Department of Energy
Savannah River Operations Office
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MAY 13 2025

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

Mr. Jon Richards
Savannah River Site Remedial Project Manager
Superfund and Emergency Management 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 to the 2024 Effectiveness Monitoring Report (EMR) for Monitored Natural Attenuation (MNA) at the L-Area Southern Groundwater (LASG) Operable Unit (OU) (U) Data from 2022 through 2023 (SRNS-RP-2024-00998, Revision 0, August 2024) SEMS Number: 77

The U.S. Department of Energy (DOE) is submitting the subject comment responses for your review. The U.S. Environmental Protection Agency's (EPA) and South Carolina Department of Environmental Services'(SCDES) comments were received on December 12, 2024, and December 17, 2024, respectively. This report will not be revised; however, all comment responses will be included in the next report, as applicable. Please review the enclosures and provide your approval within thirty (30) days from receipt. The effort and time that the EPA and the SCDES have provided on this operable unit are appreciated.

Comments or questions from you or your staff may be directed to me at (803) 952-6211, or the DOE Program Manager, April Coffman, at (803) 952-7244.

Sincerely,

MATTHEW BAKER

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Date: 2025.05.13 08:41:17 -04'00'

Matthew R. Baker
Acting FFA Remedial Project Manager
DOE-Savannah River Operations Office
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RDDD-25-134

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Ms. Susan Fulmer
Mr. Jon Richards 2

Enclosures:
1. SRS Response to the South Carolina Department of Environmental Services' Comment on the 2024 Effectiveness Monitoring Report (EMR) for Monitored Natural Attenuation (MNA) at the L-Area Southern Groundwater (LASG) Operable Unit (OU) (U) Data from 2022 through 2023 (SRNS-RP-2024-00998, Revision 0, August 2024) SEMS Number: 77
2. SRS Responses to the U.S. Environmental Protection Agency's Comments on the 2024 Effectiveness Monitoring Report (EMR) for Monitored Natural Attenuation (MNA) at the L-Area Southern Groundwater (LASG) Operable Unit (OU) (U) Data from 2022 through 2023 (SRNS-RP-2024-00998, Revision 0, August 2024) SEMS Number: 77

cc w/o encl:
M. Reece, SCDES-Columbia
H. J. Porter, SCDES-Columbia
J. Blalock, SCDES-Columbia
S. French, SCDES-Columbia
R. G. Stewart, SCDES-Columbia
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T. G. Corley, SCDES-Midlands Aiken Environmental Affairs Office
C. L. Robertson, SCDES-Midlands Aiken Environmental Affairs Office
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cc w/encl:
H. H. Cathcart, SCDES-Columbia
B. Martin, EPA-Atlanta
M. McRae, TechLaw, Inc.

SRS Responses to South Carolina Department of Environmental Services Comments on the 2024 Effectiveness Monitoring Report (EMR) for Monitored Natural Attenuation (MNA) at the L-Area Southern Groundwater (LASG) Operable Unit (OU) (U) - Data from 2022 through 2023 SEMS Number: 77 (SRNS-RP-2024-00998, Revision 0, August 2024)

Comments received December 17, 2024
Page 1 of 1

SCDES SPECIFIC COMMENTS

1. Section 4.3.2, Tetrachloroethylene (PCE), page 8. The fourth sentence of this section states that "all KSZ monitoring wells were below the MCL of 5 µg/L." The next sentence then indicates that KSZ well LAC 8DL exceeded the MCL of PCE at 5.43 µg/L in 2023. Please correct this discrepancy.

Response: Clarification

Section 4.3.2, *Tetrachloroethylene (PCE)* should have omitted the sentence "All KSZ monitoring wells were below the MCL of 5 µg/L." The subsequent statements about the KSZ monitoring well PCE concentrations are correct and accurately describe PCE trends in the KSZ monitoring wells. No changes to the August 2024 Monitoring Report are proposed.

