



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

January 09, 2020

**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



Dear Mr. Hennessey:

The U.S. Environmental Protection Agency (EPA) has reviewed the 2018 Annual Comprehensive TNX Area Groundwater Monitoring and Remedial Action Effectiveness Interim Report (SEMS #21, 29), Revision 0, dated June 2019.

EPA cannot approve the above mentioned report until the comments below have been addressed. EPA notes that DOE-SRS has proposed have a meeting of all FFA signatory parties after 3 consecutive year to discuss noted data gaps, analytical methods (1,4 dioxane), and remedy efficacy along with the general site path forward. EPA supports and looks forward to this meeting. If you have any questions, please contact me at (404) 229 -9500.

Sincerely,

A handwritten signature in blue 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, SCDHEC

**EPA COMMENTS ON THE  
2018 ANNUAL COMPREHENSIVE TNX AREA GROUNDWATER MONITORING AND  
REMEDIAL EFFECTIVENESS INTERIM REPORT**

**SEMS NUMBER 21, 29**

**REVISION 0, DATED JUNE 2019**

**SAVANNAH RIVER SITE  
SOUTH CAROLINA**

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**EPA COMMENTS:**

1. In the List of Figures, Page ii of iv, Figure ES-2 is listed as TNX Area Trichloroethylene (TCE) Concentration in Groundwater, 4Q2017 with >500 µg/L TCE Plume from 4Q1996 Superimposed. Additionally, Figure ES-3 is listed as Comparison of Trichloroethylene Concentration in the Treatment Zone in 2007 and 2017. The figures should reference 4Q2018 and 2018, respectively. For clarity, revise the 2018 Annual Comprehensive TNX Area Groundwater Monitoring and Remedial Action Effectiveness Interim Report (U), SEMS Numbers: 21, 29, SRNS-RP-2019-00391, Revision 0, dated June 2019 (2018 Annual Report) to address this discrepancy.
2. Section 1.2.3, New TNX Seepage Basin (NTSB), Page 3 of 54 states, “During periods of unusually high discharge, the seepage section of the basin overflowed to Outfall X-013A which in turn discharged to a local surface depression.” Outfall X-013A and a local depression near NTSB are not depicted on Figure A-3; therefore, it is not clear where overflow from the NTSB would flow. Revise the 2018 Annual Report to address this issue.
3. The first complete paragraph of Section 2.0, Site Hydrogeology, Page 7 of 54, includes a discussion of the hydraulic conditions of the Floridian aquifer system in the TNX Area. The text states, “This is evident by looking at average values for water level data collected between first quarter 1995 and fourth quarter 2017 from wells P 26A, P 26B, and P26D.” It is unclear if the water level data collected during the 2Q2018 and 4Q2018 were evaluated for this discussion. Additionally, the paragraph includes further discussion of the static well head pressure at location P 26. In the paragraph, sentence four states, “The average hydraulic head measured in the LAZ of the UTRAU at P 26D is 35.1 m (115.3 ft) amsl which is 2.8 m (9.2 ft) less than the average hydraulic head measured in the semi-confined GAU.” Based on the data provided in the text, the referenced semi-confined unit of the GAU is location P 26B. However, the previous sentence referred to location P 26B as “the unconfined GAU,” and the fifth sentence refers to the GAU unit as confined. Finally, the discussion references Appendix D, Hydrograph for Station 26; however, the data within the text is not clearly presented on the referenced hydrograph for Station 26. Revise the 2018 Annual Report to address this issue.
4. The screened zone of P 26A is not depicted on Figure A-4 (Appendix A, Page A-9), although the P 26 location is included in the TNX Area Cross Section A-A’. For completeness, update the 2018 Annual Report to address this issue.
5. The first complete paragraph of Section 3.3, Edible Oil Treatment, Page 10 of 52 states, “The EO treatments have significantly reduced VOC concentrations in the groundwater.” However, the text does not reference data (Figure A-38) to support this statement. Revise the text to reference supporting data.

