MDHSS Involvement and Recommendations for Vapor Intrusion Investigations

Michelle Hartman
Missouri Department of Health and Senior Services (MDHSS)
Bureau of Environmental Epidemiology
Health and Risk Assessment Program
P.O. Box 570
Jefferson City, Missouri 65102-0570
(573) 751-6102
Missouri Department of Health and Senior Services (MDHSS)
MDHSS has primary responsibility for safeguarding the health of the people of Missouri.

Bureau of Environmental Epidemiology (BEE)
BEE has responsibility for the investigation and prevention of illnesses and medical conditions related to the environment.

Health and Risk Assessment Program (HRAP)
HRAP is responsible for evaluating human exposure to hazardous substances in the environment and for making health-protective recommendations regarding actions needed.
Human Health Risk Assessments (HHRA)

- HHRAs evaluate potential risks from current and potential future exposures and provide a quantitative estimate of the likelihood of health problems occurring over time if no actions were taken to clean up contamination. Important to note that results of a risk assessment are estimates of the potential for adverse effects, not certainties.

- A tool used in cleanup decision-making.
Public Health Assessments (PHA) & Public Health Consultations (PHC)

- PHAs evaluate potential health outcomes resulting from past, current, and potential future exposures and addresses community concerns.
- PHCs differ from PHAs in that the consultation focuses on a specific question or issue and provides a more rapid response.
- PHAs and PHCs provide specific recommendations on actions to be taken to protect public health.
MDHSS Role in Risk Management

**RISK & HEALTH ASSESSMENT** (MDHSS Role)

- Unbiased scientific approach to assessing potential health risks.

**RISK MANAGEMENT** (Regulator’s Role)

- The process of weighing policy alternatives and selecting the most appropriate regulatory action by integrating the results of risk assessment with other considerations, such as feasibility, cost, etc.
MDHSS Role in Vapor Intrusion (VI)

- Evaluate sites for potential VI risks and make recommendations for VI investigations.
- Participate in planning phases for VI investigations and review work plans.
- Assist in community outreach planning and participate in outreach activities.
- Review sampling results and make recommendations on actions needed.
- Address health concerns and provide health education to communities.
VI is evaluated using a tiered approach:

- A preliminary analysis to determine the potential for VI.
  - Comparison of available groundwater data to generic screening levels developed using conservative default attenuation factors that reflect generally reasonable worst-case conditions.
  - If concentrations are above these generic screening levels, additional sampling and further evaluation is typically recommended.

- A detailed VI investigation accounting for potential seasonal variation and using a multiple lines of evidence approach, including concurrent collection of sub-slab soil gas, indoor air, and ambient air samples, to determine whether the VI exposure pathway is complete.
  - Concurrent sampling allows for data comparison and accurate assessment of the risks of VI, as well as timely response to any health hazards.
VI investigations need to address potential mitigation actions:

- If exposures are found to be occurring from vapor intrusion, it would not be acceptable to delay planning for and implementing mitigation.

- The need for mitigation action needs to be considered and agreed upon upfront. MDHSS recommends development of a decision matrix.
MDHSS recommends a decision matrix be developed to determine response actions and further recommends VI comparison levels include screening levels and action levels:

- Screening levels are typically based on a cancer risk (CR) of 1E-6 and non-cancer hazard quotient (HQ) of 1, while VI action levels are based on the lower of a CR of 1E-5 or HQ of 1.
  - If screening levels are exceeded, periodic monitoring is recommended.
  - If action levels are exceeded, actions to mitigate risk are recommended.
  - Preemptive mitigation is also recommended if site data/conditions indicate a high threat for VI to occur in the future.
<table>
<thead>
<tr>
<th>Sub-Slab Soil Gas (SS) (attenuation factor of 0.03)</th>
<th>Indoor Air (IA)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IA &lt; 1E-6 Cancer Risk &amp; &lt; Hazard Quotient of 1</td>
</tr>
<tr>
<td>SS &lt; 1E-6 Cancer Risk &amp; &lt; Hazard Quotient of 1</td>
<td>No Additional Action</td>
</tr>
<tr>
<td>SS ≥ 1E-6 Cancer Risk &amp; ≤ Hazard Quotient of 1</td>
<td>Further Assessment</td>
</tr>
<tr>
<td>SS &gt; 1E-5 Cancer Risk or &gt; Hazard Quotient of 1</td>
<td>Further Assessment / Preemptive Mitigation</td>
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</tbody>
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Community Outreach Recommendations

• Knowledge about the community should be obtained upfront and considerable planning should be put into community outreach.

• Potential questions and answers should be considered and talking points should be developed prior to making contact with the community.
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Case Examples

• Residential Sites
• Commercial / Industrial Sites
• Other Sites
QUESTIONS

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