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NATURAL RESOURCES

Michael L. Parson, Governor

Carol S. Comer, Director

February 3, 2020

Christine Jump, Project Manager
Superfund Division
United States Environmental Protection Agency, Region 7
11201 Renner Boulevard
Lenexa, Kansas 66219

RE: Review of Draft Preliminary Excavation Plan, West Lake Landfill Superfund Site
Operable Unit-1, Dated January 2020

Dear Christine Jump:

The Missouri Department of Natural Resources' Federal Facilities Section has performed a cursory review of the draft document referenced above. Our review was necessarily cursory because the document contained insufficient information to meet the objectives and the intent of the document with respect to being a reliable resource moving forward.

Based on the statement of work, the geostatistical model is the basis for activity and volume calculations, in addition to ultimately identifying what will be excavated. The model should provide value to the excavation investigation as a statistical tool to reduce the amount of field sampling activity necessary to reliably delineate the boundaries of the excavation.

As summarized in EPA's meeting topics sent via email on October 7, 2019, and the Department's November 19, 2019 comment letter on the work plan and design criteria report, there was an expectation to proceed through logical steps to first understand the processes internal to the modeling approach, review the entire process for its new purpose, then determine where weaknesses are, or what can strengthen the model to maximize effectiveness. Inherent in this expectation was a stepwise, transparent, and documented evaluation of previously identified limitations from the December 2017 S.S. Papadopoulos geostatistical report in addition to prior regulatory comments generated during RIA/FFS development period. The next step in this expectation would be, through the Preliminary Excavation Plan, identify field investigation needs to resolve known or identified weaknesses and limitations of the modeling process.

During the remedial design process, we have continued to engage EPA and responsible parties in an attempt to collect specific information necessary to allow for independent process review and repeatability exercises. Until the first step is completed and both model processes can be reviewed, understood, repeatable, and ultimately approved, the utility of these models moving forward is indeterminate and provides no clarity on investigative needs for the excavation portion of the Design Investigation work plan or the 30% design. As such, it is expected that a substantially more robust field sampling program will be necessary in the design investigation to provide sufficient excavation delineation and activity/volume calculations.



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Christine Jump, Project Manager
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Understanding that the schedule may be negatively impacted due to delays in resolving previously identified concerns, we are providing additional specific comments to support our general conclusion and assist EPA in collecting enough information to allow comprehensive review and approval and to provide a path forward for potential acceptable future use of the models.

Thank you for giving us the opportunity to review and provide feedback on this material. If you have any questions or need further clarification, please contact me by phone at 573-751-8628, or by written correspondence at P.O. Box 176, Jefferson City, MO 65102.

Sincerely,

ENVIRONMENTAL REMEDIATION PROGRAM



Ryan Seabaugh, P.E.
Federal Facilities Section

RS:rl

c: Tom Mahler, Remedial Project Manager, EPA Region 7 (email)
Diana Engeman, Remedial Project Manager, EPA Region 7 (email)

Comments on Draft Preliminary Excavation Plan dated January 2020

Geostatistical Modeling Comments:

1. PEP Section 5.0 Data Gaps, Page 5-1: The document states: *"Parsons has adapted this geostatistical model for use in the remedial design for the Site, as described in Appendix A."* The supporting sensitivity analyses do not provide a full demonstration of the complete modeling process and sensitivities at multiple stages of the process. For example, none of what is presented covers CDF development and associated sensitivities or magnitude of "pragmatic adjustments."

Comment: Please provide demonstration that this model can be used for the new objective of Remedial Design given the limitations noted in the 2017 Geostatistical Report.

2. PEP Section 5.0 Data Gaps, Page 5-1: This section of the document fails to identify several limitations noted in the 2017 geostatistical report. Please provide a complete evaluation of the modeling methodologies (including preprocessing, kriging, post processing) and identify any weaknesses that could be bolstered with additional sampling. We expect this section to bring forward those limitations and assumptions in the 2017 geostatistical report that may have been acceptable for remedial alternative comparison purposes but need to be further assessed for Remedial Design purposes. In addition to the limitations and assumption noted in the 2017 geostatistical report, we expect this section of the PEP to identify other items that need to be further assessed and to determine if additional sampling is required. This includes topics such as the use of gamma soft data to represent the absence/presence of Thorium.

Comment: Develop the Data Gaps section of the report to identify elements throughout preprocessing, kriging, and post processing and provide specific analysis for sensitivities and data needs.

3. Appendix A, Page 2: The document states: *"Based on the three intended uses described above, the geostatistical efforts were set forth with the following objectives: Review and evaluate the previously completed geostatistical approach and determine if there are potential intrinsic failures, oversimplifications, or areas for potential improvement;...The analyses and processes used for meeting these objectives are described herein, with additional details provided in attachments."* The information contained in the document was insufficient to demonstrate that this objective was met.

Comment: Further develop the document to address comments on Section 5 and Appendix A page 4 to adequately meet objectives described in the plan document.

4. Appendix A, Page 4: The document states: *"Many aspects of these evaluations of inputs, assumptions, and procedures were documented in SSP&A's Evaluation of Uncertainty (Appendix I of SSP&A December 2017) which determined that the estimates of RIM volume and extent were quite stable over reasonable ranges of input values and assumptions."* The 2017 report demonstrated that the extent greater than 52.9 pCi/g is sensitive to manual adjustment of the CDF. No demonstration has been provided to show how this may impact design criteria.

