

Vapor Intrusion Evaluation

Autumnwood Development, Amaryllis Court Wildomar, CA

State of California CALEPA

Department of Toxic Substances Control

Dr. Bill Bosan (HERO)

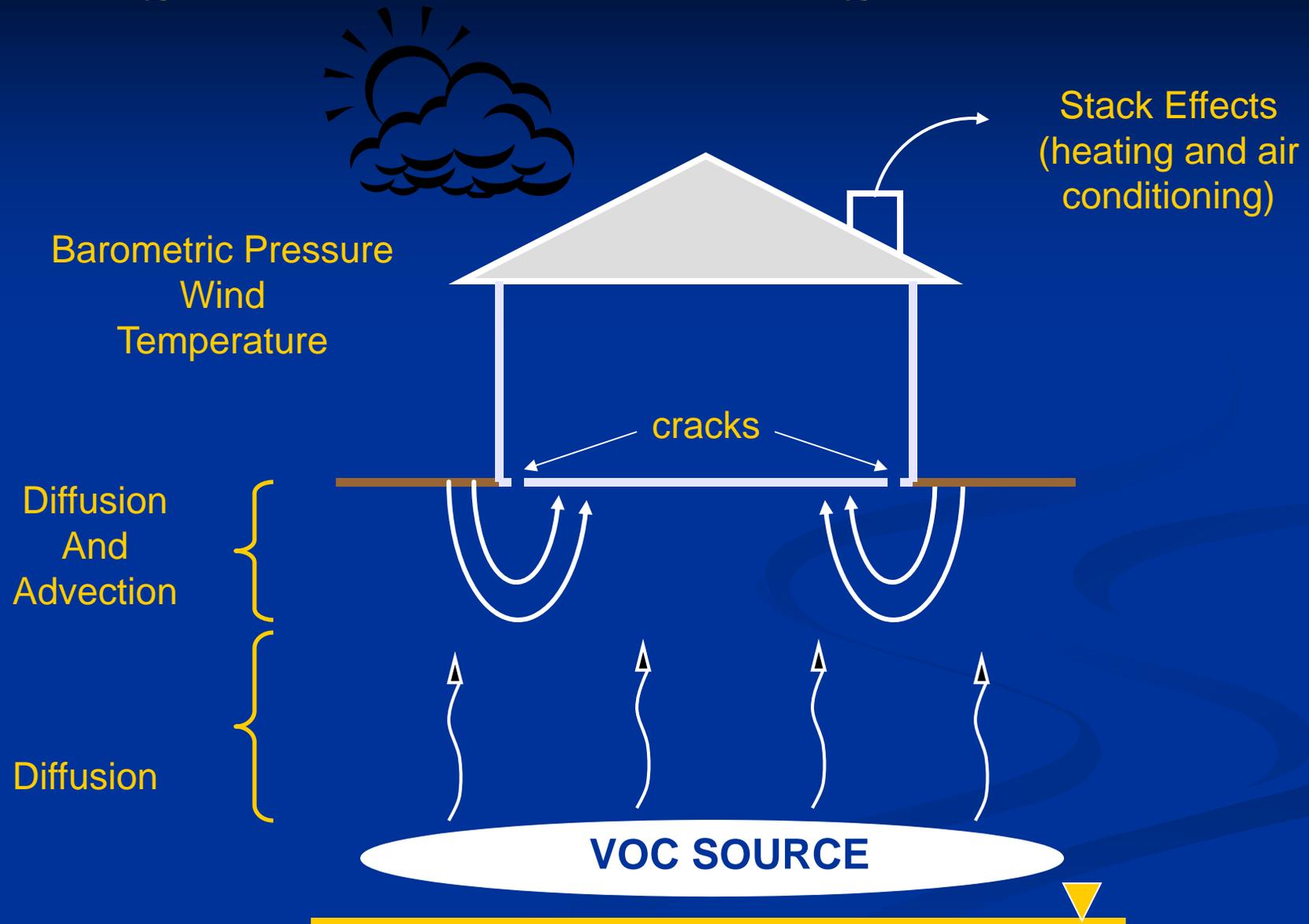
Theo Johnson (GSU)

September 17, 2013

What is Vapor Intrusion?

