



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
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September 13, 2013

4WD-FFB

Rachel Blumenfeld
United States Department of Energy
Portsmouth/Paducah Project Site Office
P.O. Box 1410
Paducah, Kentucky 42002

RE: EPA Comments on the Final Characterization Report for SWMUs 211-A and 211-B Volatile Organic Compound Sources for the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, KY (DOE/LX-07-1288&D1)

Dear Ms. Blumenfeld,

The Environmental Protection Agency (EPA) has received the D1 EPA Comments on the Final Characterization Report for SWMUs 211-A and 211-B Volatile Organic Compound Sources for the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, KY (DOE/LX-07-1288&D1). EPA comments are attached.

If you have any questions or require additional information, please contact me at (404) 562-8513.

Sincerely,

Jennifer Tufts
Remedial Project Manager
Federal Facilities Branch

ec: Todd Mullins, KDEP-Frankfort
Leo Williamson, KDEP-Frankfort
Jennifer Woodard, DOE
Jana White, LATA KY
Jon Richards, EPA R4

EPA Comments on the Final Characterization Report for SWMUs 211-A and 211-B Volatile Organic Compound Sources for the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant (DOE/LX-07-1288&D1)

I. GENERAL COMMENTS

1. The results of groundwater sampling are discussed in Sections 5.3 and 6.3 of the Report. While these discussions include an evaluation of the constituents that were detected in the groundwater samples, there is no discussion of the results with respect to the contaminant sources at SWMUs 211-A and 211-B. For example, as discussed in Section 7, a source of high concentrations of TCE was found in the area of soil boring 211-A-036. There are no monitoring wells in the vicinity of this source, and this should be discussed in the Report. Groundwater flow at SWMUs 211-A and 211-B should be discussed, so it is clear whether the monitoring well results are representative of groundwater contaminant concentrations downgradient of the identified source areas. Revise Sections 5.3 and 5.4 of the Report to discuss the results of the groundwater sampling with respect to the source areas identified during the investigation.
2. Section 4.9 of the Report indicates that data verification, validation and assessment were conducted for this project. However, the Report does not include the analytical data packages and data validation reports (DVRs). This information should be provided to support the data presented, conclusions reached in the Report, and to support data usability presentations. Revise the Report to provide the laboratory data packages and DVRs.
3. The discussion of the data quality assessment in Section 4.9, Data Evaluation, is insufficiently detailed. The information presented does not clearly identify how data quality issues may or may not affect or limit the usability of the data. Worksheet #37 of the Quality Assurance Project Plan (QAPP) provided as Attachment A5 to the *Remedial Design Work Plan for Solid Waste Management Units 1, 211-A, 211-B, Volatile Organic Compound Sources for the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, dated June 2012 (RDWP) indicates that data assessment packages will be produced and states, "Data assessment packages will be reviewed to document any issues pertaining to the data and to indicate if data quality objectives of the project were met." The assessment packages, including descriptions of how the assessments were performed, should be included in the Report to support the results and conclusions reached based on the data. The following are additional examples of information that should be provided:
 - a. Tables 8 and 12 indicate that qualifiers were applied to the data, but a discussion of the QC exceedances that led to qualification of the data is not included in the Report, including whether any results were rejected. This discussion should identify and summarize the QC exceedances, as well as the extent of these exceedances, so the impact of these QC outliers on data usability is clear. Also, the discussion of rejected results, if applicable, should indicate how these data gaps

may impact project decisions. Revise the Report to discuss the QC exceedances and qualifiers added to the data during validation, as well as the impact of these qualifications on the usability of the data.

