



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

JUL 19 2018

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: Fifth Five-Year Remedy Review Report for Savannah River Site Operable Units with Operating Equipment (U) Aiken, South Carolina (SRNS-RP-2017-00567, Redline Revision 1, July 2018) (Redline Pages), Savannah River Site Fifth Five-Year Remedy Review Report for Savannah River Site Operable Units with Operating Equipment Fact Sheet (ERD-EN-2017-0076, July 2018) (Redline Pages), and Savannah River Site's Responses to the Regulatory Comments on the Revision 0 Document

In accordance with the terms of the Federal Facility Agreement (FFA), the U.S. Department of Energy (DOE) is submitting the subject information for your review. The Revision 0 Remedy Review Report and supporting documentation was submitted to the South Carolina Department of Health and Environmental Control (SCDHEC) and U.S. Environmental Protection Agency (EPA) on December 20, 2017. Comments from SCDHEC and EPA were received on March 19, 2018 and April 23, 2018, respectively. The Revision 1 redline pages incorporate the Savannah River Site's responses to the regulatory comments on the Revision 0 document. The Fact Sheet was also revised to incorporate applicable responses.

During the revision period, the Fifth Five-Year Remedy Review Report for the Engineered Cover Systems (SRNS-RP-2016-00609, Revision 1.1, November 2017), Fifth Five-Year Remedy Review Report for the Stabilization/Solidification Cover Systems (SRNS-RP-2016-00610, Revision 1.1, December 2017), and the Record of Decision Remedial Alternative Selection for the Wetland Area at Dunbarton Bay in Support of Steel Creek Integrator Operable Unit (SRNS-RP-2013-00730, Revision 1, April 2018) were issued to the public. Therefore, Table A-3, *Chronological Listing of SRS Issued Decision Documents*, was updated to reflect these document issuance dates. In addition, due to regulatory approval to discontinue monitoring and reporting at the L-Area Burning/Rubble Pit (131-L) Operable Unit, the unit was removed from Table

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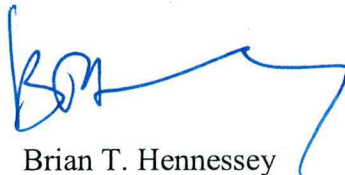
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A-5, *List of OU Subunits with Remedial Actions* and added to Table A-4, *Summary of No Remedial Actions at SRS OUs*.

Please review the enclosures and provide your response within forty-five (45) days of receipt. The effort and time that the SCDHEC and EPA 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-18-165

Enclosures:

1. Fifth Five-Year Remedy Review Report for Savannah River Site Operable Units with Operating Equipment (U) Aiken, South Carolina (SRNS-RP-2017-00567, Redline Revision 1, July 2018) (Redline Pages)
2. Savannah River Site Fifth Five-Year Remedy Review Report for Savannah River Site Operable Units with Operating Equipment Fact Sheet (ERD-EN-2017-0076, July 2018) (Redline Pages)
3. Savannah River Site's Responses to South Carolina Department of Health and Environmental Control's Comments on Fifth Five-Year Remedy Review Report for Savannah River Site Operable Units with Operating Equipment (U) Aiken, South Carolina (SRNS-RP-2017-00567, Revision 0, December 2017)
4. Savannah River Site's Responses to U.S. Environmental Protection Agency's Comments on Fifth Five-Year Remedy Review Report for Savannah River Site Operable Units with Operating Equipment (U) Aiken, South Carolina (SRNS-RP-2017-00567, Revision 0, December 2017)

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cc w/o encl:

G. K. Taylor, SCDHEC – Columbia

D. Scaturro, SCDHEC-Columbia

S. French, SCDHEC-Columbia

M. D. Wilson, SCDHEC-Columbia

G. N. O'Quinn, 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 Received 03/19/2018

General Comments

1. The RCOC tables in each OU-specific appendix (Tables C-2, D-2, etc.) should be consistent throughout the document in specifying which type of RCOC each constituent is (HH, CM, ecological, etc.) and if it is a HH RCOC, which receptor scenario (residential, industrial/future worker). Specifically, Table E-2 should include a column clearly listing the RCOC type for each constituent, and Table L-2 should designate the type of HH RCOC (residential/industrial/future worker) for the RCOCs listed in the “Soil-PAHs” portion of the table. Additionally, Appendix K does not include a RCOC table for MIPS (CM RCOCs TCE and PCE). Please revise/include these tables to be more consistent with the others throughout the document.

Response: Agree.

The approach for development of the Savannah River Site (SRS) Five-Year Remedy Review Reports has been to extract the refined constituents of concern (RCOC) tables directly from the Records of Decision (or appropriate decision document) if available. As the SRS cleanup program matured and more regulatory guidance became available, the level of detail for the presentation of RCOCs improved when compared to older documents generated early in the program. For this reason, the RCOCs in the operable unit (OU)-specific appendices vary in format and detail. For future Five-Year Remedy Review Reports, SRS will present the RCOCs in the OU-specific appendices using a more consistent format to ensure that the receptor scenario and type of RCOC (i.e., human health, ecological, contaminant migration, principal threat source material [PTSM], applicable or relevant and appropriate requirement [ARAR]) are identified.

For the *Fifth Five-Year Remedy Review Report for SRS OUs with Operating Equipment*, SRS will revise Table E-2, Table L-2, and add a table to Appendix K as suggested in the comment. The revised tables are shown below.

on:

Fifth Five-Year Remedy Review Report for Savannah River Site Operable Units with Operating Equipment (U) – Aiken, South Carolina (SRNS-RP-2017-00567, Revision 0, December 2017) received December 27, 2017.

Comments Received 03/19/2018

Table E-2 was revised to add columns for the type of COC (ARAR, HH, or CM).

Table E-2. Remedial Goals for OU Soil under Industrial Land Use

Subunit	Refined COCs	Type of COC			RG (mg/kg)	Basis
		ARAR	HH	CM		
Piles Area	Arsenic		X		4.4	2X average background
	Lead		X		400	USEPA TBC criteria
	PCB-1254	X			1	TSCA action level
	Benzo[a]pyrene		X		0.052	1E-06 risk level*
Ash Area	Arsenic		X		4.4	2X average background
Trenches Area	Arsenic		X		4.4	2X average background
	Benzo[a]anthracene		X		2.56	1E-06 risk level
	Benzo[a]pyrene		X		0.256	1E-06 risk level
	Benzo[b]fluoranthene		X		2.56	1E-06 risk level
	Dibenzo[a,h]anthracene		X		0.256	1E-06 risk level
	TCE			X	0.0877	CM soil clean up level
	PCE			X	0.656	CM soil clean up level

ARAR – Applicable or Relevant and Appropriate Requirements

CM – contaminant migration

COC - constituent of concern

HH – human health

RG – remedial goal

TBC – to be considered

TSCA - Toxic Substances Control Act, 1976

*The 1E-06 risk level is based on a resident, consistent with unrestricted use in the Piles Area

Table L-2 was revised to consolidate the ARAR, CM, and HH RGO columns into a new “Basis” column, and add columns for the type of COC (ARAR, HH, or CM). The appropriate human health receptor (current worker, future industrial worker, resident) was added to the Type of RCOC – HH column. New footnotes were added as appropriate. Please note that the removed columns in Table L-2 are not shown as strikethrough text to assist with readability of the revised table.

on:

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Table L-2. PBRP RCOCs by Medium and Subunit with Final Remedial Goals

Medium (Units)	RCOC	Type of RCOC			RG	Basis
		ARAR	CM	HH		
Soil - PAHs (mg/kg)	Benzo[a]anthracene			X _{Res, IW}	2.56	<u>1E-06 risk level</u>
	Benzo[a]pyrene			X _{Res, IW, CW}	0.256	<u>1E-06 risk level</u>
	Benzo[b]fluoranthene			X _{Res, IW}	2.56	<u>1E-06 risk level</u>
	Benzo[k]fluoranthene			X _{Res, IW}	25.6	<u>1E-06 risk level</u>
	Chrysene			X _{Res}	256	<u>1E-06 risk level</u>
	Dibenzo[a,h]anthracene			X _{Res, IW}	0.256	<u>1E-06 risk level</u>
	Fluoranthene			X _{Res}	2670	<u>1E-06 risk level</u>
	Indeno[1,2,3-c,d] pyrene			X _{Res, IW}	2.56	<u>1E-06 risk level</u>
	Phenanthrene			X _{Res}	3270	<u>1E-06 risk level</u>
	Pyrene			X _{Res}	2000	<u>1E-06 risk level</u>
Soil – CM COC (mg/kg)	Antimony		X		4.588	<u>95th percentile background</u>
	Chromium		X		35.22	<u>95th percentile background</u>
	Copper		X		40.8	<u>CM soil clean up level</u>
	Nickel		X		11.432	<u>95th percentile background</u>
	Zinc		X		1110	<u>CM soil clean up level</u>
	Tetrachloroethylene (PCE)		X		0.00338	<u>CM soil clean up level</u>
	Trichloroethylene (TCE)		X		0.00153	<u>CM soil clean up level</u>
	Aroclor 1242		X		0.00843	<u>CM soil clean up level</u>
	Dibenzofuran		X		0.195	<u>CM soil clean up level</u>
Groundwater (µg/L)	1,1-Dichloroethylene	X		X _{Res, IW}	7.0	<u>MCL</u>
	Trichloroethylene	X		X _{Res}	5.0	<u>MCL</u>

ARAR – applicable or relevant and appropriate requirement

CM – contaminant migration

CW – current worker

HH – human health

IW – industrial worker

MCL – maximum contaminant level

Res - Resident

RG – remedial goal option

Bkgd – Background

NA – not applicable

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A new table that displays the RCOCs and RGs for the MIPS L OU will be added to Appendix K. Text will be added to the end of the last paragraph in Section III Background under Basis for Action as follows:

“...For TCE, the CM remedial goal (RG) is 0.0408 mg/kg and the CM RG for PCE is 0.307 mg/kg. Exceedances of these values in soils indicate that TCE and PCE may leach to groundwater at levels above the MCL (5 µg/L). Final RGs for the MIPS L OU are shown in Table K-2.”