- Vapor Intrusion is the migration of volatile chemicals from the subsurface into overlying buildings through permeable sediments.
- Volatile chemicals in buried wastes and/or contaminated groundwater can emit vapors that may migrate through subsurface soils and into indoor air spaces of overlying buildings.

Vapor Intrusion – Conceptual Model



Site Characterization

■ Vapor Intrusion Characterization

- Soil Gas Sampling near and adjacent to structures
- Sub-slab Sampling
- Indoor Air Sampling
- Groundwater Sampling

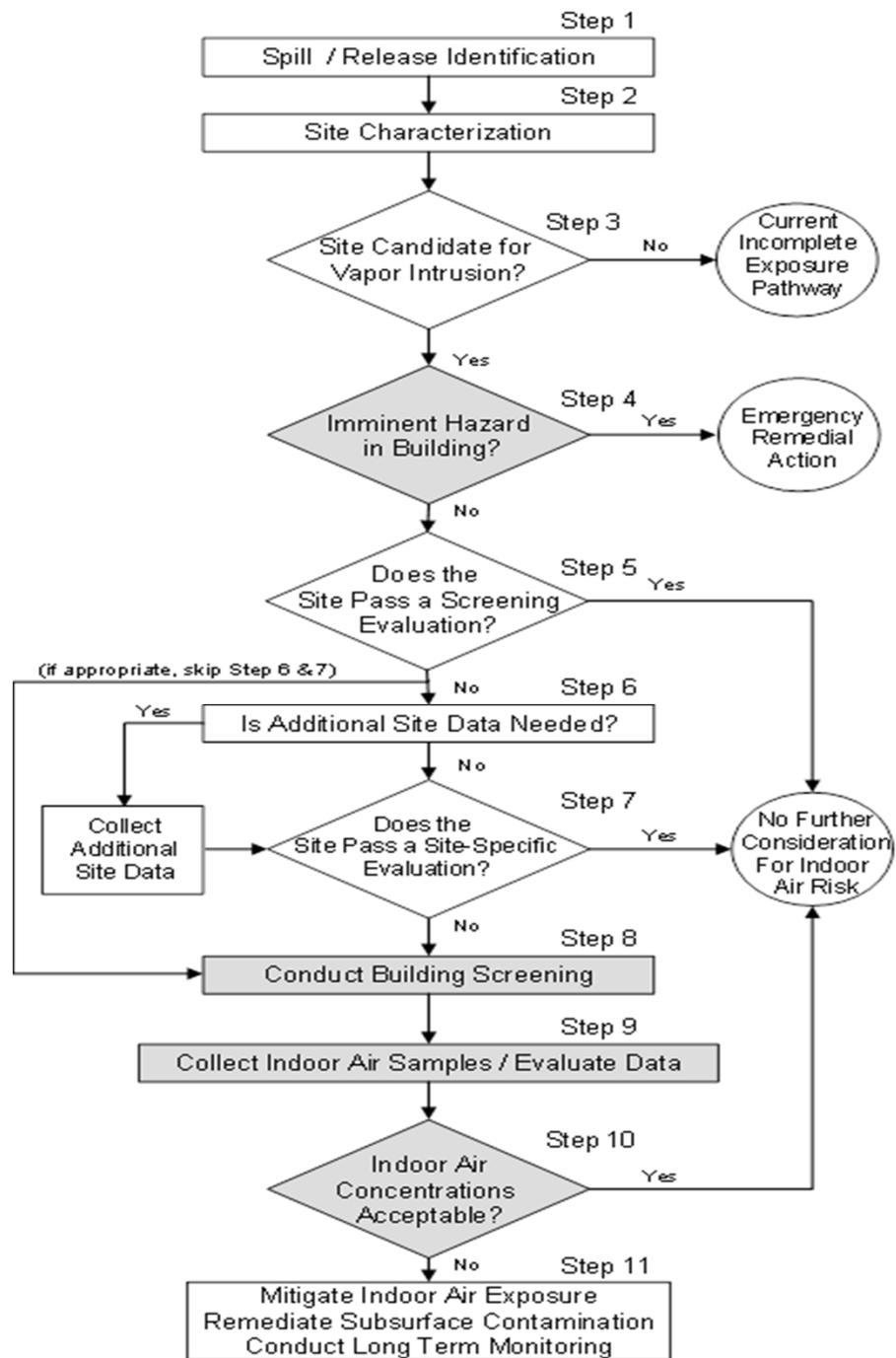
Other Sources of Indoor Air Vapors

- Building Materials
- Heating/Cooling Energy Sources
- Residual Volatile Components of Stored Items
- Household Activities (Cooking/Cleaning)
- Consumer Products Used In The Building
- Background Contaminants From Ambient Outdoor Air

Volatile Organic Compounds (VOCs) Near Buildings

- **DTSC/EPA Protocol**
 - Characterize the Release
 - Is Vapor Present Near Buildings?
 - Sub-slab Sampling, If Vapor is Present.
