



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
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ATLANTA, GEORGIA 30303-8960

December 07, 2018

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Brian Hennessey, 730-B
SRS Remedial Project Manager
Area Completion Projects
Savannah River Operations Office
P.O. Box A
Aiken, South Carolina 29802

ENVIRONMENTAL COMPLIANCE &

DEC 10 2018

AREA COMPLETION PROJECTS

Dear Mr. Hennessey:

The U.S. Environmental Protection Agency (EPA) has reviewed the 2017 Annual Comprehensive TNX Area Groundwater Monitoring and Remedial Action Effectiveness Interim Report (CERCLIS/SEMS #21, 29), Revision 0 dated June 2018.

EPA cannot approve the above mentioned report until the comments below have been addressed. If you have any questions, please contact me at (404) 229-9500.

Sincerely,

A handwritten signature in black ink, appearing to read "Diedre Lloyd".

Diedre Lloyd
Remedial Project Manager
Restoration and Sustainability Branch
Region 4, Superfund Division
61 Forsyth Street, S.W.
Atlanta, Georgia 30303

cc: Angelia Holmes, DOE-SRS, C. L. Bergren, SRNS-ACP (Signed Original), Karen Adams, DOE-SRS, C.L. Bergren SRNS-ACP (Signed Original), Susan Fulmer, SCDHRC

**EPA COMMENTS ON THE
2017 ANNUAL COMPREHENSIVE TNX AREA GROUNDWATER MONITORING AND
REMEDIAL EFFECTIVENESS INTERIM REPORT**

SEMS NUMBER 21, 29

REVISION 0, DATED JUNE 2018

**SAVANNAH RIVER SITE
SOUTH CAROLINA**

EPA COMMENTS:

1. In the Executive Summary, Current Remedial Action, Page ES-2 of ES-8, the text states “Trichloroethylene concentrations are less than the maximum contamination level in all wells in the treatment area, and reductive conditions are present in the treatment area. Trichloroethylene concentrations exceeding the maximum concentration level are located downgradient of the edible oil treatment area in the distal groundwater plume.” However, the text in Section 5.4 Analytical Results, Page 20 of 58, indicates the monitoring wells used during the 2015 edible oil injection (i.e., TBG 3, TBG 4, TBG 5, TRW 3, TRW 4R, and TVM 1M) have been experiencing foamy samples causing above normal method detection limits and sample quantitation limits for laboratory analyses. As such, many of the detection limits or estimated quantitation limit (EQL) noted for volatile organic compound (VOC) analyses were greater than the respective maximum contaminant levels (MCLs). Please revise the text in the Executive Summary to address this issue and identify the uncertainty with the VOC analytical results in the treatment area.
2. The last sentence in the Executive Summary, Current Remedial Action, Page ES-2 of ES-8 states “SRS estimates that all trichloroethylene concentrations will be less than the maximum concentration level in two to three years.” However, the text in Section 8.1, Summary on Page 53 of 58 states “SRS estimates that TCE concentrations will be less than the MCL in four years.” Revise the text in each section to address and explain this discrepancy in the estimated number of years that TCE concentrations will be less than MCLs.
3. In the Executive Summary, Groundwater Monitoring, Page ES-3 of ES-8 the last paragraph states “1,4-Dioxane was sampled in 2017 at all monitoring wells during the second and fourth quarter. 1,4-Dioxane was detected in two monitoring wells in 2017.” The text in Section 6.7, 1,4-Dioxane, Page 38 of 58, states the laboratory EQL for 1,4-dioxane analysis was elevated and greater than the respective regional screening level for drinking water of 0.46 micrograms per liter ($\mu\text{g/L}$) in all wells sampled. As such, it is recommended the text be revised in the Executive Summary of the Annual Report to recognize this issue and identify the uncertainty with the 1,4-dioxane analytical results.
 - a. EPA notes again in this TNX EMR as was noted in the previously conditionally approved TNX EMR: 1,4-Dioxane sample quantitation limits remain above the regional screening level (RSL) for 1,4-Dioxane of 0.46 $\mu\text{g/L}$. EPA maintains a 1,4 dioxane fact sheet that outlines some analytical options that may be useful:
https://www.epa.gov/sites/production/files/2014-03/documents/ffro_factsheet_contaminant_14-dioxane_january2014_final.pdf. Please provide assurance that this RSL will be met in future sampling events.

