



# ENVIRONMENT REPORTER



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## VAPOR INTRUSION

Recent increased attention to the migration of volatile chemicals from subsurface soil or groundwater contamination into buildings has raised concern about the evaluation of vapor intrusion in the process of buying and selling real property. In response, ASTM International's Subcommittee on Real Estate Assessment and Management developed a standard practice, released March 3, to be used as a tool to evaluate vapor intrusion in that context. The author of this article is the sole member of subcommittee E 50.02 whose negative vote was not withdrawn after the final ballot in December 2007. In this article, he explains how this standard undermines ASTM Phase I standard E 1527-05 on all appropriate inquiries and directs environmental professionals to speculate about unacceptable risks in indoor air of inhabited buildings.

### **New ASTM Standard for Assessment of Vapor Intrusion: More Harm Than Good?**

By CHRISTOPHER M. ROE

**V**apor intrusion is the migration of volatile chemicals from subsurface soil or groundwater contamination into overlying buildings. The chemicals volatilize from the impacted soil or groundwater and migrate as soil gas through pore spaces in soil toward areas of lower pressure and chemical concentration (usually toward the surface). The soil gas can enter buildings through cracks in foundations and utility conduits. The chemicals that enter a building have the opportunity to accumulate and cause human exposures to a degree they would not if dispersed in open, ambient air.

At least three things are true about the potential for volatile contaminants to migrate into buildings as vapors (vapor intrusion):

1. Vapor intrusion is subject to growing scrutiny.
2. Vapor intrusion determinations are complex and are not made easily.
3. Vapor intrusion determinations inherently are high stakes because they are determinations about unacceptable health risks in the breathing air of building inhabitants.

With these truths as backdrop, ASTM International, through its Committee E50 and Subcommittee E50.02, set out to develop a tool for evaluating vapor intrusion

issues in the context of the purchase and sale of real estate. The result is E 2600-08, *Standard Practice for Assessment of Vapor Intrusion into Structures on Property Involved in Real Estate Transactions* (VI Standard Practice). Unfortunately, the VI Standard Practice does not adequately take into account items two and three above.

Moreover, in issuing this VI Standard Practice, Committee E50 decided it needed to “clarify” its own *Standard Practice for Environmental Assessments: Phase I Environmental Site Assessment Process* (E 1527-05). E 1527-05, of course, has been deemed by the Environmental Protection Agency to satisfy “all appropriate inquiries” under the federal superfund law<sup>1</sup> and the regulations promulgated thereunder.<sup>2</sup> ASTM E 1527-05 provides the guidelines for the Phase I environmental site assessments performed everyday. This clarification of the existing standard is unfortunate as well as being unnecessary and unjustified.

## Emergence, Character of Vapor Intrusion Issue

Concerns about vapor intrusion, as discussed here, have arisen out of the context of the investigation, assessment, and cleanup of contaminated soil and groundwater under the federal superfund and hazardous waste laws as well as comparable state statutes. Assessment of the vapor intrusion pathway is part of conducting a human health risk assessment where the contamination at issue involves volatile chemicals.

There is no question vapor intrusion is the subject of growing scrutiny. For example, as noted by E 50.02 in the materials that accompany the VI Standard Practice, more than 26 states have developed or adopted vapor intrusion guidance in the last few years. EPA requires the indoor air pathway to be addressed in its environmental indicators evaluations<sup>3</sup> and issued its current draft guidance in November 2002.<sup>4</sup> The Interstate Technology and Regulatory Council (ITRC), a coalition led by state and federal regulatory personnel, issued *Vapor Intrusion Pathway: A Practical Guide* in January 2007.<sup>5</sup> California passed legislation in 2007 requiring consideration of the vapor intrusion pathway in cleanups there.<sup>6</sup> At the federal level, Sen. Hillary Rodham Clinton (D-

N.Y.) introduced legislation (S. 1911) Aug. 1, 2007, aimed at vapor intrusion risks, especially risks related to trichloroethylene (TCE).<sup>7</sup>

Vapor intrusion determinations are complicated by a number of factors, including 1) their reliance on modeling, including the various inputs to the models and the inherent difficulty of assessing preferential pathways; 2) the varied methodologies and models being applied by regulators; and 3) the various sources of volatile chemicals in indoor air, including ambient air concentrations, indoor sources, and subsurface contaminants. According to EPA, “the vapor intrusion pathway is complex and, consequently, we recommend a comprehensive assessment of this pathway using all available lines of evidence be conducted before drawing conclusions about the risks posed by this pathway.”<sup>8</sup>

