

MRBCA Stakeholder Group
Agenda Topics
June 9, 2016

1. Early relief from consideration of groundwater domestic use pathway

The first paragraph of subsection 6.6.2 of the 2006 MRBCA guidance states, in part: “For early relief from consideration of [the groundwater domestic use pathway], an ordinance that prohibits well drilling along with a Memorandum of Agreement with a governing body . . . can be used to justify an incomplete pathway.” In the experience of the HWP, some consultants applying MRBCA have misinterpreted this provision to mean that full characterization of groundwater contamination is not necessary if the domestic use pathway can be shown to be incomplete. This was never the intention of the provision.

Full characterization of groundwater contamination is necessary to ensure the extent of the contamination is known in order to facilitate the identification and assessment of all groundwater exposure pathways.

The HWP recommends that the MRBCA guidance be clarified to indicate that full site characterization is required at all sites to which the MRBCA process is applied, and the extent of site characterization is not wholly reliant on, and in some cases may be determined apart from, an exposure pathway assessment. In addition, the guidance should clearly explain that groundwater characterization includes the collection of data to facilitate an evaluation of plume stability.

1.1 Domestic use pathway and groundwater contamination at nearby sites

Regarding evaluations of the probability that a groundwater zone could be used as a future source of drinking water, subsection 6.6.2 of the MRBCA guidance (and section (8)(D)7.E of RBCA rule) indicates that the following should be considered: “Urban development considerations for sites in areas of intensive historic industrial or commercial activity, having groundwater zones in hydraulic communication with such industrial or commercial surface activity, and located within metropolitan areas that had a population of at least 70,000 in 1970.” This provision recognizes that, in some parts of the state, groundwater contamination might be so widespread and from a general variety of sources (as opposed to discrete sources, such as a tank leak or other discrete releases associated with specific commercial/industrial operations for which one or more specific entities can be determined to be responsible) as to not be practical to remediate and, therefore, that the groundwater zone need not be considered as a potential future source of drinking water. However, this should not be interpreted to mean that the presence of discrete groundwater contamination in an otherwise

usable aquifer necessarily renders the domestic use pathway incomplete. In such instances, a portion of an aquifer might be currently unusable – and the domestic use pathway in that portion of the aquifer currently incomplete – but the future domestic use pathway is still potentially complete. In short, except as provided for by the “urban development considerations” provision, the domestic use pathway may not be ruled incomplete for an aquifer that would be usable but for the presence of anthropogenic contamination. We propose to modify the guidance to make this clear.

Also in subsection 6.6.2, the guidance states: “In metropolitan urban areas, common human activities often impact the uppermost saturated zone. Due to these anthropogenic impacts, it may not be reasonable in some cases to consider the uppermost saturated zone as a domestic water supply source . . .” While this statement might be accurate in some specific situations, groundwater domestic use may not be ruled out by simply referencing this statement. Rather, a thorough analysis of groundwater, to include groundwater samples analyses as well as evaluations of natural quality and yield will in most cases be necessary. We propose qualifying the cited guidance accordingly.

2. Cumulative risk – when to calculate

The 2006 MRBCA guidance and 10 CSR 25-18.010(14)(F) stipulate that cumulative carcinogenic and non-carcinogenic risks are to be evaluated at each site evaluated under MRBCA. However, the 2006 MRBCA guidance is not clear – and in some places is contradictory or not entirely logical – regarding cumulative risk assessment. As a result, since implementation of MRBCA in 2006, the HWP has required cumulative carcinogenic risk evaluation irregularly, and generally only when multiple carcinogenic COCs have been present, and calculation of cumulative non-carcinogenic risk has been required only rarely. The Department of Health and Senior Services (DHSS) has advised the HWP that cumulative risk evaluation should occur at most sites.

When cumulative risk - particularly non-carcinogenic cumulative risk – exceeds the acceptable risk level, one way to address the excess risk would be to modify (decrease) the applicable target levels (refer to Appendix I of the 2006 MRBCA for an illustration of this idea). By remediating COC concentrations to the lower target levels, remaining cumulative risk would be reduced to an acceptable level. However, this approach can result in a drastic reduction in the applicable target levels. While this may ultimately be necessary, the HWP believes the guidance should be clear with respect to the various options for addressing excess cumulative risk and their potential overall effect on the remediation of and risk management at a site.

In the 2006 MRBCA guidance, cumulative risk assessment is discussed in subsections 8.7, 9.2, 9.3, 10.3, and 10.4, with the most detailed discussion in subsection 8.7. However, as discussed

above, this guidance is not clear as to when and how cumulative risk is to be assessed. Therefore, the HWP proposes to significantly revise the guidance to clarify specifically when cumulative risk must be evaluated and how the evaluation is to be conducted. This will entail revising all of the aforementioned subsections and (most likely) consolidating all guidance on the subject into a single section on cumulative risk.

2.1. Potential effects of above changes on sites

General discussion of the potential effects of changes in the evaluation of cumulative risk on sites addressed under MRBCA.

