristics
 - Lithology/hydrogeology
 - Source strength and distance to building/receptor
- Receptors
 - Current / future
 - Residential / Industrial



Evolution of the VI Practice Ahead of Guidance

Typical Guidance 2002 Linear (flow chart) Approach

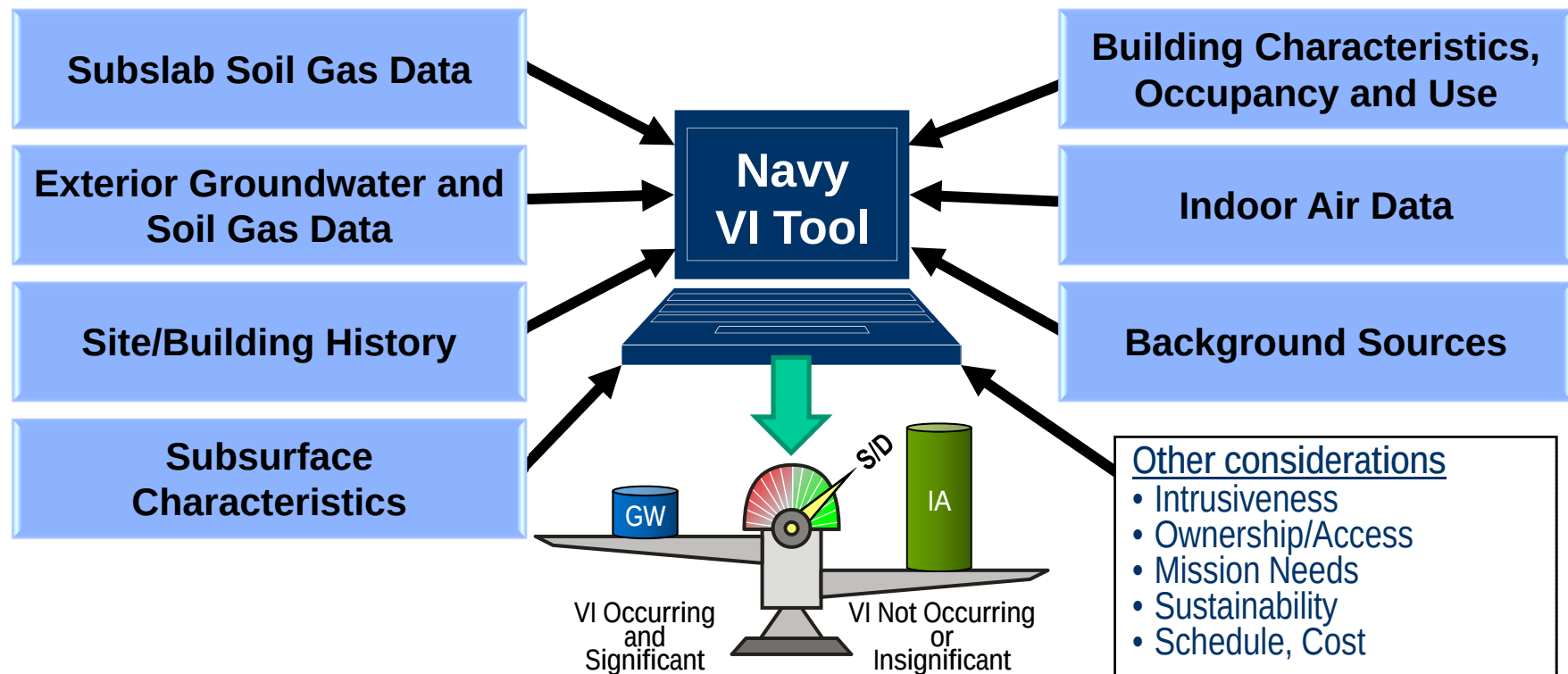
- Sequentially Evaluate Single Lines of Evidence