Responsible Party: Ashley Shull, (803) 952-7090, ashley.shull@srs.gov

SRS Responses to United States Environmental Protection Agency's Comments on the 2024 Effectiveness Monitoring Report (EMR) for Monitored Natural Attenuation (MNA) at the L-Area Southern Groundwater (LASG) Operable Unit (OU) (U) - Data from 2022 through 2023 SEMS Number: 77 (SRNS-RP-2024-00998, Revision 0, August 2024)

Comments received December 17, 2024

USEPA GENERAL COMMENTS

1. The required frequency of the groundwater sampling performed for the monitoring well network is inconsistently presented in the EMR. According to Section 1.0 (Introduction) and Section 4.3 (Groundwater and Surface Water Results), only key source zone (KSZ) wells and wells that exceeded maximum contaminant levels (MCLs) for volatile organic compounds (VOCs) are sampled annually. However, Table 1 (LASG OU MNA Monitoring Network) indicates that wells with a detection of VOCs in the previous odd year should be sampled in the even year (i.e., sampled annually). Based on Appendix C (Time-Series Plots), this would indicate that additional wells should have been sampled in the even years based on detections of tetrachloroethene (PCE) in odd years, such as wells LSW026DL, LSW031DL, and LSW 2DL. In addition, it is unclear what sampling frequency is required for samples collected for tritium analyses. Please revise the EMR to consistently present the required sampling frequency for groundwater samples to be analyzed for VOCs and tritium.

   Response: Clarification

   According to the *Addendum to the Monitored Natural Attenuation Effectiveness Monitoring Plan for the L-Area Southern Groundwater Operable Unit (NBN) (U)*, (SRNS-RP-2012-00857, Rev 1, May 2013) any well that has VOC concentrations above MCLs in odd years will include VOC and tritium analyses in even years. Future reports and letters will correct Table 1 to list the even year sampling requirement as follows: "If VOCs are Detected Above MCLs in Previous Odd Year". In 2021, wells LSW026DL, LSW031DL, and LSW 2DL were below MCLs; therefore, these wells were not sampled in 2022.

   Additionally, tritium is only required to be sampled biennially in odd years at monitoring wells that are not KSZ monitoring wells (KSZ wells are always sampled annually). If a well is sampled in even years, tritium is also included in the analyses along with VOCs. No changes to the August 2024 Monitoring Report are proposed.

   Responsible Party: Ashley Shull, (803) 952-7090, ashley.shull@srs.gov

2. Section 5.0 (Conclusions) notes the overall decreasing trends in groundwater and surface water concentrations, but the EMR should also mention the one well where concentrations of PCE are not decreasing. As noted in Section 4.3.2 (Tetrachloroethylene [PCE]), PCE concentrations at well LSW 25DL have not decreased or increased since monitoring began in 2004, and this well currently has the highest PCE concentrations. Therefore, this well is currently not meeting data quality objective (DQO) #3 for decreasing concentrations as groundwater approaches L Lake (see Section 4.0, Monitoring and Reporting). Please revise the EMR conclusions to note that the PCE concentrations at well LSW 25DL remain steady and will be monitored closely to ensure DQO #3 can be met.

   Response: Clarification

   The conclusion in future reports and letters will include discussion that concentrations of VOCs at well LSW 25DL remain steady and will continue to be closely monitored, as

appropriate. No changes to the August 2024 Monitoring Report are proposed.

Responsible Party: Ashley Shull, (803) 952-7090, ashley.shull@srs.gov

3. It is unclear whether biodegradation is occurring generating transformation daughter products (i.e., cis-1,2-dichoroethene [DCE], vinyl chloride) at concentrations that exceed respective MCLs. The text states that the contaminant concentrations will be reduced below remedial goals by natural attenuation processes including dispersion, dilution, and radioactive decay; however, the EMR does not report sample results for cis-1,2-DCE or vinyl chloride. It is noted that one of the remedial action objectives (RAOs) for the LASG OU is to prevent human exposure to groundwater above MCLs. As such, it appears that groundwater monitoring and reporting for cis-1,2-DCE and vinyl chloride concentrations will be necessary to demonstrate that the RAO has been achieved. Please revise the EMR to discuss how the potential presence of degradation products at concentrations above MCLs will be addressed by the LASG OU monitoring program.

