Department of Energy
Savannah River Operations Office
P.O. Box A
Aiken, South Carolina 29802

JUN 24 2019

Ms. Susan B. Fulmer, P. G., Manager
Federal Remediation Section
Division of Site Assessment, Remediation and Revitalization
Bureau of Land and Waste Management
South Carolina Department of Health and Environmental Control
2600 Bull Street
Columbia, South Carolina 29201

Mr. Jon Richards
Acting Savannah River Site Remedial Project Manager
Superfund Division
U. S. Environmental Protection Agency, Region 4
61 Forsyth Street, SW
Atlanta, Georgia 30303

Dear Ms. Fulmer and Mr. Richards:

SUBJECT: Sixth Five-Year Remedy Review Report for Savannah River Site Operable Units with Native Soil Covers and/or Land Use Controls (U) Aiken, South Carolina (SRNS-RP-2018-00811, Revision 1, June 2019) (Redline Pages) and Savannah River Site's Responses to the Regulatory Comments on the Revision 0 Document, SEMS Number: 00

In accordance with the terms of the Federal Facility Agreement, the U. S. Department of Energy is submitting the subject information for your review. The Revision 0 Remedy Review Report and supporting documentation was submitted to the U. S. Environmental Protection Agency (EPA) and South Carolina Department of Health and Environmental Control (SCDHEC) on December 20, 2018. The EPA and SCDHEC provided comments on the Revision 0 report on March 29, 2019 and April 3, 2019, respectively. The Savannah River Site's responses to the regulatory comments were incorporated into the Revision 1 redline pages.

Please review the enclosures and provide your comments or approval within forty-five (45) days of receipt. The effort and time that the EPA and SCDHEC have given on the subject report are greatly appreciated.

Questions from you or your staff may be directed to me at (803) 952-8365.

Sincerely,

Brian T. Hennessey
SRS Remedial Project Manager
Infrastructure and Area Completion Division

IACD-19-164

Enclosures:
1. Sixth Five-Year Remedy Review Report for Savannah River Site Operable Units with Native Soil Covers and/or Land Use Controls (U) Aiken, South Carolina (SRNS-RP-2018-00811, Revision 1, June 2019) (Redline Pages), SEMS Number: 00
2. SRS Responses to U. S. Environmental Protection Agency Comments on the Sixth Five-Year Remedy Review Report for Savannah River Site Operable Units with Native Soil Covers and/or Land Use Controls (U) – Aiken, South Carolina, SRNS-RP-2018-00811, Revision 0, December 2018, SEMS Number: 00
3. SRS Responses to South Carolina Department of Health and Environmental Control Comments on the Sixth Five-Year Remedy Review Report for Savannah River Site Operable Units with Native Soil Covers and/or Land Use Controls (U) – Aiken, South Carolina, SRNS-RP-2018-00811, Revision 0, December 2018, SEMS Number: 00

cc w/o encl:
G. K. Taylor, SCDHEC – Columbia
D. Scaturo, SCDHEC-Columbia
S. French, SCDHEC-Columbia
M. Reece, SCDHEC-Columbia
G. N. O'Quinn, SCDHEC-Aiken Environmental Affairs Office
B. Cameron, SCDHEC-Aiken Environmental Affairs Office
R. H. Pope, EPA-Atlanta

cc w/encl:
D. Lloyd, EPA-Atlanta
J. Tufts, EPA-Atlanta
M. McRae, TechLaw, Inc.

COMMENTS

1. The general remedial action objectives (RAOs) at SRS are listed in the Response Action Summary subsection on Page 8 of 24. Land use controls (LUCs) have also been selected as part of the remedial action and are necessary to ensure protectiveness of the remedy. As such, it is recommended this section include a list of the general LUC objectives (e.g., prohibit residential use, prevent unauthorized access, prevent unauthorized intrusive activity) implemented at SRS. *Revise the Sixth Five-Year Review Remedy Report for Savannah River Site Operable Units with Native Soil Covers and/or Land Use Controls (U), SRNS-RP-2018-00811, Revision 0; dated December 2018 (Sixth Five-Year Review Remedy Report) to address this issue.*

   Response: Agree.

   The following text will be added to the end of the "Response Action Summary" section after the bullets:

   "Additionally, LUCs are part of all remedial actions where hazardous substances, pollutants, or contaminants remain on-site above levels that allow for unlimited use and unrestricted exposure. The type of LUCs and implementation and reference to the OU-specific land use control implementation plan (LUCIP) are described in detail in Section VII of the OU-specific appendices. LUCs are defined for individual OUs, but in general, LUC objectives at SRS are:

   - **Prevent exposure to, or ingestion of, contaminated media.**
   - **Prohibit residential use.**
   - **Prevent unauthorized access.**
   - **Prevent unauthorized intrusive activity."**

   The following sentence will be added to the end of the last paragraph in "Response Action Summary" section: "Table 3 provides a summary of the LUC objectives for the OUs with native soil covers and/or LUCs."

