



# ***ON CONTAMINATED SITES***

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Version 2 Effective date: November 1, 2017

## **Introduction**

## **Regulatory context**

Where PSI findings indicate the presence of

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Health Canada's Federal Contaminated Risk Assessment in Canada: Guidance for Soil Vapour Intrusion Assessment at Contaminated Sites [see Reference 1] to estimate, from the soil and groundwater data, the concentrations of vapour substances in subsurface vapour. Then apply appropriate ministry vapour attenuation factors in Protocol 22 to the estimated concentrations of vapour substances in subsurface vapour to estimate the concentrations of vapour substances in the breathing zone.

[Characterisation in Support of Human Health Risk Assessment. Volumes 1-3;](#)

and

Science Advisory Board's [Guidance on Site Characterization for Evaluation of Soil Vapour Intrusion into Buildings.](#)

In circumstances of conflicting guidance, the CCME Guidance Manual should be followed.

Qualified professionals carrying out or interTf1 0eying o

The option to estimate substance concentrations in subsurface vapour from substance concentrations in soil and groundwater is intended as a cost-saving characterization approach (a) where soil and water is well characterized, substance concentrations in soil and water are low, and vapour contamination is unlikely, or (b) where the vapour source will be removed from the site regardless of the outcome of the vapour assessment. Use of this modelling approach in other situations is not recommended.

The estimation of substance concentrations in subsurface vapour from measured substance concentrations in soil is not recommended as a sole characterization approach for substances with a liquid specific gravity greater than one because these substances can be present in the form of dense nonaqueous phase liquids (DNAPLs). DNAPLs are often difficult to identify and delineate, so vapour arising from DNAPLs will also be difficult to characterize through modelling alone.

If vapour substance concentrations are estimated in the breathing zone using both vapour data (i.e., Approach A or B) and soil and groundwater data (i.e., Approach C), preference should be given to the estimates derived using vapour data. Also, if the estimates from vapour data and soil/groundwater data are widely different, provide valid, scientific rationale for the disparity.

### **Vapour sampling and analysis**

The following references provide guidance on vapour sampling and analysis. :

Chapter 7, Chapter 8, and appended checklists therein of CCME's [Guidance Manual for Environmental Site](#)

- a) It is up to the qualified professional to determine how many vapour sampling events are required to capture the worst-case concentrations expected in the breathing zone for a particular site. Vapour data collected from multiple seasons and years is desirable. However, the results of one round of vapour sampling could be sufficient if accompanied by strong scientific arguments, a well characterized vapour source, and the results of a defensible vapour model which supports the vapour sampling results.
- b) Qualified professionals need to indicate, with supporting documentation, whether or not the substance concentration in vapour is at steady-state or decreasing at the location where the vapour sample was taken. Refer to Reference 3 for guidance.
- c) Indoor, crawlspace, and subslab samples will only be valid for the building from which they were collected unless sufficient documentation is provided to support the case that the results are also valid for other buildings.
- d) In some situations, subsurface vapour collected from uncovered or partially covered areas of a site will not be representative of vapour concentrations beneath adjacent buildings or beneath a building erected above the sampling site in the future. For details, see Section 7.4.2, Table 7-1, and Figures 7-1 and 7-2 of CCME's [Guidance Manual for Environmental Site Characterisation in Support of Human Health Risk Assessment. Volumes 1-3.](#)

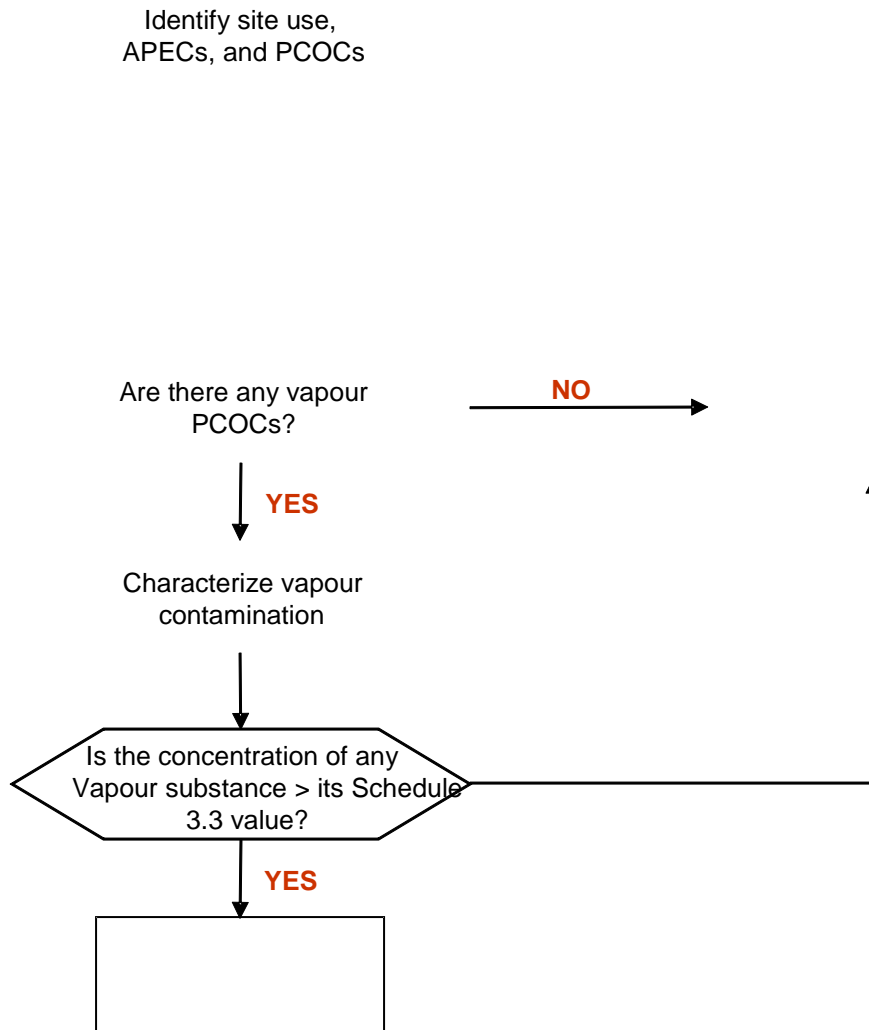
to control vapour intrusion risk is considered to be an engineering control and qualifies as a risk control for vapour exposure. Therefore sites using risk management are only eligible for risk based contaminated sites legal instruments. For guidance on the design, installation, monitoring, and maintenance of vapour management systems, refer to external sources, including the following documents:

California EPA [vapour mitigation advisory](#)

## References

1. Health Canada (2010). Federal Contaminated Risk Assessment in Canada: Guidance for Soil Vapour Intrusion Assessment at Contaminated Sites. Available by request from [cs-sc@hc-](mailto:cs-sc@hc-sc.gc.ca)

**Figure 1. Vapour assessment flowchart**



PCOC: potential contaminant of concern  
APEC: area of potential environmental concern  
DL: detection limit  
CSR: Contaminated Sites Regulation  
Schedule 3.3: Schedule 3.3 of the CSR, in force Nov. 1, 2017