   Response: Clarification

   Previous characterization efforts for LASG OU indicated that biodegradation is not occurring in the UTRA or GA at LASG. Therefore, biodegradation is not included in the listing of site specific MNA processes for the LASG OU. Additionally, VOC daughter products such as cis-1,2-dichloroethylene and vinyl chloride were not identified as COCs in the LASG OU ROD and were not included in the Effectiveness Monitoring Plan (EMP).

   Although not required as part of the LASG EMP, SRS generally includes the analysis of degradation products (i.e., 1,1-dichloroethylene, cis-1,2-dichloroethylene, trans-1,2-dichloroethylene, and vinyl chloride) when analyzing for PCE and TCE. Data collected from 2020 through 2023 at the LASG OU included 59 samples of groundwater or surface water. 1,1-Dichloroethylene, trans-1,2-dichloroethylene, and vinyl chloride were not detected in any of the samples. Cis-1,2-dichloroethylene was detected in 4 of the 59 samples, with a maximum estimated concentration of 0.599 µg/L well below the MCL of 70 µg/L. SRS will continue to follow the EMP required sampling and reporting for tritium, PCE, and TCE. No changes to the August 2024 Monitoring Report are proposed.

   Responsible Party: Ashley Shull, (803) 952-7090, ashley.shull@srs.gov

USEPA SPECIFIC COMMENTS

1. **Section 4.1, Groundwater Elevation Measurements and Groundwater Flow Direction, Page 5 of 38:** A minimum elevation measurement for Pen Branch is identified as 57.95 meters (178 feet), but it is unclear when and where this measurement was taken. Figure 5 (Potentiometric Surface of the Upper Aquifer Zone [4Q2023]) does not include a monitoring location within Pen Branch. Please revise the text to clarify when and where the elevation of the Pen Branch was measured for this comparison of the elevation of the stream and LASG OU groundwater.

   Response: Clarification

SRS Responses to United States Environmental Protection Agency's Comments on the 2024 Effectiveness Monitoring Report (EMR) for Monitored Natural Attenuation (MNA) at the L-Area Southern Groundwater (LASG) Operable Unit (OU) (U) - Data from 2022 through 2023 SEMS Number: 77 (SRNS-RP-2024-00998, Revision 0, August 2024)

The statement "(minimum measurement of 57.95 m [178 ft] amsl)" refers to the westernmost groundwater elevation within the UTRA at well LSW 12DL, not the water elevation in Pen Branch, which is approximately 150 ft amsl. In future reports, the text will more clearly associate the elevation with the correct measurement location at the LASG westernmost well, LSW 12DL.

In addition, the elevations were not updated in Section 4.1, *Groundwater Elevation Measurements and Groundwater Flow Direction* and should have stated a "(minimum measurement of 56.1 m [184 ft] amsl at well LSW 12DL)". No changes to the August 2024 Monitoring Report are proposed.

Responsible Party: Ashley Shull, (803) 952-7090, ashley.shull@srs.gov

2. **Section 4.1, Groundwater Elevation Measurements and Groundwater Flow Direction, Page 5 of 38:** This section discusses vertical gradients in the LASG OU groundwater, but the calculations of the vertical gradient based on the most recent groundwater elevation data are not provided. For example, the text indicates there is little difference between hydraulic head measurements in the Upper Three Runs aquifer (UTRA) between the Upper Aquifer Zone (UAZ) and the Lower Aquifer Zone (LAZ) (i.e., average of 0.2 meters/0.6 feet); however, based on Appendix B, Table B-1 (L-Area Southern Groundwater OU MNA Monitoring Results, 2022 – 2023), differences in the groundwater elevations between the UAZ and LAZ ranged from 0.38 feet (wells LSW 12C to LSW 12DL) to 2.3 feet (wells LSW 8C and LSW 8DL) in October 2023. It is unclear how the average was determined. Further, based on these differences in water elevation, a potentiometric map of the LAZ should be provided to show the groundwater flow direction in the LAZ and support evaluation of the LAZ monitoring well network. Please revise Section 4.1 to discuss the differences in groundwater elevations for the October 2023 data and include any calculations for the vertical gradients (e.g., in a table). Please also include a figure showing the potentiometric surface for the LAZ groundwater.