Comment: We recommend EPA develop a review process to determine the appropriate use of Soft Data in the models and to what extent Soft Data should be used in the models. For example, is it appropriate to use Soft Data to determine non-exceedance of Th230 at 52.9 pCi/g? If not, what tools need to be developed or what data needs to be collected to either be able to use the Soft Data for this purpose or to replace the Soft Data. This needs to be determined before the DIWP to reduce the number of investigation mobilizations and to help reduce extension of the project schedule.

5. Appendix A, Page 6: The document states: *“Thus far all sensitivity analyses conducted by SSP&A indicate that the final Base Case CDF is appropriate, and the results are insensitive to small differences in the CDFs when comparing the volumes and extent of RIM >52.9 pCi/g.”* This statement appears to contradict statements from the PEP and 2017 geostatistical report which reported that pragmatic adjustments to the CDF were made to adjust the extent of RIM >52.9 pCi/g to eliminate occurrences beyond or within the convex hull (See Figure A-2). Because of this sensitivity, it is important to understand CDF development, use, and impacts it has on the model, model outputs, sampling needs, changes in the design, and confidence in remedial implementation.

Comment: To help understand the CDF development and appropriateness, we recommend the EPA review of the Probability Distribution Function, including the actual field data used to construct the PDF.

6. Appendix A, Page 8: The document states: *“The determination of these settings was accomplished by starting with SSP&A parameters, and then, where subtle differences were noticed, conducting iterative response testing to provide acceptable matches of: (1) volumes, and (2) spatial extent of RIM >52.9 pCi/g.”* As commented in previous letters, there is no requirement for the Parsons model to be equal to the prior 2017 models that was constructed for Feasibility Study purposes.

Comment: With that in mind, please provide a demonstration that this new model is capable of accomplishing the new objectives for Remedial Design purposes. The models must be understood and supported prior to identifying any potential weaknesses that can be bolstered with additional sampling during the Design Investigation Work Plan.

7. Appendix A, Page 13: The document states: *“Figure A-8(b) shows the sill plotted against RIM volume in cubic yards for Area 2.”*

Comment: Figure A-8(b) is missing.

8. Appendix A, Page 13: The document states: *“There are three main objectives for identification of potential additional boring locations which the geostatistical model will support:*

- *Further delineating areas of RIM >52.9 pCi/g;*
- *Further evaluating and improving upon previously determined correlations between soft data and hard data; and*
- *Further defining activity concentration estimates in support of meeting total activity requirements.”*

Comment: Suggest expanding the scope of the second bullet to state: "Further evaluating and improving any weaknesses identified in the geostatistical models, including correlations between soft data and hard data; and"

9. Appendix A, Page 14: The document states: *"From the standard deviation EVS estimates the "confidence" associated with the prediction made using the kriging model."*

Comment: Please provide a simple and substantive explanation of "confidence"

10. Appendix A, Page 15: The document states: *"In EVS, uncertainty is high where concentrations are predicted to be relatively high...but the confidence in that prediction is low."*

Comment: Please provide a simple and substantive explanation of "uncertainty"

11. Figure A-2:

Comment: The specific Hard and Soft Data used to develop the CDF at and around the threshold of 52.9 pCi/g should be provided.

12. Figure A-3: It appears the CDF is either plotted incorrectly or the Y axis is incorrectly labeled.

Comment: Please correct and confirm any implications on modeling.

13. Appendix B, Equation 4, Page 4: The document state: *"AIP Z1-Z2 = Area of isolated pockets of RIM over the depth interval z1 to z2."*

Comment: Should "Area" be "Activity"?

14. Appendix B, Page 5: The document state: *"For hard data, analytical results of activity concentrations for radium and thorium were added together to provide a combined activity concentration at each sample location"*

Comment: We recommend processing and modeling activity for radium and thorium separately.

15. Appendix B, Page 5: The document state: *"As no new data has been collected since the Final Feasibility Study (FFS), the SSP&A continuous cumulative distribution function (CDF) regression equations for the transformation of soft data (normalized gamma responses) to combined radium and combined thorium values were retained from SSP&A's geostatistical analysis."*

Comment: No demonstration was provided showing that this is appropriate for this new activity model. Recommend EPA review this for appropriateness.

16. Appendix B, Page 5: The document state: *"If soft data were present for the same sample location as hard data, the hard data were retained, and the soft data were removed. If two instances of soft or hard data were present at the same sampling interval, the lowest activity concentration was retained to limit anomaly-based irregularities."*

Comment: Recommend EPA review this for appropriateness.

17. Appendix B, Page 6: The document states: *"The calculations are a relative comparison and not absolute and therefore insensitive to the process on this level."*

Comment: Please provide evidence or demonstration of this conclusion. Could spatial differences cause this conclusion to be impacted? Recommend EPA review this for appropriateness.

Other comments

18. Figure 4 & 5 and/or other relevant modeling figures:

Comment: For relevant figures denoting layers of model outputs, include layers for elevations 0-4 feet and 4-8 feet.

19. Figure 4 & 5 and/or other relevant modeling figures:

Comment: Layer maps should only show hard and/or soft data points inclusive of each layer.

20. Figure 12:

Comment: Correct the Bridgeton Landfill Boundary line.

21. Figure 13, Area 1 RIM > 52.9: There are locations in shallow depths or depths with anticipated excavated overburden that have been chosen as non-excavation.

Comment: Instances of these types of proposals should be compared with requirements of the ROD.