TCE Vapor Intrusion Concerns: Assess & Mgmt of Health Risks

EPA-NCDEQ discussion

October 22, 2018

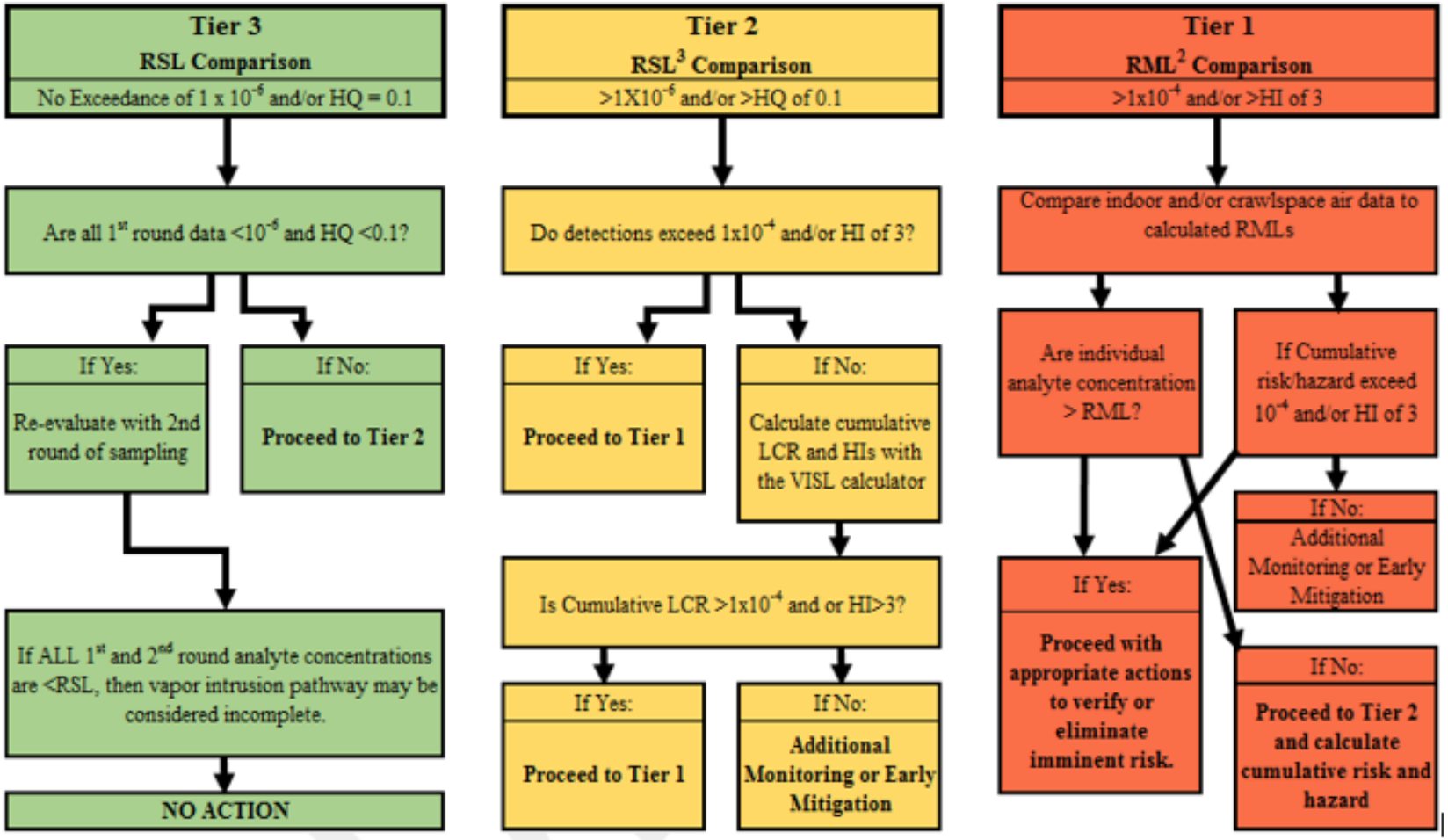
TCE Toxicity Changes

Date(s):	Cancer risk (1E-6) from EPA RSL Tables	Chronic noncancer (HI=1) from EPA RSL Tables	Removal Management Level	Rationale
Up to 6/2011	1.2 µg/m³	N/A	120 µg/m³ based on 1E-4 risk	CalEPA IUR of 2.0E-06 $(\mu g/m^3)^{-1}$
6/2011 to 9/2011	1.2 µg/m³	10 µg/m³	120 µg/m³ based on 1E-4 risk	CalEPA IUR of 2.0E-06 $(\mu g/m^3)^{-1}$ NY RfC 1.0E-02 mg/m³
9/2011 to 2013	0.43 µg/m³	2.1 µg/m³	6.3 µg/m³ based on HQ of 3	IRIS IUR of 4.1E-06 $(\mu g/m^3)^{-1}$ IRIS RfC 2.0E-03 mg/m³
2014	0.48 µg/m³	2.1 µg/m³	6.3 µg/m³ based on HQ of 3	IRIS IUR of 4.1E-06 $(\mu g/m^3)^{-1}$ IRIS RfC 2.0E-03 mg/m³