Table K-2. MIPS L RCOCs with Final Remedial Goals

<u>Medium</u>	<u>RCOC</u>	<u>Type of COC</u>	<u>RG (mg/kg)</u>	<u>Basis</u>
<u>Soil</u>	<u>Tetrachloroethylene (PCE)</u>	<u>CM</u>	<u>3.07E-01</u>	<u>CM soil clean up level</u>
	<u>Trichlorethylene (TCE)</u>	<u>CM</u>	<u>4.08E-02</u>	<u>CM soil clean up level</u>

RCOC – refined COC

Table K-2 that currently depicts the actual versus estimated O&M costs will be relabeled Table K-3 in the Revision 1 document. Text references to Table K-2 and Table K-3 will be revised in Appendix K as appropriate.

Responsible Party: Sadika O’Quinn, 803-952-6697, sadika.o’quinn@srs.gov

Specific Comments

1. Section II, Site Chronology, page 4. This section is more of a regulatory chain of events than a true site chronology (as the section heading suggests). An introductory sentence explaining that would be helpful.

Response: Agree.

The first two sentences in Section II, Site Chronology will be revised as follows:

“A summary of the regulatory history of the SRS is provided below beginning with tThe 1988 National Resources Defense Council (NRDC) Consent Decree (Civil Action No. 1:85-2583-6). The Consent Decree was an agreement between the NRDC...”

Responsible Party: Sadika O’Quinn, 803-952-6697, sadika.o’quinn@srs.gov

2. Section III, Background, page 5. Please include an introductory sentence that clearly explains that SRS was constructed in the early 1950s to produce the basic materials used in the fabrication of nuclear weapons in support of the nation’s defense programs.

Response: Agree.

The first sentence in Section III, Background, will be revised as follows:

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“The primary mission of SRS was constructed during the 1950s to produce the basic materials used in the fabrication of nuclear weapons, primarily tritium and plutonium, in support of has been to produce to tritium, plutonium, and other special nuclear materials for our nation’s defense programs.”

Responsible Party: Sadika O’Quinn, 803-952-6697, sadika.o’quinn@srs.gov

3. Section III, Land and Resource Use, page 6. The second paragraph of this subsection reads “residential uses of SRS land *should be* prohibited” (emphasis added) but doesn’t clearly state that it *will be* prohibited. Please clarify if this can be added without compromising the integrity of the document.

Response: Clarification

The specific language “residential uses of SRS should be prohibited” is extracted directly from the 1996 Future Use Report and is the template language agreed to for use in SRS ROD documents. To clarify that land use controls as part of a remedial action will prevent residential use, the following sentence will be added to the end of the second paragraph:

“LUCs selected as part of a remedial action will prohibit residential use of the area.”

Responsible Party: Dena Brett, 803-952-6031, dena.brett@srs.gov

4. Section III, Land and Resource Use, page 6. The third paragraph of this subsection discusses the sources of the water supply at SRS (“Virtually all site process and drinking water is pumped from the deeper Crouch Branch and McQueen Branch aquifers.”). Please reword or include where other site process and drinking water is pumped from.

Response: Agree.

The text in Section III, Land and Resource Use will be revised as follows:

“SRS obtains its own drinking and process water supply from groundwater located beneath the SRS. SRS domestic and process water systems are supplied from a network of approximately 40 wells in widely scattered locations across the site, of which eight wells supply the primary drinking water system. Virtually all Wells serving site process and drinking water in the larger site areas are typically 180 to 270 m (600 to 900 ft) in depth and pump water is pumped from the deeper Crouch Branch and McQueen Branch aquifers. Wells serving the smaller site facilities, such as barricades, pumphouses, and field laboratories, are shallower in depth (30 to 90 m [100 to 300 ft]) and are similar to large household type wells. The SRS domestic water systems meet state and federal drinking water standards. ~~There is no current or projected future use of surface water or shallow aquifer groundwater as a drinking water source at the SRS.~~”

Responsible Party: Sadika O’Quinn, 803-952-6697, sadika.o’quinn@srs.gov

5. Section III, Land and Resource Use, page 6. The last sentence of the third paragraph of this subsection states that surface water and shallow aquifer groundwater will not be used as a
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drinking water source at the SRS. Please clarify if these sources (surface water and/or shallow groundwater) could be used for other purposes, i.e. process water.

Response: Clarification.

Surface water and/or shallow groundwater is not used for drinking water or process water at SRS. For clarification, the last sentence of the third paragraph in Section III, Land and Resource Use, will be removed. Please see the revised text in the response to Specific Comment #4.

Responsible Party: Sadika O’Quinn, 803-952-6697, sadika.o’quinn@srs.gov

6. Section III, History of Contamination, page 6. Please expand this section and discuss in slightly more detail “past disposal practices.”

Response: Agree.

The last sentence in Section III, History of Contamination, will be revised as follows:

“Hazardous substances, as defined by the CERCLA, are currently present in the environment at SRS, with past disposal practices (e.g., seepage basins, pits and piles, landfills, etc.) resulting in soil and groundwater contamination.”

The last sentence in the first paragraph in Section III, Background, will also be revised to include the more detailed information regarding “past disposal practices”.

Responsible Party: Sadika O’Quinn, 803-952-6697, sadika.o’quinn@srs.gov

7. Section IV, Remedial Actions, page 8. Please clarify if surface water should be included in the first two bullets of the list of remedial action objectives (RAOs).

Response: Agree.

The first two bullets of the list of RAOs will be revised to include surface water as follows:

- **Prevent exposure of trespassers, industrial workers, and/or hypothetical residents to soils, surface water, or groundwater containing unacceptable levels of contaminants.**
- **Prevent exposure of ecological receptors to soils, surface water, or groundwater containing unacceptable levels of contaminants.**

Responsible Party: Sadika O’Quinn, 803-952-6697, sadika.o’quinn@srs.gov

Appendix C – A-AREA BURNING/RUBBLE PITS (731-A, -1A) AND RUBBLE PIT (731-2A) MISCELLANEOUS CHEMICAL BASIN/METALS BURNING PIT (731-4A/731-5A) OPERABLE UNIT

1. Table C-2, Summary of Remedial Action Objectives and Remedial Goals for Soil, page C-36. K-40 is listed as a RCOC, but there is no “X” for any of the COC categories.

Response: Agree.

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Potassium-40 is identified as a HH RCOC in the A-Area Ash Pile Subunit. Table C-2 will be revised to include an “X” in the HH column for potassium-40.

Responsible Party: Justin Steadman, 803-952-7346, justin.steadman@srs.gov

Appendix B - EVALUATION OF CHANGES IN STANDARDS AND TOXICITY.

1. Page B-2. The discussion concerning the change to the “plus daughters” (+D) isotopes in the second paragraph on page B-2 [“Noteworthy changes in the RSLs and PRGs are a result of implementing revised exposure parameters from the 2011 Exposure Factors Handbook in 2014. In 2016, the “plus daughters” (+D) isotopes were removed from the radionuclide selection list and the secular equilibrium PRG calculation was identified as the preferred (i.e., default) value.”] should be expanded to make the change more easily understood. Footnote “d” to Table B-2. Comparison of Radiological Standards in Soil Media begins to explain the change a bit more clearly.

Response: Agree.

The discussion in Appendix B regarding the “plus daughters (+D)” isotopes will be revised as follows:

“Noteworthy changes in the RSLs and PRGs are a result of implementing revised exposure parameters from the 2011 Exposure Factors Handbook in 2014. In 2016, the “plus daughters” (+D) isotopes were removed from the radionuclide selection list and the secular equilibrium PRG calculation was identified as the preferred (i.e., default) value. a major revision to the approach for calculating PRGs was announced by USEPA. The primary change was that the plus daughters (+D) isotopes designation was removed from the radionuclide selection list and the secular equilibrium PRG calculation was identified as the preferred (i.e., default) value.

Before this revision, the +D designation indicated that the slope factor used in the PRG calculation included the contribution from ingrowth of daughter isotopes. Prior to 2014, the +D designation included daughter products with half-lives of six months or less; in 2014, the +D designation was expanded to include daughter products with half-lives out to 100 years. The intention of the +D designation was to ensure realistic PRGs by including contributions from their short-lived decay products, assuming equal activity concentrations (i.e., secular equilibrium) with the principal or parent nuclide in the environment.

The current PRG calculation considers all the daughters in the decay chain (regardless of half-life). The PRGs for each daughter are combined with the parent on a fractional basis to produce a single PRG for the parent. The resulting PRG is based on secular equilibrium of the full chain.

Table B-2 is a Comparison of Radiological Standards in Soil Media. In 2012, the PRGs for cesium-137, radium-226, radium-228, thorium-228, uranium-235 and uranium-238 had the +D designation and included daughter products with half-lives less than six

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months (see footnote d). Daughter products were not considered in the PRG calculation for the other analytes in the table.

There are two entries for the 2017 PRGs in Table B-2. For each constituent, the top entry is the PRG for the individual radionuclide (i.e., no daughter products). The bottom entry (in parentheses) is the default PRG that includes the subsequent daughter products from the entire decay chain.”

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

Appendix D – A/M-AREA GROUNDWATER OPERABLE UNIT

1. Section IV, Remedial Actions, Remedy Implementation – A/M Area Groundwater OU, page D-10. Please clarify whether the air strippers are actively operating or if pumped groundwater is simply circulating through. As written, it isn't clear. (“Both the M-1 and A-2 Air Strippers currently comply with their air emissions permit without treatment.”)

Response: Agree.

