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July 29, 2016

Ms. Tracey Duncan
US Department of Energy
Portsmouth/Paducah Project Site Office
5501 Hobbs Road
Paducah, Kentucky 42053

RE: Submittal of Comments on the C-400 Vapor Intrusion Study Work Plan to Support the Additional Actions for the CERCLA Five-Year Review (DOE/LX/07-2403&D1)
Paducah Site
Paducah, McCracken County, Kentucky
KY8-890-008-982

Ms. Duncan:

The Division of Waste Management (Division) has completed its review of the abovementioned document, dated April 29, 2016. Please address the attached comments on in a revised version of the document.

If you have any questions or require additional information, please contact Brian Begley at (502) 782-6317, or e-mail at brian.begley@ky.gov.

Sincerely,

For April J. Webb, P.E., Manager
Hazardous Waste Branch

AJW:bb:gb:lww

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DWM File: #730; Graybar: ARM20160011 (5-Yr Rev for Rem Actions - C-400 VI WP)

**Kentucky Division of Waste Management Comments to the
C-400 Vapor Intrusion Study Work Plan to Support the Additional Actions for the
CERCLA Five-Year Review at the Paducah Gaseous Diffusion Plant**

Paducah Site, Paducah, Kentucky

DOE/LX/07-2403&D1

July 27, 2016

General Comments

1. The composite worker non-cancer RSL for TCE is $8.8 \mu\text{g}/\text{m}^3$, which corresponds to a Hazard Quotient of 1. When the air concentration exceeds a Hazard Quotient of 3 ($26.4 \mu\text{g}/\text{m}^3$ for TCE) in the presence of sensitive receptors, EPA recommends immediate action. At a Hazard Quotient of 3, EPA Region 9 offers temporary relocation with an expected response time of days (Alana Lee, personal communication). Are there sensitive receptors (women of childbearing age) working in this building?
2. Are any seams or expansion joints present in the concrete floor at C-400? Linear features (resembling seams) appear to be present in slides #26 and #27 of the C-400 Remediation Strategy. If present, how far down do they extend in relation to the noted 16-inch slab thickness?
3. Include an interactive pdf figure with toggle layers in the e-version of the D2 *Vapor Intrusion Study Work Plan* that spatially identifies the areas in and around the C-400 building associated with VOCs (primarily TCE and associated degradation products). Include all known VOC processes and their known (solid line) or estimated (dashed line) boundaries. Also include the location of drain lids and lines, sump locations and lines (historic and current configurations), VOC-related SWMU boundaries, sewers, concrete areas where TCE reportedly spilled or was dumped on floors near the degreaser(s). Please display the known features with a solid line and suspected features with a dashed line. For clarity, only label or highlight features associated with known or suspected associations to VOCs. Also include toggle layers for pre- and post- remediation soil and water VOC concentrations in the UCRS and a separate layer for the RGA. Include a layer that outlines suspected DNAPL areas separately for Phase I, IIA, and IIB. The intent is to better understand the known and assumed areas in and around the C-400 building where TCE historically was used and therefore residual DNAPL may reside. Kentucky is willing to work with, and provide input on, the layers to be included on the interactive pdf.

Specific Comments

1. Table 1, Pg. 5

Several boxes in this table were left blank. Provide the missing information and if no data exists, then consider assigning 'NA' for the blank cells where appropriate. Please revise.

2. Section 5.2, Pg. 6 “Building is susceptible to VI”

“A crack has been identified in the building slab...” This statement implies that within the 122,900 ft² surface area of the C-400 building, only one crack has been identified. Please disclose if other cracks exist, if additional cracks were identified, what is the criteria (depth and length) being used to define a crack, where are they located and note if they potentially provide a pathway to the underside of the concrete slab. Also indicate the areas that are inaccessible to observation and therefore are considered to have conditions that are unknown. On page 24, more detail is provided; however, the first sentence in the third paragraph ‘...openings such as the identified slab crack and potentially other openings such as ...’ implies that only one crack is known to be present in the slab. Please elaborate on the effort and impediments that support the one crack finding.

3. Figure 4, Pg. 11

Kentucky acknowledges that the Vapor Intrusion conceptual site model (CSM) was developed with input from DOE, EPA, and KY during scoping meetings. A CSM should be continuously reviewed and updated to reflect the current understanding based on available information. Potential vapor intrusion migration pathways are identified within this Work Plan that are not reflected in this CSM depiction. The gravel beneath C-400 is not depicted below the basement – please label the basement and add gravel beneath it. In addition, sub-surface utility corridors intersecting the remediated portion of the CSM are not depicted. Please add. Also, it is worth noting that more than 100 (sand-filled) >12-inch vertical shafts are located within the ‘remediated’ area that extend through the silt or clay areas. The depiction of the ‘remediated’ area in the CSM does not appear to depict the large vertical conduits still present in the remediated areas. DOE’s current assumption is that TCE DNAPL is present beneath the C-400 building and the CSM depicts the only source of TCE DNAPL that is associated with an AST. At a minimum, the CSM should depict the uncertainty that DNAPL is present beneath the C-400 building. Please explain the ‘Note: Qsoil represents soil gas entry; Qbldg represents building ventilation.’ Where are these two variables depicted in the figure?