   Responsible Party: Sadika O'Quinn, (803) 952-6697, sadika.oquinn@srs.gov

2. The Sixth Five-Year Review Remedy Report Appendix B (Evaluation of Changes In Standards And Toxicity) states that an evaluation was performed for analytes that were identified as constituents of concern (COCs) for the SRS OUs discussed in Appendix C through Appendix M, to determine if there were any changes in standards or toxicity values that would call into question the protectiveness of the remedy for these OUs. However, Appendix B does not appear

to indicate whether all detected contaminants (chemical and radiological) were screened against the updated standards, toxicity values, or PRGs for radionuclides to determine whether additional COCs or Refined COCs (RCOCs) may be identified for each OU. Please provide a response, and as appropriate, revisions to Appendix B to specify if all detected constituents at each of the OUs were screened against updated screening values, such as Regional Screening Limits (RSLs) and radionuclide PRGs to determine if any other COCs or RCOCs should be identified for the soil cover or Land Use Control (LUC) OUs. Additionally, for the radionuclides under consideration, *please specify if secular equilibrium was used in identifying the appropriate screening PRG values or not and if not, if daughter radionuclides for each parent radionuclide were considered in the tabulation of the PRG.*

Response: Clarification.

The evaluation compared the analytes that were identified as COCs for the OUs discussed in Appendix C through Appendix M, consistent with Core Team agreements and the five-year remedy reviews that have been previously approved. The evaluation consisted of comparison of the most recent RSLs/PRGs (2018) to the values available in 2014 when the last five-year remedy review for SRS OUs with native soil covers and/or LUCs was initiated to identify any significant changes in toxicity values. No protectiveness issues with respect to changes in RSLs/PRGs were identified and the conclusions corroborate the previous report. Further for this group of OUs, the changes to the RSLs/PRG values are inconsequential since the exposure pathway is effectively broken with implementation of the native soil covers and/or LUCs remedy. The remedial actions in place are protective of human health and the environment and are functioning as intended. The following footnote will be added to Table B-2: "c - Analytes listed were identified as COCs for the OUs discussed in Appendix C through Appendix M of the document."

In Table B-2. Comparison of Radiological Standards in Soils Media, there are two entries for the 2018 PRGs. For each constituent, the top entry is the PRG for the individual radionuclide (i.e., no daughter products), and the bottom entry is the default secular equilibrium PRG that includes the subsequent daughter products from the entire decay chain. These values were compared to the 2014 PRGs.

Responsible Party: Doug Martinson, (803) 952-6043, douglas.martinson@srs.gov

3. Appendix D, Section VII. Technical Assessments states that a final list of COCs and remedial goals (RGs) have not been determined for the C-, K-, and L-Reactor Complexes, however changes to the Constituents of Concern (COCs) is not anticipated even though screening values listed in Appendix B have changed. Notably, changes have been made to the EPA's Radionuclide Preliminary Remediation Goal (PRG) calculator, but the Sixth Five-Year Review Remedy Report does not say if the newest PRG values will be used to identify COCs, and whether secular equilibrium daughter nuclides will be included in PRG calculations used to identify PRGs for the Reactor Complexes. *Please revise the Sixth Five-Year Review Remedy Report to address whether secular equilibrium (which includes all daughter nuclides but does*

not account for decay) will be selected for calculating radionuclide PRGs, and how COCs and RGs will be selected for radionuclides at the C-, K-, and L-Reactor Complexes.

Response: Clarification.

The C-, K-, and L- Reactor Complexes are still operating facilities, and as such, formal baseline risk assessments have not been performed. The information to support the early action remedial decision for the C-, K-, and L- Reactor Complexes was based on a range of expected conditions due to similar designs and operational histories with the P- and R-Reactor Complexes. The presumed COCs are deemed sufficient to support industrial land use with LUCs until a final ROD is issued for each of these facilities. It is premature to establish a commitment at this time as to how PRGs, COCs and RGs are to be calculated or selected in future CERCLA documentation.

