ARF-024902

REGION 4
ATLANTA, GA 30303

ENVIRONMENTAL COMPLIANCE &

MAR 5 2025

SRNS-OS-2025-00063

March 5, 2025

AREA COMPLETION PROJECTS

Mr. Matthew Baker, 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: SEVENTH FIVE-YEAR REMEDY REVIEW REPORT FOR SAVANNAH RIVER SITE OPERABLE UNITS WITH GROUNDWATER REMEDIES (U), SEMS NUMBER: 00, SRNS-RP-~~2023-~~00934, REVISION 0 DECEMBER 2024 SAVANNAH RIVER SITE AIKEN, SOUTH CAROLINA 2024 adm 8/5

Dear Mr. Baker,

The U.S. Environmental Protection Agency, Region 4 (EPA), has reviewed the 7th 5Year Review for Groundwater Remedies Ous, and attached are our comments.

If you have any questions or require additional information, please contact me at (404) 431-1340.

Sincerely,

JON RICHARDS

Digitally signed by JON RICHARDS
Date: 2025.03.05 12:25:47 -05'00'

Jon Richards
FFA Remedial Project Manager
Superfund & Emergency Managment Division

ec: C.L. Bergren, SRNS-ACP Susan Fulmer, SCDHEC

GENERAL COMMENTS

1. According to the Seventh FYR per- and polyfluoroalkyl substances (PFAS) was evaluated as an emerging contaminant only for the Appendix C, C-Area Groundwater (CAGW) Operable Unit (OU) (see Page C-11 of C-32, Fourth Paragraph) because of the use of aqueous film forming foam (AFFF) to extinguish a fire on a piece of forestry equipment in October 2010. The text states that elevated PFAS concentrations were found in nearby Castor Creek in 2022, and limited PFAS sampling was conducted at nearby C Area wells and Castor Creek surface water stations in the fourth quarter of 2024. The text states that this potential contamination is not directly related to C Area Operations. The Seventh FYR does not evaluate PFAS for any of the other OUs in the report because of the determination that PFAS were not identified as applicable to those OUs based on the OU history of contamination. However, it appears that only AFFF sources of PFAS have been considered in the evaluation of emerging contaminants for the C-Area Groundwater OU as well as for the other OUs in the Seventh FYR. Recent EPA guidance (EPA Federal Facilities Superfund Program – RPM Bulletin 2024-01 *Considerations When Reviewing PFAS in Five-Year Reviews* April 3, 2024) and Department of Energy (DOE) guidance and memorandums (*Addressing Per- and Polyfluoroalkyl Substances at the Department of Energy, Memorandum for Heads of Departmental Elements,* September 2021; *PFAS Strategic Roadmap: DOE Commitments to Action 2022-2025,* August 2022; and *Initial Assessment of Per- and Polyfluoroalkyl Substances at Department of Energy Sites,* October 2022) indicate that non-AFFF sources of PFAS should be considered and evaluated. Non-AFFF sources or processes such as metal plating, Manhattan project liquid discharges, Cold War era liquid waste discharges, wastewater treatment discharges, or landfills may be sources of PFAS. The undetected presence of PFAS could cause protectiveness statements to be invalid. PFAS should be evaluated for at all Ous to determine whether non-AFFF PFAS sources have caused contamination of environmental media. *Please revise the Seventh FYR to address PFAS as an emerging contaminant in the technical assessment sections and provide a recommendation that PFAS sampling be performed at all the OUs with groundwater remedies.*

2. Groundwater elevation and flow direction maps are not provided for any of the OUs covered by the Seventh FYR. The Seventh FYR should present groundwater elevation and flow direction maps for each of the OUs with groundwater remedies to support the technical assessment discussions. *Please revise the Seventh FYR to include groundwater elevation and flow direction maps for each of the OUs.*

3. Trend diagrams are provided for some but not all OUs in the Seventh FYR and interpretation of the trend in the diagrams that are in the report is provided; in some cases the trends are obviously declining, but in others it is ambiguous as to whether a trend is decreasing, increasing, or stable. No statistical analyses have been provided that definitively determine the direction of a trend. Use of a Mann-Kendall test to statistically assess if there is an upward or downward trend of the variable of interest over time should be used for the primary constituents of concern (COCs) for each OU. This test could help determine if a single increase in concentration is statistically anomalous. *Please revise the Seventh FYR to include statistical analysis of the trends of primary COCs for each OU with a groundwater remedy.*

