MORASH, MELANIE

From: MORASH, MELANIE
Sent: Friday, January 22, 2016 1:23 PM
To: J. Wesley Hawthorne
Cc: Elizabeth Brown; Heather O'Cleirigh; Joseph Innamorati; Linda Niemeyer; Michele Yuen; Morgan Gilhuly; Nancy-Jeanne LeFevre; Peter Bennett; Peter Scaramella; Rebecca Mora; Shau Luen Barker; Shaun Moore; Soetebier, Kristen; Todd Maiden; Wendy Feng; Cynthia Woo; Lawrence McGuire; Leslie Lundgren; Rafael Rangell; Rose Condit; Wenqian Dou; DIAZ, ALEJANDRO; Estrada, Thelma; Harris-Bishop, Rusty; Lyons, John; Maldonado, Lewis; MORASH, MELANIE; Plate, Mathew; Shaffer, Caleb; Stralka, Daniel; Yogi, David
Subject: EPA Comments - Mitigation Plan for Residences #92/93, #71/99, #100
Attachments: SP/TDY Mtn View - Residential VI Results

Good afternoon, Wes,

Thank you for submitting this second batch of three residential mitigation plans (RES #92/93, RES #71/99, RES #100). The following are EPA's comments on these plans. These comments also pertain to the first batch of three plans (RES #21, 84/85, 105/124/125), as appropriate, and should be incorporated into all final plans that are submitted to EPA for review and approval following meetings with owners/tenants and site visits.

Please submit revised plans for RES #92/93, 71/99, and 100 responsive to these comments by COB Wednesday, January 27th. Upon approval by EPA, please have all three mitigation plans translated into Spanish and provide these translations to CB&I for review.

(1) RES 100-Specific Mitigation Plan Comment:

The broken asphalt in the crawlspace for RES 100 should be excavated for trenching to install the 4" PVC soil gas extraction pipe. The pipe needs to be laid in a trench to make the extraction of soil gas more uniform over the crawlspace floor. A 4" pipe laying on the surface of the crawlspace will not be as effective in establishing a partial negative pressure under the membrane that is uniform over the crawlspace.

(2) Design Decisions

Page 2, Description Section: The plan states that options will be discussed with owner or will accommodate owner requirements. However, design decisions should also be approved by EPA for sound technical basis as well.

(3) Vapor Barrier

Page 2, Description Section: EPA supports the proposal of a vapor barrier that is Class A, however, the 10 mil thickness proposed in insufficiently thick and inconsistent with EPA's guidance. A thicker barrier (20 or 30 mil) is less likely to be punctured or otherwise damaged. The specifications included for the proposed barrier also seem to indicate its usage for slab-on-grade buildings, as opposed to crawlspaces. Please revise to a 20 mil Vapor Block, Class A vapor barrier to address durability concerns.

(4) ASTM Standard

Page 3, Paragraph 3: Instead of ASTM E2121-11, revise to ASTM E2121-13.

(5) Schedule

Page 4, Implementation Schedule: It states that implementation of the plan will take 90 days, yet the installation will take no more than three days. Please reduce the estimated timeframe for required implementation (such as to 15-45 days, depending site-specific situations).

(6) Crawlspace Action Levels

Regarding the proposed crawlspace action levels (with footnote justification), the provided justification for the proposed crawlspace cleanup level is not defensible and is insufficiently protective. EPA's preferred action level for this early action associated with the ongoing VI evaluation is the long-term screening level (0.48 micrograms per cubic meter or ug/m3), which can be evaluated in light of the risk range and a robust statistical analysis of background outdoor air concentrations.

Regarding the outdoor air concentrations, while we have seen outdoor air TCE levels up to 0.62 ug/m3 in the course of the investigation, these levels do not appear to be typical. Further sampling and analysis is appropriate regarding background for the site, and should include data sets from sampling investigations at nearby sites and historical outdoor air trends.

Calculation of House-Specific Attenuation Factors Not Defensible

The approach proposed in the mitigation plans is to set "house-specific" crawlspace cleanup levels, minimizing the attenuation factor (AF) ratio, defined as the crawlspace concentration divided by the indoor air concentration. However, with only two sets of data points in the dataset (for example, RES 92 and 93 data sets in the plan for RES 92/93), statistical calculations would not be meaningful, which EPA assumes is why the plan proceeds with a simple range comparison. However, the dataset is simply too small to yield a result of any confidence. EPA cannot support building-specific nor site-specific attenuations on such a basis.

The small number of data points for this house do not make for a robust evaluation of a building-specific or site-specific crawlspace attenuation factor. Consider for instance, EPA, 2012[1], in which EPA concluded that data from 45 residential buildings nationwide were not a statistically significant data set to modify an attenuation factor for crawlspace-to-indoor-air to a value different than 1. Therefore, the default attenuation factor should be 1 (no attenuation) per EPA's OSWER guidance, and the long-term target crawlspace air concentration for TCE remains the long-term screening level (0.48 $\mu g/m^3$) for justification of mitigation termination procedures.

Using the larger data set from EPA's vapor intrusion guidance, the 90th percentile shows no attenuation between crawlspace and indoor air. Therefore, we must assume no attenuation and use an appropriate action level for these early mitigation efforts. (See below for discussion of data from this and other VI investigations that illustrate lack of attenuation.) While we can set a higher level (though still within the risk range, see below) at which to evaluate the effectiveness of the mitigation work, EPA's long-term goal for Superfund Sites is to lower exposures as much as possible within the protective risk range to the low end of the risk range (for TCE, the long-term screening level).

