Savannah River
NUCLEAR SOLUTIONS™
FLUOR • NEWPORT NEWS NUCLEAR • HONEYWELL

SRNS-J2000-2019-00307
RSM Track Number: 10666

MAY - 1 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:

SUBMITTAL OF SAVANNAH RIVER SITE INVESTIGATION-DERIVED WASTE MANAGEMENT PLAN, APPENDICES A, B, AND C (WSRC-RP-94-1227, REDLINE REVISION 9G, APRIL 2019) AND SAVANNAH RIVER SITE'S RESPONSES TO THE REGULATORY COMMENTS ON THE REDLINE REVISION 9F DOCUMENT

The Savannah River Site (SRS) submitted the SRS Investigation-Derived Waste Management Plan, Appendices A, B, and C (WSRC-RP-94-1227, Redline Revision 9F, December 2018) on January 15, 2019. The South Carolina Department of Health and Environmental Control and U.S. Environmental Protection Agency provided comments on February 13, 2019 and March 1, 2019, respectively. The SRS' responses to the regulatory comments have been incorporated into Appendix A - Aqueous IDW and Appendix B - Non-Aqueous IDW as stated in the responses. Appendix C - Summary of Changes is included to provide you with a summary of the revisions to Appendices A and B. SRS plans to develop a clean copy of the appendices and implement the updated HBLs upon regulatory approval.

Please review the enclosed appendices and provide your comments or approval within thirty (30) days of receipt. If you have any questions or comments regarding this submittal, please contact Ms. Shelia McFalls at (803) 952-6819, or via email at shelia.mcfalls@srs.gov.

Sincerely,

Amy J. Meyer, Manager
Environmental Compliance
Environmental Compliance & Area Completion Projects

slm:TAB

MAY - 1 2019

Enclosures:

1. Appendix A – Aqueous IDW, Appendix B – Non-Aqueous IDW, and Appendix C - Summary of Changes (WSRC-RP-94-1227, Redline Revision 9G, April 2019)
2. SRS Response to South Carolina Department of Heath and Environmental Control Comment on Submittal of Savannah River Site Investigation-Derived Waste Management Plan, Appendices A, B, and C (WSRC-RP-94-1227, Redline Revision 9F, December 2018)
3. SRS Response to U.S. Environmental Protection Agency Comment on Submittal of Savannah River Site Investigation-Derived Waste Management Plan, Appendices A, B, and C (WSRC-RP-94-1227, Redline Revision 9F, December 2018)

cc: D. Scaturo, SCDHEC-Columbia
G. K. Taylor, SCDHEC-Columbia
S. French, SCDHEC-Columbia
M. Reece, SCDHEC-Columbia
H. H. Cathcart, SCDHEC-Columbia*
G. O'Quinn, SCDHEC – Aiken Environmental Affairs Office*
B. Cameron, SCDHEC – Aiken Environmental Affairs Office
* w/enclosures

SRS Response to South Carolina Department of Health and Environmental Control Comment on:
Submittal of Savannah River Site Investigation-Derived Waste Management Plan,
Appendices A, B, and C (WSRC-RP-94-1227, Redline Revision 9F, December 2018)
Comments received February 13, 2019

General Comment

1. Appendix A – Health-Based Levels for Radioactive Aqueous IDW, page A12. This table includes radioactive isotopes with the appropriate MCL for alpha and beta/gamma emitters. Since uranium has an MCL of 30 ug/L, please consider removing uranium from this table and add a footnote for explanation. IDW is screened for gross alpha using 15 pCi/L (MCL) and should include uranium, which is an alpha emitter. If the MCL is exceeded, samples are then speciated for individual isotopes and must include U-234, U-235 and U-238.