6. Section 5.2, Water-Level Measurements, Page 19 of 54 states a water table map was constructed showing current conditions from water-level measurements collected during the 4Q2018 and calculated horizontal flow rates in the unconfined portion of the UTRAU/GAU range for the same period. Review of Appendix E (Time Series Graphs) shows that many constituent concentrations fluctuate seasonally between the 2Q and 4Q sampling events, which is likely due to seasonal variation in groundwater levels. For completeness, revise the 2018 Report to include a water table map for both 2Q2018 and 4Q2018 and calculate horizontal flow rates.
7. The text in Section 5.4 Analytical Results, Pages 20 & 21 of 54 states, “TRW 2 and TCM 5 have a history of exceeding the Maximum Contaminant Level (MCL) (5 µg/L) for TCE. TNX 28D has a history of detectable concentrations of TCE that periodically exceed the MCL since 2016.” However, TCE was also detected in TIR 1 during 4Q2018 and the time series plot of TCE in TIR 1 (Appendix E, page E-243 of E276) shows a history of detectable TCE above MCLs. Additionally, the time series plot of TCE in TNX 28D (Appendix E, page E-258 of E-276) indicates that TCE concentrations are generally increasing. Revise the text to include TNX 28D in the summary narrative.
8. The text in Section 5.4 Analytical Results, Page 21 of 54 states, “Gross alpha was detected in eight monitoring wells during 2Q2018. The gross alpha activity at TCM 5 (23 pCi/L) was the only well to exceed the MCL (15 pCi/L).” Similar results are reported for gross alpha in 4Q2018. However, during both monitoring events, the sample-specific estimated quantitation limit is above the MCL of 15 pCi/L for TBG 4. As such, it is unclear if gross alpha MCL exceedances also occurred at TBG 4. Revise the 2018 Annual Report to address this issue.
9. The text in Section 6.2 (pH), Page 31 of 54, paragraph 2 states “During the 4Q2018, there were no wells with a pH of less than 5 (Figure A-14). However, the text in Section 5.3 (pH) states that “During the 4Q2018, two monitoring wells (i.e. TIR 1U and TNX 16D) had a pH less than 5 (A-14). Additionally, Figure A-14 only depicts one well location (TNX 16D) with a pH less than 5; the second location (TIR 1) with a pH of less than 5 during 4Q2018 shows the pH value at well location TIR 1L rather than well TIR 1U. For clarity revise the 2018 Annual Report to address this issue.
10. The text in Section 6.2, pH, Page 31 of 54, third paragraph states, “After the 2008 and 2010 injections, elevated pH was observed in three of the injection wells, TBG 4, TBG 5, and TNX 3D. A basic solution was also added during the 2015 EO injections; however, it does not appear to have buffered the aquifer as much as the 2008 and 2010 injections.” There are, however, no data included in the 2018 Annual Report to support this statement. Revise the 2018 Annual Report to include and reference data that support this statement.
11. The text in Section 6.4, Edible Oil Parameters, Pages 35 & 36 of 54, paragraph 2 states, “In 2018, ORP results increased during the 4Q2018.... At this time, it is not apparently clear why ORP results increased at these wells.” It is unclear if these statements refer to ORP within site-wide wells or specific wells within the emulsified oil (EO) treatment area. For clarity, revise the text to address this issue.
12. The text in Section, 6.4 Edible Oil Parameters, Page 36 of 54, second complete paragraph states, “VFA concentrations have also been detected in the monitoring wells (i.e. TRW 1, TRW 2, and TVR 1A) suggesting that EO has been distributed out into the aquifer.” The time series plots for Total VFA in these wells shows that total VFAs detections in these wells have fluctuated, and VFAs have not been detected in these wells since 2Q2017. Revise the text of the 2018 Annual Report to address this issue.

13. The text in the last paragraph of Section 6.5 Combined Radium, Uranium, Gross Alpha and Adjusted Gross Alpha, Page 38 of 54, states, “At TBG 3, gross alpha and combined radium exceedances appear to be directly related. At TBG 4, the gross alpha concentrations appear to correlate with combined radium concentrations before 2010 and correlate to uranium concentrations after 2010.” References to data to support this comparison are not provided. It is noted that time series graphs with both gross alpha and the related radionuclide would better support the analysis. Revise the 2018 Annual Report to address this issue.
  
14. The text in Section 8.1 Summary, Page 49 of 54, last paragraph states, “There does not appear to be a discernible and consistent groundwater plume with respect to 1,4-dioxane at TNX. The detections of 1,4-dioxane appear to be localized to TBG 5 with only sporadic detections at the other monitoring wells.” Detections of 1,4-dioxane at TBG 5 and the other monitoring wells are greater than the respective regional screening level for drinking water of 0.46 micrograms per liter ( $\mu\text{g/L}$ ), which should be noted. Additionally, the uncertainty of the lack of detections due to elevated estimated quantitation limits for 1,4-dioxane at all wells should be noted. It is recommended that the text be revised to recognize the above noted issue and identify the uncertainty with the 1, 4-dioxane analytical results.
  - a) 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/ffiro\\_factsheet\\_contaminant\\_14-dioxane\\_january2014\\_final.pdf](https://www.epa.gov/sites/production/files/2014-03/documents/ffiro_factsheet_contaminant_14-dioxane_january2014_final.pdf).
  - b) 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.
  
15. The data comparison presented in Appendix A, Figure A-40, Page A-45 of A-46, Comparison of Vinyl Chloride Concentration in the Treatment Zone in 2010 and 2018 is unclear. All wells in July/August 2010 are shown as being 0  $\mu\text{g/L}$ , while data for December 2018 are non-detect. Revise the 2018 Annual Report to address this issue.