



ENVIRONMENTAL COMPLIANCE &

May 31, 2023

MAY 31 2023

Mr. Brian T. Hennessey, SRS Remedial Project Manager
Remediation and Deactivation & Decommissioning Division
U. S. Department of Energy
Savannah River Operations Office
Post Office Box A
Aiken, South Carolina 29802

AREA COMPLETION PROJECTS

Re: Treatability Study Data Report for Groundwater Injection and Discharge Canal Neutralization at the D-Area Groundwater Operable Unit (OU) (U) – 2022 Data and Information, SEMS Number: 63 (SRNS-TR-2023-00009, Revision 0, January 2023) received February 1, 2023.

Dear Mr. Hennessey:

The Department has completed its review of the above referenced document pursuant to the Savannah River Site Federal Facility Agreement. The attached comments were generated as a result of this review. These comments must be addressed prior to final approval of the above referenced document. As specified in Section XXII, Review/Comment on Documents, the appropriate technical staff will be available to participate in a joint DOE/EPA/DHEC comment resolution meeting to discuss these comments, if necessary.

To schedule a meeting to resolve the attached comments or to obtain further information, please contact me at (803) 898-4331.

Sincerely,

Susan B. Fulmer

Digitally signed by Susan B.
Fulmer
Date: 2023.05.31 08:48:47 -04'00'

Susan B. Fulmer, P.G., Manager
Federal Remediation Section
Division of Site Assessment, Remediation, Revitalization
Bureau of Land and Waste Management

cc: C. L. Bergren, SRNS-ACP (Signed Original)
Travis Fuss, Aiken Environmental Affairs Office (via email)
Jon Richards, EPA Region IV
Heather Cathcart, BLWM

South Carolina Department of Health and Environmental Control Comments on:
Treatability Study Data Report for Groundwater Injection and Discharge Canal Neutralization
at the D-Area Groundwater Operable Unit (OU) (U) – 2022 Data and Information,
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General Comments

1. According to Section 5.1, the conceptual design for the treatability study was revisited and the possibility of an underestimation of the total volume of water required to raise the water level in the injection field 5 feet was discussed. The potential revised volume, 75 million gallons as opposed to the original estimated volume of 19 million gallons, would take approximately a year to a year and a half to accomplish with the target injection rate of 120 gpm and longer with the current rate of 85 gpm. Based on information presented on page 3 in Section 2.0, a total of 10 pore space volumes could significantly displace and raise the pH levels in the upper water table within a three-year study period. This was based on the 19 million gallon estimated pore space volume; and if the actual pore space volume is closer to 75 million gallons, it would take approximately 12 years to accomplish this water displacement with the target injection rate of 120 gpm.

Based on this information, the Department concurs with the recommendation in Section 7.0 (Summary) that the conceptual model be revisited and that a detailed hydrogeologic reevaluation of the site be conducted, with the understanding that the results of this reevaluation will be presented in the next report.

2. The calculations used to estimate the volume of water needed to raise the water table 5 feet in the D-Area Coal Storage Area (DCSA) appear to be oversimplified and do not account for several factors influencing the hydrogeology of the OU. In the report, the volume of water needed to create a groundwater mound of 5 feet across the DCSA was calculated by multiplying the area of the DCSA by the water table rise of 5 feet and a porosity of 30%, yielding an estimated required volume of 19 million gallons. Although the estimated volume was revised to 75 gallons, this equation omits other hydrologic factors that are likely to influence the results of groundwater injections, including the following: the presence of downward vertical gradients at the OU; the depth of the screened interval and permeability of the material where the injection wells are screened; movement of injected groundwater through preferential flow pathways due to the heterogeneity of the aquifer materials; movement of groundwater downgradient as groundwater is injected upgradient; and groundwater recharge from rainfall. As part of the hydrogeologic reevaluation of the treatability study discussed in Section 7.0, the Department recommends the use of a groundwater model that accounts for additional factors that are influencing the effectiveness of the groundwater injections.

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3. The document references quarterly sampling for metals at select locations and monthly stream flow measurements, but past data for these measurements is not included in the report. In future reports, please include historical stream flow measurements, as well as time-series plots of analytical results for metals, for comparison between pre-injection and post-injection conditions.

Specific Comments

1. Table 1, D-Area Treatability Study Monitoring Network and Sampling Schedule, page 17. The table presents total depth of wells in feet below ground surface (bgs) and screened interval in feet above mean sea level (amsl). In future reports, please revise Table 1 to include screened intervals in feet bgs.
2. Section 2.0, Project Description, pages 2 and 3. The section states that injected groundwater will “create a hydraulic head,” but the meaning of this is unclear since hydraulic head is always present at any particular point throughout an aquifer. In context this was interpreted to mean, “increase the hydraulic head,” (i.e., raise the elevation of the water table). Please confirm this interpretation is correct.