- b. Page 53 of 58, 4th paragraph: report notes "...there does not appear to be a discernable/consistent plume with respect to 1,4 dioxane." EPA suggests that lower detection limits for 1,4 dioxane would provide additional clarity and information if the sampling quantitation limits met the RSL potentially enabling better plume delineation for 1,4 dioxane.
4. The treatment zone is not clearly defined in Figure ES-3. Comparison of Trichloroethylene Concentration in the Treatment Zone in 2007 and 2017, Page ES-7 of ES-8. For example, the text in the Executive Summary, Current Remedial Action, Page ES-2 of ES-8, states "Trichloroethylene concentrations are less than the maximum contamination level in all wells in the treatment area, and reductive conditions are present in the treatment area. Trichloroethylene concentrations exceeding the maximum concentration level are located downgradient of the edible oil treatment area in the distal groundwater plume." As such, it is uncertain whether monitoring well TRW 2 depicted in the Figure ES-3 with a November 2017 TCE concentration of 24 µg/L is located within the treatment zone or in the distal groundwater plume area since the TCE concentration is greater than the MCL. Revise the report to address this issue.
5. The last paragraph in Section 2.0, Site Hydrogeology, Page 7 of 58 states "Particle tracking from the groundwater model (WSRC 2000) illustrates westerly flow from TNX source areas to the Savannah River with some water discharging to the X-08 Ditch and wetlands (Figures A-6 and A-7)." In Figure A-13. TNX Area Water Table Elevation Fourth Quarter 2017, Page A-18 of A-50, the groundwater flow path direction depicted near TNX 8D and TNX 36D show a southerly flow path, and away from the X-08 Ditch and Savannah River. The southerly flow path would explain the VOC detections in TNX 8D, TNX 35D and TNX 37D. As such, it is uncertain whether the results of the 2000 groundwater modeling are still valid based on current groundwater flow direction observations and analytical results. Revise the Annual Report to address and explain this issue.
6. The text in Section 5.4, Analytical Results, Page 20 of 58 states "The monitoring wells used during the 2015 edible oil injection (i.e., TBG 3, TBG 4, TBG 5, TRW 3, TRW 4R, and TVM 1M) have been experiencing foamy samples. The foam is likely a by-product of the edible oil and the complex biogeochemistry that is occurring in the subsurface." One of the remedial action objectives listed in Section 3.1, Objectives on Page 8 of 58 is to "Return groundwater to beneficial uses." The Annual Report mentions but does not discuss how the production of foam and the complex biochemistry occurring in the subsurface in the treatment area will impact the returning the groundwater to beneficial use, particularly if concentrations of groundwater contaminants of concern (COCs) have attained respective MCLs.
 - a. Revise the report to provide further clarification and explanation regarding the foam which is hypothesized to be a by-product of edible oil and the complex biogeochemistry in the subsurface.
 - b. Revise the Annual Report to address the issue of ensuring that groundwater is returned to beneficial use within in the TNX treatment area.
7. The text in Section 8.1, Summary on Page 53 of 58 states "SRS estimates that TCE concentrations will be less than the MCL in four years." However, based on the time-series plots for TCE at several wells, the remedial cleanup timeframe for TCE is uncertain. For example, the time-series plot presented for TCE in monitoring well TNX 28D on Page E-256 of E-274 shows an overall increasing trend for TCE concentrations. The second and fourth quarter 2017 TCE concentrations in TNX 28D measured 7.2 µg/L and 12 µg/L, respectively. Additionally, the time-series plot for TCE at monitoring well TRW 2 indicates a non-steady trend currently above the MCL. The second and fourth quarter 2017 TCE concentrations in TRW 2 measured 21 µg/L and 24 µg/L, respectively. As

such, it is uncertain whether TCE concentrations will be less than the MCL in all site wells in four years. Revise the Annual Report to address this issue.

8. The text in Section 8.1, Summary on Page 53 of 58 states “SRS estimates that TCE concentrations will be less than the MCL in four years.” However, the Annual Report does not provide a similar estimate for cleanup of radionuclide contamination. Based on the time-series plots for total recoverable uranium for monitoring wells TBG 4 and TCM 5, Pages E-272 and E-273 of 274 respectively, the remedial cleanup timeframe is uncertain. Please discuss associated remedial cleanup time frames for radionuclides and revise the Annual Report to address this issue.
9. In Figure A-13. TNX Area Water Table Elevation Fourth Quarter 2017, Page A-18 of A-50, two groundwater flow paths are depicted in the figure. In the figure one flow path arrow is bounded by the letters A - A’ and the other is bounded by the letters B - B’. However, the figure legend does not define or explain the use of the A - A’ or B - B’ notations. For clarity, revise the figure to address this issue.