Vapor intrusion analysis inherently is high stakes because it is a form of human health risk assessment regarding a particularly intimate media, the breathing air found in homes and offices. The Interstate Technology and Regulatory Council opens its *Practical Guide* by stating: “Degradation of indoor air quality causes more apprehension and anxiety among building occupants than are typically associated with other environmental problems.”<sup>9</sup> The lawsuit filed against IBM in January 2008 by 90 residents and businesses in IBM’s birthplace, Endicott, N.Y., highlights this. The lawsuit is, to a great degree, about the alleged intrusion of vapors from contaminated groundwater into homes and workplaces.<sup>10</sup>

## ASTM’s Response

In this context, members of ASTM Committee E50 and the author and issuer of E 1527-05 decided E50 should develop and issue a tool to provide guidelines on the assessment of vapor intrusion in real estate transactions. In 2005, Subcommittee E50.02 developed a task force and charged it with developing a standard.

After two years of work, in November 2007 the proposed *Standard Practice for Assessment of Vapor Intrusion into Structures on Property Involved in Real Estate Transactions* went out for final ballot to the entire E50 Committee and ultimately was approved (39 ER 442, 3/7/08).<sup>11</sup>

## Summary of Concerns

The issuance and application of this standard has a potential to do harm in two principal ways:

<sup>7</sup> The TCE Reduction Act of 2007 (S. 1911) would require EPA, among other things, to develop and apply a reference concentration with respect to vapor intrusion in CERCLA cleanups. See <http://www.capitolpub.com/images/newsletters/clintonces1911.pdf> on the Web.

<sup>8</sup> *Draft Subsurface Vapor Intrusion Guidance*, p. 21.

<sup>9</sup> ITRC *Practical Guide*, Section 1.1.

<sup>10</sup> *Blaine v. International Business Machines Corp.*, N.Y. Sup. Ct., No. 2008/000012, 1/3/08 (39 ER 96, 1/11/08).

<sup>11</sup> This author joined ASTM only after he heard this standard was under development and the draft standard largely was complete. When the final ballot went out in November 2007, he studied the proposal and made his concerns known to the task group chair. After weeks of discussions, which resulted in some changes to the standard deemed by the task group to be non-substantive, he submitted the only negative vote on the E50 ballot that was unresolved. This article explains why.

<sup>1</sup> Comprehensive Environmental Response, Compensation, and Liability Act, 42 USC 9601(35)(B).

<sup>2</sup> 40 CFR 312.11.

<sup>3</sup> *Interim Final Environmental Indicator Guidance Under RCRA* (Feb. 5, 1999), available on the Web at [http://www.epa.gov/epaoswer/hazwaste/ca/eis/ei\\_guida.pdf](http://www.epa.gov/epaoswer/hazwaste/ca/eis/ei_guida.pdf).

<sup>4</sup> *Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils*, (67 FR 71169, 11/29/02), available on the Web at <http://www.epa.gov/correctiveaction/eis/vapor.htm> (hereinafter, *Draft Subsurface Vapor Intrusion Guidance*). Despite repeated statements of the intention to do so, EPA has not issued a final version of this guidance.

<sup>5</sup> ITRC also issued *Vapor Intrusion Pathway: Investigative Approaches for Typical Scenarios* in January 2007. Both documents are available on the Web at [http://www.itrcweb.org/gd\\_VI.asp](http://www.itrcweb.org/gd_VI.asp).

<sup>6</sup> California A.B. 422 (2007) amending the Carpenter-Presley-Tanner Hazardous Substance Accounts Act (California Superfund Act) and Porter-Cologne Water Quality Control Act to require risk assessments to consider vapor intrusion (38 ER 2310, 10/26/07).

1. It directs environmental professionals to speculate in written conclusions about the presence of unhealthy levels of volatile chemicals in the indoor air of inhabited buildings.
2. It undermines E 1527-05, and Phase I environmental site assessments, as constituting all appropriate inquiries under the federal superfund law.

Moreover, after “clarifying” that contamination that reaches the target property in vapors would not be identified under a properly conducted E 1527-05 environmental site assessment, the VI Standard Practice, even in its initial screening tiers, does not provide a mechanism equivalent to E 1527-05 or the Phase I process for filling the perceived gap.