Response: Clarification

There are 4 well clusters in the western tritium plume that have both an UAZ and LAZ well for calculating the difference in elevations within the UTRA.

The statement in Section 4.1, *Groundwater Elevation Measurements and Groundwater Flow Direction,* was mistakenly not updated and should have stated the following "... Based on water elevation data in co-located well clusters, there is a small downward head (average of ~~0.2~~ 0.37 m [~~0.6~~ 1.23 ft]) within the UTRA from the UAZ to the LAZ."

In future biennial reports, a table similar to the one below will be provided to show hydraulic head differences between well clusters.

	LSW 8	LSW 9	LSW 12	LSW 14	
UAZ	198.25	192.33	184.09	189.56	
LAZ	195.95	191.52	183.71	188.13	Average
Difference	2.3	0.81	0.38	1.43	1.23

SRS Responses to United States Environmental Protection Agency's Comments on the 2024 Effectiveness Monitoring Report (EMR) for Monitored Natural Attenuation (MNA) at the L-Area Southern Groundwater (LASG) Operable Unit (OU) (U) - Data from 2022 through 2023 SEMS Number: 77 (SRNS-RP-2024-00998, Revision 0, August 2024)

Because the LAZ wells are all located within the western-most portion of the area, a potentiometric surface map would not fully represent the LAZ groundwater and was therefore not included. However, the potentiometric surface in the LAZ is similar to the UAZ with groundwater flow in the western tritium plume towards the southwest and a more westerly flow towards Pen Branch near the western side of the LUC boundary. Additionally, the western tritium plume is shrinking (as shown in Figure 8, *LASG OU Tritium Plume [4Q2023]*), and only contains one well above the tritium MCL (LSW 9DL) which is located in the UAZ. No changes to the August 2024 Monitoring Report are proposed.

Responsible Party: Ashley Shull, (803) 952-7090, ashley.shull@srs.gov

3. **Section 4.3.2, Tetrachloroethylene (PCE), Page 8 of 38:** The text states that all KSZ monitoring wells were below the MCL of 5 micrograms per liter (µg/L), but the text also states that KSZ well LAC 8DL exceeded the MCL in 2023 with a concentration of 5.43 ug/L. Please revise the text to present consistent information for the PCE concentrations and exceedances of the MCL in the KSZ wells.

   Response: Clarification

   The sentence, "All KSZ monitoring wells were below the MCL of 5 µg/L" should have been omitted. The subsequent statements about the KSZ monitoring well PCE concentrations are correct and accurately describe PCE trends in the KSZ monitoring wells. No changes to the August 2024 Monitoring Report are proposed.

   Responsible Party: Ashley Shull, (803) 952-7090, ashley.shull@srs.gov

4. **Section 4.3.2, Tetrachloroethylene (PCE), Page 9 of 38, and Appendix B, Table B-1, L-Area Southern Groundwater OU MNA Monitoring Results, 2022 – 2023:** The text states that PCE was not detected at Station LSW029DL during 2022 or 2023, but Table B-1 reports results from 2023 only for this well. Based on Table 1 (LASG OU MNA Monitoring Network), well LSW029DL should only be sampled in even years if VOCs are detected in the previous odd year. Please revise Section 4.3.2 and Table B-1 to consistently present the sampling performed at well LSW029DL in 2022 and 2023.

   Response: Clarification

   Well LSW029DL is only sampled in even years if VOCs are detected above MCLs in odd years as described in the LASG EMP Addendum (Refer to the response to General Comment 1). Additionally, well LSW026DL located east of well LSW029DL, has been below the PCE MCL of 5 µg/L since 2016 indicating the PCE plume has not migrated to the west. No changes to the August 2024 Monitoring Report are proposed.

   Responsible Party: Ashley Shull, (803) 952-7090, ashley.shull@srs.gov