[1]EPA, 2012, ***EPA's Vapor Intrusion Database: Evaluation and Characterization of Attenuation Factors for Chlorinated Volatile Organic Compounds and Residential Buildings***, EPA 530-R-10-002, Office of Solid Waste and Emergency Response, Washington, DC 20460, March 16.

Concerns Regarding Make-Up Air

As discussed above, EPA's guidance includes a general attenuation factor of 1 for crawlspaces and does not support the methodology used in the footnote of the mitigation plans of a building-by-building basis using a very limited data set.

Without evidence to the contrary, we must assume that there are potentially certain rooms in each building (such as interior rooms, or other rooms with certain occupancy features) that are poorly ventilated, or without windows or other

venting entirely, for which all of the replacement ("make-up") air may be coming from the crawlspace. In these rooms we will likely see much higher levels of contaminants (for example, under increased stack effect during the heating season), given higher frequency monitoring that is capable of detecting these variations.

Given the presence of such indoor spaces, it would not be acceptable to leave crawlspace TCE levels at a concentration that is three times higher than the long-term screening level, in light of the narrowness of the risk range and the stringency of the short-term screening level.

An alternate scenario is a future modification to the building (such as a renovation or repair that creates new pathways to the crawlspace) that we have no control over, which may create future unacceptable exposures.

Sampling Results at Nearby Sites

EPA is conducting VI investigations at similar South Bay sites in similar residential settings (similar housing stock – mix of older and newer single- and multi-family buildings, raised over crawlspace) where no attenuation is observed via the crawlspace. (We have already discussed the sampling results of RES 79 of this investigation, which was completely sealed during the sampling event (in-between tenancies) and showed identical TCE levels indoors and in the crawlspace.)

In fact, indoor air levels higher than crawlspace levels are being observed across multiple sampling events without apparent indoor air sources of TCE. See, for example the attached data table for the residential VI evaluation associated with the Teledyne/Spectra-Physics site in Mountain View, CA.

For example, the occupant of RB-6 is elderly and does not generally leave his home. This pattern of occupancy results in all windows & doors shut for extended periods of time, which allows indoor air levels of TCE rising from the crawlspace to accumulate.

Another example – the levels measured in RB-8 result from a winter sampling event, during which the occupants heat their home and minimize opening & closing of doors. We can see levels in the indoor air during this sampling event that are six times higher indoors then in the crawlspace.

<u>The proposed crawlspace action level of 1.6 ug/m3, for example, for Residence #92/93, would not have been sufficiently protective in either of these cases. Action levels must ensure protectiveness across all reasonable occupancy (exposure, ventilation, etc.) scenarios.</u>

Excerpt from Teledyne/Spectra-Physics Data Table:

RB-2 (0.23 ug/m3 TCE in indoor air / 0.22 ug/m3 TCE crawlspace)
RB-6 (1.8 ug/m3 TCE in indoor air / 0.75 ug/m3 TCE crawlspace)
RB-8 (2.9 ug/m3 TCE in indoor air / 0.48 ug/m3 TCE crawlspace)
RB-21 (0.63 ug/m3 TCE in indoor air / 0.39 ug/m3 TCE crawlspace)
RB-24 (0.64 ug/m3 TCE in indoor air / 0.38 ug/m3 TCE crawlspace)

Need for a Mitigation Effort Consistent with Final VI Remedy

EPA needs to ensure that the ultimate remedy for vapor intrusion, memorialized in the future Record of Decision Amendment (RODA) for the Triple Site, is consistent with the current mitigation effort. For example, we would not want to implement mitigation systems for buildings that result in levels that are less protective then the cleanup levels for indoor air that are ultimately established in the RODA. This would necessitate us returning to these buildings in the future to re-do the mitigation systems. Rather, we should aim for a system that is more protective, to ensure that the systems we install can be the final, permanent VI remedy for each of the affected buildings.

For example, a number of Region 9 sites have used a goal of 1 ug/m3 as an evaluation benchmark with a margin of safety to be protective of short-term exposures. Note that these benchmarks were set prior to EPA's 2011 re-assessment of the toxicological properties of TCE when the previous long-term screening level for TCE in residential settings was 1.2 ug/m3 and the risk range extended to approximately 100 ug/m3 (vs 2 ug/m3, as is now the case).

See, for example, the RODA for the MEW Superfund Site in Mountain View, which established a residential cleanup level of 1 ug/m3 TCE for indoor air. Or the interim residential indoor air cleanup level of 1 ug/m3 for the Motorola 52nd Street Superfund Site established in the Amended Consent Decree. At the Moffett Field and CTS Printex Superfund Sites, a TCE residential indoor air cleanup standard of 1 ug/m3 has also been established. For the MEW and Moffett Field Sites, crawlspace levels exceeding this standard of 1 ug/m3 prompt additional actions, such as increased sampling frequency and system optimization. While a few residences have required optimization of the mitigation system, these standards have generally been achievable.

(7) Operations, Maintenance & Monitoring (OMM) Plan

A reminder that OMM plans for these residential mitigation efforts must be provided to EPA for review before EPA can issue final approval of these mitigation plans.

Regards,

Melanie

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Subject: Mitigation Plan for Residence #92/93

Melanie:

In accordance with your request, please find attached a mitigation plan for the subject residence at the Triple Site.

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