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ACQUISITION,
TECHNOLOGY
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1200 Pennsylvania Ave, NW
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For EPA Docket ID No. EPA-HQ-SFUND-2010-1086:

The Department of Defense appreciates the opportunity to review and comment on the Environmental Protection Agency's consideration to add a potential vapor intrusion component to the hazardous ranking system.

As requested in the Federal Register Notice dated January 31, 2010, the attached is a complete set of comments for your consideration and inclusion in EPA Docket ID No. EPA-HQ-SFUND-2010-1086.

My point of contact for this issue is Ms. Deborah Morefield, who can be reached at (703) 571-9067, deborah.morefield@osd.mil. Please contact her if you have any questions or if you need additional information.

Sincerely,

A handwritten signature in black ink that reads "Maureen Sullivan".

Maureen Sullivan
Director, Environmental Management

Enclosures:
As stated

cc:
DASA (ESOH)
DASN (E)
SASAF (ESOH)
DES-E

Department of Defense (DoD) Comments on Potential Addition of Vapor Intrusion Component to the Hazard Ranking System

Overall comments on whether to move forward with the addition of Vapor Intrusion (VI) into the Hazard Ranking System (HRS), and if so, to determine a range of potential approaches.

The Department of Defense (DoD) is actively and systematically addressing VI on many of its sites through the investigation and 5-year review processes. Contaminants with potential for VI are considered as part of any investigation program DoD conducts. DoD currently addresses issues related to VI under the Defense Environmental Restoration Program (DERP) and follows the approach outlined in the DoD Vapor Intrusion Handbook, Deputy Under Secretary of Defense for Installations and Environment, January 2009. The potential for vapor intrusion is captured in the groundwater migration and soil exposure pathways by scoring three categories of factors: likelihood of exposure; waste characteristics; and targets. DoD does not see a benefit in adding a new pathway to the HRS.

In addition, while the potential VI issue is not new, the current science surrounding VI is still in its early phases. The correlation between source strength, migration pathway and site geology is not well understood. Our ever evolving understanding and lack of correlation is evidenced by the minimized use of the Johnson and Ettinger model and recent efforts to develop new models which currently have not been fully vetted by the scientific community and EPA. Accordingly, at this point in time, DoD feels it is inappropriate to introduce VI into the HRS.

1. The level and extent of vapor intrusion contamination that would warrant evaluation for placement on the NPL, as well as the identification of screening level information sufficient to perform this evaluation.

The HRS is a screening tool used to place a site on the NPL where further investigation needs to be conducted to determine extent of threat and need for cleanup. The current HRS screening criteria, which include groundwater and soil, are sufficient to capture the screening requirements. Further investigation, once sites are listed on the NPL, can focus on risk assessment and methods of exposure such as VI into buildings. An insufficient amount of fate and transport data (via the extent of the contaminant plume) is collected during the preliminary assessment/site inspections to adequately estimate a score for VI. For VI to be considered a potential pathway, a significant source strength immediately beneath or adjacent to a structure not covered by relevant OSHA regulations (constituents potentially in the subsurface) must be present. Focus should be on sites with known soil and/or groundwater contamination, since they are the primary source media for VI. DoD finds the Federal Register preamble to be misleading when it states, "The groundwater

pathway does not consider the potential risk of exposure to vapor intrusion from contaminated aquifers."

Groundwater will be the most common environmental data set available for initial VI screening purposes. Sites with groundwater concentrations that are below MCLs should not be included in the HRS screening for VI since the MCL is the primary regulatory standard for groundwater acceptability. In addition, uncertainties regarding future land use, building construction, site occupants and potential exposure profiles, and VI fate and transport modeling are so large as to preclude a meaningful screening step at undeveloped sites.

Data available for VI evaluation will vary significantly from site to site with groundwater and soil data being the most predominant. VI should be considered as an exposure route from the existing groundwater and soil migration pathways with certain criteria for screening out such as groundwater concentration below MCL and lack of exposure pathway (e.g., at undeveloped sites).

2. Methods for incorporating vapor intrusion into the HRS while, to the extent possible, maintaining the structure of the other pathways in the current HRS and retaining that same structure throughout the new mechanism for vapor intrusion (i.e., likelihood of release, waste characteristics, and targets). These methods could include the addition of vapor intrusion as a migration pathway (e.g., groundwater), or part of an exposure pathway (e.g., threat within a direct exposure pathway along with soil).

DoD believes that much more extensive characterization is needed to make a VI determination than what is collected during the early investigation phases. VI risks are generally governed by 1) distance from vapor source to building, 2) magnitude of vapor source strength, 3) toxicity of COCs, 4) geologic characteristics, and 5) building/foundation characteristics. The first two governing characteristics are difficult to even speculate upon until a detailed site characterization is complete. Including VI as a driving factor in HRS without this information would require speculation beyond reasonable scientific limits.

Both the groundwater and soil migration pathways, which are part of the current HRS, indirectly provide for scoring volatile contaminants such as dry cleaning solvents, industrial de-greasers and petroleum product spills that are often cited as sources of VI. Contaminants with potential for VI are already considered as part of any DoD investigation; therefore, there is no need to add a new pathway. The present HRS can be easily modified to allow consideration of potential vapor intrusion. Individual factors can be added or modified for two of the existing pathways (soil exposure and groundwater migration) to permit a higher score where vapor intrusion is a potential concern. The most appropriate categories to modify are: (1) Likelihood of Exposure; and/or (2) Targets.

In addition, the potential completeness of the VI exposure pathway will be based on land use, site development and presence of buildings, and the nature and extent of contamination.

Accordingly, DoD believes that the large number of parameters and data requirements would make it extremely difficult to have adequate data in the hazard ranking phase to assign a score to potential VI exposures.

