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## Vapor intrusion on the rise

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Defined as the migration of volatile chemicals from the subsurface into the indoor air of overlying buildings, vapor intrusion (VI) has received increased regulatory attention due to its potential for posing unacceptable exposure risks to building occupants. The evaluation of VI-related risks is complicated by the presence of background levels of volatile chemicals in indoor air unrelated to VI, as well as the variability of soil gas and indoor air data collected as part of VI investigations.

Currently, 24 states have developed guidance to assess and mitigate the VI pathway (see map at <http://vapor-intrusion.blogspot.com/>). Many other states have developed VI guidelines as part of larger contaminated site management documents or developed groundwater volatilization criteria as a first step to determine whether the VI pathway may be complete. Indoor air screening levels for a given volatile chemical, such as trichloroethylene (TCE), tetrachloroethylene (PCE) or benzene, can vary by as much as three orders of magnitude between states.

Massachusetts published final interim guidance in December 2011 and is now in the process of amending the Mass. Contingency Plan to better address VI mitigation and site closure. New Hampshire has recently updated its VI guidance to revise some of its existing screening levels. Both states have also issued stringent TCE short-term exposure limits for women of childbearing age in residential and commercial settings. These limits were developed in response to a recent toxicology review of TCE by the U.S. Environmental Protection Agency (EPA).

At the federal level, EPA has released two draft final VI guidance documents in April 2013 for public comments (<http://www.epa.gov/oswer/vaporintrusion/>). These documents are substantially different from EPA's 2002 draft VI guidance and reflect advances in the field over the past 10 years. Consistent with most recent state guidance documents, EPA recommends a multiple-line-of-evidence approach relying on empirical data and cautions against using indoor air modeling as a single line of evidence for ruling out the VI pathway. To responsible parties, this could mean facing additional investigation costs and increasing public participation efforts even if groundwater or soil gas data suggest VI-related exposure risks are limited.

Laurent Levy, Ph.D., P.E., is a senior project manager for Gradient, Cambridge, Mass.

New England Real Estate Journal - 17 Accord Park Drive #207, Norwell MA 02061 - (781) 878-4540