 - Evaluate Chemical Use In The Building
 - Indoor Air Quality Sampling
 - Groundwater Sampling

DTSC Vapor Intrusion To Indoor Air Assessment



Note: Shaded steps do not apply to future building scenarios

Soil Gas and Associated Risks

	Maximum			
	Soil Gas	Soil Gas		
	Concentration	Depth	Indoor Air	Indoor Air
Volatile Organic Compound	($\mu\text{g}/\text{m}^3$)	(feet)	Risk	Hazard
Chlorobenzene	66	10	NC	4.6E-05
Chloroform	149	10	3.0E-07	4.4E-04
Chloromethane	389	5	4.3E-07	6.2E-03
Toluene	48	5	NC	1.9E-04
Trichloroethene (TCE)	40	5	8.1E-08	2.3E-02
Trichlorofluoromethane	69	10	NC	7.7E-05
1,2,4-Trimethylbenzene	140	5	NC	7.8E-03
		Total	8.E-07	0.04

Addressing Vapor Intrusion Assessment Data Gaps

- Evaluate historical data
 - Soil
 - Soil Gas
 - Indoor Air
- Evaluate potential data gaps
 - Soil Gas
 - Groundwater Sampling

Proposed Sampling

- Soil (3 locations, 9 samples)
 - SVOCs, OCPs, PCBs, metals
- Soil Gas (15 locations, 30 samples)
 - VOCs
- Groundwater (4 locations, 4 samples)
 - VOCs and formaldehyde

