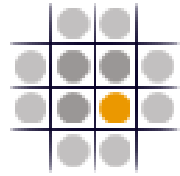


# **Generic Assessment Criteria for Groundwater Vapour Risk Assessment**

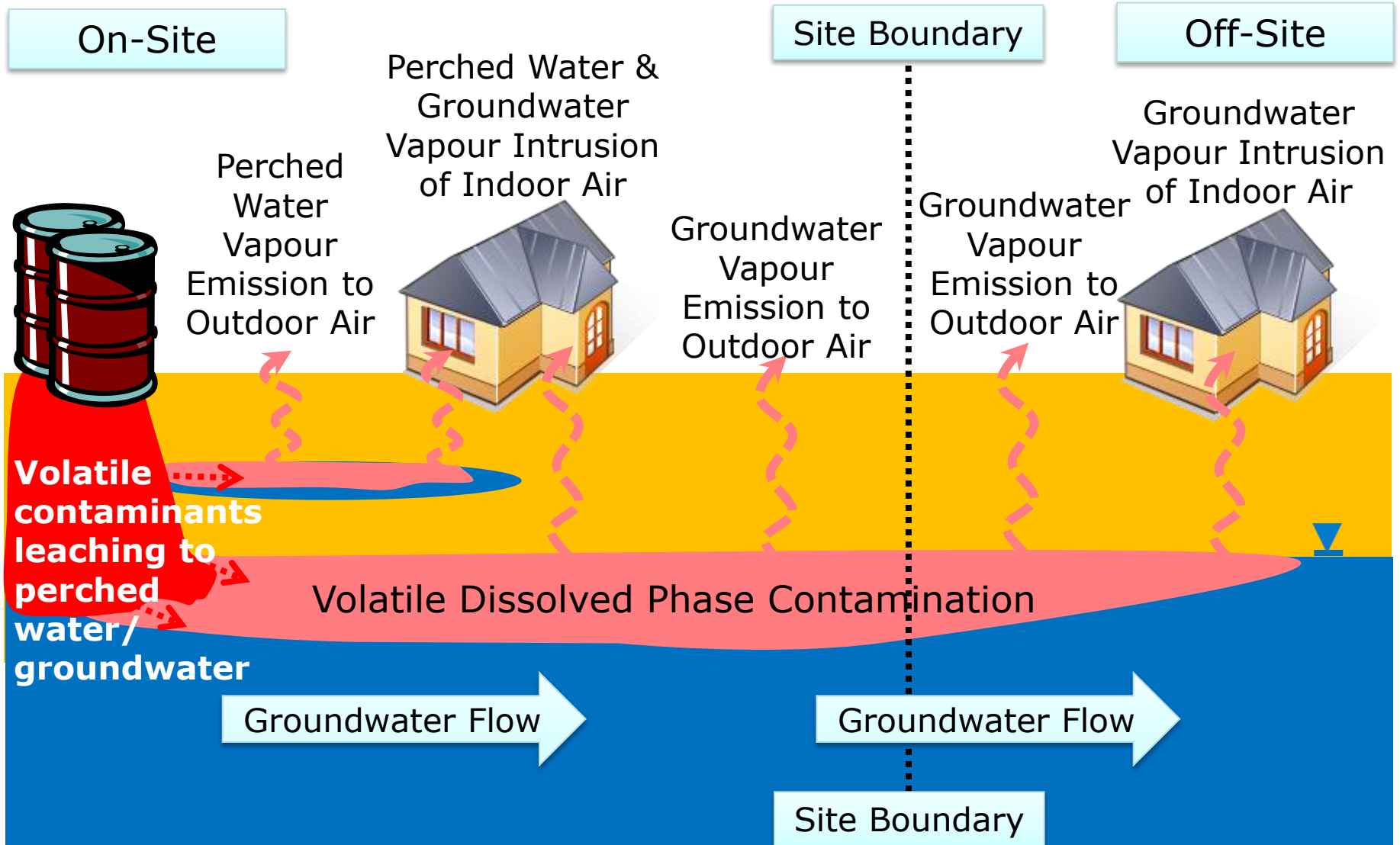
Update on the work of the SoBRA  
Groundwater Vapour Subgroup