The second paragraph in Section VII. Technical Assessment, "Are Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives still valid?" will be revised as follows:

"Since the CKL Rx have not begun characterization activities, a final list of constituents of concern (COCs) and RGs have not been determined. <u>The methods to calculate or select preliminary remediation goals, COCs and RGs will be determined prior to conducting the formal remedial investigation/baseline risk assessment and issuing the final ROD.</u> The USEPA standards and toxicity values have been updated since the last five-year remedy review as shown in Appendix B. ~~The changes to the values for COCs at CKL Rx were not significant, and the RAOs, continue to be met by the remedial action.~~ No new standards or to-be-considered guidance have been identified that call into question the protectiveness of the remedy. **<u>The RAOs at CKL Rx continue to be met by the remedial action.</u>"**

Responsible Party: Doug Martinson, (803) 952-6043, douglas.martinson@srs.gov

General Comments

1. There are discrepancies and inconsistencies throughout the document regarding native soil covers and whether or not they are applicable to each operable unit (OU). According to Table 2 in the Savannah River Site Summary section, not every OU discussed in this report has a native soil cover included as a remedy component. Gunsite 012 is one of these; however, in Appendix G for Gunsite 012, the first full paragraph on page G-9 mentions soil covers, as well as Section VI of Attachment G-1. Also, Table 2 indicates water as the "soil cover" for PAR Pond and LTR Tail Portion. In Appendix K for this OU, the last paragraph of page K-10 indicates ant mounds on soil covers. It should be noted that the sentence mentioning this along with down trees and overgrown vegetation near signs is not included in Section VI of Attachment K-1. Finally, Footnote b of Table 2 states that maintenance of native soil covers is a component of remedy implementation. However, several of the "Remedy Implementation" and/or "System Operations/Operation and Maintenance" sections for each OU do not list this component. The report should be revised to clearly and consistently state the applicability of native soil covers for each OU.

   Response: Agree with Clarification.

   As discussed in Appendix A, Section I, Phase 1: Native Soil Covers and/or LUCs subsection, native soil covers for the OUs discussed in the FYRR report were already in place prior to the selection of LUCs as the final remedial action. Therefore, LUCs are identified as the remedial action in Table 2. Any maintenance required for the native soils covers (i.e., repair erosion damage, filling depressions, etc.) is addressed during annual site inspections of the LUCs. The following changes are proposed to clarify the applicability of native soil covers for each OU.

   a) **A sentence will be added to the beginning of Section IV. Remedial Actions, Remedy Implementation subsection for the seven OUs identified with native soil covers to clarify that covers were already in place prior to implementation of the remedial action as follows:**

      Appendix E – ECODS L-1, N-2, P-2 and R-1A, -1B, -1C

      "<u>Following waste disposal activities, the trenches were backfilled with soil to create a native soil cover.</u> Implementation of the ECODS L-1, N-2, P-2, and R-1A, -1B, -1C OU remedial action…"

Appendix F – F-Area Burning/Rubble Pit

"Following waste disposal activities, the pits were covered with soil to create a native soil cover. The final remedial action for FBRP OU was institutional controls…"

Appendix H – Heavy Equipment Wash Basin and Central Shops Burning/Rubble Pit:

"Following waste disposal activities, CSBRP-5G was covered with soil to create a native soil cover. The selected remedy for the HEWB/CSBRP-5G OU is institutional controls (i.e., LUCS) which include…"

Appendix I – K-Area Bingham Pump Outage Pit (643-1G):

"Following waste disposal activities, the pit was covered with backfill to create a native soil cover. The implementation of the selected remedy included…"

Appendix J – L-Area Bingham Pump Outage Pits and P-Area Bingham Pump Outage Pit:

"Following waste disposal activities, the pits were covered with backfill to create native soil covers. The implementation of the selected remedy for LBPOP/PBPOP included…"

Appendix L – R-Area Bingham Pump Outage Pits and R-Area Unknown Pits #1. #2. #3:

"Following waste disposal activities, the pits were covered with backfill to create native soil covers. The implementation of the selected remedy included…"

Appendix M – Silverton Road Waste Unit

"Following waste disposal activities, the pit was covered with native soil and graded to create a native soil cover. Implementation of the SRWU remedial action included…"

b) Section VI. Five-Year Review, Summary of Inspections and Interviews, will be reviewed to ensure that "native soil covers" are specified for the seven OUs identified with native soil covers, as applicable. In addition, the Five-Year Review Site Inspection Checklists will be reviewed and revised to include "native soil covers" as applicable in Section VI, Subsection B. Other Site Conditions for

consistency with Section IV. Five-Year Review, Summary of Inspections and Interviews.

c) **Appendix K - PAR Pond (685-G) and LTR IOU Tail Portion: The words "on soil covers" will be deleted from the last paragraph in Section VI, Five-Year Review Process, Summary of Inspections and Interviews as follows:**

"Scheduled annual site inspections conducted from 2015 to 2018 identified the presence of downed trees, overgrown vegetation near signs, and ant mounds ~~on soil covers~~."