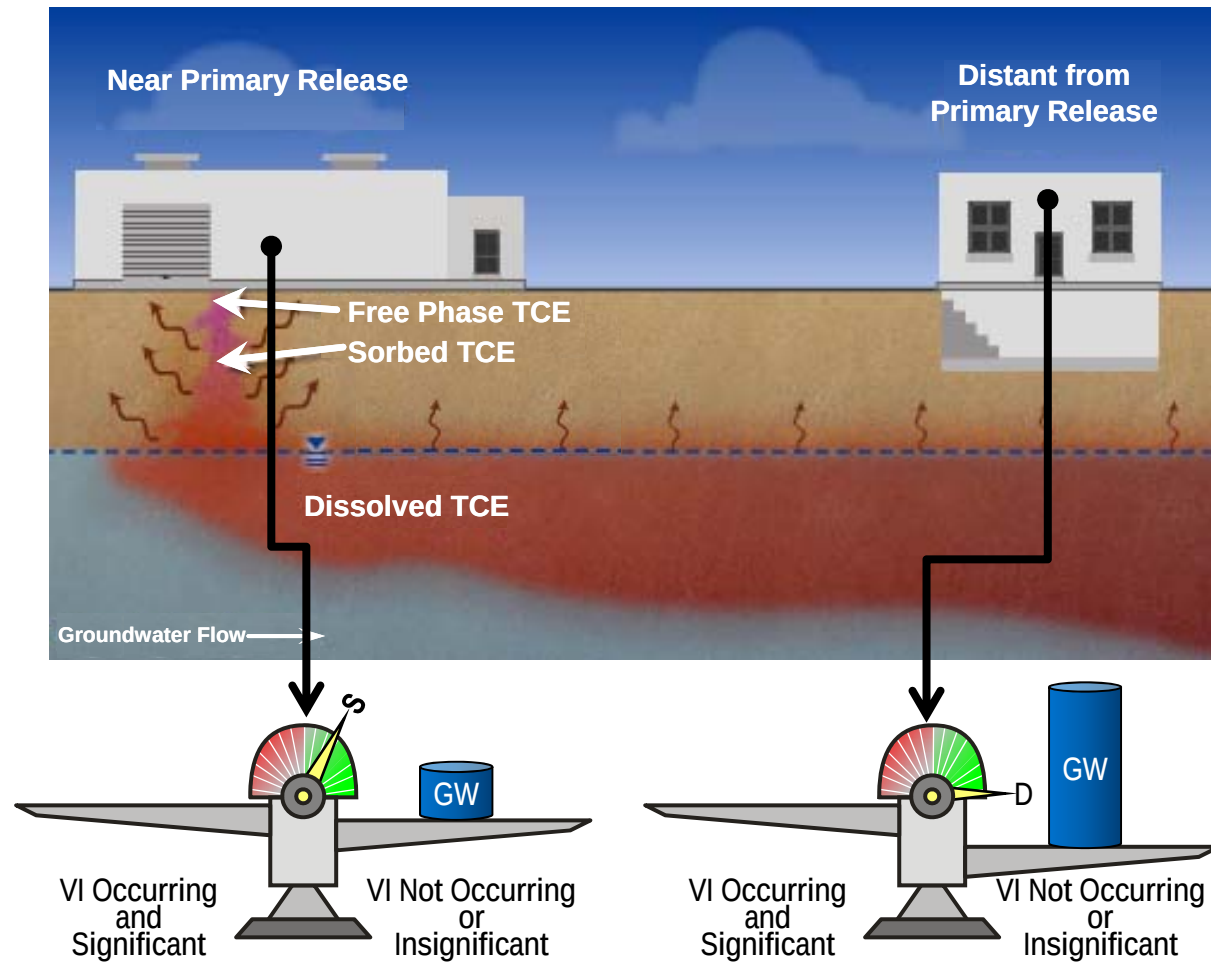
Evolution of the VI Practice Ahead of Guidance

Non-Linear Approach 2011

- Simultaneously Weigh Multiple Lines of Evidence
- Understand Evidence Strengths/Limitations
- Strong Focus on Conceptual Site Model

