Department of Energy
Savannah River Operations Office
P.O. Box A
Aiken, South Carolina 29802

JAN - 9 2024

Ms. Susan B. Fulmer, P. G., Manager
Federal Remediation Section
Division of Site Assessment, Remediation and Revitalization
Bureau of Land and Waste Management
South Carolina Department of Health and Environmental Control
2600 Bull Street
Columbia, South Carolina 29201

Mr. Jon Richards
Savannah River Site Remedial Project Manager
Superfund Division
U. S. Environmental Protection Agency, Region 4
61 Forsyth Street, SW
Atlanta, Georgia 30303

Dear Ms. Fulmer and Mr. Richards:

SUBJECT: Savannah River Site's Responses to the Regulatory Comments on the Effectiveness Monitoring Report for the Monitored Natural Attenuation (MNA) at the Chemicals, Metals, and Pesticides (CMP) Pits Operable Unit (OU) (U) April 2022 through March 2023 (SRNS-RP-2023-00474, Revision 0, June 2023) SEMS Number: 24

In accordance with the terms of the Federal Facility Agreement, the U.S. Department of Energy (DOE) is submitting the subject comment responses for your review. The U.S. Environmental Protection Agency (EPA) and the South Carolina Department of Health and Environmental Control (SCDHEC) provided comments on the report on October 12, 2023. The report will not be revised; however, all comment responses will be included and/or addressed in the next report, as applicable. Please review these responses and provide your approval thirty (30) days from receipt. The time and effort that the SCDHEC and the EPA have given on the subject operable unit are greatly appreciated.

Questions from you or your staff may be directed to me at (803) 952-7805, or the DOE Operable Unit Manager, Karen Adams, at (803) 952-7871.

Sincerely,

AVERY HAMMETT

Digitally signed by AVERY HAMMETT
Date: 2024.01.08 13:52:31 -05'00'

Avery G. Hammett
FFA Project Manager, DOE-Savannah River
Remediation and Deactivation & Decommissioning Division

RDDD-24-115

JAN - 9 2024

Enclosures:
1. SRS Responses to South Carolina Department of Health and Environmental Control Comments on the Effectiveness Monitoring Report for the Monitored Natural Attenuation (MNA) at the Chemicals, Metals, and Pesticides (CMP) Pits Operable Unit (OU) (U) April 2022 through March 2023 (SRNS-RP-2023-00474, Revision 0, June 2023) SEMS Number: 24
2. SRS Responses to United States Environmental Protection Agency Comments on the Effectiveness Monitoring Report for the Monitored Natural Attenuation (MNA) at the Chemicals, Metals, and Pesticides (CMP) Pits Operable Unit (OU) (U) April 2022 through March 2023 (SRNS-RP-2023-00474, Revision 0, June 2023) SEMS Number: 24

cc w/o encl:
J. Blalock, SCDHEC-Columbia
S. French, SCDHEC-Columbia
M. Reece, SCDHEC-Columbia
G. K. Taylor, SCDHEC-Columbia
G. Stewart, SCDHEC-Columbia
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Effectiveness Monitoring Report for the Monitored Natural Attenuation (MNA) at the Chemicals, Metals, and Pesticides (CMP) Pits Operable Unit (OU) (U), April 2022 through March 2023, SEMS Number: 24, (SRNS-RP-2023-00474, Revision 0, June 2023)
Comments received October 12, 2023.

SCDHEC Specific Comments

1. Section 2.2.2.2, PCE and TCE in the Transmissive Zone, page 12. The first sentence of this page indicates that the maximum detection of PCE in the TZ was 2,470 µg/L at monitoring well CMP 35D. Figure 10, Table 3 and Table 4 each indicate a maximum of 2,700 µg/L at this location. Please correct this discrepancy.

   Response: Agree/Clarification

   As shown on Tables 3 and 4, the maximum concentration of PCE detected within the TZ between April 2022 and March 2023 was 2,700 µg/L at well CMP 35D. The text will reference the correct maximum results as presented in the tables in future reports. No changes to the June 2023 EMR are proposed.