Wildomar CA

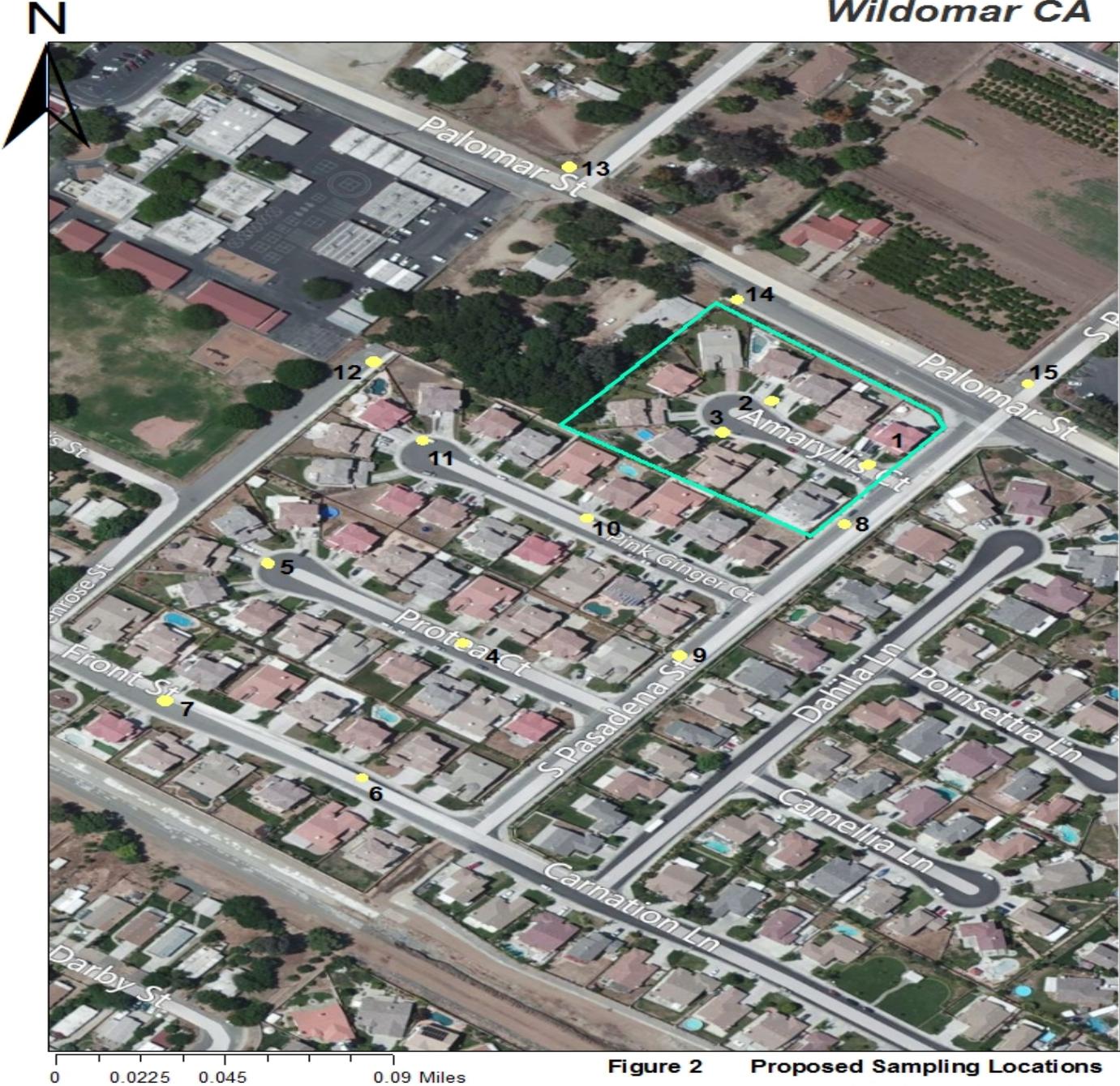


Figure 2 Proposed Sampling Locations

Next Steps

- **Anticipated Sampling/Results Timeframe**
 - **Start Time: Late October - Early November 2013**
 - **Results: Mid November - Early December 2013**
- **Future Meeting to Discuss Results**

Useful Links

■ Revised Soil Gas Advisory

- http://www.dtsc.ca.gov/SiteCleanup/upload/SAG_Review_Draft.pdf

■ Unit conversions

- <http://www.handpmg.com/documents/conversion-of-units.xls>

■ VI guidance

- [http://www.dtsc.ca.gov/AssessingRisk/upload/HERD_POL_Eval Subsurface Vapor Intrusion interim final.pdf](http://www.dtsc.ca.gov/AssessingRisk/upload/HERD_POL_Eval_Subsurface_Vapor_Intrusion_interim_final.pdf)

- A “Quick Link” will be added to the DTSC website under Autumnwood Development, Wildomar. Site specific documents will be uploaded to this link for public access.

DTSC Contacts

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Questions/ Comments