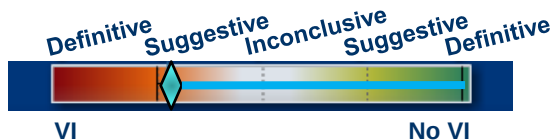


Key Concept of Tool: Strength of Evidence Depends on CSM

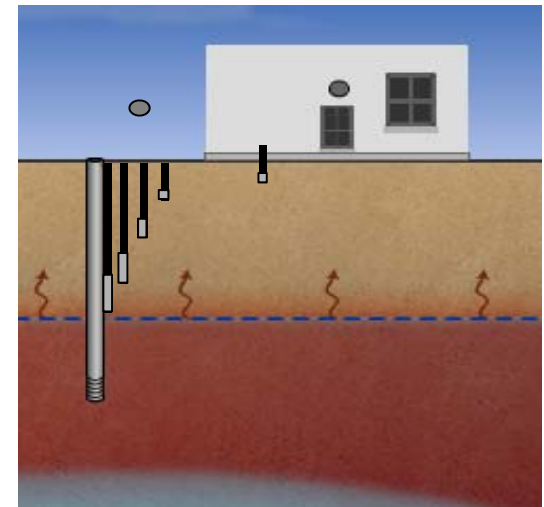
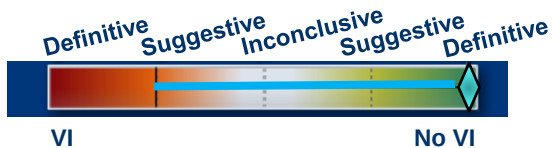


Strength of Evidence – Groundwater & Soil Gas

- Determining the strength of groundwater or soil gas data as a line of evidence
- Concentrations > SL only suggestive that VI is occurring because it is predictive



- Can be definitive that VI is not occurring when:
 - Groundwater is the only vapor source
 - Levels at or near water table are below SL
 - Site is well characterized at the water table



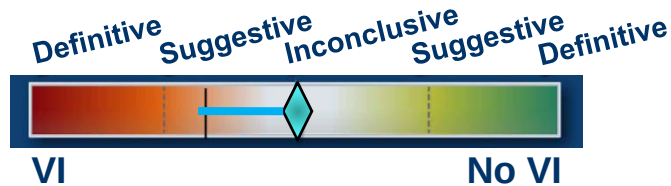
Strength of Evidence – Indoor Air