3. Consideration of the importance of evaluating the potential threat to populations not demonstrated to be exposed to contaminant intrusion.

While DoD believes potential future exposures to be important, we believe future exposures due to VI are too uncertain for HRS scoring. Due to uncertainties, it would be unreasonable to evaluate potential threats to populations.

4. The identification of sampling procedures available and practical to detect the presence of contamination due to vapor intrusion.

Appropriate sampling techniques for VI screening are discussed in numerous references, including the Department of Defense (DoD) Vapor Intrusion Handbook, January 2009 [<http://www.clu-in.org/download/char/dodvihdbk200901.pdf>] and the Interstate Technology and Regulatory Council (ITRC), Vapor Intrusion Pathway: Investigative Approaches for Typical Scenarios, January 2007.

Sampling procedures for VI HRS screening should be based on proven and reliable techniques. DoD recommends relying on standard soil and/or groundwater sampling procedures available for those media and the likely contaminant groundwater concentration or the presence of non-aqueous phase liquid (NAPL). Assessing the potential risk associated with VI more directly through sampling would require either sampling specific buildings directly or accepting the large degree of uncertainty associated with sampling soil vapor and estimating building attenuation factors.

5. The availability of screening sampling strategies that can adequately compensate for the variability in vapor intrusion rates under different climatic and seasonal conditions.

In the absence of detailed site investigations, which are generally not available at the HRS timeframe, there are significant variations and uncertainties associated with vapor source identification and strength, geology, and building characteristic. Thus, climatic and seasonal conditions do not warrant specific considerations. In addition, there is great variability and lack of consistent approaches for evaluating impacts of different climatic and seasonal conditions on VI. DoD does not believe site-specific meteorological/climatological data should be collected and analyzed solely for the VI HRS process.

6. Identification of analytical methods sufficiently precise and accurate to demonstrate a significant increase in contaminant levels from vapor intrusion.

There are numerous reference sources available, including the ITRC and DoD guidance documents, that describe sufficiently precise and accurate analytical methods that are adequate for the VI HRS screening process. For instance, the analytical methods and protocols for sampling indoor air, when required, should be able to account for background indoor air vapor concentrations from sources unrelated to site contamination. EPA needs to clarify what constitutes a "significant increase."

7. The importance of the threat posed by exposure to contaminant vapor intrusion via inhalation, dermal contact with the vapors or condensate on surfaces, and ingestion.

Only consider the inhalation pathway at this time. Despite limited scientific and risk exposure information currently available for the VI pathway, DoD expects the risk from dermal contact with the vapors or condensate on surfaces, and ingestion to be more limited than that of direct inhalation. It is unrealistic to think that contaminant vapors carried into buildings by the inward migration of soil vapors will exist at concentrations high enough to condense on surfaces and become a dermal exposure problem. DoD recommends that dermal exposure from VI or particulate intrusion not be part of HRS scoring.

8. The identification of what environmental factors (e.g., porosity of soil, presence of a contaminated aquifer, climate) and structural and lifestyle factors (e.g., houses with basements) should appropriately be considered in determining whether a site warrants sampling for contaminant vapor intrusion.

As a result of the many variables noted below, it is not appropriate to conduct sampling for vapor intrusion at the screening level (current HRS). Sampling to establish the potential for vapor intrusion should only take place during an expanded site inspection. Consideration must be given to those environmental factors and parameters that influence and contribute to vapor intrusion. These include: soil gas data, near-slab soil gas data, groundwater data, background data (from indoor and outdoor samples), building construction and current conditions, sub-slab soil gas (or crawl space) data, indoor air data, ambient air samples collected concurrently with indoor air samples, comparison of constituent ratios of chemicals in soil gas and indoor air, site-specific geology, results of fate and transport modeling, results of the risk assessment, and site or building ownership and control. Guidance regarding application of environmental and structural/lifestyle factors should be finalized to ensure HRS scores for VI are derived uniformly across the board.

In addition to conventional geologic/hydrogeologic parameters, consider the following factors when determining whether sampling a site for VI is warranted:

- Distance to vapor source
- Toxicity of Contaminants of Concern (COCs)
- Concentration of COCs in soil and groundwater
- Building characteristics

- Vadose zone geology and permeability

9. In addition to residences, schools and other occupied structures, the identification of structures in which contaminant vapor intrusion could result in a significant threat to human health (e.g., community recreation centers, cultural centers, museums, athletic facilities).

While different structures with different occupant habits can be expected to result in varying patterns for VI exposure, DoD recommends the HRS screening step should focus its goal on site screening and not attempt to include details regarding building design or exposure scenarios beyond those already considered in the current HRS guidance. Although it may be appropriate to make conservative and generic assumptions during the screening step, consideration of alternative building and exposure profiles should only be included when the site progresses to the VI investigation phase.

DoD recommends EPA update its protocol and guidance on conducting site-specific assessments to ensure that VI pathway investigations are developed in a consistent manner rather than add the VI pathway to the HRS process. Additionally, when evaluating sites that include structures for commercial/industrial use, EPA should give appropriate consideration regarding jurisdiction over vapor intrusion in the workplace.

10. The possible need to consider not only contaminant vapor intrusion, but also intrusion of contaminants in solid (i.e., particulates) and liquid forms.

The mechanism for intrusion of particulates is not clear. If particulate intrusion occurs from contamination in surface soils being tracked into a structure, we believe that scoring the direct exposure pathway adequately addresses this type of particulate intrusion. DoD recommends that dermal exposure from VI or particulate intrusion not become part of HRS scoring. Intrusion and exposure to contaminants adsorbed to soil or dissolved in groundwater are already included in their own exposure pathways. It is not clear why these should be again considered under SVI.