Department of Energy
Savannah River Operations Office
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NOV 16 2022

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
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: Savannah River Site's Responses to the Regulatory Comments on the Performance Evaluation Report for the A-Area Burning/Rubble Pits (731-A, -1A) and Rubble Pit (731-2A) and the Miscellaneous Chemical Basin/Metals Burning Pit (731-4A, -5A) Operable Unit - January through December 2021 (U) (SRNS-RP-2022-00178, Revision 0, May 2022) SEMS Number: 28

In accordance with the terms of the Federal Facility Agreement, the U.S. Department of Energy (DOE) is submitting the subject comment responses for your review and approval. The U.S. Environmental Protection Agency (EPA) and South Carolina Department of Health and Environmental Control (SCDHEC) provided comments on July 14, 2022 and September 8, 2022, respectively. This performance evaluation report (PER) will not be revised; however, all comment responses will be included in the next scheduled PER, as applicable. Please review these responses and provide your approval within thirty (30) days from receipt. The time and effort that the SCDHEC and the EPA have given on the subject operable unit are greatly appreciated.

Questions from you or your staff may be directed to me at (803) 952-8365, or the DOE Federal Project Director, Ms. Karen Adams, at (803) 952-7871.

Sincerely,

Brian T. Hennessey

Digitally signed by Brian T. Hennessey
Date: 2022.11.15 15:32:17 -05'00'

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

IACD-23-103

Enclosures:

1. SRS Responses to the U. S. Environmental Protection Agency's Comments on the Performance Evaluation Report for the A-Area Burning/Rubble Pits (731-A, -1A) and Rubble Pit (731-2A) and the Miscellaneous Chemical Basin/Metals Burning Pit (731-4A, -5A) Operable Unit - January through December 2021 (U) (SRNS-RP-2022-00178, Revision 0, May 2022) SEMS Number: 28
2. SRS Responses to the SCDHEC Comments on the Performance Evaluation Report for the A-Area Burning/Rubble Pits (731-A, -1A) and Rubble Pit (731-2A) and the Miscellaneous Chemical Basin/Metals Burning Pit (731-4A, -5A) Operable Unit - January through December 2021 (U) (SRNS-RP-2022-00178, Revision 0, May 2022) SEMS Number: 28

cc w/o encl:
J. Blalock, SCDHEC-Columbia
S. French, SCDHEC-Columbia
M. Reece, SCDHEC-Columbia
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cc w/ encl:
M. McRae, TechLaw, Inc.

Comments received 07/14/2022

GENERAL COMMENTS

1. The PER indicates that in multiple subunits, no BaroBall™ samples were collected for the second quarter 2021 (2Q21) A-Area Burning/Rubble Pits and Rubble Pit and Miscellaneous Chemical Basin (ABRP/MCB) due to unfavorable atmospheric conditions (i.e., high barometric pressure); however, it is unclear why BaroBall™ samples could not be collected once the barometric pressure returned to atmospheric conditions that would allow for sampling. *Please revise the PER to discuss how samples will be obtained from BaroBall™ wells in the future during unfavorable atmospheric conditions to ensure samples can be collected when the subsurface vapor is exiting the well.*

Response: Agree.

Vapor sampling of passive SVE wells equipped with BaroBalls™ should be performed during natural outflow events when the subsurface pressure is higher than the atmospheric pressure. Natural outflow events do not always occur in a timely manner during a particular quarterly sampling event, which was the case during the second quarter 2021. In the second quarter 2021, no natural outflow events occurred, no sample was collected, and sampling continued in the third quarter 2021 when the next natural flow event occurred. An alternative sampling method was introduced in 2022 to help collect a sample during unfavorable atmospheric conditions. The alternative sampling method applies a vacuum to the well head using a portable vacuum pump and measures CO_2 concentrations to aid in determining if a representative soil vapor sample is being collected. CO_2 concentrations are significantly higher in subsurface vapor, from the aerobic respiration of microbial communities, than in atmospheric CO_2 concentrations. It is preferred to collect samples from BaroBall™ wells during natural outflow events. On the occasion when a natural outflow event does not occur during a particular quarter, the alternative method will be used to collect a sample that quarter. It is still possible that no sample can be collected using the alternative sampling method, when CO_2 concentrations are lower than expected. If no sample can be collected during unfavorable atmospheric conditions and using the alternative method, then the sample will be cancelled for that quarter and resampling will be attempted during subsequent quarters.