- $IA < SL_{IA}$ – Suggestive to definitive VI not occurring or insignificant
 - Suggestive with limited spatial/temporal coverage
 - Definitive with adequate CSM and spatial/temporal indoor air data



Strength of Evidence – Indoor Air

- $IA > SL_{IA}$ – Depends on results of the background evaluation
 - Indoor > screening level and no background evaluation performed (inconclusive to suggestive of VI)



- Indoor > screening level and background evaluation concludes background source (suggestive to definitive no VI)



Strength of Evidence – Indoor Air

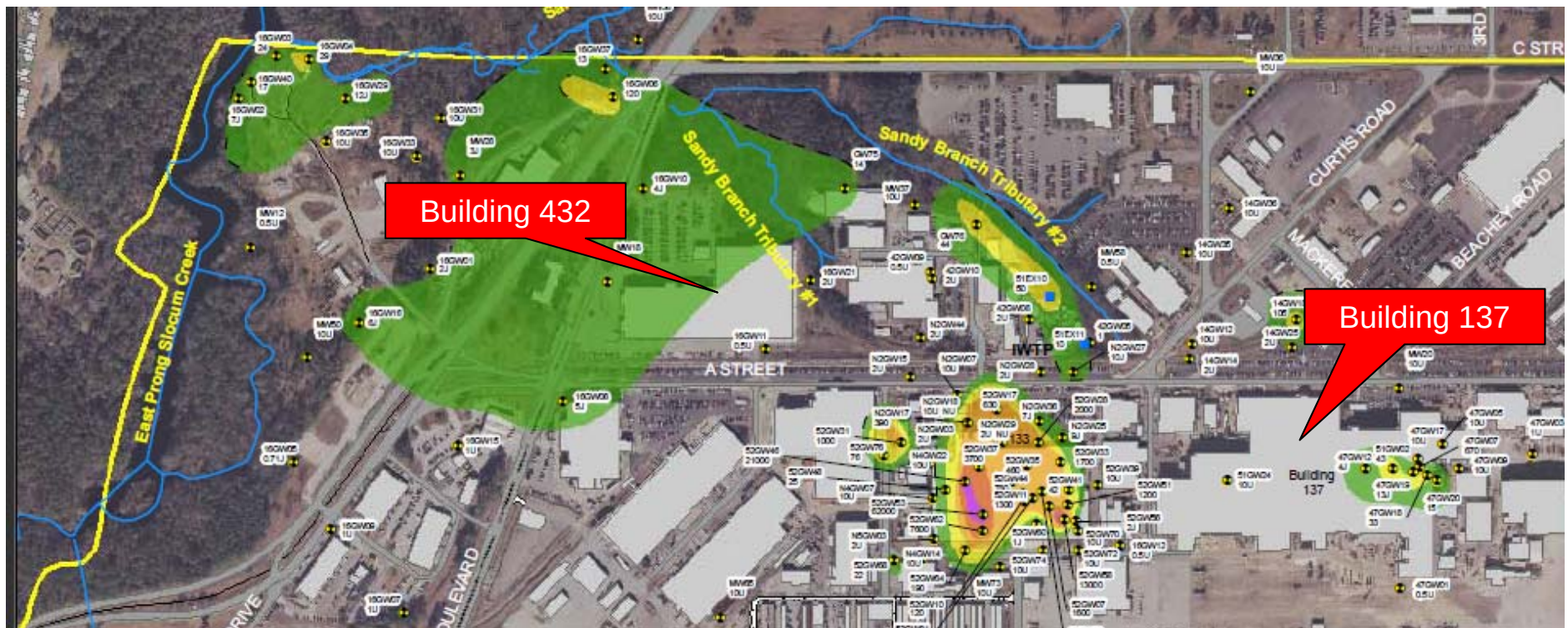
- Indoor > screening level and background evaluation concludes no background source (suggestive to definitive of VI)