Vapor Intrusion Guidance

- EPA released the final VI Technical Guides in 2015
- Recommends use of **multiple lines of evidence** in evaluating and making decisions
- Discusses potential impact of **indoor sources**
- Describes how petroleum hydrocarbon vapors should be addressed
- Provides guidance about **mitigation systems**
  - Operations and maintenance
  - Monitoring and termination criteria
  - When is **preemptive mitigation appropriate**?
- Address institutional controls, deed restrictions, and Superfund five-year reviews

Table 1. Tiered Response Actions[1] for Indoor Air Concentrations Determined to be Site Related



[1]Applicable to Residential and Industrial receptor scenarios.

[2] Regional Removal Management Level (RML) are values at or greater than 1x10^{-4} and/or HQ = 3

[3] Regional Screening Level (RSL) are values at or greater than risk =1x10^{-6} and/or HQ = 1

E.g., Site Specific Screening Table

	A	B	C	D	E	F	G
1	Residential Air Screening Table						
2		RSL(1)	RSL(1)	RML(2)	RML(2)	Sub-slab(1)	Sub-slab(1)
3		ug/m3	ppbv	ug/m3	ppbv	ug/m3	ppbv
4	Benzene	0.36	0.12	36	12	12	4
5	Toluene	5200	1400	15,000	4000	170,000	45,000
6	Xylene	100	23	300	69	3500	800
7	PCE	11	1.6	120	18	360	53
8	TCE	0.48	0.1	2.1*	0.4*	16	3
9	1,2-Dichloroethene**	7.3	1.8	21	5	243	61
10	Chloroform	10***	2***	12	2.5	330	68
11	1,2-Dichloroethane	0.11	0.03	11	2.8	3.6	0.9
12	Ethylbenzene	1.1	0.25	110	25	37	9
13							
14	(1) based on lower of HI=1 or 1x10e-6, except 1,2-DCE & chloroform						
15	(2) based on lower of HI=3 or 1x10e-4, except 1,2-DCE & chloroform						
16	* based on HI=1 to be protective of sensitive sub-populations						
17	**based on non-cancer toxicity (RfD) of 1,2-DCA						
18	***based on HI=0.1 because of chloroform being a threshold carcinogen						

EPA HQ TCE "guidance"

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

AUG 27 2014

OFFICE OF
SOLID WASTE AND
EMERGENCY RESPONSE

MEMORANDUM

SUBJECT: Compilation of Information Relating to Early/Interim Actions at Superfund Sites and the TCE IRIS Assessment

FROM: Robin H. Richardson, Acting Director
Office of Superfund Remediation and Technology Innovation (OSRTI)

TO: Superfund Division Directors, EPA Regions 1 - 10

Purpose

This compilation of information was prepared in response to requests from U.S. Environmental Protection Agency (EPA) Regional Offices. It provides information regarding existing EPA guidance on early or interim actions at Superfund sites. It also provides current information about the toxicity of trichloroethylene (TCE). The information referenced in this document may be used to support Superfund decision making at sites with actual or potential inhalation exposures to TCE.

EPA HQ TCE "guidance" cont'd

Summary

Existing guidance provides that responders should consider *early or interim action(s)* where appropriate to eliminate, reduce, or control the hazards posed by a site. In doing so, IRIS generally provides the best available toxicological information in support of *early or interim action* for buildings where investigations of indoor air contamination identify site-related concentrations of TCE.

TCE Removal Management Level (RML) for Indoor Air

EPA Region 4 recommends using a chemical/site specific removal management level (RML) of 2 µg/m^3 based on a Hazard Quotient of 1 for residential exposures. This RML is protective of the most sensitive and vulnerable human receptor population, women in their first trimester of pregnancy, because of the potential for cardiac malformations in the developing fetus during this short timeframe.

Region 4 Recommendations for ↑TCE

- Temporary relocation of residents and mitigation measures are recommended for the residential properties with confirmed TCE indoor air levels exceeding 2 µg/m^3. Mitigation effectiveness is defined as a reduction of the TCE indoor air concentration to below 2 µg/m^3.

- Resampling is needed for residences with mitigation systems to confirm that the TCE levels in the indoor air have decreased.