4. Section 6, Pg. 12

In the seventh bullet on page 12, it states ‘historical data with no reported result and no recorded detection limit were not included in the historical data evaluated for use.’ How many data points is this statement referring to? Can data points with ‘no recorded detection limit’ be inferred if the sampling device model was recorded? Would that data at least be useful qualitatively?

5. Section 6.1.1, Pg. 13

The first paragraph discusses a controlled process where ‘after degreasing was complete, the cleaned item was shifted to the side of the degreasing unit and excess solvents were allowed to drain into a collection basin connected to the degreaser.’ According to historical accounts documented in the book ‘Callous Disregard’, TCE was allowed to soak into concrete and in some cases gallons would spill out of items after removal from the degreaser. The accounts discussed in ‘Callous Disregard’ allege that these activities were carried on for years.

6. Section 6.1.1, Pg. 13

The final paragraph in this section references Figure 3 with ‘(1) degreaser and cleaning tank pits; (2) drains and sewers; (3) the east side basement; (4) tanks and sumps outside the building, including underground piping running from tanks; and (5) various first-floor processes.’ Figure 3 does not clearly depict (or it is illegible) numbers #2, #3 or #4. An interactive pdf (General Comment #3) of the available C-400 information should address this concern.

7. Table 2, Pg. 13

The average rate of TCE use in the C-400 Cleaning building, especially during the 1970s, (approximately >15,000 gal/month) needs to be better understood. What documentation is available to support the 1992 CH2M Hill summary table? Based on the known TCE storage capacity (degreaser maximum capacity x 3, TCE storage tank, maximum rate of volatilization, etc.) how is it physically possible to use that volume of TCE each month? How much TCE would evaporate if the degreasers operated non-stop during the 1970s? Were the degreasers ever emptied and new TCE added? How was the discarded TCE documented and managed during the 1970s?

8. Section 6.2, Pg. 14

For clarity, please consider placing a reference to Table 1 in this section.

9. Section 6.4, Pg. 15

The last sentence of the first paragraph states ‘currently, at least one (out of ten) ventilation fans operates continuously to ventilate the building.’ Please add more explanation about the location of all ten fans. Based on a tour of C-400 and a picture of the stacks associated with the cleaning tanks (there are six large fans), where are the other four located and do those fans move the same amount of air volume?

10. Figure 6, Pg. 17

Underground utility bedding can be a source for vapor intrusion. Figure 6 in the document lacks sufficient detail to be informative of the presence of utilities relative to potential source areas. Please provide a figure that identifies the utilities within the building such as

those shown in Figure 6 and also includes the locations of potential source areas and proposed sample locations, as shown in Figure 9.

11. Section 6.5.1.2, Pg. 21

The middle of the fourth paragraph states ‘the target soil level for residential settings is 0.02 µg/kg; the equivalent value for commercial settings is approximately 6 times higher or 0.1 µg/kg.’ Mathematically, the value should be 5 times higher instead of 6. Please revise.

12. Section 6.5.1.2, Pg. 21

The last sentence of the last paragraph indicates the presence of a 10-foot gravel fill layer. The 10-foot gravel layer thickness is based upon two vertical borings where the gravel thickness ranged from 8 to 12 feet. It is possible that the gravel thickness will vary to a greater extent than the two data points reflect. Please revise the sentence to disclose the uncertainty associated with the 10-foot thickness statement.

13. Appendix A, Section A.2.4.4 2013 SWMU 4 Passive Soil Gas Study, Pg. A-5

This section states “This evaluation again demonstrated that soil gas does not migrate easily through the shallow soil of the UCRS at PGDP. This information is provided to support the understanding of how soil vapors may move through the UCRS in the vicinity of PGDP.” SWMU 4 is a historical burial ground with pits of disturbed soil and areas of undisturbed soil, all covered with a clay cap. It is a stretch to say that movement of vapor through a structure such as SWMU 4 is indicative of movement of vapor through undisturbed UCRS soils, or disturbed soil beneath C-400. Please revise this section.

14. Appendix B, pg. B-29 QAPP Worksheet #12

The measurement performance criteria for the concentration level is stated in this table as ‘very low.’ Can the performance criteria be quantified so as to have a unit of measure?

- End of Kentucky Comments - -