KEY POINT: Exceedance of screening level and “Significant” does not mean unacceptable risk or mitigation action is required

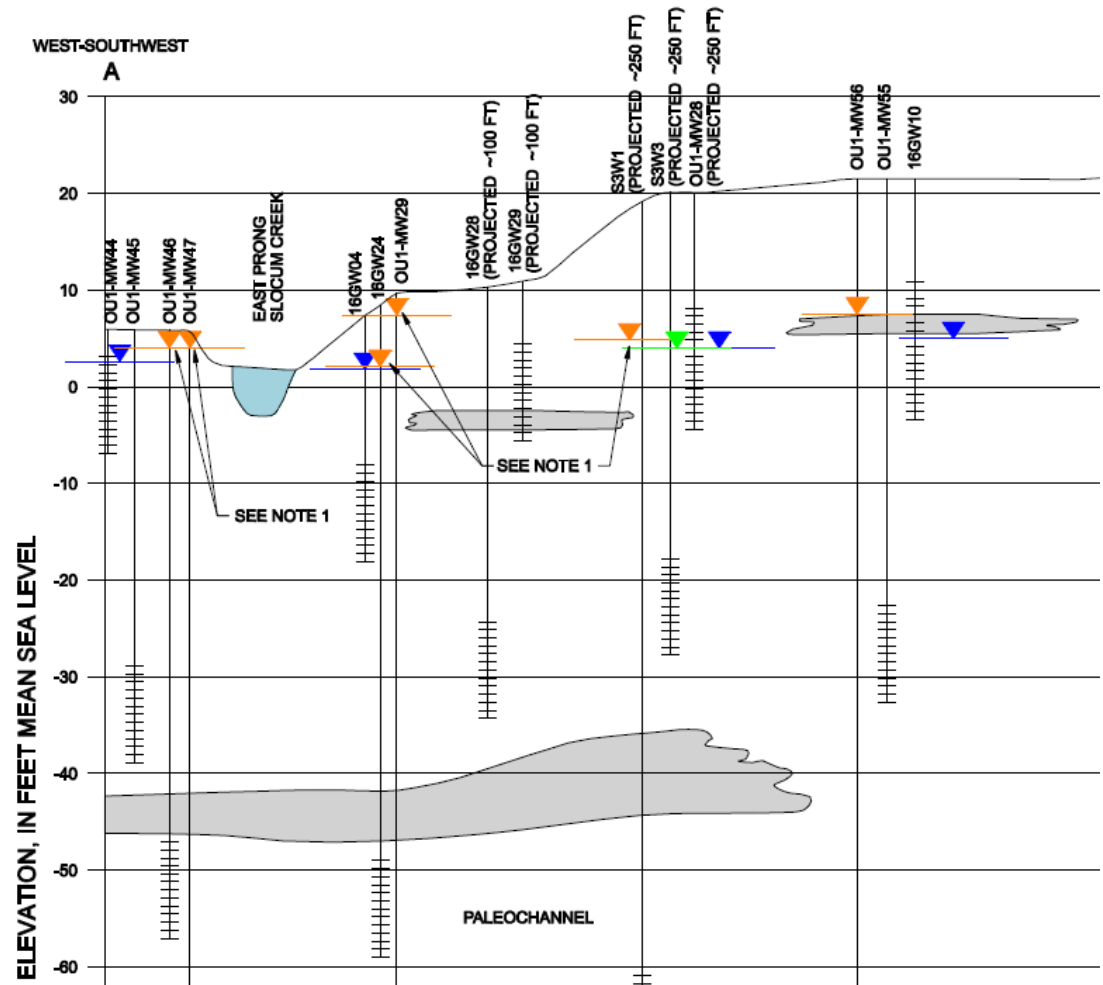
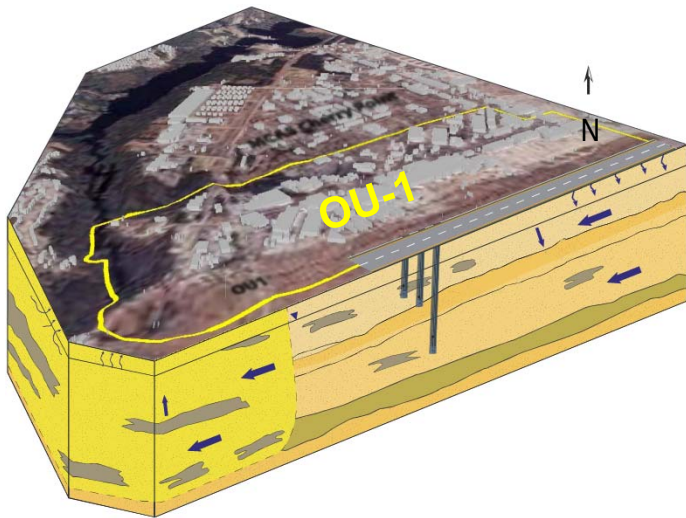
Example Case Study: MCAS Cherry Point