The goal of E 1527-05 is to identify recognized environmental conditions, “the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing [or past or materially threatened] release. . . .”<sup>12</sup> In other words, a Phase I identifies releases that may affect the target property. On the other hand, the goal of the new VI Standard Practice is to identify potential (pVICs) or actual vapor intrusion conditions (VICs), defined as the “presence or likely presence of any [chemical of concern] in the indoor air environment of existing . . . structures . . . at a concentration that presents or may present an unacceptable health risk to occupants” [emphasis added].<sup>13</sup> In other words, the VI Standard Practice identifies potential health risks. Recognized environmental conditions (RECs) and pVICs are not parallel or equivalent concepts.

If the science and regulatory scrutiny of volatile contaminant migration has evolved to the degree that all appropriate inquiries investigations require the evaluation of nearby volatile releases as recognized environmental conditions, then E 1527-05, as currently drafted, is broad enough to encompass this evolution. E 1527-05 does not discuss and is not limited to any particular contaminant migration pathway. Therefore, a volatile release the environmental professional concludes likely impacts soil gas at the target property at greater than de minimis levels (above vapor intrusion target or screening values levels, for example) properly is identified as a recognized environmental condition under E 1527-05. For the sake of the screening required by all appropriate inquiries, there is no need for the consultant to go on to speculate about whether that volatile release is creating unhealthy conditions in the indoor air, just as he or she need not provide risk assessment conclusions in a Phase I report about groundwater contamination identified as a recognized environmental condition.

If vapor intrusion analysis is called for or desired, a thorough analysis using appropriate data and federal or state guidance should be performed. Shortcut risk assessments with presumed conclusions are bad policy and bad science.

## Overview of VI Standard Practice (E 2600)

The stated purpose of the VI Standard Practice is to define good commercial and customary practice for

<sup>12</sup> E 1527-05, Section 1.1.1. The only risk assessment aspect of REC identification involves the exclusion of de minimis conditions, but these conditions must pose no threat to human health or the environment and would not be the subject of enforcement.

<sup>13</sup> E 2600-08, Section 1.1.1.

conducting a vapor intrusion assessment in a real estate transaction.<sup>14</sup> The practice is intended for voluntary use by parties who wish to conduct a screening evaluation to determine whether a potential for vapor intrusion exists at a target property, and if so, to identify alternatives for further investigation or mitigation. The VI Standard Practice does not replace federal or state guidance on vapor intrusion. Instead, it is designed to provide a framework for a screening level evaluation of vapor intrusion that may lead to the application of such guidance.

The VI Standard Practice presents a four-tiered approach. The first tier is an initial screen to determine if a potential vapor intrusion condition exists based on information similar to what otherwise is gathered as part of a Phase I under E 1527-05. Key to the Tier 1 process are the minimum search distances surrounding the target property, which take into consideration groundwater direction and are a subset of the search distances used in E 1527-05 for identifying potentially relevant sources or releases.

Where potential sources of volatile chemicals are identified within the search distances, the environmental professional is directed to presume a potential vapor intrusion condition exists unless sufficient information exists to rule such a condition out. This is, by design, a prescriptive process.<sup>15</sup>

To support the presumption, the task group apparently considered data on average plume distances for typical types of sites, such as dry cleaners and gas stations, and also considered the conclusion by EPA and others that vapors can migrate, vertically or horizontally, as much as 100 feet from the edge of a plume into nearby buildings.

Tier 1 also directs that, if a potential vapor intrusion condition is identified (or presumed), the source of the contamination must be added as a recognized environmental condition to any associated Phase I assessment. Exceptions do exist. For example, a potential vapor intrusion condition, and apparently the associated recognized environmental condition, can be eliminated if vapor intrusion previously has been evaluated and eliminated by other parties, there are existing engineering controls, or there is an “inherently safe building design” that would cut off the vapor intrusion pathway.

If a potential vapor intrusion condition is found not to exist as a result of the standard’s Tier 1 process, E 2600 presumes vapor intrusion likely is not a concern at the target property.

<sup>14</sup> E 2600, Section 1.1 states, in part, “The purpose of this practice is to define good commercial and customary practice in the United States of America for conducting a *vapor intrusion assessment (VIA)* on a property involved in a *real estate transaction*” [emphasis in original].