The M-1 Air Stripper is currently operating. Groundwater from the recovery wells is treated at the M-1 Air Stripper. The effectiveness of the M-1 Air Stripper is monitored using samples from the stripper influent and effluent. Effluent from the M-1 Air Stripper is discharged to an unnamed tributary of Tims Branch, Tims Branch, and then to Upper Three Runs. The discharged water is sampled at National Pollutant Discharge Elimination System permitted outfalls to comply with the Clean Water Act.

The A-2 Air Stripper was shut down in 2012 and is temporarily operated quarterly to perform preventative maintenance. A series of monitoring wells are currently used to monitor the potential migration of VOCs from the shallow aquifers to deeper aquifers.

To clarify the operational status of the M-1 and A-2 Air Strippers, the first paragraph and four bullets in Section IV, Remedy Implementation, A/M Groundwater OU, will be replaced with the following text:

“The remedial action for the A/M Area Groundwater OU was implemented through the following activities:

- ~~• Removing the dissolved plume contaminants using a recovery well system connected to an air stripper, designated the M-1 Air Stripper (Figures D-2 and D-4). This system was designed to hydraulically contain and capture the high concentration VOC plume. The original recovery well network (eleven wells) began operations in September 1985. Two additional recovery wells were installed near the Met Lab and began supplying groundwater to the M-1 Air Stripper in July 2000. The recovery wells are screened predominantly in the Lost Lake Aquifer Unit, with a few of the wells also having screens in the M-Area Aquifer Zone and the Middle Sand Aquifer Zone of the Crouch Branch Confining Unit.~~
 - ~~• Conducting an evaluation of off-gas treatment options for the air strippers.~~
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- ~~Monitoring of air stripper off-gas and treated water discharge, recovery well flow rates and concentrations, and groundwater concentrations in nearby monitoring wells to evaluate the effectiveness of the system.~~
- ~~In addition, multiple remediation strategies and technologies have been implemented in response to discussion provided in the A/M Area Groundwater IROD, along with the collection of further characterization data.~~

initiated with the installation and operation of the M-1 Air Stripper and eleven recovery wells in September 1985. Two additional wells were installed near the Met Lab and began supplying groundwater to the M-1 Air Stripper in July 2000. This system was designed to hydraulically contain and capture the high concentration VOC plume predominantly in the Lost Lake Aquifer Zone, with a few of the wells also having screens in the M-Area Aquifer Zone and the Middle Sand Aquifer Zone of the Crouch Branch Confining Unit. Monitoring of air stripper influent and effluent water, recovery well flow rates and concentrations, and groundwater concentrations in nearby monitoring wells is conducted to evaluate the effectiveness of the system. The treated effluent from the air stripper is sampled at NPDES permitted outfalls to comply with the Clean Water Act. The exhaust from the M-1 Air Stripper currently complies with the air emissions permit without additional treatment.

The A-2 Air Stripper and recovery well system was installed to capture the northern portion of the VOC groundwater plume, which is associated with historical solvent use and disposal in laboratory facilities. The A-2 Air Stripper and six recovery wells were installed to restrict migration of VOC contamination within the Lost Lake Aquifer Zone, thereby preventing future downward migration into the deeper aquifer system. The A-2 Air Stripper began operations in 1996. The six recovery wells are screened in the Lost Lake Aquifer Zone and the Middle Sand Aquifer Zone of the Crouch Branch Confining Unit. Due to diminished mass removal rates at the six recovery wells, the A-2 Air Stripper was shut down in October 2012 after SCDHEC approved a temporary authorization (TA) (SCDHEC 2012). The A-2 Air Stripper remains shutdown as a series of monitoring wells are used to observe the potential effects on VOC contaminant migration from the Lost Lake Aquifer to the underlying Crouch Branch Aquifer Unit. The A-2 Air Stripper is temporarily operated quarterly to perform preventative maintenance and to sample the recovery wells that are a part of the shutdown monitoring well network. Monitoring of air stripper influent and effluent water and groundwater concentrations in nearby monitoring wells is conducted to evaluate the effectiveness of the system. The treated effluent from the air stripper is sampled at NPDES permitted outfalls to comply with the Clean Water Act. The exhaust from the A-2 Air Stripper currently complies with the air emissions permit without additional treatment.”

Responsible Party: Branden Kramer, 803-952-6378, brandenkramer@srs.gov

2. Section IV, Remedial Actions, Remedy Implementation – *A/M Area Groundwater OU*, page D-10. The end of the first paragraph states that the strippers “comply with their air emissions
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on:

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permit without treatment.” For clarity, please revise the sentence to show that it is without additional treatment or treatment for the exhaust/vent.

Response: Agree with Clarification.

As noted in the response to Appendix D Comment #1, Section IV, Remedial Actions, Remedy Implementation, *A/M Area Groundwater OU* has been revised and restructured. The referenced sentence has been deleted. For the M-1 Air Stripper, the following sentence has been added to the text: **“The exhaust from the M-1 Air Stripper currently complies with the air emissions permit without additional treatment.”** For the A-2 Air Stripper, the following sentence has been added to the text: **“The exhaust from the A-2 Air Stripper currently complies with the air emissions permit without additional treatment.”**

Responsible Party: Branden Kramer, 803-952-6378, branden.kramer@srs.gov

3. Section IV, Remedial Actions, Remedy Implementation – *A/M Area Groundwater OU*, page D-10. Please discuss how the process water from wells PW 20A and PW 53A are “operated to provide mass removal and plume control” (page D-10). Include how the water is treated and/or used and if discharged after use, where it is discharged.

Response: Agree.

A paragraph will be added to the end of Section IV, Remedial Actions, Remedy Implementation, *A/M-Area Groundwater OU* as follows: **“Two process water production wells (PW 20A and PW 53A), which are screened in the deeper Crouch Branch Aquifer Unit, are operated to provide water for the Savannah River National Laboratory (SRNL) key essential services such as chilled water, steam, cooling water, and for SRNL’s Nuclear Safety Class fire water system. These wells are operated at a minimum of 50% capacity to capture a portion of the groundwater plume within the Crouch Branch Aquifer Unit downgradient of the SRNL complex. Groundwater from these production wells is not treated. On January 5, 2016, the SRS requested a “contained-in determination” for the groundwater contaminated with RCRA-listed wastes (F001/F002) that is used as process water throughout the A/M Area (SRNS 2016). On December 7, 2016, the SCDHEC approved a “contained-in determination” for production wells, PW 20A and PW 53A, establishing limits of 161 µg/L for TCE and 27 µg/L for PCE (SCDHEC 2016b). To determine compliance with these limits, samples are collected from the two production wells a minimum of once per quarter. In addition, TCE and PCE is also analyzed at NPDES permitted outfalls to verify no impacts to surface water.”**

Responsible Party: Branden Kramer, 803-952-6378, branden.kramer@srs.gov

4. Section IV, Remedial Actions, Remedy Implementation – *A/M Area Groundwater OU*, page D-10. The last paragraph refers to twelve recirculation wells of which only four are operating. Please correct the second sentence to reflect this. For example, “The plume,...is being treated by a series of ~~twelve~~ in situ air stripping wells... Due to high contaminant concentrations... aerators were installed in **four of the twelve** wells, SSR009...”

Response: Agree.

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The sentence was revised as follows: “The plume, which covers an area of approximately 325 hectares (800 acres), is was being treated by a series of twelve in situ air stripping wells (airlift recirculation wells [ARW]) that were brought online in 1996. Due to high contaminant concentrations in the plume on the north end of the ARW line, multi-stage in-well aerators were installed in four of the twelve wells (i.e., SSR009 through SSR012) to enhance removal efficiency from 70% to 90% in 2001.”

Responsible Party: Branden Kramer, 803-952-6378, branden.kramer@srs.gov

5. Section IV, Remedial Actions, Remedy Implementation – *MCB/MBP Subunit*, page D-11. The first bullet makes reference to a predicted 90% reduction in contaminant concentration by the airlift recirculation wells (ARWs). In the second bullet, it simply states that they were shutdown. Clarification as to why the ARWs were shutdowns needs to be included.

Response: Agree.

The ARWs at MCB/MBP did not operate as predicted. Text will be added to the beginning of Section IX, Remedy Implementation, *MCB/MBP Subunit*, 2nd bullet as follows: “Between 2002 and 2011, the eleven ARWs only removed a total of 46 lbs of VOCs from the Lost Lake Aquifer. MIS-001 through MIS-005 were installed to target the >500 µg/L TCE plume, a concentration that has not been observed since after start-up in 2002. The removal rates in the Lost Lake Aquifer had declined over time, which was an indication that active remediation of the vadose zone had cut off the majority of contaminant migration to the groundwater at the MCB/MBP OU.”

Responsible Party: Branden Kramer, 803-952-6378, branden.kramer@srs.gov

6. Section IV, Remedial Actions, Remedy Implementation – *MCB/MBP Subunit*, page D-11. Please describe the criteria used to shut down the eleven airlift recirculation wells (ARWs).

Response: Agree.

Please refer to the response to Appendix D Comment #5.

Responsible Party: Branden Kramer, 803-952-6378, branden.kramer@srs.gov

7. Section IV, Remedial Actions, Remedy Implementation – *ABRP Subunit*, page D-13. Please clarify when the 1,4-dioxane plume was identified, and if it was after the last five-year review.

Response: Agree.

Section IV, Remedy Implementation, *ABRP Subunit*, 2nd paragraph after the bullets was revised as follows: “A 1,4-dioxane contaminant plume was identified below the M-Area Settling Basin and ABRP Subunit has been detected at the ABRP Subunit since 2008. In 2011, the groundwater protection standard changed from 150 µg/L to 6.1 µg/L. In 2012, SRS initiated a comprehensive sampling plan to analyze for 1,4-dioxane at all monitoring wells as defined in the 2000 RCRA Permit Renewal Application for M-Area and Met Lab HWMFs Postclosure (WSRC-IM-98-30, Volume III). Based on the comprehensive

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sampling, a contaminant plume was identified below the M-Area Settling Basin and the ABRP Subunit. The plume extends...