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USEPA GENERAL COMMENTS

1. It is unclear whether a cost analysis will be provided in the 2024 CMP Pits EMR, along with the updated model evaluation. The EMR states, "Savannah River Site (SRS) will use the 2021 data, as well as recent groundwater data, to update the source term (and plumes) in the 2017 model to simulate if an additional action to reduce the residual source would improve cleanup timeframes;" however, a cost analysis should also be performed and provided with the updated model evaluation. The costs associated with the reduced cleanup timeframes, including capitol and operational costs of contingency actions, should be compared to the costs to perform long-term monitoring (LTM), including five year reviews (FYRs) for the next approximately 100 years. Please revise the EMR to indicate that a cost analysis will be prepared, along with the model update, and provided in the 2024 CMP Pits EMR.

   Response: Clarification

   A cost analysis is not currently planned with the model update. The purpose for updating the 2017 model is to allow for the evaluation of additional source term and groundwater data to determine changes, if any, to plume movement and impact to Pen Branch and if an additional action would improve cleanup timeframes. The updated model results will be discussed in the June 2024 CMP Pits report. Further discussion will be held with the Core Team if the model results deem it necessary to evaluate other remedial actions. No changes to the June 2023 EMR are proposed.

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2. It is unclear why Section 1.3 (Observed Hydrostratigraphy at the CMP Pits OU) does not discuss all the stratigraphy that is depicted in the cross sections. For example, Figures 12 through 14 and Figures 21 through 28 illustrate stratigraphic layers designated as "A-Horizon, AA-Horizon" that are not discussed elsewhere in the text. Please revise the text to discuss the A-Horizon and AA-Horizon that are depicted in the cross sections.

   Response: Clarification

   The A-Horizon and AA-Horizon are lithostratigraphic layers of the vadose zone above the transmissive zone within the Upper Three Runs Aquifer. These horizons are typically in the unsaturated zone and during rain events may contain areas of perched water. These geologic layers are characterized by a higher abundance of clays and silts compared to the underlying transmissive zone. A brief description of the A- and AA-Horizon will be included in future reports. No changes to the June 2023 EMR are proposed.

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3. The EMR does not include data validation reports; as such, it is unclear whether the data was validated. All monitoring data should undergo data validation. Please revise the EMR to include data validation reports.

   Response: Agree/Clarification

   Validation reports are typically not submitted with groundwater EMRs. Data reported in the EMR are collected in accordance with the CMP Pits Effectiveness Monitoring Plan (EMP) (WSRC-RP-2005-4077, Rev 1, Feb 2006). Because the EMP did not specify a data quality level, data are verified and unvalidated (VU). Data verification of VU data involves the process of evaluating the completeness, correctness, and conformance of the data against the analytical method and contractual requirements. VU qualified data does not include laboratory reports of the laboratory QC results but requires SRS to verify the analytical data results are submitted appropriately from the laboratories. SRS utilizes SCDHEC and/or USEPA accredited labs which require compliance with analytical method requirements.

   In future reports, text will be included to state "The analytical data presented in this EMR include data quality level of verified and unvalidated (VU)." No changes to the June 2023 EMR are proposed.

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4. The term "not decision data" (NDD) is used on figures and in tables within the EMR; however, the text does not discuss the meaning of this term. This term is used in Table 4 (CMP Pits OU PCE Max Results from 2008 and 2022 (µg/L)) and Table 5 (CMP Pits OU Lindane Max Results from 2008 and 2022 (µg/L)), as well as for all site figures containing sampling data; however, the meaning of this term and how it affects the data are unclear. Please revise the EMR to discuss the meaning of NDD, including how it affects data.

   Response: Agree/Clarification

   The acronym NDD stands for "non-decision data" and is used to identify estimated, J-qualified data on the plume map figures, cross sections, and tables 4 and 5. In future reports, estimated values will not use the acronym NDD, and instead will display estimated values with brackets around the concentration value consistent with Table 3. Footnotes and legends will also identify that concentrations in brackets are estimated, J-qualified data. No changes to the June 2023 EMR are proposed.

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5. The EMR does not use bookmarks. All sections, subsections, figures, tables, and attachments should be denoted with a bookmark in the portable document format (PDF) for easier navigation. Please revise the EMR to include bookmarks.