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- What is the problem?
- What is the purpose of the work?
- How is the previous work being updated
- Preliminary results

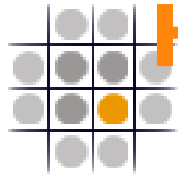


# What is the Problem?



## What is the purpose of the work?

- Develop generic assessment criteria (GAC) and accompanying guidance for use as a robust, conservative tool for preliminary assessment (screening) of human health risks from contamination in sub-surface waters in a manner compliant with current UK guidance.



# How the previous work is being updated?

- Revised contaminant shortlisting (66)
  - Published tox, phys-chem data available
  - Dissolved phase lab detectable ( $S \geq 0.1 \mu\text{g/l}$ )
  - Volatile ( $H \geq 1 \text{ Pa}\cdot\text{m}^3/\text{mol}$ )
  - Toxic ( $C_{\text{sat vap}} \geq C_{\text{air}}$ )
- GAC derived using CLEA v1.07
  - Existing chemical database revised (LQM S4UL)
  - Vapour inhalation pathways only
  - C4SL exposure parameters with minimal risk HCV
- Updated sensitivity analysis and J+E cross-check

# Revised GAC (Preliminary)

<b>SAND, 1% SOM</b>	<b>Residential (<math>\mu\text{g}/\text{l}</math>)</b>		<b>Commercial (<math>\mu\text{g}/\text{l}</math>)</b>	
	<b>Pre-C4SL GAC</b>	<b>Revised GAC</b>	<b>Pre-C4SL GAC</b>	<b>Revised GAC</b>
Inhalation rates	SR3	C4SL	SR3	C4SL
Pathways	All	Vapour Inhalation only	All	Vapour Inhalation only
Benzene	80	210	21,000	20,000
Naphthalene	150	220	>19,000*	>19,000*
Vinyl Chloride	0.4**	0.6**	70	60

\* Calculated GAC > aqueous solubility. NOT a groundwater vapour risk BUT other pathways may be important, e.g. NAPL

\*\* GAC  $\leq$  typical lab MDL. Detection in groundwater warrants further investigation, i.e. vapour sampling

# J+E Cross-Check (Preliminary)

<b>SAND, 1% SOM</b>	<b>Residential Indoor Air Concentration (<math>\mu\text{g}/\text{m}^3</math>)</b>	
	<b>Revised GAC</b>	<b>J+E Worksheet</b>
Benzene	2.2	0.3
Naphthalene	1.1	0.3
Vinyl Chloride	0.5	0.07

- Current CLEA model conservative
- Predicted concentrations differ by 0.6 to 0.9 OOM due to simulated effect of capillary fringe
- 5-fold increase to soil to indoor air factor could correct for capillary fringe

- Gap identified in UK risk assessment protocols to assess human health risks from groundwater vapours
- GAC revisions underway using CLEA v1.07 to align with recent changes in UK guidance
- Further work required to understand effect of capillary fringe and finesse possible modifications to GAC derivation method using CLEA v1.07



# 2nd Cut Revised GAC (Preliminary)

Residential ( $\mu\text{g}/\text{l}$ )

<b>SAND, 1% SOM</b>	Residential ( $\mu\text{g}/\text{l}$ )		
	<b>Pre-C4SL GAC</b>	<b>Revised GAC</b>	<b>2nd Cut Revised GAC</b>
Inhalation rates	SR3	C4SL	C4SL
Pathways	All	Vapour Inhalation only	Vapour Inhalation only
Benzene	80	210	1,000*
Naphthalene	150	220	1,000*
Vinyl Chloride	0.4	0.6	3*

\* Soil to indoor air correction factor increased by factor of 5 to account for effect of capillary fringe. CLEA v1.07 predicted indoor air concentrations are then more comparable to J+E



# Thanks to Recent Contributors

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