<sup>15</sup> There is some lack of clarity in the VI Standard Practice about how the search distances relate to the presumptions of potential vapor intrusion conditions. Borrowing from E 1527-05, the vapor intrusion standard defines the search distances by specific sources of information, for example, the environmental professional is required to look for National Priorities List sites within one mile upgradient of the target. However, the search distances also are used for making the presumptions. The author assumes a non-NPL volatile spill known by the environmental professional to exist within a mile upgradient, and which cannot be ruled out, would generate the presumption of a pVIC under the VI Standard Practice. However, this is not clear.

On the other hand, if the Tier 1 process does identify a pVIC, the environmental professional may move on to Tier 2, proceed directly to Tier 4 and the adoption of a mitigation mechanism, or presumably the process could end with the identification of the pVIC and the corresponding recognized environmental condition.

Tier 2 provides a more refined screening process that focuses heavily on information regarding the source of the contamination and the plume emanating from that source. Tier 2 also can include invasive sampling of soil, soil gas, and/or groundwater at or near the target where plume delineation data is not available for the known or suspected contaminated sites within the appropriate distance.

Tier 2 provides two tests. One is a so-called plume test, which assesses whether the plume is close enough to an existing or planned structure on the target property to result in a pVIC. The other is the risk-based concentration test, which compares sample results to generic risk-based concentrations or screening or target values in the state where the target is located (or site-specific standards developed by the environmental professional).

If a pVIC cannot be screened out at the Tier 1 or Tier 2 levels, the user may go on to a more sophisticated environmental sampling under Tier 3 to determine if a vapor intrusion condition exists.

Tier 3 essentially is a full blown vapor intrusion assessment at the property, potentially using crawl space, groundwater, soil gas, or sub-slab sampling; indoor air sampling; and site-specific modeling for attenuation factors. The results of this sampling then are compared to the appropriate guidance to make a conclusive determination about the existence of any vapor intrusion condition at the property.

Tier 4 basically is a discussion of potential mitigation techniques that may be used if a vapor intrusion condition is found to exist, or as an alternative to further site-specific evaluation if a potential vapor intrusion condition is determined to exist. The standard points out that at any point in the process, for example when a pVIC is identified in Tier 1, the user can jump to preemptive mitigation in lieu of further evaluation of the pathway.

## Explanation of Principal Concerns

**Identification of Potential Vapor Intrusion Condition Is Speculation About Potential Health Risks.** In Tier 1 of the standard, particularly, the environmental professional is called upon to declare a pVIC—the potential “presence or likely presence of any [chemical of concern] in the indoor air environment of existing . . . structures . . . at a concentration that presents or may present an unacceptable health risk to occupants” [emphasis added]—based on little more than the existence of a potential volatile source within the search distances.

For example, Section 8.6 of the VI Standard Practice appears to direct the environmental professional to presume and identify a pVIC where a volatile release (perhaps regardless of concentration) is present or suspected within 2,640 feet (to as much as 5,280 feet) up-gradient of the target and insufficient information is available to rule it out.

This is remarkable. As noted, EPA and others have concluded vapors can travel as much as 100 feet from a volatile source. Task force members and/or others re-

portedly have compiled and made some conclusions about average plume lengths from certain types of sources. However, taken together, such information does not equate to any scientific likelihood that subsurface contamination from a dry cleaner a mile upgradient actually would create unhealthy levels of perchloroethylene (PCE) in the inhabited indoor spaces of a particular target property. It seems the much more likely outcome, if the air in the target building actually were sampled, is that PCE from the dry cleaner would not be found. In such a circumstance, for the environmental professional to follow the VI Standard Practice’s presumption and label the target building with a potential vapor intrusion condition means the professional is speculating about potential unhealthy conditions in the breathing air of real people based on no real science. ASTM should not encourage such speculation, and no environmental professional should engage in it.

It is worth noting here that the standard’s Tier 1 screening is not the equivalent of Tier 1, Primary Screening under the EPA guidance, which is designed to allow the user to decide whether to move on to EPA’s Tier 2, Secondary Screening.<sup>16</sup> Primary screening under the EPA guidance does not use the term “pVIC,” and it does not generate a conclusion about risks to persons from indoor air.

In fact, as noted earlier, the very first sentence of the EPA’s Tier 2, Secondary Screening section states: “The vapor intrusion pathway is complex and, consequently, we recommend that a comprehensive assessment of this pathway using all available lines of evidence be conducted before drawing conclusions about the risks posed by this pathway.”