SPECIFIC COMMENTS

1. **Section I, Introduction, Site Chronology, Page 4 of 34:** The text in the second paragraph appears to be a discussion of Appendix A, Seventh Five-year Remedy Review Report Phased Reviews; however

the references to tables are confusing. The text states that Table 1 is the Five-Year Summary Review Form, which is correct for the report Table 1, but is not Table A-1, Seventh Five-Year Remedy Review Report Phases for SRS OUs, in Appendix A. The text then states that Table 2 provides a chronology of the decision documents; however, report Table 2 is a list of OUs with groundwater remedies. A chronological listing of decision documents is included in Appendix A as Table A-4, Chronologic Listing of SRS Issued Decision Documents. *Please correct the text to clarify whether tables being referred to are Appendix A tables or report tables, and to state that Table 2 is a list of OUs with groundwater remedies. In addition, revise the text to refer to Appendix A Table A-4 as to where a chronological listing of SRS issued decision documents can be found.*

2. **Section III, Progress Since Last Review, Page 10 of 34:** The text states that the previous protectiveness statements from the Sixth FYR concluded that all OUs were found to be protective. This section does not provide any statements on progress since the last review. *Please revise the Seventh FYR to provide a summary of progress for each OU since the previous review.*

3. **Section VI, Issues/Recommendations, Page 15 of 34, and Table 7, Issues and Recommendations Identified in the Seventh Five-Year Remedy Review Report for SRS OUs with Groundwater Remedies, Page 33 of 34:** There are no recommendations or follow-up actions in the text or Table 7; however, Section VII, Protectiveness Statement(s), recommended the following: "For the C Area GW OU, unit-specific land use controls (LUCs) were not part of the interim remedy. In the *Sixth Five-Year Remedy Review Report for Savannah River Site Operable Units with Groundwater Remedies* (SRNS 2017a), USDOE recommended including the CAGW OU in the list of OUs in the FFA Annual Progress Report (SRNS 2023a) that recognize SRS facility security and administrative controls that restrict unauthorized access as providing long-term protection of human health and the environment." The text and Table 7 should include the recommendation that the CAGW OU should be included in the list of OUs in the FFA Annual Progress Report for LUCs. *Please revise the text in Section VI and Table 7 accordingly.*

4. **Appendix D, Chemicals, Metals, and Pesticides (CMP) Pits (080-170G, 080-171G, 080-180G, 080-181G, 080-182G, 080-183G, And 080-190G OU, Section VII, Technical Assessment, "Is the Remedy Functioning as Intended by the Decision Document?" Page D-13 of D-32:** The text in the second bullet indicates that there are increasing concentrations of tetrachloroethylene (PCE) and lindane but concludes that the remedial activities are meeting remedial action objectives (RAOs); however, it is unclear how the RAO to reduce the COCs in the groundwater plume to maximum contaminant levels (MCLs) is being met when concentrations of COCs are increasing. This suggests the monitored natural attenuation (MNA) remedy is not effectively remediating the groundwater contamination. *The Seventh FYR should discuss how the increasing COCs are not related to an issue with MNA remedy performance. Additionally, the Seventh FYR should provide a recommendation and follow-up actions that additional remedial action may be required should PCE and/or lindane concentrations continue to increase above cleanup levels.*

5. **Appendix F, L-Area Southern Groundwater Operable Unit, Section VII, Technical Assessment, "Is the Remedy Functioning as Intended by the Decision Document?" Page F-10 of F-32:** The text in the second full paragraph states contaminant levels are not increasing and references Figure 7, Time Series Plot for Tetrachloroethylene (PCE) Station LAC 8; however Figure F-7 shows that the PCE concentration increased from approximately 2 ug/L to slightly over 5 ug/L in the most recent sampling event and has been increasing since 2020. Also, data for trichloroethylene (TCE) are not

presented and the TCE concentration trend is unclear. *Please provide the TCE data trend similar to the PCE trend, and revise the text to reflect that PCE has been increasing since 2020 and concentrations are currently above the MCL as shown by the most recent PCE result.*