- b. The Report does not include a discussion of overall biases and trends in the data or whether any overall biases or trends in the data impacted project decisions. Revise the Report to discuss whether significant trends and biases were noted in the data, how the trends and biases were evaluated, and to provide sufficient information to verify all conclusions on the data, including but not limited to usability, trends, and biases.
 - c. The Report does not discuss whether results for QC samples were acceptable (e.g., equipment rinsate blanks, trip blanks, and field duplicates), or if these QC samples were collected and analyzed at the necessary frequencies. Further, it is unclear if the results or collection frequencies for these samples may impact data quality and usability. Revise the Report to discuss the QC samples that were collected and if the results and/or frequencies of QC samples had an impact on data usability.
 - d. A discussion of the project completeness is not presented. A description of the extent to which the sampling plan and sampling procedures were followed, laboratory analyses met all method and quality control requirements, and how the data met the precision, accuracy, representativeness, completeness, and comparability (PARCC) objectives for the project in accordance with the QAPP and DQOs should be provided in Section 4.9.
4. The number of borings sampled and analyzed for VOCs at SWMU 211-B is inconsistently presented in the Report. The Executive Summary page xiii refers to 19 borings but the second bullet at the top of the page xv refers to 20 borings that were sampled and analyzed for VOCs at SWMU 211-B. In addition, Section 6.2, Soil Sampling Results, indicates a total of 19 borings were completed and sampled but Table 10 includes a list of 20 station locations where soil samples were collected. Please revise the Report to consistently indicate the number of soil borings sampled and analyzed.
5. With respect to the potential for an injection technology at SWMU 211B, the Conclusion section states that “The hydrologic analysis to assess the ability of the HU1, HU2, and HU3 formations to accept injectate at suitable pressures and flow rates indicate that soil conditions at SWMU 211-B are consistent with the requirements associated with an injection dependent technology; however, the anticipated maximum injection flow rates likely would be low resulting in challenges for effective substrate delivery state.” However, it is not clear why potential challenges are identified for SWMU 211B. Based on the information presented in Sections 5.4 and 6.4, similar conclusions were reached between SWMUs 211A and 211B regarding injection technologies based on the soil grain distribution data. Also, injection pressure estimates could not be determined for SWMU 211B due to the construction of the nested wells. Remove the statement regarding the challenges for effective substrate delivery at SWMU 211B, and include information from Section 6.4, specifically, “. . . a flow rate of approximately 2.4 gpm at a pressure of 50 psi should provide effective distribution of injectate among the HU1, HU2, and HU3 formations at SWMU 211-B”

II. SPECIFIC COMMENTS

1. **Section 2.5, Conceptual Site Models, Page 11**

The text indicates that the maximum historical TCE concentration detected in soil was 8,100 ug/kg. However, this concentration is not plotted on Figure 6. Please revise the figure and also indicate if this concentration was included in the mass calculations.

2. **Section 3, Data Quality Objectives, Page 19**

The text indicates that the only exceedances of measurement performance and other acceptance criteria for VOCs results are the exceedances of reporting limits discussed in Section 4.9. However, Tables 8 and 12 indicate that VOC results were qualified for other exceedances. For example, the TCE results for groundwater samples collected September 5, 2012, indicate that the associated matrix spike failed acceptance criteria. Also, a complete data quality assessment has not been presented in the Report, as discussed in the general comments above. Revise the statement regarding whether the data met measurement performance and other acceptance criteria to identify applicable qualified data in Tables 8 and 12 and to take into account a complete data quality assessment.

3. **Table 8, Summary of Groundwater Metals, VOC, and Dissolved Gases Data for SWMU 211-A, Pages 41 to 42 and Table 12, Summary of Groundwater Metals, VOC, and Dissolved Gases Data for SWMU 211-B, Pages 52 to 54**

Several manganese results are qualified “X” in these tables, and the Notes for each table describe this qualifier as requiring further footnotes to define the results. However, no further information is provided for the qualifications of these results. Revise these tables to define the qualifiers applied to the manganese results.

4. **Table 10, Soils VOC Data (Average Borehole Concentration) for SWMU 211-B, Page 48**

The TCE concentration for borehole 211-B-005 is listed as 863 ug/kg, but this concentration is not identified as exceeding the Groundwater Protection Remediation Goal of 75 ug/kg for TCE (i.e., highlighted and bolded as indicated in Note 4). Revise this table to resolve this discrepancy.

5. **Figure 10, SWMU 211-B Cross-Section with TCE Isopleths and Hydrogeologic Units, Page 65**

The cross sectional view of the subsurface units shown on Figure 10 are not consistent with the boring log descriptions provided for soil borings 211-B-004 and 211-B-005. Figure 10 shows both the bottom of these borings at the base of the HU3 unit. However, the boring logs provided in Appendix D show boring 211-B-004 extending approximately 3.5 feet

into HU4 and 1.5 feet into the underlying HU5 unit, and boring 211-B-005 extending approximately 7 feet into HU4. Please review Figure 10 and the boring logs presented in Appendix D and clarify this discrepancy in the Report. Also, indicate if soil samples were analyzed for VOCs at 65 feet bgs for 211-B-004 and 211-B-005.