REGION 4
ATLANTA, GA 30303

October 1, 2024

Ms. Avery Hammett
SRS Remedial Project Manager
Remediation and Deactivation & Decommissioning Division
U.S. Department of Energy
Savannah River Operations Office
P.O. Box A
Aiken, South Carolina 29802

EPA Comments: Treatability Study Data Report for Groundwater Injection and Discharge Canal Neutralization at the D-Area Groundwater Operable Unit (OU) (U), 2023 Data and Information, SEMS Number: 63, SRNS-TR-2024-00261, Revision 0, June 2024.

Dear Ms. Hammett:

The U.S. Environmental Protection Agency, Region 4 (EPA) has reviewed the Treatability Study Data Report for Groundwater Injection and Discharge Canal Neutralization at the D-Area Groundwater Operable Unit (OU) (U), 2023 Data and Information, SEMS Number: 63, SRNS-TR-2024-00261, Revision 0, June 2024. EPA has the following comments on this report.

If you have any questions or require additional information, please contact Brianne Martin at (678) 906-8075.

Sincerely,

BRIANNE MARTIN Digitally signed by BRIANNE MARTIN
Date: 2024.10.01 15:30:16 -04'00'

Brianne Martin, RPM
Federal Facilities Branch
Superfund and Emergency Management Division

cc: C.L. Bergren, SRNS-ACP
Susan Fulmer, SCDES

GENERAL COMMENTS

1. It is unclear why there are no time-series plots for cobalt (Co) or nickel (Ni), since Figure 24, Surface Water Concentrations of pH and Cobalt and Nickel at DSWM-8, DSWM-8A, and DSWM-9 includes plots of pH compared to concentrations of these metals. Figure 24 would be easier to interpret if times-series plots were included for these metals. Also, it is unclear if there are correlations between Co and pH or between Ni and pH as the text does not discuss these metals. Please revise the TSDR to include time-series plots for Co and Ni and revise the text to discuss whether changes in pH correlate with changes in the concentrations of these metals.

2. It is not possible to verify statements about injection well flow rates or the data presented on Figure 17, Graph of Injection Well Flow Rates for 2022 and 2023, and Figure 18, Cumulative Groundwater Injection Volumes Per Well (in millions of gallons). A table with monthly and cumulative injection well flow data should be included to support the text and figures. Please revise the TSDR to include a table with injection well flow data.

3. A borrow pit immediately west-southwest of the 488-4D Ash Landfill is shown on several figures; however, the TSDR does not discuss the current operational status of the borrow pit and it is unclear whether based on the inverted elevation, the local groundwater flow direction is being impacted. Although unlabeled, the borrow pit shown on Figure 1, D-Area Powerhouse Associated Facilities, appears to have surface water present and it is unclear whether this represents the groundwater table. In addition, the presence of surface water within the borrow pit potentially poses an unacceptable risk due to exposure to acidic and metals contaminated groundwater. Please revise the TSDR to discuss the borrow pit, including whether surface water in this feature is at the same elevation as groundwater, and if it potentially poses an unacceptable risk to groundwater or ecological receptors.

4. Several of the figures do not have north arrows. North arrows are missing from Figures 2, 6, 7, 10, and 11. Please revise these figures to include a north arrow.

5. There are two page numbers on each page of the text, tables, and figures. For example, the page where Section 7.0, Summary, begins is numbered 14 of 72 at the top right of the page and 20 of 256 at the bottom left of the page. Please choose one page numbering system and delete the other.

SPECIFIC COMMENTS

1. **Section 5.1.2, Water Level Observations, Pages 9 and 10 of 72:** Given that 63 inches of rainfall represents nearly 50 percent more rainfall in 2023 than the average rainfall at the Savanah River Site, it is unclear if the observed increase in water levels in 2023 was due to the increased rainfall, to the injections, or to both. An analysis of the impact of the observed precipitation based on infiltration rates and evapotranspiration was not presented in the TSDR, so the impact of the increased precipitation on water levels is unclear. Please revise the TSDR to include an analysis of the impact of the increased precipitation on measured water levels.

2. **Section 5.2, CaCO3 Reactive Structures, Page 13 of 72 and Figure 20, CaCO3 Reactive Structure Surface Water pH Results:** Figure 20 indicates that the pH at all three stations increased in December 2023, and it is unclear if this change is related to breaching and the removal of the calcium carbonate (CaCO3) reactive structures. The text does not state when in December 2023 the structures were removed or whether the pH measurements were made before, during, or after the structures were breached and removed. Please revise the text to discuss whether the increase in the measured pH at all three stations in December 2023 was related to the removal of the CaCO3

reactive structures and whether these measurements were taken before, during, or when the structures were breached and removed.

3. **Section 5.2, CaCO3 Reactive Structures, Page 14 of 72:** The text discusses the relationship between metals and pH but does not discuss whether there is an observable trend in the relationship between sulfate and pH, as depicted on Figure 23, Surface Water Concentrations of pH and Beryllium, Aluminum, and Sulfate at DSWM-8, DSWM-8A, and DSWM-9. The text should be revised to discuss whether low pH correlates with lower sulfate concentrations, particularly at downgradient location DSWM-9. Please revise the text to discuss how pH and sulfate concentrations are related.

4. **Figure 2, D-Area Groundwater 2Q2023 pH and Beryllium Plume, Page 27 of 72:** An acid groundwater plume should be drawn around DWP 8 where the pH was measured at 3.8. In addition, data for this location and the other wetland monitoring wells are not included in Table A-1, D-Area Groundwater Treatability Study Data Table (2023). Please revise Figure 2 to include an acid groundwater plume surrounding DWP 8 and revise Table A-1 to include the missing data from the wetland monitoring wells.

5. **Appendix D, DAG OU Treatability Study Injection Reevaluation, Section 2.0, Analytical Transport Modeling of Injected Water at the DAG OU, Pages D-6 and D-7 of D-12:** A number of assumptions were made for the transport modeling, but a sensitivity analysis was not conducted, so the extent to which the assumptions would impact the model results is unclear. For example, the aquifer hydraulic conductivity (K) was estimated as 20 feet per day (ft/day), even though slug testing indicated the maximum K is 15 ft/day. A sensitivity analysis should be conducted to evaluate the extent to which various parameters would impact the model; this should include, but not be limited to K, dispersion, and the injection flow rate. Please conduct a sensitivity analysis for the transport modeling and revise the TSDR to present the results.