- Large industrial area (565 acres)
- Multiple sources contribute to chlorinated-VOC groundwater plumes



Example Case Study: MCAS Cherry Point

- VOC concentrations suggestive of free phase TCE
- Depth to GW is 4 to 21 ft bgs
- Wells screened at multiple depths



Navy VI Assessment Tool: Live Demonstration

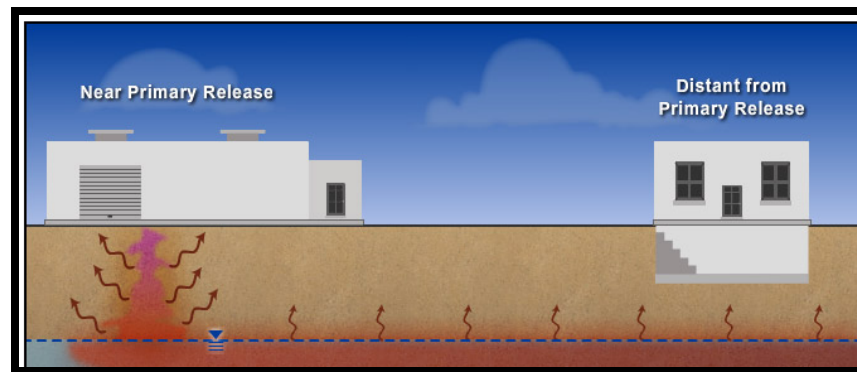
SITE MAP | NAVFAC | LOG OUT

VAPOR INTRUSION ASSESSMENT TOOL

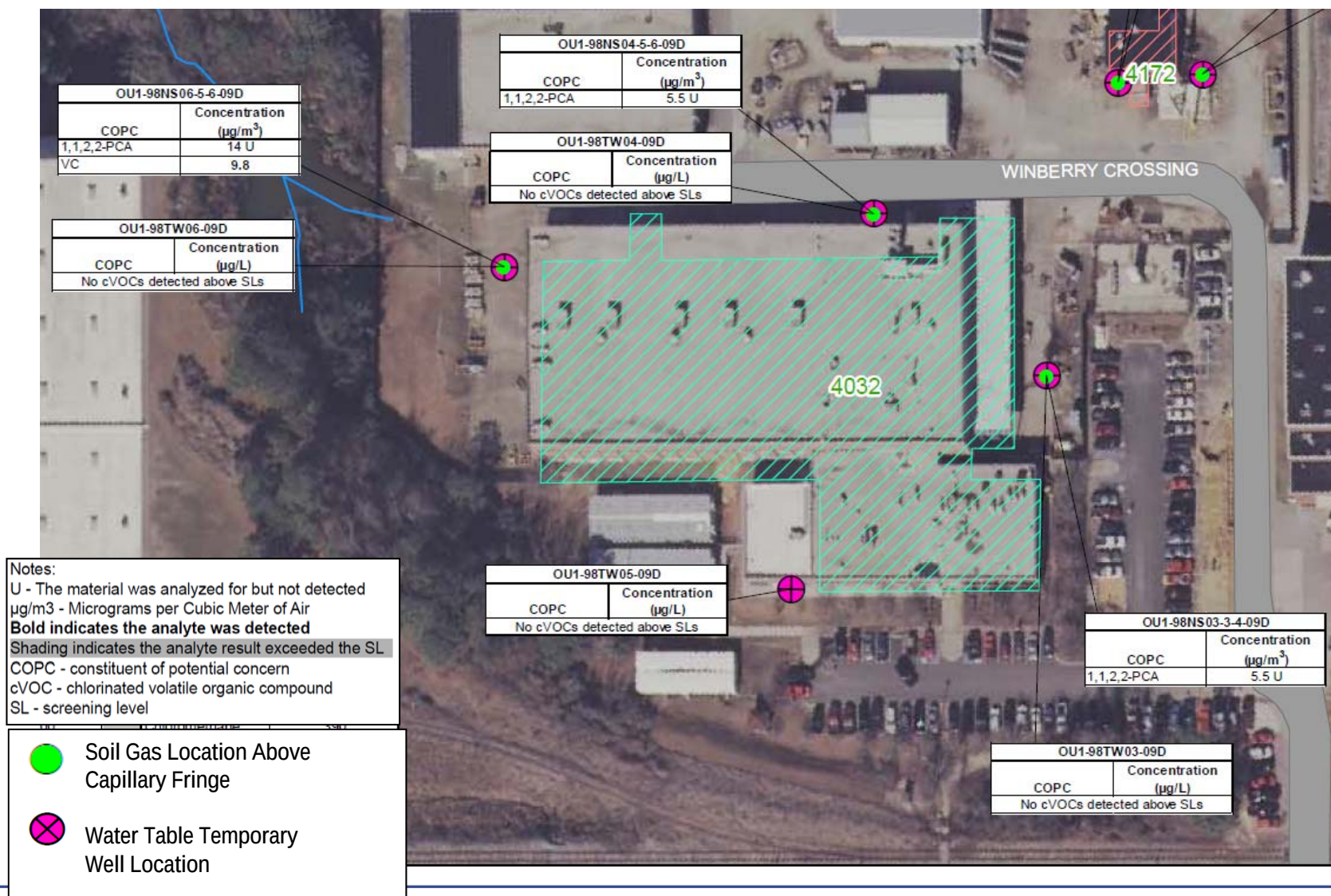
[Home](#) | [Project Setup](#) | [Conceptual Site Model](#) | [Site Evaluation](#) | [Reports](#) | [Resources](#)

Welcome...

...to the Website for the United States Navy Vapor Intrusion (VI) Evaluation Tool. This Tool is designed by NAVFAC to provide Remedial Program Managers (RPMs) and other environmental restoration professionals with technical information to make informed decisions about vapor intrusion.