6. **Appendix F, L-Area Southern Groundwater OU, Section VII, Technical Assessment, "Is the Remedy Functioning as Intended by the Decision Document?" Page F-10 of F-32, and Figure F-8, L- LRSB and LAOCB Performance Monitoring Station Locations, Page F-22 of F-32:** The text states that based on the 2020 data results there are no contaminant migration concerns with the associated surface units from the L-Area Reactor Seepage Basin (LRSB) and L-Area Oil and Chemical Basin (LAOCB) based on performance monitoring, and references Table F-5, LAOCB and LRSB Performance Monitoring Results (2016) and Figure F-8. However, Table F-5 presents 2016 and not 2020 monitoring results and Figure F-8 (dated 12/13/2012) does not present data from performance monitoring. *Please revise Table F-5 to present the 2020 monitoring results and revise Figure F-8 to present the concentrations relative to performance monitoring sample results.*

7. **Appendix G, R-Area Operable Unit, Section VII, Technical Assessment, "Is the Remedy Functioning as Intended by the Decision Document?" Page G-16 of G-46:** The text in the first paragraph discusses generally decreasing trends of carbon-14 and tritium; however, there are no figures or trend diagrams supporting these statements. *Please provide trend diagrams for the COCs to support statements that trends are stable or decreasing, consistent with figures provided for the other OU evaluations.*

EPA HQ Comments:

EXPECTATIONS FOR PFAS AND EMERGING CONTAMINANTS IN FIVE-YEAR REVIEWS:
After reviewing numerous five-year reviews, *FFRRO has observed the following best practices in addressing PFAS and other emerging contaminants of potential concern in Five-Year reviews:*

a. Progress Since Last Review: This may be an appropriate location to summarize the status of the investigation into PFAS or other emerging contaminants, such as 1,4-dioxane.
b. Data Review: This section may be an appropriate location if there are data pertaining to emerging contaminants to review.

Note that in either (a) or (b), the description of PFAS should include a concise summary of the scope of the investigation to date, and the results should be screened as set forth in the latest EPA and DOD guidance (e.g. DOD 2019, EPA 2019, DOD 2020, etc.)

c. Technical Assessment: In most cases, Question B is the most appropriate place to address PFAS and other emerging contaminants. Specifically, the guidance asks to review exposure assumptions, including the detection or presence of new contaminants (Page 4-5 of 2001 Guidance).

Exhibit 4-1: Three Questions Used to Determine Whether a Remedy is Protective

When you ask...	you should consider whether...
Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy selection still valid?	• there are changes in standards identified as Applicable or Relevant and Appropriate Requirements (ARARs) in the ROD, newly promulgated standards, and/or changes in TBCs identified in the ROD, that could call into question the protectiveness of the remedy; • there are changes in land use or the anticipated land use on or near the site; • new human health or ecological exposure pathways or receptors have been identified; • new contaminants or contaminant sources have been identified; • there are unanticipated toxic byproducts of the remedy not previously addressed by the decision documents; • there are changes in the physical site conditions; and • there are changes in the toxicity factors for contaminants of concern.

d. Issues/Recommendations: This section should include any issue(s) identified and proposed follow-on actions as needed. This section can also be used to describe how emerging contaminants will be addressed going forward.
e. Protectiveness Determinations: Facilities are selecting short-term protective if they have at least a preliminary understanding of PFAS contamination and are confident that there are no current drinking water exposures. Facilities are selecting to defer protectiveness if the characterization is incomplete. Other emerging contaminants should be addressed in a similar manner.

References:

EPA, 2001. Comprehensive Five-Year Review Guidance. EPA 540-R-01-007. June 2001.
EPA, 2012. Clarifying the Use of Protectiveness Determinations for Comprehensive Environmental Response, Compensation, and Liability Act Five-Year Reviews. OSWER 9200.2.111. September 13, 2012.
EPA, 2019. Interim Recommendations to Address Groundwater Contaminated with Perfluorooctanoic Acid and Perfluorooctanesulfonate. OLEM Directive No 9283.1-47. December 19, 2019.
DOD, 2019. Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program. October 15, 2019.
DOD, 2020. Per-and Polyfluoroalkyl Substances Sampling of Department of Defense Drinking Water Systems. March 2, 2020.