Furthermore, EPA’s Tier 1, Primary Screening specifically takes into account that insufficient information may exist to determine whether a structure is “near” (generally within 100 feet of ) a volatile release (or the edge of a plume emanating therefrom) and requires the collection of additional data before reaching any conclusions.<sup>17</sup> The VI Standard Practice takes the opposite view, speculating that the problem exists until it can be proven otherwise.

**Speculation About Health Risks Is Not Necessary to Satisfy All Appropriate Inquiries.** All appropriate inquiries under CERCLA is focused on the identification of releases and material threats of releases of hazardous substances on, in, or at the property.<sup>18</sup> This identification for the most part is without regard to complete risk pathways or risk assessment. This approach is reflected in the all appropriate inquiries regulations<sup>19</sup> themselves and in ASTM’s E 1527-05.

For example, offsite contamination that the environmental professional concludes migrates or likely migrates to the target property at greater than de minimis levels in groundwater is identified as a recognized environmental conditions regardless of whether groundwa-

<sup>16</sup> *Draft Subsurface Vapor Intrusion Guidance*, pp. 14-20.

<sup>17</sup> *Draft Subsurface Vapor Intrusion Guidance*, Primary Screening, Question #2, potential answer 3, p. 16, “If sufficient data are not available—check here and document the need for more information on the Summary Page. After collecting the necessary data, Question 2 can then be revisited with the newly collected data to re-evaluate the completeness of the vapor intrusion pathway.”

<sup>18</sup> 42 USC 9601(35)(A)(i) and (B)(i).

<sup>19</sup> 40 CFR 312.

ter expresses itself at the surface of this site, the groundwater will be used for any purpose at the site, or the groundwater contamination poses a threat to building occupants through a vapor intrusion pathway.

Therefore, it is simply unnecessary from an all appropriate inquiries point of view to create a summary risk assessment process to deal with the vapor migration pathway. If volatile contaminants migrate as vapors to the subsurface at the target property above de minimis levels, the source of those vapors likely should be identified as a recognized environmental condition regardless of whether a completed exposure pathway exists (and without regard to whether the current building at the target has a subsurface parking garage or vapor mitigation system).

**The User May Not Resolve the Issue.** It is essential to remember that the ASTM E50 task group has developed this standard to be used by the environmental professional primarily in the context of a transaction, not in the context of a step-wise application of federal or state vapor intrusion guidance by the responsible party or the agency. This means the parties paying for the environmental professionals' services, at least at the time they do so, most often will have no stake in or responsibility for cleanup of the environmental conditions that may be the source of vapors. In addition, they likely will not even have an ownership interest in the target property itself yet. In this context, there is no reason to assume the "user" of the vapor intrusion standard will feel compelled to follow through and pay for additional levels of sampling and analysis that may be needed under the VI Standard Practice to undo or resolve the issues created by the environmental professional's presumed identification of a pVIC.

**Implications for Building Owner, Occupants, Tenants.** The declaration of a pVIC by an environmental professional is a determination of a potential risk in the breathing space of building inhabitants. For the building owner, inhabitants, and tenants, this determination immediately may give rise to health and liability concerns potentially based on no more than the existence of the target property to an inadequately characterized volatile release within a search distance.

An owner handed a VI Standard Practice report by a prospective buyer or a lender will face tough choices, including doing nothing and potentially face liabilities to users of the building for failing to disclose what later may be seen as material information, trying to disprove the speculation through the expense of indoor or invasive sampling, or installing a vapor mitigation system that likely is unneeded. In addition, mitigation options may be significantly more expensive on any existing commercial building than the task force may have assumed.

An interesting question is what liability the environmental professional (or others) may have to such a building owner if the pVIC declaration can be shown to be harmful to the owner's interests and not to have a reasonable scientific basis?

**The Standard Inappropriately and Unnecessarily Undermines E 1527-05 and Creates Confusion About Its Own Relationship to All Appropriate Inquiries.** The VI Standard Practice had been publicized by the task group as a mechanism to resolve confusion it perceived in the marketplace regarding whether a vapor intrusion analysis

was part of a Phase I environmental site assessment.<sup>20</sup> However, the VI Standard Practice likely will generate substantial confusion about whether environmental professionals will need to consider and identify releases that affect the target by a vapor pathway in conducting Phase I assessments or only if they are hired to perform the new standard.