Water Table and Soil Gas Results Above Capillary Fringe Near Bldg. 4032



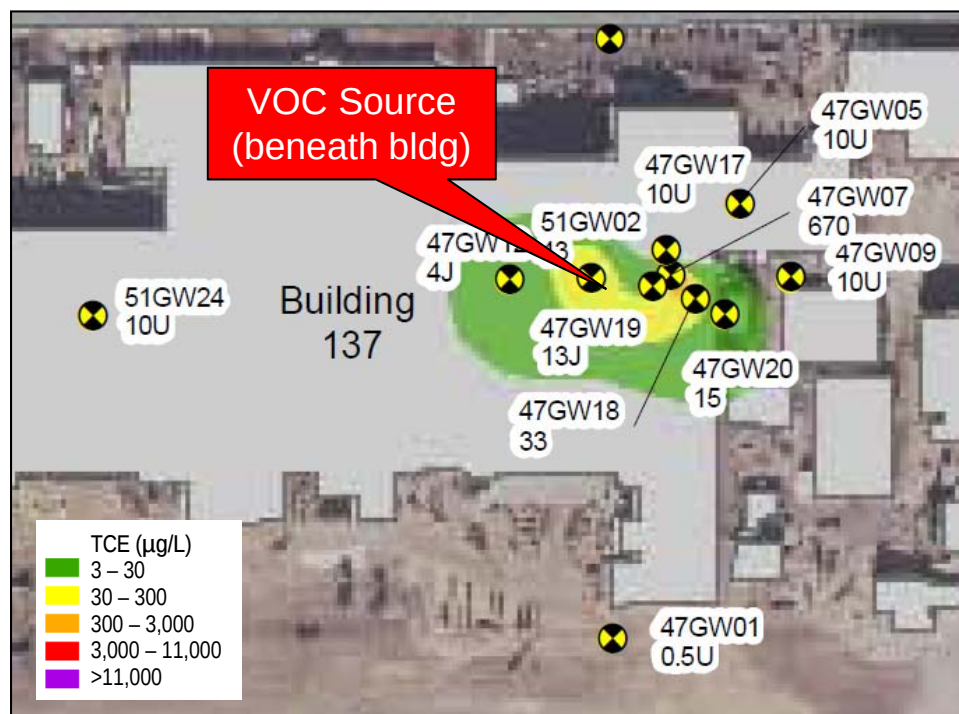
Evaluation of Subslab Soil Gas Data at Bldg. 137

Building ID: Building 137

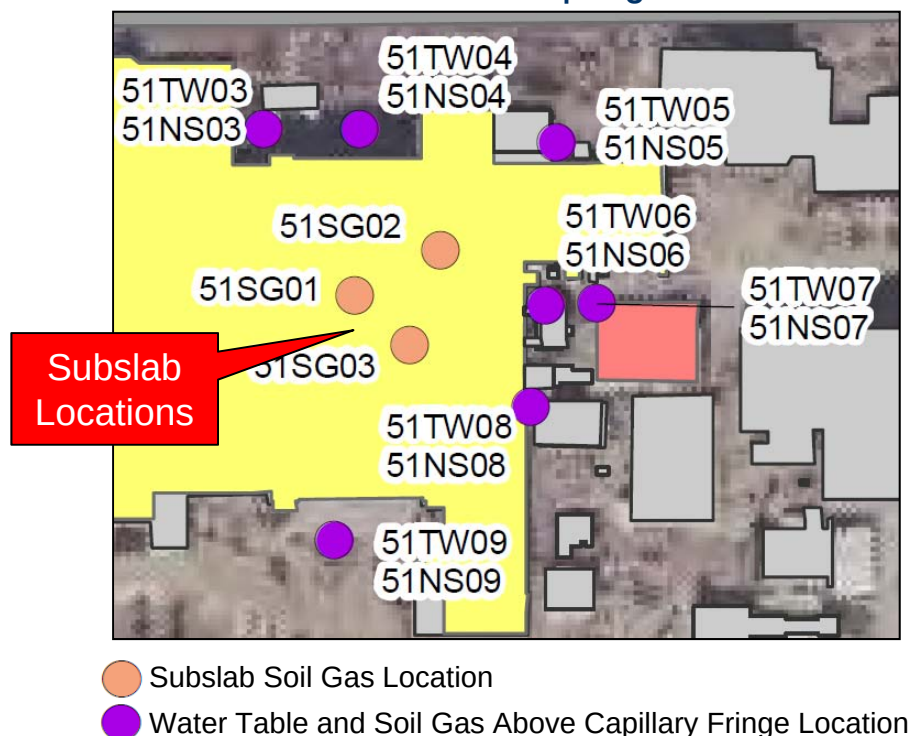
Scenario: Current Building Near Primary Release