Responsible Party: Branden Kramer, 803-952-6378, branden.kramer@srs.gov

8. Section IV, Remedial Actions, Remedy Implementation – *ABRP Subunit*, page D-13. Please clarify when the 1,4-dioxane plume was identified, and if it was after the last five-year review.

Response: Agree.

Please refer to the response to Appendix D Comment #7.

Responsible Party: Branden Kramer, 803-952-6378, branden.kramer@srs.gov

9. Section VII, Technical Assessment, page D-21. Are the LUC requirements discussed at the top of page D-21 relevant only to the ABRP Subunit? If they are, please revise this paragraph to make that clear.

Response: Clarification.

As discussed in Appendix D, a LUCIP is in place for the ABRP/MCB/MBP OU surface units. For the A/M Groundwater OU, land use restrictions are administered through the RCRA Permit Renewal for the SRS. For clarity, the last paragraph is Section VII, Technical Assessment will be revised as follows:

“A Land Use Control Implementation Plan (LUCIP) is in place for the ABRP/MCB/MBP OU surface units. The LUC requirements for the A/M-Area Groundwater OU are discussed and approved as part of the closure/post-closure/permit application process and are governed by the RCRA Permit Renewal for the SRS (SCDHEC 2017). Therefore, an ~~an Land Use Control Implementation Plan~~ OU-specific LUCIP is not required for this ~~the A/M Area Groundwater~~ OU. As discussed in the RCRA Permit Renewal, The institutional controls (i.e., LUCs) ~~that~~ are in place to prevent exposure to or ingestion of contaminated groundwater....”

Responsible Party: Branden Kramer, 803-952-6378, branden.kramer@srs.gov

10. Figures D-4 through D-9 (Historic Photographs). Please include the date (at least the year) that the photographs were taken.

Response: Agree.

Text indicating that Figure D-4 and D-5 were taken in 2017 have been added to the figure titles. Figures D-4 and D-5 are the only photos included in Appendix D.

Responsible Party: Branden Kramer, 803-952-6378, branden.kramer@srs.gov

11. Attachment D-1, Five-Year Review Site Inspection Checklist – A/M Area Groundwater, page D-38. Section V.B. for “Signs” at the bottom of this page shows an “X” for the N/A Box, yet the “Remark” portion states “Signs are in good condition.” Please correct this discrepancy.

Response: Agree.

on:

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received December 27, 2017.

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There are no OU-specific warning signs required for the A/M Area Groundwater OU. Section V.B.1 of Attachment D-1 will be revised to remove the statement, “Signs are in good condition”.

For clarity, references to warning signs in the text and Site Inspection Checklist will be removed from Appendix D. Specifically, reference to warning signs in Section VII. Technical Assessment, Section X. Protectiveness Statements(s), Attachment D-1 Section V.B.1, and Attachment D-1, Section XI, B. will be corrected. Similar corrections will be made for the F-Area Groundwater OU (Appendix H) and the H-Area Groundwater OU (Appendix I).

Responsible Party: Branden Kramer, 803-952-6378, branden.kramer@srs.gov

Appendix E – A-AREA MISCELLANEOUS RUBBLE PILE (731-6A) OPERABLE UNIT

1. Section III, Background, Basis for Taking Action, page E-4. The first full paragraph of this page list both arsenic and benzo[a]pyrene as HH RCOCs at the Ash Area subunit. Table E-2 lists only arsenic. Please correct.

Response: Agree.

Per the Record of Decision for AMRP OU (WSRC-RP-2001-4197), the only HH RCOC at the Ash Area subunit is arsenic. The text in Section III, Background, Basis for Taking Action, will be revised to the following:

“At the Ash Area, the human health refined COC is ~~are~~ arsenic and benzo(a)pyrene. Both This COCs ~~are~~ is associated with the ash in the soils at the unit...”

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

Appendix F – C-AREA BURNING/RUBBLE PIT OPERABLE UNIT (131-C) AND OLD C-AREA BURNING/RUBBLE PIT (NBN)

1. Figure F-2, CBRP OU LUC Boundary and Monitoring Stations, page F-16. This figure, which shows the LUC boundary of CBRP, contains “SVE Well” in the legend, but the scope of the figure does not allow the locations of the four operating MicroBlower™ SVE well to be clearly seen. Please include an additional figure showing the locations of the wells, similar to Figure L-3 in Appendix L.

Response: Agree.

Figure F-3 CBRP OU SVE Stations will be added to Appendix F as requested. Figure F-3 is attached to the comment responses.

Responsible Party: Terry Killeen, (803) 952-6850, terry.killeen@srs.gov

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Appendix H – F-AREA GROUNDWATER OPERABLE UNIT

1. Section IV, Remedial Actions, Remedy Implementation – *Active Treatment with Pump – Treat – ReInjection*, page H-5. Please provide a very brief explanation of why operation of the pump and treat system was suspended.

Response: Agree.

Section IV, Remedial Actions, Remedy Implementation – *Active Treatment with Pump-Treat-ReInjection* will be revised as follows: “In 1997, SRS designed and built a pump-and-treat system using a water treatment unit (WTU) with a network of injection and extraction wells. The remediation system extracted groundwater downgradient of the seepage basins, passed it through the WTU to remove metals and radionuclides, and reinjected the treated water upgradient to maintain the recirculation loop. To reduce the migration of tritium to Fourmile Branch, the system lengthened the tritium pathway in the extraction/reinjection loop, which allowed more time for tritium decay prior to discharging to Fourmile Branch. Over the course of pump-and-treat operations, due to increased water volume and gradient from injection of treated water, the effectiveness of the system on reducing tritium flux to Fourmile Branch had diminished. This prompted termination of operations and implementation of new corrective actions (subsurface barriers and gates, and base injection). Operation of the pump and treat system was suspended October 2003 upon receipt of conditional approval by SCDHEC.”

Responsible Party: Kevin Boerstler, 803-952-6766, kevin.boerstler@srs.gov

2. Section IV, Remedial Actions, Remedy Implementation – *Passive Control of Water Table Gradients and pH Treatment*, page H-6. Please provide a description of the “subsurface barrier and gate system” constructed. Include figures, if relevant.

Response: Agree.

Section IV, Remedial Actions, Remedy Implementation – *Passive Control of Water Table Gradients and pH Treatment* will be revised as follows: “The barriers were constructed across the preferential groundwater flow paths leading to the wetlands adjacent to Fourmile Branch. The subsurface barrier and gate system reduces the groundwater flow velocity (allowing more time for radioactive decay) and controls the flux of contaminants to Fourmile Branch. Within the gates, base injection is operated to immobilize metals and metallic radionuclides. With the expansion of the system, the barrier, composed of low permeability amendments, consists of four walls totaling 750 m (2,500 ft) in length and three gates/funnels. Construction utilized an in-situ soil mixing technique to blend acid resistant pozzolan cement and attapulgite clay with native soils. A small percentage of caustic was also added to the cement to facilitate curing. Upon hardening, the resulting soil/cement mixture formed a low permeability (less than 1E-06 cm/s) subsurface barrier approximately 0.75 m (2.5 ft) thick on average. Vertically the wall was installed from just below ground surface to the base of the upper aquifer zone. The barrier depth is approximately 20 m (65 ft) and 0.75 m (2.5 ft) thick. The location of the original barrier, the extension, and the base injection wells are shown in Figure H-2.

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Responsible Party: Kevin Boerstler, 803-952-6766, kevin.boerstler@srs.gov

3. Section V, Progress since Last Review, page H-8. Please revise the second bullet on page H-8 to make clear that the additional silver chloride injections were done.

Response: Agree with Clarification.

A silver chloride injection campaign has been scheduled for FY2018 but has not yet been executed. For clarity, the second bullet will be removed and the last paragraph in Section V revised as follows:

“Base injection continues – Modifications were made to several of the base injection wells to better direct the base solution to areas of the acid impacted portions of the aquifer that were likely not receiving sufficient base. A silver chloride injection campaign has been scheduled for FY2018.”

Responsible Party: Kevin Boerstler, 803-952-6766, kevin.boerstler@srs.gov

4. Section V, Progress since Last Review, page H-8. Please revise the third bullet to clarify the information to be conveyed.

Response: Agree.

Section V, Progress since Last Review, 3rd bullet will be revised to read “~~Awarded approval on submission of Revision 2 to the 2000 RCRA Permit Renewal Application Volume IX, that a~~Added silver chloride as a corrective action for iodine-129 at the F-Area HWMF (Revision 2 to the 2000 RCRA Permit Renewal Application, WSRC-IM-98-30, Volume IV).”

Responsible Party: Kevin Boerstler, 803-952-6766, kevin.boerstlyer@srs.gov

Appendix I – H-AREA GROUNDWATER OPERABLE UNIT

1. Section IV, Remedial Actions, Remedy Implementation – *Passive Treatment with Subsurface Barrier System*, page I-5. Please provide a description of the “groundwater barriers” constructed. Include figures, if relevant.

Response: Agree.

Section IV, Remedial Actions, Remedy Implementation – Passive Treatment with Subsurface Barrier System will be revised as follows: “In 2004, two groundwater barriers were installed. One barrier was placed upgradient of Basin H-4 and a second barrier was placed downgradient of the basin for a total of 948 m (3,160 ft) ~~of low permeability wall.~~ The subsurface barrier and gate system reduces the groundwater flow velocity (allowing more time for radioactive decay) and controls the flux of contaminants to Fourmile Branch. Construction utilized an in-situ soil mixing technique to blend acid resistant pozzolan cement and attapulgite clay with native soils. A small percentage of caustic was also added to the cement to facilitate curing. Upon hardening, the resulting soil/cement mixture formed a low permeability (less than 1E-06 cm/s) subsurface barrier approximately 0.75 m (2.5 ft) thick on average. Vertically the wall was installed from

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just below ground surface to the base of the upper aquifer zone. Placement of the barrier walls altered groundwater levels near the walls (groundwater gradient), thus altering groundwater flow paths and increasing groundwater travel times to surface water and seep lines.”