The basis for the existing confusion, as articulated by the task group, was that the definition of recognized environmental conditions in E 1527-05 expressly includes the identification of releases and threatened releases "into structures on the property," but the list of items excluded from E 1527-05 as "nonscope" includes "indoor air quality." Apparently, in the task group's view, an environmental professional could not identify releases that relate to the property by the vapor intrusion pathway without making determinations about indoor air quality.

To resolve this perceived conflict, the task group chose to conclude the "indoor air quality" nonscope listing trumps the definition of recognized environmental condition and excludes vapor intrusion considerations from a Phase I.<sup>21</sup> Section 5.1 of the VI Standard Practice simply ignores the language of the definition of a recognized environmental condition that covers releases into structures, at least to the extent migration into the building is via the vapor pathway.

Reading part of the definition of a recognized environmental condition out of E 1527.05 is inappropriate and unnecessary to address the problem. Full-blown vapor intrusion analysis that reaches conclusions about "indoor air quality" is and certainly always has been beyond the scope of a Phase I environmental site assessment. However, the identification of releases that are a threat to the target property because they may cause chemicals to enter the building in vapors is entirely within the scope of a Phase I.

A CERCLA release is a release to the outdoor environment. As the definition of a recognized environmental condition acknowledges, CERCLA releases can migrate from the environment into structures. When a release poses that threat, the language of E 1527-05 requires the release to be identified as a recognized environmental condition. This is true regardless of whether the chemical enters the basement in groundwater seepage or through vapor intrusion. For offsite releases, if the condition in the offsite environment reasonably threatens to cause greater than de minimis levels of contaminants in the subsurface of the target property, the offsite release would be identified as a recognized environmental condition. Again, it should not matter whether the standard exceeded by the migration would be a groundwater maximum contaminant level or a soil gas screening value. It is hard to see how the

<sup>20</sup> *ASTM Hopes to Draft a Standard to Quell Vapor Intrusion Confusion* (15 EDDG 43, 6/15/06)

<sup>21</sup> Section 5.1 of the VI Standard Practice states as follows:

Indoor air quality, and therefore vapor intrusion as a contributing indoor air issue, is a non-scope consideration in a Phase I conducted in accordance with the ASTM E 1527 standard. This standard is not meant to preclude an environmental professional from providing a professional opinion in the Phase I ESA on the impact of potential vapor migration onto a target property if deemed necessary to satisfy "all appropriate inquiry."

inclusion of indoor air quality was ever intended to exclude these recognized environmental conditions.

EPA deemed E 1527-05 to satisfy all appropriate inquiries, and when it did so it presumably evaluated E 1527-05 with all of its terms, especially its core definitions, intact. It also is worth remembering that vapor intrusion is not a newly discovered concept. In fact, vapor intrusion has been a consideration in superfund risk assessments for almost twenty years.<sup>22</sup> What has happened recently is simply a matter of degree. Vapor intrusion now is seen as a much more viable and significant risk pathway in many more situations than it had been previously.

There is no explanation issued with the VI Standard Practice about how the task group came to the conclusion it was appropriate to read the indoor air exclusion to trump part of the definition of recognized environmental condition. There is a legal memo that accompanies and supports the standard called *Legal Background on Federal and State Liability for Vapor Intrusion* (VI Legal Background). This document simply does not address the alleged confusion regarding E 1527-05 and vapor intrusion. There is no discussion in the VI Legal Background of what was intended in listing indoor air quality as nonscope under E 1527-05, and, in particular, whether or not it is appropriate to declare that indoor air quality was meant to exclude vapor intrusion. It also does not directly address whether releases that relate to the property by vapor pathways should be considered in all appropriate inquiries. However, it does in fact conclude the migration of contaminants into structures gives rise to potential CERCLA liability.<sup>23</sup>

For an analysis of what was meant by the indoor air quality exclusion, it is much more fruitful to go to the text of E 1527-05 itself, and to the Legal Background issued by Committee E50 along with the standard.<sup>24</sup> First, from the language of Section 13 of E 1527-05, "Non Scope Considerations," the reader comes away with the distinct understanding that all of the nonscope

<sup>22</sup> See, for example, *Assessing Potential Indoor Air Impacts for Superfund Sites* (1992) and *Options for Developing and Evaluating Mitigation Strategies for Indoor Air Impacts at Superfund Sites* (1993). In 1997 and 1998, EPA developed a series of spreadsheets that allowed for site-specific application of the Johnson and Ettinger Model (1991) and the *Interim Final Environmental Indicator Guidance Under RCRA* (1999) expressly required assessment of vapor intrusion to indoor air and noted in doing so:

Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

<sup>23</sup> E 2600, Appendix X1 at X1.1.1.7, which concludes that CERCLA releases would include migration of contaminated vapors from hazardous substances located in the subsurface into a building.