A summary of the new sampling method will be added to the next Performance Evaluation Report in Section 2.1.4 as follows:

"…Note that BaroBallTM samples for 2Q21 ABRP/MCB were not obtained due to unfavorable atmospheric conditions (i.e., BaroBall™ wells are considered not venting during high barometric pressure events when no subsurface vapor is exiting the well.). <u>In the event that unfavorable atmospheric conditions (i.e., high barometric pressure) are present, an alternative sampling method that applies a vacuum to the well head using a portable vacuum pump will be employed to collect sample CO_2 concentrations. The CO_2 concentrations will</u>

be measured during sample collection to determine if a representative soil vapor sample is being collected. CO_2 concentrations are significantly higher in subsurface vapor from the aerobic respiration of microbial communities than in atmospheric CO_2 concentrations. It is still possible that no sample can be collected using the alternative sampling method when CO_2 concentrations are lower than expected. If no sample can be collected during unfavorable atmospheric conditions using the alternative method, then the sample will be cancelled for that quarter and resampling will be attempted during subsequent quarters."

Responsible Party: Eric Schiefer, (803)952-6273, eric.schiefer@srs.gov

2. It is unclear if the calculated mass of volatile organic compound (VOC) contamination removed in 2021 by the MicroBlower™ and BaroBall™ wells combined has been impacted by the 2Q21 sampling event where no BaroBall™ samples were collected at the ABRP/MCB. *Please revise the PER to discuss if the mass of VOCs removed from the ABRP/MCB is underestimated since no BaroBall™ samples were collected in 2Q21 at the ABRP/MCB.*

Response: Clarification.

As described in Section 2.1.4 the VOC mass (PCE and TCE) removed from the SVE wells was estimated from the vapor-phase concentrations, flow rates and operational period. Although no BaroBall™ samples were collected during the 2Q21 sampling event, the assumption is that the vapor-phase concentrations remain constant between the 1Q21 and 3Q21 sampling events. Therefore, the VOC mass (PCE and TCE) removed is still estimated. No change to the 2021 report is proposed.

Responsible Party: Eric Schiefer, (803)952-6273, eric.schiefer@srs.gov

SPECIFIC COMMENTS

1. **Section 1.3, Groundwater, Page 2 of 48:** It is unclear if trichloroethylene (TCE) concentrations are below the groundwater maximum contaminant level (MCL) in the M-Area Aquifer Zone (MAAZ) water table aquifer wells near the ABRP source. The text states tetrachloroethylene (PCE) is below the MCL in all eight MAAZ wells, however, no discussion of TCE results is presented. As such, the effectiveness of the vadose zone remedial action (RA) on reducing TCE concentrations in the MAAZ is unclear. *Please revise the text to discuss the TCE results in the eight MAAZ wells located near the ABRP source as a line of evidence to support vadose zone RA effectiveness.*

Response: Agree.

Groundwater is not part of the ABRP/MCB/MBP OU. As reported for the M-Area Hazardous Waste Management Facility under the RCRA Permit Renewal program, the MAAZ wells near the ABRP, MCB and MBP sources are either approaching or less than the maximum contaminant level for PCE and TCE (0.005 ppm) indicating mass depletion from the source.