Responsible Party: Kevin Boerstler, 803-952-6766, kevin.boerstlyer@srs.gov

Appendix L – P-AREA BURNING/RUBBLE PIT (131-P) (PBRP) OPERABLE UNIT

1. Section III, Background, Basis for Taking Action, page L-4. This section discusses the CM and GW RCOCs, but does not discuss the HH RCOCs that are mentioned in Section IV and Table L-2. Please include these in the RCOC discussion in this section.

Response: Agree.

The following sentences will be added to the 2nd paragraph in Section III, Background, Basis for Taking Action. The paragraph will read as follows:

“Based on the RCRA Facility Investigation (RFI)/Remedial Investigation (RI) with Baseline Risk Assessment report (WSRC 2001), the PBRP OU soil poses a threat to human health receptors as it is contaminated with polyaromatic hydrocarbons (PAHs)(Table L-2). Human health refined constituents of concern (RCOCs) for the current on-site worker include benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, dibenzo[a,h]anthracene, and indeno[1,2,3-c,d]pyrene. Human health RCOCs for the future on-site resident include these constituents plus chrysene, fluoranthene, phenanthrene, and pyrene (Table L-2).”

Responsible Party: Justin Steadman, 803-952-7346, justin.steadman@srs.gov

2. Section IV, Remedial Actions, Remedy Selection, page L-5. The second bullet of this page for protection of future industrial workers include six of the ten HH RCOCs listed in the top portion of Table L-2. Chrysene, fluoranthene, phenanthrene, and pyrene are not included. Please include.

Response: Clarification.

Chrysene, fluoranthene, phenanthrene, and pyrene are not included in the Remedy Selection section because these constituents were only identified as HH RCOCs for the residential receptor. The RCOCs for the industrial worker are correctly listed in Section IV Remedial Actions. For clarification, Table L-2 has been revised to identify the HH RCOCs for each human health scenario. The revised Table L-2 is included in the response to the SCDHEC General Comment #1.

Responsible Party: Justin Steadman, 803-952-7346, justin.steadman@srs.gov

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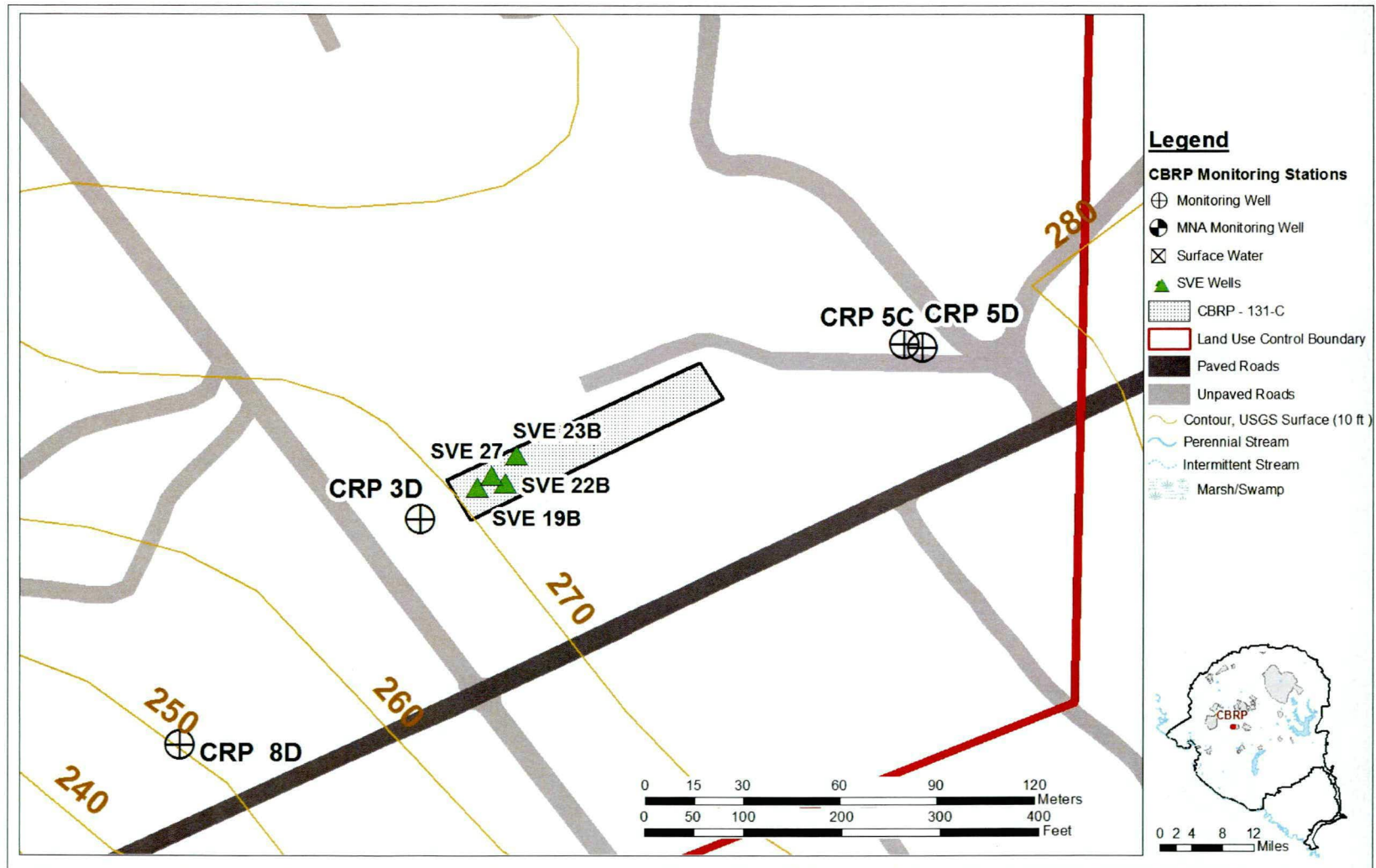


Figure F-3. CBRP OU SVE Stations

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I. GENERAL COMMENT

1. In Section VIII., Issues, Page 14 of 24 the text identifies the following issues associated with altering or shutting down the remedial activities:
 - The passive system at A-Area Miscellaneous Rubble Pile (AMRP) OU has been successful in treating VOC contamination. Remedial goals (RGs) have likely been achieved and operation of the passive soil vapor extraction (SVE) system may no longer be needed.
 - The D-Area Operable Unit (DAOU) Bubble Tower MicroBlower™ SVE has been successful in treating VOC contamination. Contaminant removal from the MicroBlower™ SVE system has greatly diminished or ceased since 2012.

However, consistent with USEPA Five Year Review guidance, issues that currently prevent the response action from being protective, or may do so in the future should be identified in this section. As such, the text in this section should clearly indicate the uncertainty regarding future protectiveness if the SVE remedial action(s) is shutdown for each OU. As noted in the recommendations/follow-up actions section additional characterization will be conducted to determine if RGs have been achieved for trichloroethylene (TCE) and tetrachloroethylene (PCE) in accordance with the *Sampling and Analysis Plan/or the A-Area Miscellaneous Rubble Pile (731-6A) Operable Unit (U) (SRNS 2015b)*. *Revise the of the Fifth Five-Year Remedy Review Report for Savannah River Site Operable Units with Operating Equipment (U), SRNS-RP-2017- 00567, Revision 0; dated December 2017 (Fifth Five-Year Remedy Review Report) as well as the relevant sections of Appendix E and Appendix G.*

Response: Clarification.

Operation of the SVE systems at AMRP OU and the DAOU will not be permanently removed from service unless the RGs have been achieved. Therefore, there are no uncertainties regarding future protectiveness for the AMRP OU or the DAOU. For clarity, the text in Section VIII, Issues, will be modified as follows for AMRP OU and DAOU, respectively:

- “• **The passive system at A-Area Miscellaneous Rubble Pile (AMRP) OU has been successful in treating VOC contamination. Soil Remedial goals (RGs) have likely been achieved and operation of the passive SVE system may no longer be needed for future protectiveness.**
- **The D-Area Operable Unit (DAOU) Bubble Tower MicroBlower™ SVE has been successful in treating VOC contamination. Contaminant removal from the MicroBlower™ SVE system has greatly diminished or ceased since 2012 and operation of the SVE system may no longer be needed for future protectiveness if the soil RG has been achieved.**

The SVE systems at the AMRP OU and the DAOU Bubble Tower will continue to operate until additional characterization confirms that the RGs have been met.”

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Table E-4, Recommendations and Follow-up Actions for AMRP OU, will be revised as follows:

Issue	Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? (Y/N)	
					Current	Future
Soil RGs have likely been achieved and operation of the passive SVE system may no longer be needed for future protectiveness.	In accordance with the <i>Sampling and Analysis Plan for the A-Area Miscellaneous Rubble Pile (731-6A) Operable Unit (U)</i> (SRNS 2015b) to determine if RGs have been achieved for TCE and PCE, additional characterization of the ash layer and vadose zone soils should be conducted. If the soil RGs have been met, the passive SVE system could be shutdown.	USDOE	SCDHEC/ USEPA	June 2018	N	N

Table G-5, Recommendations and Follow-up Actions for DAOU, will be revised as follows:

Issue	Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? (Y/N)	
					Current	Future
Contaminant removal from the DAOU Bubble Tower MicroBlower™ SVE wells has greatly diminished or ceased since 2012 and operation of the SVE system may no longer be needed for future protectiveness if the soil RG has been achieved.	Due to the DAOU Bubble Tower Subunit MicroBlower™ SVE system's minimal removals of contaminants for at least the last four years (Figure G-2-2, Attachment G-2), SRS proposes to shut down the MicroBlower™ SVE system and collect a confirmation soil sample to determine if the PCE soil RG has been met (20 µg/kg). If the RG has been achieved, the results will be submitted to the Core Team for consensus to justify discontinuing operation of the SVE and/or monitoring.	USDOE	SCDHEC/ USEPA	June 2018	N	N

Responsible Party: Sadika O'Quinn, sadika.o'quinn@srs.gov, 803-952-6697

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2. OUs captured in our CERCLA database indicate OU#30 is the A-Area Misc. Rubble Pile. However, Table 1 indicates OU# 30 should be the A/M Area Groundwater OU. It looks like Table 1 in the 5YR is incorrect, see below:
 - a. A-Area Miscellaneous Rubble Pile - SRS Index Number: 48; CERCLIS Number: 30
 - b. M-Area Hazardous Waste Management Facility: A/M Area Groundwater Portion - SRS Index Number: 23; CERCLIS Number: 36

Response: Agree.