Response: Agree. The MCL for uranium is 30 µg/L (total uranium). The calculations for the isotopes U-234, U-235 and U-238 are based on this 30 µg/L MCL for total uranium. There are two methods for performing this calculation: 1) assume that the 30 µg/L is comprised of the three isotopes collectively and their normal distribution under natural conditions (U-234 = 0.00548%, U-235 = 0.72% and U-238 = 99.2745%), or 2) assume that the 30 µg/L is comprised of the individual isotope only (i.e., 100% each isotope). The results vary significantly, depending on which method is used. The U-234 (1.9E+05 pCi/L), U-235 (6.5E+01 pCi/L) and U-238 (1.0E+01) values in the table were obtained from the USEPA website assuming 100% individual isotope (method 2).

Since the MCL of 30 µg/L is for total uranium, the isotopic specific values for U-234, U-235 and U-238 will be deleted and Note 3 will be revised to direct the user to the MCL of 30 µg/L for total uranium that is identified in the aqueous IDW table (i.e., Appendix A – Health Based Levels for Aqueous IDW) as well as the IDW Management Level. Note 3 will also be revised to acknowledge that if the gross alpha screening level (i.e., 15 pCi/L) is exceeded, then individual isotopes of uranium, thorium and radium should be determined.

Appendix A – Health-Based Levels for Radioactive Aqueous IDW

Radioactive Elements	CASRN	Element Isotope	Alpha emitters MCL [1] (pCi/L)	Beta/Gamma emitters MCL [2] (pCi/L)	HBL (pCi/L)	IDW MGT LEVEL (10 x HBL, except tritium) (pCi/L)
Uranium [3]	013966-29-5	U-234	~~1.9E+05~~see note 3	N/A	~~1.9E+05~~ see note 3	~~1.9E+06~~ see note 3
Uranium [3]	015117-96-1	U-235	~~6.5E+01~~ see note 3	N/A	~~6.5E+01~~ see note 3	~~6.5E+02~~ see note 3
Uranium [3]	007440-61-1	U-238	~~1.0E+01~~ see note 3	N/A	~~1.0E+01~~ see note 3	~~1.0E+02~~ see note 3

NOTES:

3) Thorium and Uranium (and daughters) are naturally-occurring radionuclides that also have process uses at SRS (targets or fuel for reactors) and are, therefore, included in this list. Uranium has an MCL of 30 µg/L as identified in Appendix A - Health Based Levels for Aqueous IDW table. If the alpha screening value of 15 pCi/L is exceeded, then a

total uranium analysis should be run to directly compare to the IDW Management Level identified in Appendix A - Health Based Levels for Aqueous IDW table. In addition, individual isotopes of uranium, thorium and radium should be determined. ~~radioactive limits (pCi/L) are based on natural isotopic distribution of uranium and assumes uranium's concentration is 30 ppb, which is the SCDHEC/EPA SWDA MCL. These values were established in the MCL table in the Preliminary Remediation Goals (PRG) for Radionuclides website (USEPA May 2018).~~

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

SRS Response to U.S. Environmental Protection Agency Comment on:
Submittal of Savannah River Site Investigation-Derived Waste Management Plan, Appendices A, B, and C (WSRC-RP-94-1227, Redline Revision 9F, December 2018)
Comments received March 1, 2019

The U.S. Environmental Protection Agency, Region 4 (EPA), has reviewed the IDW WMP. Below is our comment:

1. The Savannah River Site Investigation-Derived Waste Management Plan, Appendices A, B and C; WSRC-RP-94-1227, Redline Revision 9F, dated December 2018 (IDW Plan) Appendix B (Health-Based Levels for Radioactive Non-Aqueous IDW) on Page B23 of B24 includes site-specific background values for radionuclides that do not meet the EPA definition of 'background' constituents. For example, according to EPA document, *Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual (Part A).* EPA/540/1-89/002, background is defined as constituents or locations that are not influenced by the releases from a site, and are usually described as naturally occurring or anthropogenic. The Appendix B table of radioactive elements includes background concentrations for Americium-241 [Am-241], Curium-244 [Cm-244], Cesium-137 [Cs-137], Plutonium-238 [Pu-238], Plutonium-239 [Pu-239], Strontium-90 [Sr-90], Thorium-232 [Th-232], and Uranium-234 [U-234], Uranium-235 [U-235], and Uranium-238 [U-238]. However only the uranium isotopes and Th-232 are found to occur naturally in soil, while Cs-137 and Sr-90 may be considered present due to anthropogenic sources, i.e., fallout from nuclear weapons testing. Therefore it is unclear why Am-241, Cm-244 and the plutonium isotopes are listed as having background concentrations. *Please provide a clarifying explanation in the IDW Plan regarding how background is defined for inclusion in the Appendix B table.*

Response: Agree. Additional text that describes the approved *Background Soil Statistical Summary Report for the Savannah River Site* will be provided after the third paragraph in section "Regulatory Sources and Order of Priority for Health-Based Limits" (page B2). In addition, Appendix B-Health-Based Levels for Radioactive Non-Aqueous IDW (page B23) will be revised to delete the "SRS Background" for Am-241, Cm-244, Pu-238, and Pu239, direct the user to Note 4, and update the "IDW MGT Level" for said isotopes. Note 4 will be revised to clarify the definition of background for inclusion in the Appendix B table. Incorporation of the changes to the SRS IDW Management Plan are as follows:

Page B2:

"... range of observed background values measured.

The *Background Soils Statistical Summary Report for the Savannah River Site* (ERD-EN-2005-0223, Re

vision 1.0, October2006) is a comprehensive soils data set based on information compiled from SRS Site-wide inorganic and radionuclide data. In 2005, both the USEPA and South Carolina Department of Health and Environmental Control agreed that it would be beneficial to develop an SRS Site-wide background data report consisting of data from approved environmental restoration projects. The sample location, sample collection, and

laboratory analysis for the background data was previously approved under the Environmental Restoration Program. Consequently, there is a high level of confidence that the data are representative of SRS background soils and would be appropriate for initial screening of constituents of potential concern (COPCs), aid in the establishment of unit-related remedial goal options (RGOs), and in eliminating or reducing the need to collect waste unit-specific background data. The study presents summary statistics for the 0- to 1-ft and 0- to all-depth intervals of the vadose zone. Protocols have been developed to perform COPC screening and identify RGOs utilizing the approved soil background datasets as appropriate.

Unit-specific soil background levels…"

Page B23:

Appendix B – Health-Based Levels for Radioactive Non-Aqueous IDW

Radioactive Elements (6)	CASRN	Isotope	PRG 1.0E-06 (pCi/g) (7)	PQL (pCi/g) (3)	SRS Background (pCi/g) (4)	IDW MGT LEVEL (pCi/g)
Americium	14596-10-2	Am-241	5.19E-02	6.00E-02	~~1.6E-01~~ See Note 4	~~1.6E-01~~ 6.00E-02
Curium	13981-15-2	Cm-244	9.79E-03	6.00E-02	~~2.3E-01~~ See Note 4	~~2.3E-01~~ 6.00E-02
Plutonium	13981-16-3	Pu-238	1.26E-02	8.00E-02	~~2.40E-01~~ See Note 4	~~2.40E-01~~ 8.00E-02
Plutonium	15117-48-3	Pu-239	4.53E-02	3.00E-02	~~1.30E-01~~ See Note 4	~~1.30E-01~~ 4.53E-02

NOTES:

4) **Updated applicable elements with values at the 95th percentile of the SRS background soils summary report (ERD-EN-2005-0223, Rev. 1.0, October 2006), Appendix B-2, entitled "Upland Soils (All Depth Intervals)". SRS background values apply to natural and anthropogenic sources; therefore, Americium, Curium, and Plutonium isotopes (Am-241, Cm-244, Pu-238, and Pu-239) are excluded.**

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