3. Cumulative risk and multi-jurisdictional sites

The BVCP occasionally works with sites at which a portion of the property has been excluded because of the presence of, usually, a regulated underground storage tank (UST) system. Generally, the excluded portion of the site is not discernable from the rest of the site, and the excluded area is generally as accessible to site receptors as is the rest of the site.

- For such sites, how should cumulative risk evaluation be managed?
- Should the cumulative risk from the excluded portion of the site be included in the cumulative risk evaluation for the BVCP site?
- In evaluating this issue, note that the Tanks RBCA guidance does not require an evaluation of cumulative risk.

4. Cumulative risk calculations for multi-component mixtures

When COCs at a site represent groups of individual COCs – for instance dioxins, PCBs, and PAHs – how should cumulative risk be evaluated? The most notable example of this situation is when dioxins are present and each dioxin congener is converted to a 2,3,7,8-TCDD equivalent using the Toxic Equivalency Factor (TEF) method.

5. Identification of critical cumulative risk provisions

The HWP undertook a general analysis of how cumulative risk evaluation is presented in the 2006 MRBCA guidance. The analysis found that the guidance is not entirely clear, logical, or consistent. Therefore, the HWP proposes to modify the guidance to include the following cumulative risk provisions:

- Cumulative risk need not be evaluated when the maximum soil and groundwater concentration of each COC at a site is below its DTLs. Note that this would be a policy decision, as it is possible for cumulative non-carcinogenic risk to exceed the acceptable level even when the maximum concentration of each COC is below its DTL.

- If the concentration of each carcinogenic COC is less than its applicable RBTL or SSTL, an evaluation of cumulative carcinogenic risk is warranted only if at least 10 carcinogenic COCs are present at the site. If less than 10 carcinogenic COCs are present at concentrations below their respective target levels, it is not mathematically possible for cumulative carcinogenic risk to exceed the acceptable level.
- Cumulative carcinogenic risk evaluation is warranted if two or more carcinogenic COCs are present and the concentration of at least one of the COCs exceeds an applicable target level.
- Non-carcinogenic cumulative risk must be evaluated when two or more non-carcinogenic COCs are present, whether or not concentrations of the COCs exceed applicable target levels. Note that this provision is potentially inconsistent with the first above which indicates that cumulative risk evaluation is not necessary if the maximum concentration of each COC is less than each COC's DTL.
- Because each COC-specific target level must be included in the cumulative risk equations, the target levels – whether RBTLs or SSTLs – must be known in order to calculate cumulative risk. Subsections 8.8, 9.3, and 9.5 of the 2006 MRBCA guidance erroneously discuss developing target levels (whether RBTLs or SSTLs) only after the cumulative risk assessment is complete. While it might be necessary to modify the RBTLs or SSTLs based on the results of the cumulative risk assessment, it is not correct to say that the RBTLs or SSTLs are developed after the assessment, as, again, the RBTLs and SSTLs must be known in order to calculate cumulative risk in the first place.
- If cumulative carcinogenic or non-carcinogenic risk exceeds the acceptable level, the target levels might need to be reduced to decrease cumulative risk to an acceptable level. The degree of this reduction in target levels can be significant, in particular for non-carcinogenic COCs.
- If the cumulative non-carcinogenic risk exceeds the acceptable level, one option to further refine the risk is to sort the COCs by the target organ or body system they affect, and re-calculate the level of risk accordingly (i.e., for each organ and/or body system). However, this would be a Tier 3 activity and would necessarily involve review by DHSS.

As part of the RBTL update and guidance revision, DHSS will be developing Excel-based software to calculate RBTLs and SSTLs. The software will also calculate cumulative carcinogenic and non-carcinogenic risk based on COC concentration data entered by the user. (NOTE: The computational software developed by the RAM Group and in use since 2006 also calculates cumulative risk based on user-entered data.)

The guidance requires extensive revision to clearly explain the conditions under which cumulative risk must be evaluated, and what options are available if the calculated cumulative risk exceeds an acceptable level.

6. Subsurface Soil Contamination and AULs

The 2006 MRBCA guidance and the MRBCA rule do not require the use of an environmental covenant when concentrations of COCs in subsurface soil exceed surface soil targets (neither the guidance nor rule speak to this issue). However, if subsurface soil containing COCs at concentrations above surface soil targets is brought to the surface by, for instance, site development, COCs in the now surface soil could pose unacceptable risk.

- Should an environmental covenant be required for such sites?
- Or should the condition simply be noted in the Certification of Completion?
- Or should neither be required?

7. Surface soil becomes subsurface soil

If contaminated surface soil becomes subsurface soil, should an environmental covenant be required? For instance, if clean fill is used to raise the grade of a site and addition of the fill causes contaminated surface soil to become subsurface soil, should the fill be considered a cap and an environmental covenant required? Under the 2006 MRBCA guidance, if COCs in the surface soil exceed surface soil targets, and fill is placed over the soil, whether to prevent access or to raise the grade, the fill is serving as a cap and a covenant is required.