   Response: Agree

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The PDFs of future reports will include bookmarks for easier navigation. No changes to the June 2023 EMR are proposed.

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USEPA SPECIFIC COMMENTS

1. **Section 1.3, Observed Hydrostratigraphy at the CMP Pits OU, Page 4, and Figure 4, Stratigraphic Surfaces of the TCCZ and TCLC with 2Q2022 Dry Zones of the TZ and MAZ, PDF Page 47:** It is unclear why the data from the 2002 modeling effort and well installation records that were used to map the confining unit surfaces were not compared to the most recent water elevation data. The text indicates the confining unit surfaces were compared to, "the most current fourth quarter 2021 (4Q2021) water elevation;" however, it is noted a more accurate representation of current conditions would be to compare to data collected within the reporting period. Additionally, the referenced Figure 4 does not state which water elevation data was used to generate the figure. Please revise the EMR to use the most recent groundwater elevations for comparison, and ensure Figure 4 includes a reference to the data used to generate the groundwater elevations.

   Response: Agree

   The confining unit surfaces were compared to the second quarter 2022 (2Q2022) water elevation surfaces, not fourth quarter 2021 (4Q2021) as incorrectly referenced in Section 1.3. The 2Q2022 water elevations are provided in Table 3 and in Figures 7 and 8. The most recent data for 2Q2022 were used to develop Figure 4 as denoted in the legend. The most recent water elevation data will be correctly referenced in future reports. No changes to the June 2023 EMR are proposed.

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2. **Section 1.4, Observed Hydrology at the CMP Pits OU, Page 6:** There is a discrepancy in the text regarding total rainfall in 2022. The first paragraph states, "Rainfall during 2022 (total of 51.55 inches) measured more than the 2021 measurements and was above the 20-year average (48.88 inches);" whereas, the last sentence of the second paragraph states, "With lower rainfall totals in 2022, flow patterns have not changed significantly from 2021." Please revise the text to address the discrepancy.

   Response: Agree/Clarification

   The text in Section 1.4, Observed Hydrostratigraphy, page 6 at the end of the second paragraph should have stated "... With higher rainfall totals in 2022, ...", not lower rainfall totals. Future reports will ensure consistent discussion of rainfall totals. No changes to the June 2023 EMR are proposed.

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3. **Section 1.4, Observed Hydrology at the CMP Pits OU, Page 7:** The EMR does not include a reference for the calculated hydraulic conductivity constant and porosity in the Gordon Aquifer (GA). The text indicates the values were based on other data reports in the vicinity of the landfill; however, a specific reference should be included. Please revise the EMR to include a reference for the hydraulic conductivity and porosity in the GA.

   Response: Agree/Clarification

   The GA hydraulic conductivity constant and porosity were based on early studies at SRS. However, more comprehensive SRS studies have been conducted and compiled and will be referenced in future documents. The SRS regional groundwater flow model for C, K, L, and P-reactor areas documents that the average horizontal conductivity for the Gordon Aquifer is 35 ft/day and a porosity of 25% (WSRC-TR-99-00248, *Regional Groundwater Flow Model for C, K, L, and P Reactor Areas*, September 1999, Rev 0). The next EMR to be submitted in June 2024 will use the GA hydraulic conductivity constant of 35 ft/day and porosity of 25% and reference the regional groundwater flow model for C, K, L, and P-reactor areas document. No changes to the June 2023 EMR are proposed.

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4. **Figure 2, CMP Pits OU Subunits, PDF Page 43:** The figure contains symbology that is not defined in the figure legend; as such, it is unclear what they represent. Examples include green filled circles and orange filled triangles. Please revise the figure legend to include a description of all symbology used on the figure.

   Response: Agree/Clarification

   In Figure 2, CMP Pits OU Subunits, the green circles are the CMP Pits monitoring wells and the orange triangles are surface water stations. The legend will be updated in future reports to define the symbology presented in the figure. No changes to the June 2023 EMR are proposed.