Investigative Strategy: Subslab Soil Gas Data

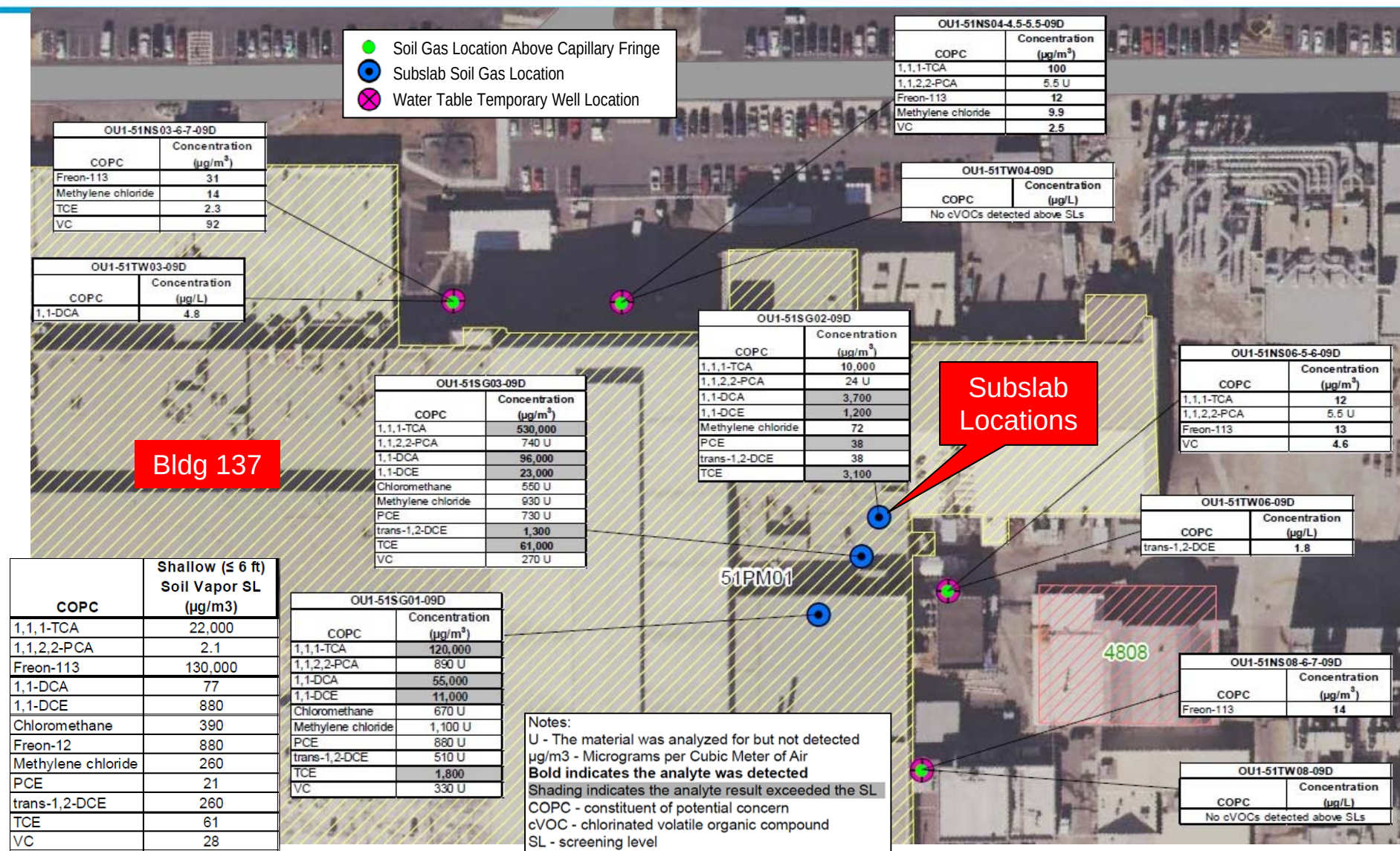
TCE Concentrations in Groundwater



Subslab Soil Gas Sampling Locations



Subslab Soil Gas Results at Building 137



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Questions?