The CERCLIS number for A-Area Miscellaneous Rubble Pile (731-6A) OU will be changed from 36 to 30 in Table 1. Likewise, the CERCLIS number for A/M Groundwater OU will be changed from 30 to 36.

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

3. Going forward, EPA encourages DOE to use the 2016 FYR Template (MS Word Format is attached as *final_five_year_review_recommended_template_1.20.2016.doc*) when preparing the FYR report (especially for the 'Progress Since the Last Five-Year Review' Section). The 2016 FYR Template does not reduce the requirements of the FYR process, but it does streamline the FYR report format and improves the overall consistency for reports completed across all Regions. You may find additional information regarding the FYR Guidance Documents at the following website: <http://www.epa.gov/superfund/writing-five-year-reviews-superfund-sites>. You may find additional information regarding the tools for writing the FYR (including the 2016 FYR Template) at the following website: <http://www.epa.gov/superfund/writing-five-year-reviews-superfund-sites>. The Tables contained in the 2016 FYR Template contained required information that is needed for data entry into our CERCLA database [SEMS]. [see attachment]

Response: Clarification.

This document pertaining to operable units with operating equipment is the fifth phase of the 5th Five-Year Remedy Review Report for the Savannah River Site. Agreement was reached during the May 2014 Core Team meeting to group the OUs by remedy types into five categories: 1) native soil cover and/or land use controls (LUCs); 2) groundwater; 3) engineered covers; 4) geosynthetic and stabilization/ solidification cover systems; and 5) operating equipment. The first 5th Five-Year Remedy Review Report was issued in November 2015, prior to the availability of the 2016 FYR Template. To maintain consistency among the five phases for the 5th Five-Year Remedy Review Report for the Savannah River Site, adoption of the 2016 FYR Template will be implemented for the 6th Five-Year Remedy Review Report for the Savannah River Site beginning with Phase 1, Native Soil Cover and/or LUCs scheduled for submittal in December 2018.

Responsible Party: Sadika O'Quinn, sadika.o'quinn@srs.gov, 803-952-6697

4. For some OUs, the description of required LUCs and discussion of how LUCs are being implemented and met is too sparse. For example, Page C-15 simply states that: "The Land Use Control Implementation Plan for the ABRP/MCB/MBP OU governs LUC implementation, maintenance, monitoring, reporting, and enforcement of LUCs (WSRC
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2008). All LUC objectives are being met."

- a. For all OUs w/ LUCs as a component of the selected remedy, please describe in the relevant Appendix evaluating the particular OU what the LUC objectives are (e.g., no disturbance of cap, prohibition of groundwater use, physical access controls, prohibition on residential use, etc.), how the LUC objectives are being implemented (e.g., pursuant to an OU-specific LUCIP), whether the LUC implementation document is in place, and whether the LUC objectives are being met (e.g., as observed during site inspection).
- b. *See for e.g., EPA "Comprehensive Five-Year Review Guidance," OSWER No. 9355.7-03B-P, June 2001, Sample Report, page F-25, which contains the following sample response to Question A: Is the remedy functioning as intended by the decision document. Sample Response, discussion pertaining to ICs: "The institutional controls that are in place include prohibitions on the use or disturbance of groundwater until cleanup levels are achieved, and prohibitions on excavation activities, disturbance of the cap, and any other activities or actions that might interfere with the implemented remedy. No activities were observed that would have violated the institutional controls. The cap and the surrounding area were undisturbed, and no new uses of groundwater were observed. The fence around the site is intact and in good repair.*

Response: Agree with clarification.

For the A/M-Area Groundwater OU (Appendix D), F-Area Groundwater OU (Appendix H), and H-Area Groundwater OU (Appendix I), the LUCs are discussed and approved as part of the closure/post-closure/permit application process and are governed by the RCRA Permit Renewal for the SRS. A Land Use Control Implementation Plan is not required for these OUs and no further discussion is needed in the Five-Year Remedy Review Report.

The discussion of the LUCs for the OUs in Appendices C, E, F, G, J, K, L, and M in response to Question A will be expanded as shown below.

Appendix C, Section VII. Technical Assessment, Is the Remedy Functioning as Intended by the Decision Document?, last paragraph will be modified as follows:

"The Land Use Control Implementation Plan for the ABRP/MCB/MBP OU governs LUC implementation, maintenance, monitoring, reporting, and enforcement of LUCs (WSRC 2008). The LUCs that are in place include physical access controls to prevent unauthorized entry to SRS (fences, guards, security patrols, etc.), use restrictions to prevent unauthorized contact, removal or excavation of contaminated soils, restrictions to prevent unauthorized access to or use of groundwater until cleanup levels are met, and restrictions to prevent disturbance of the ABRP soil cover system. Warning signs are in good condition, and no activities were observed that would have violated the LUCs. All LUC objectives are being met."

Appendix E, Section VII. Technical Assessment, Is the Remedy Functioning as Intended by the Decision Document?, second paragraph will be modified as follows:

"The Land Use Control Implementation Plan for AMRP OU is included as Appendix C

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of the Post Construction Report and governs LUC implementation, maintenance, monitoring, reporting, and enforcement of LUCs (WSRC 2004). The LUCs that are in place include physical access controls to prevent unauthorized entry to SRS (fences, guards, security patrols, etc.), use restrictions to prevent unauthorized contact, removal or excavation of contaminated soils, restrictions to prevent unauthorized access to or use of groundwater until cleanup levels are met, and restrictions to prevent disturbance of the Trenches Area soil cover system. Warning signs are in good condition, and no activities were observed that would have violated the LUCs. All LUC objectives are being met.”

Appendix F, Section VII. Technical Assessment, Is the Remedy Functioning as Intended by the Decision Document?, last paragraph will be modified as follows:

“The Land Use Control Implementation Plan for CBRP OU governs LUC implementation, maintenance, monitoring, reporting, and enforcement (WSRC 2009b). The LUCs that are in place include physical access controls to prevent unauthorized entry to SRS (fences, guards, security patrols, etc.), use restrictions to prevent unauthorized contact, removal or excavation of contaminated soils, restrictions to prevent unauthorized access to or use of groundwater until cleanup levels are met, and restrictions to prevent disturbance of the CBRP Disposal Pit soil cover system. Warning signs are in good condition, and no activities were observed that would have violated the LUCs. All LUC objectives are being met.”

Appendix G, Section VII. Technical Assessment, Is the Remedy Functioning as Intended by the Decision Document?, fifth and sixth paragraph will be modified as follows:

“The Early Action Land Use Control Implementation Plan for DAOU governs LUC implementation, maintenance, monitoring, reporting, and enforcement (SRNS 2011b). LUCs that are in place include physical access controls to prevent unauthorized entry to SRS (fences, guards, security patrols, etc.);, use restrictions to prevent unauthorized contact, removal or excavation of contaminated soils, restrictions to prevent unauthorized access to or use of groundwater until cleanup levels are met, and restrictions to prevent disturbance of the soil covers for the D-Area Asbestos Pit, the northern section of the 489-D CPRB, and the Bubble Tower. Warning signs are in good condition, and no activities were observed that would have violated the LUCs.~~administrative controls that maintain this site for industrial use only (SRS is a secured government facility with land use restrictions), and warning signs and LUCs (SRS Site Use/Site Clearance Program). The Early Action Land Use Control Implementation Plan for DAOU governs LUC implementation, maintenance, monitoring, reporting, and enforcement (SRNS 2011b).~~ All LUC objectives are being met.”

Appendix J, Section VII. Technical Assessment, Is the Remedy Functioning as Intended by the Decision Document?, first bullet will be modified as follows:

“• The selected remedy of LUCs is continuing to prevent human exposure to contaminated soils and concrete slabs. The Land Use Control Implementation Plan for

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MAOU governs LUC implementation, maintenance, monitoring, reporting, and enforcement of LUCs (SRNS 2009b). The LUCs that are in place include physical access controls to prevent unauthorized entry to SRS (fences, guards, security patrols, etc.), use restrictions to prevent unauthorized contact, removal or excavation of contaminated media (i.e., soils, concrete slabs), restrictions to prevent unauthorized access to or use of groundwater until cleanup levels are met, and restrictions to prevent disturbance of the vegetative cover system. Warning signs are in good condition, and no activities were observed that would have violated the LUCs. All LUC objectives are being met. The annual inspections indicate that there are no intrusive activities and the soil covers over the passive SVE systems are intact.”

Appendix K, Section VII. Technical Assessment, Is the Remedy Functioning as Intended by the Decision Document?, bullet will be modified as follows:

“• The selected remedy of Phased SVE enhanced with Soil Fracturing and institutional controls (i.e., LUCs) is effective in preventing TCE and PCE from leaching to groundwater above MCLs. The Land Use Control Implementation Plan for MIPS L OU governs LUC implementation, maintenance, monitoring, reporting, and enforcement of LUCs (WSRC 2007). The LUCs that are in place include physical access controls to prevent unauthorized entry to SRS (fences, guards, security patrols, etc.), use restrictions to prevent unauthorized contact, removal or excavation of contaminated soils, and restrictions to prevent unauthorized access to or use of groundwater until cleanup levels are met. Warning signs are in good condition, and no activities were observed that would have violated the LUCs. All LUC objectives are being met. Based on the 2016 PER (SRNS 2017), the MIPS L OU SVE system has removed 3,597 lbs and 877 lbs of PCE and TCE, respectively, through 2016.”