Additionally, the following text will be added to Section VI, Subsection B. Other Site Conditions of Attachment K-1: "Scheduled annual site inspections conducted from 2015 through 2018 identified the presence of downed trees, overgrown vegetation near signs, and ant mounds. These finding were documented on the field inspection checklist and resolved soon after discovery."

d) **Table 2 will be revised to replace water as the soil cover for PAR Pond and LTR Tail Portion with the "NA" designation.**

Responsible Party: Sadika O'Quinn, (803) 952-6697, sadika.oquinn@srs.gov

Specific Comments

Appendix C: C-Area Operable Unit

1. Disturbance of the ECODS C-1, Pages C-9 and C-10. A disturbance of the ECODS C-1 was discovered in January of 2016. This occurred when "…USFS disturbed the top foot of soil at the ECODS C-1 based on a misunderstanding of the previous site use permit conditions…" Actions were taken to correct the issue and "No activities inconsistent with the CAOU LUCs have occurred since the resolution of this discovery." The disturbance was discovered after the ROD was issued (September 2015) but before remedial actions were completed in August of 2016. Please clarify the following :
   a. Did the disturbance happen prior to the implementation of the LUCs?
   b. While the LUC boundary was modified, was the misunderstanding addressed in the site use permit conditions and/or the LUCs?

Response: Clarification.

Question A – The disturbance happened before the access control warning signs were installed.

Based on the response to Question A, Section VI. Five-Year Review Process, Disturbance of ECODS C-1 will be revised as follows:

"On January 21, 2016. SRS initially notified USEPA and SCDHEC of a soil disturbance discovered on January 12, 2016 at the ECODS C-1 including a statement that additional details would be provided in a follow-up notification no later than February 1, 2016 (SRNS 2016a). The soil disturbance occurred prior to the installation of the access control warning signs. As part of the follow-up notification of February 1, 2016…"

Question B – Yes, the misunderstanding was addressed in the site use permit conditions. In addition to prevent reoccurrence of the event, SRS implemented several programmatic corrective actions and opportunities for improvements to the Site Use program that are detailed in the *Savannah River Site (SRS) Site Use Permit Programmatic Improvements* (ERD-EN-2016-0040, September 2016) (ARF-020843). This information was electronically submitted to the regulators on September 14, 2016. SRS also conducted an "extent of condition" review on all waste units that have not yet entered into, or are in, the assessment phase (pre-ROD) to determine if there is identification in the field (e.g., signs) to alert workers of potentially harmful conditions. Eleven waste units were identified as requiring additional physical identification to help prevent disturbances. The additional signs were installed, and documentation of the installation was submitted to USEPA and SCDHEC on July 14, 2016 (IACD-16-154). No change to the document in response to Question B is proposed.

Responsible Party: Sadika O'Quinn, (803) 952-6697, sadika.oquinn@srs.gov

Appendix K: PAR Pond (685-G) (Including the Pre-Cooler Ponds and Canals) and Lower Three Runs Integrator Operable Unit Tail Portion (Middle and Lower Subunits)

1. During the regulatory walkdown on March 21, 2019, signs of recent human interaction with the Lower Three Runs tail portion were observed at the Patterson Mill Road, Boiling Springs Road, and Rocky Point Road bridge crossings in the forms of litter, fishing equipment, and trampled or cleared stream banks. At the Highway SC 125 bridge crossing, Soil Contamination Area (SCA) signs have been posted and the decrease in signs of human trespassing was considerable (though only 1 of 4 banks was observed). Although contamination levels at the other bridge crossings may not necessarily warrant the Radiological SCA signs, posting the signs at all bridge crossings may help to curtail trespassing and human interaction with the Lower Three Runs tail portion.

   Response: Clarification.

Further inspection of the bridge crossings was conducted recently to assess the degree of human interaction. Individuals do not appear to be accessing the creek locations through the intact SRS fencing and past the land use control signs, which are clearly in view on both sides of the road approaching the bridges from either direction, confirming that SRS land use controls are working as intended. Individuals appear to be accessing the creek locations from the bridges and parking/littering on the road right-of-way, neither of which are under SRS jurisdiction. The lack of interaction at the Highway SC 125 bridge crossing is not due to signage because radiological SCA signs are only posted at the SC 125 and Patterson Mill bridge locations where SRS workers enter the stream to gather samples. Rather, decreased human interaction at the SC 125 bridge crossing is likely because there is no easy pull-off parking/stopping available at the secondary road bridge crossings, the area is less accessible due to the steeper bank, and the traffic volume is higher at the SC 125 crossing. These conditions discourage loitering/fishing at the SC 125 bridge crossing. For these reasons, SRS does not believe posting additional signs will deter trespassing activities at the bridge crossings, but appreciates the observation and suggestion.

No changes to the document are proposed.

Responsible Party: Peter Avioli, (803) 952-6533, peter.avioli@srs.gov