- For longer term action, the source of the VOC contamination should be addressed so that vapor intrusion is not a significant pathway for other current or future residences or businesses in the area.

Addition of the Subsurface Intrusion to the HRS

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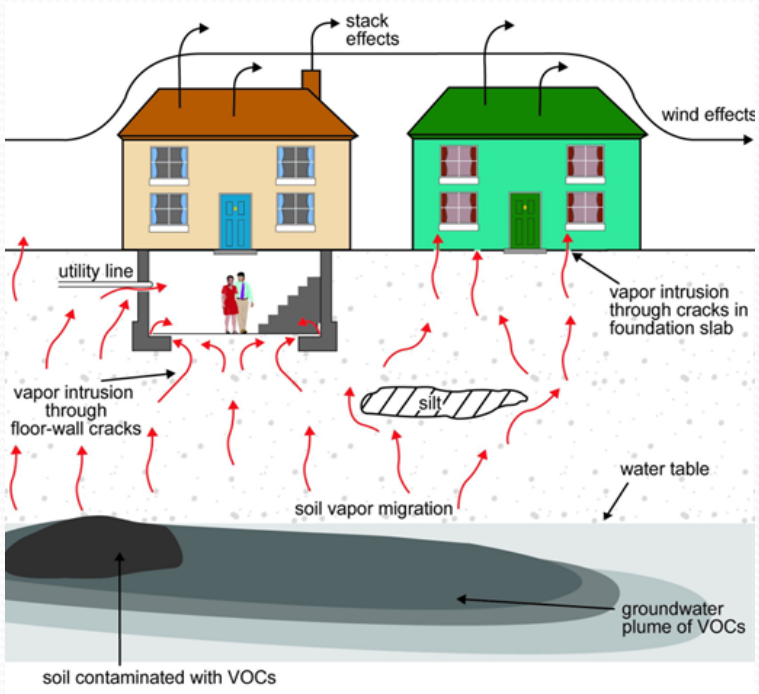
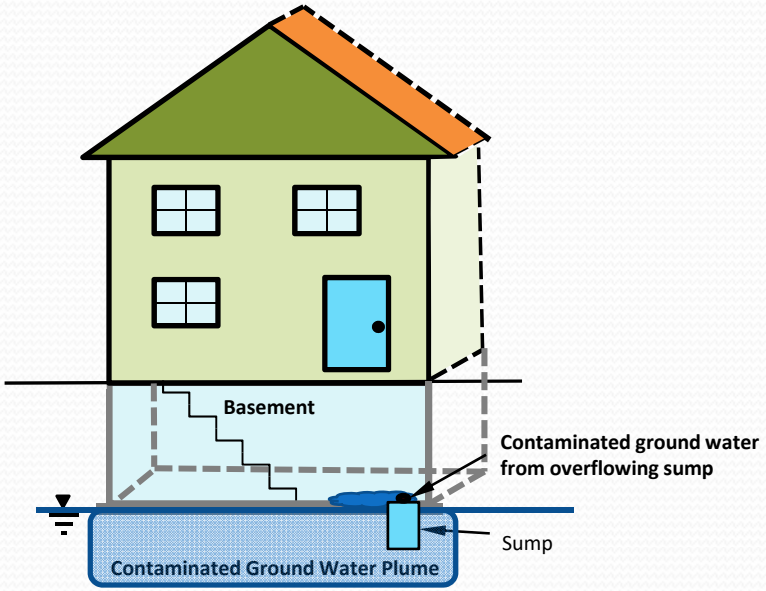
Vapor Intrusion



Contaminated Ground Water Intrusion



Scope of this Action

- The rule affects only how EPA prioritizes sites for the NPL.
- No direct regulatory impact.
- Current NPL sites are not affected (VI screening is currently part of 5-year reviews).
- No systematic re-evaluation of legacy sites.
- Minimal impacts to other federal agencies which already identify and address vapor intrusion as part of their environmental programs.

Interim Mitigation Options

Sub-Slab Venting

Temporary Indoor Filter

This is for example purposes only, not an endorsement.

Home > Air Purifiers Catalog > 5000 Series > 5000 Vocarb

5000 Vocarb

This unit features a deep-bed activated carbon filter that uses a special carbon blend to remove VOC's (volatile organic compounds) which are the most common airborne chemicals in the home. The unit also includes a medical-grade HEPA to remove 99.97% of airborne particles (pollen, dust, mold, bacteria, viruses, pet dander) down to 0.3 microns in size. ARB certified for sale in California.

Email this product
Download PDF Sales Sheet
Download PDF Manual

USD $799.98 / $999.98 With U.V.

http://www.allerair.com/air-purifiers/air-purifiers-5000-vocarb.html

- Questions or Comments?

Thank you for your time.

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