



## RISK SYMPOSIUM – JUNE 2, 2011

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### DEBATE ON:

### IMPLICATIONS OF GROUNDWATER STANDARDS FOR RISK ASSESSMENT (TECHNICAL GUIDANCE 6)

#### **Summary and Recommendations:**

1. The debate focussed on how to find solutions to successfully complete site remediation and obtain CoCs for sites within the framework of TG6, wherein a primary goal is to protect groundwater for future drinking water use. It was recognized that groundwater protection is required.
2. There was general agreement that the application of DW standards poses challenges at some sites with unique conditions, and that some options should be explored within the framework of TG6. A meeting had been scheduled by CSAP and MOE for June 9 to establish task groups to address some of these issues and possible solutions.
3. A suggestion was made that the groundwater protection policy requires a holistic approach, with interplay at several levels within BC government agencies. A specific example is the approval of Water Management Plans under the Water Act. There are no approved plans at this time, and there have not been any apparent attempts to fast track the implementation of this potentially useful management tool for protection of aquifers.
4. Clarity is required on how Director's exemptions can be applied, and what the process is in place to obtain such exemptions. It is understood that MOE is working on developing an administrative procedure for this process. There was an interest among some participants to assist with this development.

#### **A. Iron and Manganese:**

1. When assessing groundwater used for drinking water, iron and manganese can be a challenging issue. Iron and manganese are ubiquitous in the environment, they are naturally elevated in groundwater in areas of peaty soils, and they are mobilized by geochemically reducing conditions, often caused by degradation of organics derived from anthropogenic or natural sources (i.e., petroleum hydrocarbons and peat).
2. There was consensus that iron and manganese are challenging for risk assessments. It was recognized that it is difficult to delineate contamination and determine if iron and manganese are naturally elevated or elevated due to site contamination. On a contaminated site, the main concern is to clean up the source contamination and then have Mn and Fe return to background concentrations. It was unclear how delineating beyond site boundaries would work, but that some flexibility in delineating the extent could be considered.

## ***B. Groundwater contamination and sites with fractured bedrock***

1. When there is contamination over fractured bedrock (e.g., Victoria), then groundwater investigation within the rock will often be necessary. It was noted that it is very challenging to define and delineate contamination in poorly fractured rock (we do not have a good understanding of how contaminants behave in rock). Remediation requires significant effort and is expensive. Some guidance regarding groundwater contamination in fractured bedrock is provided in Chapter 3 of SAB Fractured Bedrock document.
2. Protection of DW may not be possible for some contaminated sites with fractured bedrock. Suggestions were made to focus on source removal and control future contamination through aquifer protection. Where there is existing DW use of groundwater in fractured bedrock, then consider source removal, aquifer protection, and long-term monitoring of existing wells.
3. There are relatively few practitioners in BC with contained sites expertise in fractured rock. Consideration should be given to providing technical workshops that specifically address the investigation and remediation of contaminated fractured rock in BC. Ultimately, it will be beneficial to have a concise MOE technical guidance document for this issue.

## ***C. Compliance point, source removal, and monitoring natural attenuation***

1. Preliminary policy direction: Sources of soil and groundwater contamination should be controlled or removed to the maximum extent practicable such that the contamination that has migrated beyond a site boundary meets applicable drinking water numerical standards within a “reasonable time frame”. Groundwater monitoring will be required, as appropriate to site circumstances, to demonstrate achievement of remediation standards.
2. Everyone agreed that clear guidance on this topic is needed. There is a CSAP meeting scheduled for next week to discuss this issue and guidance for monitoring natural attenuation is also being developed. Guidance from other jurisdictions will be considered in the process (i.e., Netherlands, US EPA).

## ***D. Creosote Piles***

1. Challenges with creosote piles include:
  - a. When beneficial use ceases, the 1 m grace distance no longer applies and DW standards apply (if a DW aquifer exists);
  - b. Impractical to expect site with remaining piles in urban sites to be remediated for DW purposes when DW is supplied by the city;
  - c. If piles are not pulled out and RA-DW used, it is unlikely residual PAHs will attenuate;
  - d. Pulling piles might mobilize residual creosote; PAHs may also stimulate Fe/Mn and more drinking water compliance issues;
  - e. Pulling piles might open a channel through an aquitard.

2. It was mentioned that we need groundwater protection strategies to prevent groundwater pollution using a holistic approach. This would involve a number of departments and ministries working together.

### ***E. Director's Determination and Approved Water Management Plan***

1. Director's determinations and application of exemptions. There was some confusion as to what is required for a determination of no DW use at a site (or wide-area), and various exemptions such as exemption for specific contaminants like iron and manganese). Further clarity should be provided by MOE.
2. Approved Water Management Plans will be an important tool for protection of groundwater. However, no plans have yet to be approved and there appears to be little that the Land Remediation Section can do about it as it falls under the Water Management Branch. It was recognized that this requires higher level discussions at a political level.