Appendix L, Section VII. Technical Assessment, Is the Remedy Functioning as Intended by the Decision Document?, last paragraph will be modified as follows:

“The Land Use Control Implementation Plan for the PBRP OU is located in Appendix E of the Post-Construction Report and governs LUC implementation, maintenance, monitoring, reporting, and enforcement (WSRC 2004). The LUCs that are in place include physical access controls to prevent unauthorized entry to SRS (fences, guards, security patrols, etc.), use restrictions to prevent unauthorized contact, removal or excavation of contaminated soils, restrictions to prevent unauthorized access to or use of groundwater until cleanup levels are met, and restrictions to prevent disturbance of the engineered cover system. Warning signs are in good condition, and no activities were observed that would have violated the LUCs. All LUC objectives are being met.”

Appendix M, Section VII. Technical Assessment, Is the Remedy Functioning as Intended by the Decision Document?, last paragraph will be modified as follows:

“The Land Use Control Implementation Plan for TNX Area OU governs LUC implementation, maintenance, monitoring, reporting, and enforcement (WSRC 2004a). The LUCs that are in place include physical access controls to prevent unauthorized entry to SRS (fences, guards, security patrols, etc.), use restrictions to prevent

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unauthorized contact, removal or excavation of contaminated soils, restrictions to prevent unauthorized access to or use of groundwater until cleanup levels are met, and restrictions to prevent disturbance of the engineered cover system. Warning signs are in good condition, and no activities were observed that would have violated the LUCs. All LUC objectives are being met.”

Responsible Party: Sadika O’Quinn, sadika.o’quinn@srs.gov, (803)952-6697

II. SPECIFIC COMMENTS

1. Section VI, Five-Year Remedy Review Process, Page 11 of 24:

Section VI states, "Published an announcement on September 14, 2017 that the USDOE is conducting the Fifth Five-Year Remedy Review in phases" as one of the actions already taken place as part of the Fifth Five-Year Remedy Review. However, Section VI does not state where the announcement was published. Revise Section VI to include the publication in which the announcement was published and provide a copy of the announcement as an appendix. Additionally, Section VI states, "After the USEPA and SCDHEC approve the report and USDOE, USEPA, and SCDHEC sign this report, a notice of its availability will be published in newspapers in Aiken, Columbia, Barnwell, and Allendale, South Carolina, and in Augusta, Georgia." As such, *ensure the final draft of the Fifth Five-Year Remedy Review Report also includes the names of the newspapers in Aiken, Columbia, Barnwell, and Allendale, South Carolina, and Augusta, Georgia, in which the announcements will be published.*

Response: Agree with clarification.

The document will be revised to state where the announcements are published. However, copies of the announcements are not included in an appendix because they are available in the Administrative Record File.

The text in Section VI. Five-Year Remedy Review Process, 2nd bullet will be revised as follows: “Published an announcement on September 14, 2017 that the USDOE is conducting the Fifth Five-Year Remedy Review in phases; The public was notified through mailings of the SRS Environmental Bulletin, a newsletter sent to citizens in South Carolina and Georgia on an extensive mailing list, including landowners adjacent to SRS, and through notices in the *Aiken Standard* (Aiken, SC), *The Augusta Chronicle* (Augusta, GA), *The People Sentinel* (Allendale and Barnwell, SC), and *The State* (Columbia, SC) newspapers. The Environmental Bulletin and newspaper affidavits of publication are available in the Administrative Record File;”

The referenced sentence in the last paragraph in Section VI, Five-Year Remedy Review Process, will be revised as follows: “After the USEPA and SCDHEC approve the report and USDOE, USEPA, and SCDHEC sign this report, a notice of its availability will be published in the *Aiken Standard* (Aiken, SC), *The Augusta Chronicle* (Augusta, GA), *The People Sentinel* (Allendale and Barnwell, SC), and *The State* (Columbia, SC) newspapers in Aiken, Columbia, Barnwell, and Allendale, South Carolina, and in Augusta, Georgia.

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Responsible Party: Shelia McFalls, shelia.mcfalls@srs.gov, 803-952-6819

2. Section IV, Remedial Actions, MCB/MBP Surface and Vadose Zone Soils, Page C-7 of C-48:

The second paragraph of subsection MCB/MBP Surface and Vadose Zone Soils states, "Figures C-4 through C-9 show the ABRP/MBP/MBP OU subunits during operations, prior to and after the final action." However, the dates of the photographs are not provided on the Figures. *Revise Figures C-4 through C-9 to include the dates of when the photographs were taken. Additionally, for completeness ensure the photographs presented/or other OUs includes the relative date the photograph was taken.*

Response: Agree.

Dates have been added to the photographs in Appendix C (ABRP/MCB/MBP), Appendix D (A/M-Area Groundwater), Appendix F (CBRP), Appendix J (MAOU), Appendix K (MIPSL), and Appendix M (TNX).

Responsible Party: Justin Steadman, 803-952-7346, justin.steadman@srs.gov

3. Page ES-I, Executive Summary, third paragraph currently states that all "eleven remedies have been determined to be protective of human health and the environment." Please revise to state that "ten remedies" have been determined "protective," while one, specifically the A/M-Area Groundwater OU, has been determined to be "short-term protective." As stated in the table on Page ES-4, "for the remedy to be protective in the long-term, optimization of the M-1 recovery system and/or other remediation technologies must be implemented to treat the high concentration part of the plume located outside of the recovery well zone of capture."

Response: Agree.

The third paragraph of the Executive Summary will be revised as follows, "The eleven Ten remedies have been determined to be protective of human health and the environment while the remedy for the A/M Area Groundwater OU is determined to be protective in the short-term. For the remedy to be protective in the long-term, optimization of the M-1 recovery system and/or other remediation technologies must be implemented to treat the high concentration areas of the plume located outside the recovery well zone of capture."

Responsible Party: Branden Kramer, branden.kramer@srs.gov, 803-952-6378

4. Page 11, third bullet. Please indicate where the announcement of this FYR was published, i.e., in what newspaper, etc.

Response: Agree.

See the response to Specific Comment 1. Please note that the 3rd bullet on page 11 is the 2nd bullet in Section VI, Five-Year Remedy Review Process.

Responsible Party: Shelia McFalls, shelia.mcfalls@srs.gov, 803-952-6819

5. Page 11, last bullet. Currently the text reads: "Reviewed changes in standards and to-be-considered guidance that would call into question whether the prescribed remedy was

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meeting the newer standards or guidance. Please revise to indicate that federal and state promulgated standards, i.e., chemical-specific ARARs were reviewed.

Response: Agree.

The text in Section VI. Five-Year Remedy Review Process, 5th bullet will be revised as follows:

“Reviewed changes in standards and to-be-considered guidance including federal and state promulgated standards (i.e., chemical specific applicable or relevant and appropriate requirements [ARARs]) that would call into question whether the prescribed remedy was meeting the newer standards or guidance.”

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

6. Page 12, last bullet. Please indicate to whom DOE "submitted an initial Fact Sheet for review."

Response: Agree.

The text in Section VI. Five-Year Remedy Review Process, 6th bullet will be revised as follows: “Submitted an initial Fact Sheet to USEPA and SCDHEC for review with Revision 0 of the Fifth Five-Year Remedy Review Report for SRS OUs with Operating Equipment.”

Responsible Party: Shelia McFalls, shelia.mcfalls@srs.gov, 803-952-6819

7. Page 12, First paragraph. Update text to include the date that EPA and SCDHEC participated in site inspections.

Response: Agree with Clarification.

When the Revision 0 of the Fifth Five-Year Remedy Review Report for Savannah River Site Operable Units with Operating Equipment was submitted, SCDHEC and USEPA had not conducted their site inspections of the operable units. The text in Section VI, Five-Year Remedy Review Process, first sentence will be revised as follows: “USEPA and SCDHEC ~~are scheduled to performed their~~ performed their site inspections of OUs with operating equipment with issued RODs or IRODs ~~in January 2018~~ on March 26, 2018.”

Responsible Party: Sadika O’Quinn, sadika.o’quinn@srs.gov, 803-952-6697

8. Page 13, Response to Question B. Currently the text reads: "An evaluation of changes in chemical and radiological standards that were in place when the last five-year remedy review was initiated in 2012 to the standards applicable in 2017 was conducted to determine if there were any changes that would affect the protectiveness of the selected remedies." Please revise to indicate that federal and state promulgated standards, i.e., chemical-specific ARARs were reviewed.

Response: Agree.

The text in Section VII. Technical Assessment, Question B, second sentence will be revised as follows:

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“An evaluation of changes in chemical and radiological standards including federal and state promulgated standards (i.e., chemical specific ARARs) that were in place when the last five-year remedy review was initiated in 2012 to the standards applicable in 2017 was conducted to determine if there were any changes that would affect the protectiveness of the selected remedies.”

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

9. Page 15, Section IX. The text currently reads: "SRS recommends shutdown of the AMRP passive SVE system if RGs for trichloroethylene and tetrachloroethylene have been achieved. Additional characterization of the ash layer and vadose zone soils will be conducted to verify that the remedial goals have been met. SRS recommends shutdown of the DAOU Bubble Tower MicroBlower™ SVE system due to the minimal removal of contaminants for the last four years. Confirmation soil samples will be collected to determine whether the PCE soil RGs have been met." In the first sentence, please indicate whether you are referring to soil remedial goals. Also note that document sometimes uses "RG" and other times spells out "remedial goal" - please use one or the other consistently.

Response: Agree with Clarification.