<sup>24</sup> *Legal Background to Federal Law and the Practices on Environmental Assessments on Commercial Real Estate Transactions (E 1527-05 Legal Background)*, E 1527-05, Appendix X1.

items are conditions that "do not otherwise present potential CERCLA liability."<sup>25</sup>

Second, the E 1527-05 Legal Background explains at length why many of the nonscope considerations are nonscope. Each explanation provided turns on the fact that the nonscope condition discussed is not a condition from which CERCLA liability arises. Therefore, the paradigm this analysis applies is that conditions that may give rise to CERCLA liability are within the scope of E 1527-05, and those that do not are nonscope. As noted above, the VI Legal Background actually concludes vapor intrusion is a CERCLA liability matter. According to the paradigm, vapor intrusion should not be considered nonscope.

Unfortunately, there is no explanation provided in the E 1527-05 Legal Background for the specific listing of indoor air quality. In the context in which it appears, along with such common indoor air contaminants such as asbestos fibers, fungi, microbes, mold, and radon, it is not hard to understand why indoor air quality, as a general condition, would be listed as nonscope. In most situations, indoor air quality has nothing at all to do with CERCLA liability. In addition, a vapor intrusion analysis, with its focus only on those volatile chemicals that may enter the indoor air from contamination in the subsurface, is not, in any real sense, a general evaluation of indoor air quality. For example, a vapor intrusion analysis may identify no threat from subsurface contaminants, but indoor air quality actually could be very poor due to mold or indoor storage of chemicals or petroleum. Vapor intrusion analyses also very often are completed with no sampling of indoor air.

Of special note in the E 1527-05 Legal Background is its evaluation of radon vapor intrusion as a nonscope item.<sup>26</sup> The analysis presented turns on the fact that radon is nonscope only because it is naturally occurring and CERCLA expressly excludes response actions that respond to naturally occurring materials (the Legal Background states, "No liability under CERCLA attaches for naturally occurring radon. If a party to a real estate transaction wants to look for radon within a building, no amount of radon investigation will have any bearing on one's LLPs under CERCLA.")<sup>27</sup> However, the analysis goes on to point out that each of the other elements of CERCLA liability likely are made out for radon, and it cites to the migration of radionuclides from subsurface waste disposal into buildings as a circumstance when radon gives rise to CERCLA liability.<sup>28</sup> The logic again is clear: But for the fact radon is naturally occurring, radon vapor intrusion likely would be covered by CERCLA and therefore included under the scope of ASTM E 1527-05.

What Section 5.1 of the VI Standard Practice actually states is as follows:

Indoor air quality, and therefore vapor intrusion as a contributing indoor air issue, is a nonscope consideration in a Phase I conducted in accordance with the ASTM E 1527 standard. This standard is not meant to preclude an envi-

<sup>25</sup> E 1527-05, Section 13.1.1.

<sup>26</sup> E 1527-05, Appendix X1, Legal Background, Section X1.8.3.

<sup>27</sup> E 1527-05, Appendix X1, Legal Background, Section X1.8.3.4.

<sup>28</sup> E 1527-05, Appendix X1, Legal Background, Section X1.8.3.1, citing *Amoco Oil Co. v. Borden*, 889 F.2d 664, 30 ERC 1745 (5th Cir. 1989).

environmental professional from providing a professional opinion in the Phase I ESA on the impact of potential vapor migration onto a target property if deemed necessary to satisfy "all appropriate inquiry."

