The New Subsurface Intrusion Pathway in the CERCLA Hazard Ranking System (HRS): Impacts on Site Management Strategies

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Background /Objectives: As of May 22, 2017, the United States Environmental Protection Agency (EPA) formally added subsurface intrusion (SsI), including vapor intrusion (VI), to the list of pathways evaluated under the Hazard Ranking System (HRS) rule used to evaluate sites for placement on the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) National Priorities List (NPL). Adding the SsI pathway to the HRS is likely to result in sites being listed on the NPL that would not be listed based solely on other pathways, giving them greater public visibility and the possibility to receive federal funds for cleanup (often leading to cost recovery actions against potential responsible parties). The addition of the SsI pathway to the HRS poses a significant challenge in harmonizing current HRS methodology with the nuanced judgments required for VI evaluations with multiple lines of evidence (EPA, 2015). Therefore, potential responsible parties of unlisted sites may find their sites judged by two different standards.

Approach/Activities: Detailed analysis of the HRS rule was conducted by the presentation authors and implications were explored through trial scoring of a dozen example sites. Many comment documents on the rule, filed publicly during its consideration, were analyzed to observe how the rule's provisions evolved during the review process. Recent press reports show how the rule is influencing listing decisions in the months since it became final.

Results/Lessons Learned: Our analysis demonstrated the following notable implications of the updated HRS rule. **(1) Subsurface source strength is not fully considered:** Sites with subsurface concentrations below VI screening levels, ordinarily screened out, can now score high under HRS. **(2) Screening concentrations are conservative:** Risk screening concentrations are based on 10^{-6} individual lifetime excess cancer risk and the reference concentration for non-cancer risks. Therefore, sites lower in the risk management range can score high and the fringes of the plume can become important to scoring. **(3) Building size matters:** Efforts under the rule to maintain consistency in scoring hazardous waste quantity for other pathways has a counterintuitive effect for VI, assigning a greater score to larger buildings, even with the same number of occupants as a smaller building; this could affect prioritization of buildings for sampling. **(4) Having indoor air data generally increases the score:** Occupied buildings with detectable contaminants of concern in indoor air score much higher than unsampled occupied buildings. This may influence the sequencing of VI data collection. **(5) The importance of contaminated groundwater infiltrating into basement sumps is elevated.**

In addressing comments, the wording of the rule's final version provides significant flexibility, such as, *"If sufficient data is available and state of the science shows there is no unacceptable risk due to subsurface intrusion…. that structure can be excluded."* This gives room to advocate for state-of-the-science methods in implementation. Stakeholder groups have begun using the new rule to advocate for listing specific sites, with VI as a clear a concern at some sites proposed for listing in August 2017.