

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

April 3, 2020

Mr. Brian T. Hennessey, SRS Remedial Project Manager
Infrastructure and Area Completion Division
U.S. Department of Energy
Savannah River Operations Office
P.O. Box A
Aiken, South Carolina 29802



RE: EPA Comments on the Removal Action Report for the C-Area Groundwater Operable Unit Bio-barrier Non-time Critical Removal Action SEMS Number: 82, SRNS-RP-2019-00584, Revision 0, December 2019, Savannah River Site, South Carolina

Dear Mr. Hennessey,

The U.S. Environmental Protection Agency, Region 4 (EPA), has reviewed the Removal Action Report for the C-Area Groundwater Operable Unit Bio-barrier Non-time Critical Removal Action SEMS Number: 82, SRNS-RP-2019-00584, Revision 0. EPA comments are attached.

If you have any questions or require additional information, please contact me at (404) 562-8513.

Sincerely,

**JENNIFER
TUFTS**

Digitally signed by
JENNIFER TUFTS
Date: 2020.04.03
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Jennifer Tufts
Remedial Project Manager
Superfund Division

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

Attachment

EPA Comments on the Removal Action Report for the C-Area Groundwater Operable Unit Bio-barrier Non-time Critical Removal Action SEMS Number: 82, SRNS-RP-2019-00584, Revision 0, December 2019, Savannah River Site, South Carolina

I. GENERAL COMMENTS

1. The Draft RAR should provide a summary table(s) that presents information that includes the following: injection location; injection date; injection time; injection depth; injection rates (average, minimum, maximum); conditions of each of the injection components including (as applicable) temperature, pH, dissolved oxygen, specific conductance, oxygen reduction potential); and, any visual observations noted in the field. Revise the Draft RAR to provide a table(s) summarizing the details of the above-referenced data for each of the fifteen injection points.
2. The Draft RAR should provide additional information to confirm that the final design requirements were met. For example, the list on Page 11 of 28 in Section 4.1.3 summarizes how the final design requirements were documented as being met; however, the following deficiencies are noted:
 - a) The text states that emulsified oil mixture injections were primarily within the MAZ; however, the Draft RAR does not discuss or document how the presence of the MAZ at each injection point was confirmed.
 - b) The text states that the goal of the two buffers (i.e. sodium bicarbonate and EOS CoBupHMg™) were to raise groundwater pH to the optimal range for bioremediation. However, the Draft RAR does not discuss or provide supporting documentation to confirm that pH conditions of the groundwater unit post injection were monitored to confirm this goal was met.

Revise the Draft RAR to provide supporting documentation.

3. Per Appendix E, Subcontractor Field Notebook, visual observations of daylighting were used during construction activities. However, the Draft RAR lacks discussion of visual observations of daylighting and how this information was used to implement the removal action. Revise the Draft RAR to include discussion of how visual observations of daylighting were used to successfully implement removal action construction activities.

II. SPECIFIC COMMENTS

1. **Section 1.3.2, Selected Removal Action, Pages 4/5 of 28:**

The text of Section 1.3.2 presents the key elements of the selected remedy including element 2) listed on Page 5 of 28 which states, “Establish and utilize fifteen DPT injection points to construct the treatment barriers (Figure 4): five injection points ~20.2- to 23.2-m (66- to 76-ft) below ground surface (bgs) and ten injection points ~10.1- to 13.1-m (33- to 43-ft) bgs in the distal portion of the groundwater plume location.” However, the RADP specifies the five injection points for Oil Injection Area 1 to have screen zone depths of 55- to 65-ft bgs, rather than 66 to 76-ft bgs. Revise the Draft RAR to address this discrepancy.
2. **Section 2.1, Construction Details, Page 6/7 of 28:**

The last sentence on Page 6 and first sentence of Page 7 of 28, of Section 2.1 states, “After all the emulsified oil mixture was injected, 151 L (40 gal) of EOS CoBupHMg™ was mixed with 757 L (200 gal) of water and injected into the aquifer. Finally, 1,136 L (300 gal) of chase water was injected into the aquifer.” However, this does not specify the addition of the BAC-9 microbial supplement injected midway during the emulsified oil mixture injection, as listed in the first sentence

of the same paragraph. Revise the text to list all of the components injected into the subsurface at each injection point.

3. **Section 2.3, Waste Management, Page 7 of 28:**

The text in Section 2.3 states, “There was no radioactive or hazardous waste associated with this project, as determined by waste management guidance. All job waste and personal protective equipment was disposed of as sanitary waste. All decontamination water was land applied on location.” However, the text does not include a reference to the waste management guidance used for this determination. In addition, the text does not discuss the generation of soils (if any) during DPT injection activities. Further, because monitoring well installation records are provided in Appendix D, including well development data, the text should discuss the management of soil and development water generated during these activities and reference. Revise the Draft RAR to cite the appropriate waste management guidance used to determine the disposition of wastes generated during the RA. In addition, discuss if soils were generated during the RA construction activities and discuss waste management related to monitoring well installation/development and reference supporting documents under which such activities are reported.

4. **Section 4.2.3, Continuous Monitoring of Injections, Pages 14/15 of 28:**

The last paragraph of Section 4.2.3 on Page 14 of 28 documents a process improvement made following observation of oil separation on July 24, 2019 during injection at CCIW-02, which corresponds to the last of the five injections completed at Oil Injection Area 1 per Appendix E, Subcontractor Field Notebook. Thus, the process improvement change was only implemented at Oil Injection Area 2. Revise the Draft RAR to discuss if the condition leading to a process change for the ten injection points in Oil Injection Area 2 is expected to impact successful treatment in Oil Injection Area 1.

5. **Figure 4, CAGW OU Pre-Removal Action Site Plan**

Revise Figure 4 to include groundwater flow direction.

6. **Appendix D, Groundwater Monitoring Well Records and Injection Point Soil Boring Installation Reports, Page D-30 of D-44:**

The screen length for temporary injection point CCIW02 is listed as 66 to 78 feet bgs; however, per the RADP, the injection point screen would have a 10-foot DPT screen zone. Revise the Draft RAR to address this discrepancy.