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5. **Figure 7, 2022 Potentiometric Surface for the TZ and MAZ and 8, 2022 Potentiometric Surface for the LAZ and GA, PDF Pages 53 and 55:** Figure 7 and Figure 8 do not provide a north arrow for orientation. All maps should include northward orientation to provide context. Please revise the figures to include north arrows for orientation.

   Response: Agree/Clarification

   Figures 7 and 8 are correctly oriented to true north, but north arrows were not included on either figure. In future reports, Figures 7 and 8 will include north arrows. No changes to the June 2023 EMR are proposed.

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6. **Figure 8, 2022 Potentiometric Surface for the LAZ and GA, PDF Page 55:** The 182-foot (ft) above mean sea level (amsl) contour line is drawn as a solid line east of well CMP 8A; however, there is no groundwater elevation data to support this interpretation. Please revise the figure to draw a dashed contour line to indicate groundwater elevation is inferred where no supporting groundwater elevation data exists.

   Response: Agree/Clarification

   The 182-ft amsl contour line should be inferred (dashed) north of well CMP 8A since there is no nearby well for definitive delineation. In future reports, dashed contour lines will be used if not constrained by nearby monitoring locations. No changes to the June 2023 report are proposed.

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7. **Figure 9, Monthly Rainfall Measurements in L-Area for 2022, 2021, 2020, 2019, and the 20-Year Average, PDF Page 57:** The figure does not contain monthly rainfall measurements for the entire reporting period. The reporting period is from April 2022 through March 2023, but monthly rainfall measurements are only included from January 2022 through December 2022. Please revise the figure to include the monthly rainfall measurements for all months during the reporting period.

   Response: Agree/Clarification

   The rainfall totals for January, February, and March 2023 were 7.04 inches, 5.64 inches, and 3.56 inches, respectively. January and February 2023 were above average, and March 2023 was near average. In future reports, Figure 9 will include rainfall data for the entire reporting period (April – March). No changes to the June 2023 EMR are proposed.

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8. **Table 3, CMP Pits OU Annual MNA Results, April 2022 through March 2023, PDF Pages 119 to 131:** The formatting of the table makes it difficult to determine individual well results. The name of the well is only shown on the first three pages of the table, whereas the results for each well are shown on the fourth to last page; as such, it is difficult to discern which result is for which monitoring location. Please revise the table to ensure the monitoring well name is shown on each page of the table.

   Response: Agree

   During preparation for document submittal, the Excel files were converted into PDF files and the larger table displayed on multiple sheets. The electronic Excel file that is supplied on the report CD (CMP_EMR_2022_Table3_Figure32.xlsx) includes Table 3

in its entirety with the well trend identifications used in Figure 32. The Excel file was not submitted with the electronic submittal of the report but is provided with these Comment Responses. The complete Excel data table will be submitted electronically with future reports. No change to the June 2023 EMR is proposed.

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9. **Appendix C, Additional Sampling Efforts, PDF Page 357:** It is unclear whether additional cation-anion speciation data should be collected downgradient of the pits. Section 1.4 (Observed Hydrology at the CMP Pits OU) indicates, "As groundwater approaches Pen Branch, the downward gradient may decrease or even flow upward near and underneath Pen Branch as water discharges into Pen Branch;" however, no cation-anion speciation data has been collected downgradient in order to evaluate the potential vertical component. Please revise the text to clarify whether additional cation-anion speciation analyses should be collected downgradient of the pits.

   Response: Agree/Clarification

   The purpose of doing the cation-anion sampling in 2Q2021 was for assessing aquifer conditions associated with the contamination at the CMP 10 cluster, particularly GA well CMP010A. Additional cation-anion sampling was conducted in 2Q2022 at the CMP62 and CMP63 well clusters to assess specific questions related to these well clusters and not assess the entirety of groundwater at the unit.

   SRS agrees that additional cation-anion speciation may be beneficial in a subset of downgradient wells to evaluate the potential vertical component. SRS will evaluate the existing well network to select the most appropriate wells for the additional sampling. The subset of wells to be used in cation-anion analysis in a future sampling event will be presented in the June 2024 report. Results will be presented in future EMRs. No changes to the June 2023 EMR are proposed.

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