The second sentence of Section 5.1 was not part of the standard as it was voted on in the final ballot by Committee E50. It was added in an attempt to address the concerns raised in my negative comments on the ballot. My recommendation was that Section 5.1 be deleted in its entirety. However, the result of adding the language is ambiguity, especially in the overall context of the VI Standard Practice. Is Committee E50 saying releases linked to a target property by a vapor migration pathway properly are within the scope of an E 1527-05 Phase I? Or is the application of this standard necessary to adequately identify those recognized environmental conditions? Whatever the specific language may be, inherent in the screening level tiers of this VI Standard Practice is the idea that releases related to the property by the vapor migration pathway are not being identified as recognized environmental conditions under a Phase I. The end result, therefore, contrary to the task group's stated intent of eliminating confusion in the marketplace, is that the VI Standard Practice will tend to leave both users and environmental professionals unsure about whether the identification of offsite volatile releases is appropriately a part of an E 1527-05 Phase I.

One final observation about the purported clarification in the VI Standard Practice is that vapor intrusion is nonscope under E 1527-05. This clarification, if it could be relied on appropriately, would be welcome news to any environmental professional who failed to consider a nearby volatile release as a recognized environmental condition in the preparation of a Phase I report but should have done so because of the release's potential to affect the target property. Of course, the flip side of potential consultant liability is the interest of the consultant's client to be able to rely on the consultant's work product to meet the clearly identified goal, the performance of all appropriate inquiries. To the extent this VI Standard Practice is intended at all to provide after-the-fact relief to consultants, or, going forward, to relieve environmental professionals of the need to identify all Phase I recognized environmental conditions related to the property (regardless of migration pathway) in future Phase I assessments, this VI Standard Practice is inappropriate. ASTM E50 potentially would be undermining the sufficiency under CERCLA of both past Phase I assessments and the future of its own standard as constituting all appropriate inquiries.

## Recommendations

For all of the reasons stated above, the VI Standard Practice should not be employed as currently written. Rather, anyone hiring a consultant to conduct a Phase I consistent with E 1527-05 should confirm the expectation that if the environmental professional believes, based on the exercise of reasonable professional judgment, that a nearby volatile spill is likely causing soil gas levels at the target to exceed screening or target levels, that spill should be identified as a recognized environmental condition associated with the target property. In other words, a source of vapor contamination

should be evaluated in a way logically consistent with a source that causes contaminants to migrate to the target property in groundwater. Further, consultants should not be permitted to undermine the Phase I report as all appropriate inquiries by inserting any statement that suggests they have not considered any particular contaminant migration pathway in reaching their conclusions.

If Committee E50 seeks to revise the VI Standard Practice to make it more useful, the characterization of E 1527-05 in Section 5.1 should be eliminated and the VI Standard Practice substantially revised to eliminate the presumed and prescriptive identification of a potential vapor intrusion condition based on minimal screening level information.

In addition, a process should be built into the standard to be applied where, in the environmental professional's view, insufficient information exists in the screening process to make any determination despite commercially reasonable inquiry. Similar to the approach in EPA's guidance, no conclusion on the vapor migration issue should be required under these circumstances.

## Conclusion

The new VI Standard Practice undermines ASTM E 1527-05 as all appropriate inquiries by purporting to clarify that potential recognized environmental conditions linked to the target property by the vapor migration pathway are not properly considered under that standard. This is inappropriate and unnecessary. ASTM E 1527-05 is not limited to certain migration pathways. The new vapor intrusion standard establishes a short-hand risk assessment process that calls on environmental professionals to speculate about unhealthy levels of chemicals in indoor air. Again, this is unnecessary in a transaction screen, unjustified, and potentially harmful to the interests of building owners, inhabitants, and tenants. The standard should not be applied as written and all appropriate recognized environmental conditions should be identified under the existing ASTM E 1527-05 framework. Substantial revisions to the VI Standard Practice should be made before it is put to general use.

The question of whether subsurface releases are contributing unhealthy levels of contaminants to indoor air is too complex and too important to be speculated about in a shorthand fashion. If the issue is significant enough in a given transaction situation, particularly one involving existing structures, the question should be answered using the most appropriate and applicable vapor intrusion guidance.

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**About the Author:** Christopher M. Roe, a partner in a suburban Philadelphia office of Fox Rothschild LLP, has been an environmental lawyer for 18 years. He currently serves as remediation counsel for solvent-contaminated sites across the United States and overseas. Roe joined ASTM's Committee E50 and Subcommittee E50-02 specifically to monitor the development of VI Standard Practice. He can be reached at (610) 458-4987 and [croe@foxrothschild.com](mailto:croe@foxrothschild.com). Roe especially would like to recognize colleague Derald Hay for his assistance in the preparation of this article and to thank Edward Strohbehn of Bingham McCutchen LLP for his thoughtful insights.