The text in Section 1.3 third paragraph will be revised in the next PER similar to the following:

"Soil vapor extraction (SVE) ~~is designed~~ was deployed to reduce the vadose zone source term and has a delayed impact on groundwater contamination by inhibiting further contamination. SRS expects to see a long-term impact on groundwater contamination from SVE operations in shallower groundwater; however, deeper groundwater impacts from this system may be less apparent due to commingling of the plumes. Therefore, it is important to focus on the MAAZ (water table aquifer) wells when evaluating the effectiveness of the vadose zone RAs. MAAZ wells near the ABRP/MCB/MBP OU source have decreasing VOC trends indicating mass depletion of the source. PCE is below the groundwater maximum contaminant level (MCL) in all eight MAAZ wells. TCE is trending downward to the MCL (0.005 ppm)."

Responsible Party: Eric Schiefer, (803)952-6273, eric.schiefer@srs.gov

2. **Section 4.2, MCB Vadose Zone Subunit Conclusion, Page 10 of 48:** It is unclear how an upward trend in VOC concentrations will be performed to determine when MCB BaroBall™ wells will be converted to MicroBlowers™. The text states, "If concentrations from any MCB BaroBall™ well indicate an upward trend for VOC concentrations, the well will be converted to MicroBlowers™ to ensure protection of underlying groundwater;" however, the text does not discuss whether an upward trend will be determined qualitatively based on visual observations or quantitatively by statistical analysis of trend. *Please revise Section 4.2 to discuss how upward and increasing trend in VOC concentrations will be determined to trigger when MCB BaroBall™ wells will be converted to MicroBlower™ wells.*

Response: Agree

The text in Section 4.2 second paragraph will be revised in the next PER similar to the following:

"Based on the extensive characterization and sampling history documented for the MCB Subunit since CY1996, concentrations are expected to continue to decrease with source depletion. Performance monitoring (Table 9) of the MicroBlowers™ and BaroBalls™ will continue until RGs are achieved and, in the meantime, will be checked for any upward trends in VOC concentrations. If concentrations from any MCB BaroBall™ well indicate an upward trend for VOC concentrations, the well will be converted to MicroBlowers™ to ensure protection of underlying groundwater. An upward trend is determined when the annual average concentration is more than two times greater than the previous annual average. For example, during CY2006 through CY2008, an increase was indicated at wells MCSV-07 and MCSV-17. Subsequently, MicroBlowers™ were installed on these wells."

Responsible Party: Eric Schiefer, (803)952-6273, eric.schiefer@srs.gov

3. **Section 4.3, Overall Recommendations, Page 10 of 48:** The text indicates the total mass of VOCs removed from the ABRP in 2021 is 0.46 kilograms (kg) and 1.01 pounds (lbs), which is not consistent with the total mass presented in Section 2.1.4 and Section 2.2.4 (PSVE Results) which indicates 0.45 kg or 1 lb. *Please revise the PER to clarify the correct total mass of VOCs removed from the ABRP in 2021.*

Response: Agree

The table in section 2.1.4 shows 0.460 kg (1.014 lb) as the correct total TCE mass removed for ABRP. The table in section 2.24 shows 0.231 kg (0.509 lb) as the correct total TCE and PCE mass removed for MCB. The text in future reports will ensure that the mass removed is consistent in the text and tables and in Section 4.3, Overall Recommendations.

Responsible Party: Eric Schiefer, (803) 952-6273, eric.schiefer@srs.gov

Comments received 09/08/2022

GENERAL COMMENTS

1. It is unclear if Tables 4 and 5 are missing some monitoring wells, or if sampling was not performed for the wells not included. Specifically, wells AHT-07B, -08A, -08B, -11A, -11B, -13 and -14 equipped with MicroBlowersTM are absent from Table 4, and wells AHT-10A, -10B, -12A, -12B, -15, -16 and -17 equipped with BaroBallsTM are absent from Table 5. Additionally, ARV-2D2 is listed in Table 5 as a well equipped with BaroBallsTM. Please clarify and revise these tables accordingly if necessary.

