

## Technical Guidance 4: Vapour Investigation and Remediation

May 2018

Stakeholder Comments / Recommendations	Ministry Response(s)
Page 3 How is "biologically active soil" determined?	Biologically active soil is defined in Procedure 8 "Definitions and Acronyms for Contaminated Sites". The ministry would expect a Conceptual Site Model and site investigation information to be used by a qualified professional to ascertain that biologically active soil is present to provide the biodegradation process necessary to attenuate the contamination.
Page 6 Mechanical ventilation system would be dependent on future developers and not necessarily known at time of remediation. Does this imply PAAD can't be used if we can't speak to the future ventilation system design?	Yes. The ability to use a PAAD is limited as described.
The definition of building would require clarification if applicable for semi-permanent buildings; i.e.; industry campsites as commonly used by the resource sector in remote areas.	This may be considered in future policy revisions.
Previous clarification for the requirement to complete a vapour assessment included the occasional human presence (expressed in hours/month) at an industrial/commercial site, with a future Wildland land use. Is this still applicable?	Yes, if human receptors are present at a wildlands site, then the scenario may need to be considered under risk assessment.
Section 1.0 The vapour PCOC refinement list (Table 1) could also include dry cleaner PCOCs which have been studied and recommended in CSAP's 2009 Soil Vapour Advice and Practice Guidelines.	This may be considered in future policy revisions.
Section 1.0 Terms under bullets (a) and (b) ("clearly", "likely less than") are poorly defined and could be interpreted subjectively.	This has been corrected in the final version.
Section 1.0 The reference to Chapter 5 of Soil Vapour Advice and Practice Guideline is incorrect – Section 5 of CSAP practice guideline refers to leak testing. Should this be the CCME guidance manual for site characterization?	This has been corrected in the final version.
Section 1.0 Reference to aerobically biodegradable substances, under Gasoline and Diesel Lateral Exclusion Distance, is inconsistent with Table 2 of draft P22.	Table 1 of TG4 and Table 2 of P22 have been adjusted to align with the ministry's intent to provide relief on substances which are known to aerobically biodegrade. The reference for this topic is ITRC Petroleum Vapor Intrusion (PVI) Guidance (Appendix I) found in the references of Protocol 22.
References to other sources of guidance on vapour sampling and analysis should be listed with complete references in the	The ministry's current format for documents is to hyperlink references directly and not duplicate entries by listing them in the references section.

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References section.	
Section 3.0 Under risk management using mechanical ventilation, who is responsible to sign and seal the statement of assurance that the system will achieve its “design objectives”?	A qualified professional engineer. This has been clarified in the final version of the Technical Guidance.
Section 3.0 Mechanical systems installed in parkades for air exchange do not have ‘design objectives’ for vapour risk mitigation from volatile subsurface COCs. The goal and objectives are similarly not developed for subsurface contamination issues. It is our understanding that the parkade VAFs were calculated on the basis of the air exchange capability of these mechanical systems as well as the limited duration of exposure to humans. Is the air exchange design objective sufficient to meet this requirement?	The understanding presented regarding derivation of the parkade VAF adjustment is incorrect. Please refer to the 2011 Golder / SABCS derivation document for details. Mechanical ventilation systems do have design objectives for air exchange, which forms the basis of the PAAD. Yes, air exchange design objectives are sufficient to meet this requirement.
Section 3.0 Need to specify that the recommendation for a risk-based CoC can be made by a numerical AP only for mechanical ventilation systems contemplated under this section (i.e. for parkades etc.)	This is explained in TG4 on page 6: a recommendation for a CoC based on risk-based standards for vapour where vapour contamination is risk-managed via mechanical ventilation may be made by a Numerical Standards AP.
Section 3.0 The implication is that a PAAD can only be used in a risk-based submission. If the use of the PAAD still resulted in concentrations in excess of the standards, this would then be carried forward for quantitative assessment in the RA. Presumably this would then revert to a risk AP? Also, it should be madclear that the RA would have to be limited to this one medium/pathway.	Agreed. Where vapour assessment guidance is lacking or considered inappropriate, qualified professionals should exercise defensible and documented professional judgement.
Page 3 As in Protocol 22, how would the presence of biologically active soil in lateral direction be demonstrated (i.e. how many samples per unit distance are required)?	The ministry would expect a Conceptual Site Model and site investigation information to be used by a qualified professional to ascertain that biologically active soil is present to provide the biodegradation process necessary to attenuate the contamination.
My comment is about the screening part re fuel PCOCs, as that subject comes up a lot even within our firm.	The ministry has provided clarification in the final version of Technical Guidance.
From past discussions, I believe the MoE’s intent with that section in regards to whether you can screen out the table 1	The ministry allows the PCOCs listed in Table 1 of Technical Guidance 4 and Table 2 of Protocol 22 to be utilized irrespective of the origination of

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<p>parameters from your vapour assessment based on ND soil and groundwater concentrations if your PCOC is fuel, but not otherwise. I could be wrong but that is what I thought. Where the confusion seems to arise is some interpret it to mean you can screen out those Table 1 PCOCs regardless of whether the PCOC is gasoline or diesel. For example, if your PCOC is creosote you would have naphthalene as your regulated parameter requiring testing or if you were dealing with say a pure toluene solvent then your only parameter requiring consideration in vapour would be toluene. Some people read the current TG4 and will read the future TG4 to mean you can screen out the 'fuel pcocs' from a vapour assessment regardless of whether the PCOC is a fuel or not as long as the regulated parameter is in table 1. The English language is a funny thing and I can see how someone could read it that way although I never have although I was influenced by past discussions when reading it as well.</p> <p>My comment is regardless of which of the two approaches is the MoE expectation now, the new TG4 could still be read either way in my opinion. My suggestion is you add a couple of sentences and make it explicitly clear what the MoE's expectation is in regarding to screening for table 1 items when the PCOC is not a fuel (e.g. MGP, dry cleaners, solvents, more exotic things that include btex, etc.).</p>	<p>the PCOCs; however, we note that these substances are typically found in petroleum hydrocarbons and that there could be other COPCs not listed in those tables that are relevant to the site.</p> <p>As an example, toluene solvent that did not arise from a petroleum hydrocarbon source would be eligible for PCOC refinement (provided conditions for refinement step are met), the 10 m lateral exclusion distance, or the BAAD based on the assumption that toluene would aerobically biodegrade in biologically active soil.</p>