The first mention of remedial goals in the main body of the document and each appendix will be shown as “remedial goals (RGs)”. All subsequent mentions of remedial goals will be shown as “RGs”.

The first bullet in Section VIII. Issues, will be revised to refer to soil RGs as follows:

“● The passive system at A-Area Miscellaneous Rubble Pile (AMRP) OU has been successful in treating VOC contamination. Soil Remedial goals (RGs) have likely been achieved and operation of the passive SVE system may no longer be needed for future protectiveness.”

The first sentence in Section IX. Recommendations and Follow-up Actions, will be revised to refer to soil RGs as follows:

“SRS recommends shutdown of the AMRP passive SVE system if soil RGs for trichloroethylene and tetrachloroethylene have been achieved.”

Responsible Party: Sadika O’Quinn, sadika.o’quinn@srs.gov, 803-952-6697

10. Page 15, Section X. The third paragraph currently reads: "LUCs are part of all final remedial actions where hazardous substances, pollutants, or contaminants remain on-site above levels that allow for unlimited use and unrestricted exposure. For the OUs evaluated in this report, pathways for contaminants to reach human and ecological receptors have been successfully broken by the selected remedies." There is not sufficient information in this section to assess how LUCs have been implemented to prevent or limit human exposure. Please summarize what types of LUCs are in place and whether

LUCIPs have been prepared for each of the OUs being evaluated in this FYR. If the necessary LUCs are not in place for each of the OUs being evaluated, the protectiveness statement for the affected OU should be revised to "short-term protective."

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Response: Clarification.

For the OUs evaluated in this report, the type of LUCs and implementation and reference to the OU-specific LUCIP is described in detail in the individual OU appendices in Section VIII. Technical Assessment, Is the Remedy Functioning as Intended by the Decision Document? For the A/M Area Groundwater OU, F-Area Groundwater OU, and H-Area Groundwater OU, the LUC requirements are discussed and approved as part of the closure/post-closure/permit application process and are governed by the RCRA Permit Renewal for the SRS (SCDHEC 2017); therefore, a Land Use Control Implementation Plan is not required for these OUs. As previously discussed, only the remedy for the A/M Area Groundwater OU has been determined to be protective in the short-term.

For clarity, the third paragraph in Section X. Protectiveness Statement(s) will be revised as followed:

“LUCs are part of all final 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 LUCIP is described in detail in Section VII of the OU-specific appendices. For the OUs evaluated in this report, pathways for contaminants to reach human and ecological receptors have been successfully broken by the selected remedies. For the A/M Area Groundwater OU, F-Area Groundwater OU, and H-Area Groundwater OU, the LUC requirements are discussed and approved as part of the closure/post-closure/permit application process and are governed by the RCRA Permit Renewal for the SRS (SCDHEC 2017). Therefore, a LUCIP is not required for these three groundwater OUs.”

Responsible Party: Sadika O’Quinn, sadika.o’quinn@srs.gov, 803-952-6697

11. Page 22, Table 1. Remove empty row in table.

Response: Agree.

The empty row will be deleted from Table 1 as requested.

Responsible Party: Sadika O’Quinn, sadika.o’quinn@srs.gov, 803-952-6697

12. Table A-5, page A-19. The A-Area Misc Rubble Pile (AMRP) OU CERCLIS number is listed in Table A-5 as "30"; however, on page 21, Table 1, the AMRP OU CERCLIS number is listed as "36." Please verify CERCLIS number and check FYR report to correct any inconsistent CERCLIS numbers throughout the document.

Response: Agree with Clarification.

The CERCLIS number for A-Area Miscellaneous Rubble Pile (731-6A) OU will be changed from 36 to 30 in Table 1. Likewise, the CERCLIS number for A/M Groundwater OU will be changed from 30 to 36 in Table 1. The CERCLIS numbers shown in Table A-5 are correct as listed.

Responsible Party: Sadika O’Quinn, sadika.o’quinn@srs.gov, 803-952-6697

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13. Appendix H, page H-4 states that "The remedial action objectives (RAOs) of the interim remedial action are to address the *potential ecological impacts at the seepines* along Fourmile Branch and to address the ambient water quality standards in Fourmile Branch by remediating this OU (WSRC 1995)." The phased measures to reach the RAOs included: Phase 2B-1: Reduce the discharge from the F-Area plume of all Appendix IVB- A (SCDHEC 2017) constituents in the surface water at the seepine to concentrations less than the GWPS (except tritium and iodine-129); and Phase 2B-2: Reduce the discharge from the F-Area plume of iodine-129 in the surface water at the seepine to a concentration less than the GWPS as measured at Wetland Seepine Surface Water Sampling Locations FAS-91, FAS-92, FAS-93, FAS-96, and FAS-103. It is not clear from the technical assessment what "phase" of remediation is underway. Also, the conclusion is that the remedy is "protective;" however, the technical assessment, e.g., table H-5 indicates many constituents sampled at the seepine are at levels well above the RCRA Corrective Action GWPS or MCLs. In addition, the text states, e.g., that mercury presents an identified ecological risk and is currently detected above cleanup standards. LUCs cannot prevent ecological exposure. *Thus, the protectiveness statement should be revised to "expected to be protective" upon implementation of additional actions and identify the necessary actions that are anticipated to achieve cleanup levels.*

Response: Agree with Clarification.

To clarify the phase of remediation that is underway, Section IV, Remedial Actions, Remedy Selection will be revised to include the achievement date associated with the appropriate phase. The bullets listed below the third paragraph of Section IV, Remedial Actions, Remedy Selection will be revised to read as follows:

- **Phase 1: Implement a groundwater extraction and injection system to capture and remediate those portions of the contaminant plume delineated by the 10,000 pCi/mL tritium isoconcentration contour;**
 - **Phase 2A-1: Before October 31, 2012, Reduce the mass flux (curies/year) of tritium discharging from the F-Area plume to Fourmile Branch by 70%;**
 - **Phase 2A-2: Before October 31, 2017, Reduce the concentration of the remaining Appendix IVB-A (SCDHEC 2017) constituents in Fourmile Branch (except tritium and iodine-129) to levels that are less than GWPS as measured at surface water sampling stations FMC-002F and FMA-7U;**
 - **Phase 2A-3: Before October 31, 2025, Reduce the concentration of iodine-129 in Fourmile Branch to levels that are less than the GWPS;**
 - **Phase 2A-4: Develop and test practicable technologies to be employed for the Phase 2B goals (except tritium);**
 - **Phase 2B-1: Before July 31, 2020, Reduce the discharge from the F-Area plume of all Appendix IVB-A (SCDHEC 2017) constituents in the surface water at the seepine to concentrations less than the GWPS (except tritium and iodine-129);**
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- **Phase 2B-2: Before October 31, 2030, rReduce the discharge from the F-Area plume of iodine-129 in the surface water at the seepline to a concentration less than the GWPS as measured at Wetland Seepline Surface Water Sampling Locations FAS-91, FAS-92, FAS-93, FAS-96, and FAS-103;**
- **Phase 2B-3: Give consideration to technical and economic feasibility of performing these remedial actions successfully; and**
- **Phase 3: Capture and remediate the entire contaminant plume above those concentrations listed in the GWPS (SCDHEC 2017) and/or evaluate the applicability of Alternate Concentration Limits and/or a Mixing Zone.”**

To clarify the current phase of remediation, a sentence will be added to the end of the 1st paragraph in Section VII, Technical Assessment –Is the Remedy Functioning as Intended by the Decision Document? as follows:

“SRS has met the Phase 1, 2A-1 and 2A-2 goals outlined in the SRS RCRA Permit Renewal and are actively implementing corrective actions to meet the remaining goals.”

The data provided in Table H-5 is from groundwater samples collected beneath the wetlands at the F-Area seepline. The title of Table H-5 will be revised as “Table H-5. Summary of Constituents from the F-Area Groundwater OU Seepline Groundwater Detected Above Standards.”

Of the three constituents (i.e., aluminum, barium, and mercury) identified in the ecological studies as potential threats to wildlife, only mercury was detected above the groundwater standard at the seepline (Table H-5). A more detailed discussion of mercury is provided in the *Periodic Report 5 for the Fourmile Branch Integrator Operable Unit (IOU)* (SRNS 2016b) and documents that review of available data from ecological studies and the Wildlife Survey update indicate that mercury is a regional problem attributed to atmospheric deposition and upgradient mercury discharges from offsite sources. As discussed in Section VII. Technical Assessment, studies of ecological impacts to the Fourmile Branch are ongoing (as detailed in the Fourmile Branch Periodic Reports) and indicate that the RAOs of the IROD are being met. For human receptors, exposure pathways that could result in unacceptable risks are being controlled by the barrier wall and base injection treatment systems, groundwater monitoring, and implementation of LUCs including physical access controls to prevent unauthorized entry to SRS (fences, guards, security patrols, etc.), administrative controls that restrict site use to industrial use only (via the SRS Site Use/Site Clearance Program). Therefore, no revision to the protectiveness statement for the F-Area Groundwater OU is needed.

For clarity, the second paragraph in Section VII. Technical Assessment, Is the Remedy Functioning as Intended by the Decision Document? will be revised as follows:

“Ecological assessment of Fourmile Branch indicates no impact from the F-Area HWMF. Of the three constituents (i.e., aluminum, barium, and mercury) identified in the ecological studies as potential threats to wildlife, only mercury was detected above the groundwater standard at the seepline. However, aluminum, barium, and mercury are

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~~potential threats to wildlife in Fourmile Branch in the area impacted by F-Area operations.~~ Review of available data from ecological studies indicate that mercury is a regional problem attributed to atmospheric deposition and upgradient mercury discharges from offsite sources. As part of the Fourmile Branch IOU program, studies of ecological impacts to the Fourmile Branch are ongoing and show that the RAOs of the IROD are being met.”

Responsible Party: Kevin Boerstler, 803-952-6766, kevin.boerstler@srs.gov