QUESTIONS FOR FYRS: There are four issues considered in the PFAS and Emerging Contaminants Review, which guide our recommendations:

1. Scope and Documentation: Where was sampling and evaluation for PFAS and/or other emerging contaminants summarized? Is the scope appropriate and were current guidance referenced and followed?
2. Technical Assessment: Were emerging contaminants included in Question B?
3. Issues and Recommendations: Were issues pertaining to the emerging contaminants identified? How were they addressed via recommendations?
4. Protectiveness: Does the presence of emerging contaminants affect protectiveness?

RECOMMENDATIONS:

#	Page	Comment	Category
1	Overarching	Additional documentation is needed in the main body of this report. Three questions need to be addressed: How	Scope and Documentation

		were PFAS used at this site? Where are PFAS known or suspected to be present in GW? Is there reason to believe that the nature and extent of PFAS at SRS is beyond any of the controls that are in place? Answers to these questions are needed to determine if PFAS may be impacting protectiveness of any of the existing remedies.	
2	Overarching	If PFAS investigations are ongoing then this needs to be captured under Issues, with next steps identified under Recommendations.	Issues and Recommendations
3	C-11	Area C GW -PFAS is a potential GW contaminant from fire-fighting activity and PFAS has been detected in streams within the area boundary. Additional sampling is ongoing. Therefore, the need to complete PFAS sampling and determine if any additional actions are needed must be captured under Issues and Recommendations.	Issues and Recommendations
4	C-12	Insufficient information has provided to conclude whether PFAS releases have had an impact on either human or ecological health. Sufficient information is needed to make a case that protectiveness has not been impacted. In any event, due to the uncertainty caused by the presence of PFAS, we do not see how the remedy can continue to be categorized as protective. To be short-term protective, SRS needs to demonstrate that there are current exposure pathways. High uncertainty may warrant a deferral of protectiveness.	Protectiveness

EPA ORC Comments:

Comment #1: Page 14 of 34 (PDF Page 26), Response to Question A: Consider including a bullet point addressing LUCs and institutional controls in the response to Question A. *See* Comprehensive Five-Year Review Guidance, OSWER No. 9355.7-03B-P, June 2001, at 4-1, Exhibit 4-1 ("When you ask Question A: Is the remedy functioning as intended by the decision documents? [Y]ou should consider whether . . . access (e.g. fencing, security guards) and institutional controls needed at the particular stage of the remediation are in place and prevent exposure . . . ."). See also id. at 4-3 ("Your review of an operating or completed remedial action generally will address more aspects of the remedy implementation than a review of a remedial action under construction. In general, you should consider assessing the following: . . . **Implementation of institutional controls**: Determine whether access controls (e.g. fencing, security guards) and Ics that are needed at this stage of the remediation are in place and successfully prevent exposure)".

Comment #2: Page C-12 of C-32 (PDF page 96), Section X. Protectiveness Statement(s): In the prior Sixth Five-Year Review, on page C-4 of C-32 of that document, the proposed issue date for the CAGW OU ROD was April 2027. The current Seventh Five-Year Review states that the proposed Final Rod Issue Date is April 2030. Consider including a sentence stating why the proposed issue date has changed.

Comment #3: Appendix E, Page E-8 of E-18, first bullet point: Appendix E states that

> Concentrations of PCE in the AQ1/2, AQ3, and GAU aquifers continue to slowly decrease or remain similar to concentrations from previous sampling. The most recent data at the DOSB from the year 2023 shows that PCE exceeded the MCL (5µg/L) at only DOB 15, a plume compliance well. There was no exceedance of the MCL at any of the boundary compliance wells.
>
> However, in the prior 6th Five Year Review (Appendix E at page E-8 of E-42), "PCE was below the MCL of (5ug/L) in all wells at the DOSB. . . ." Thus, the data showing that PCE exceeded the MCL in a well is contrary to the first sentence, that "[c]oncentrations of PCE . . . continue to slowly decrease or remain similar to concentrations from previous sampling." Revise to address accordingly.