   Response: Agree

   Wells AHT-07B, -08A, -08B, -11A, -11B, -13 and -14 equipped with MicroBlowers™ were inadvertently omitted from Table 4, and wells AHT-10A, -10B, -12A, -12B, -15, -16 and -17 equipped with BaroBalls™ were inadvertently omitted from Table 5.

   All omitted wells and the well gas results will be added to the appropriate tables in future reports similar to the following:

Wells AHT-07B, -08A, -08B, -11A, -11B, -13 and -14 equipped with MicroBlowers™ and the well gas results for these wells will be added to Table 4 in future reports similar to the following:

Table 4. ABRP Trench Subunit MicroBlowerTM Well Exhaust Gas TCE Results(Continued/End)

Collection Date	Station ID — TCE Soil-Gas Concentration (ppmV)						
	AHT007B	AHT008A	AHT008B	AHT011A	AHT011B	AHT013	AHT014
Well History Notes	2, 6	2, 6	2, 7	2, 7	2, 6	2, 6	2, 6
2/8/2016	ND	ND	**	**	ND	ND	ND
5/17/2016	ND	ND	**	**	ND	ND	ND
9/13/2016	ND	0.068	**	**	ND	ND	ND
12/12/2016	ND	ND	**	**	ND	ND	ND
2/13/2017	ND	ND	**	**	ND	ND	ND
5/16/2017	ND	ND	**	**	ND	ND	ND
9/14/2017	ND	ND	**	**	ND	ND	ND
12/13/2017	ND	ND	**	**	ND	ND	ND
2/12/2018	0.082	ND	**	**	0.038	ND	ND
5/14/2018	0.156	ND	ND	ND	0.044	0.036	ND
9/18/2018	0.139	ND	0.027	ND	ND	0.071	ND
12/17/2018	0.171	ND	0.273	ND	ND	ND	ND
2/11/2019	0.109	ND	0.194	ND	ND	0.033	ND
5/13/2019	0.109	ND	0.139	ND	ND	ND	ND
9/23/2019	0.106	ND	0.161	ND	ND	ND	ND
12/10/2019	ND	ND	ND	ND	ND	ND	ND
2/10/2020	0.079	ND	0.176	ND	0.045	ND	ND
5/11/2020	0.070	ND	0.062	ND	ND	ND	ND
9/21/2020	0.035	ND	ND	ND	ND	ND	ND
12/14/2020	ND	ND	0.304	ND	ND	ND	ND
2/22/2021	0.103	0.353	ND	ND	ND	ND	ND
5/10/2021	0.078	ND	ND	ND	ND	ND	ND
8/20/2021	0.051	ND	0.043	ND	ND	ND	ND
11/17/2021	0.077	ND	0.304	ND	ND	ND	ND

Wells AHT-10A, -10B, -12A, -12B, -15, -16 and -17 equipped with BaroBalls™ and the well gas results for these wells will be added to Table 5 in future reports similar to the following:

Table 5. ABRP Trench Subunit BaroBall™ Well Exhaust Gas TCE Results(Continued/End)

Collection Date	Station ID — TCE Soil-Gas Concentration (ppmV)						
	AHT010A	AHT010B	AHT012A	AHT012B	AHT015	AHT016	AHT017
Well History Notes	5, 6	5, 6	5, 6	5, 6	5, 6	5, 6	5, 6
2/8/2016	0.067	0.045	ND	ND	ND	ND	ND
5/17/2016	ND	ND	ND	ND	ND	ND	ND
9/13/2016	ND	ND	ND	ND	ND	ND	ND
12/12/2016	0.032	ND	ND	ND	ND	ND	ND
2/13/2017	ND	ND	ND	ND	ND	ND	ND
5/16/2017	ND	ND	ND	ND	ND	ND	ND
9/14/2017	ND	ND	ND	ND	ND	ND	ND
12/13/2017	ND	ND	ND	ND	ND	ND	ND
2/12/2018	ND	0.032	ND	ND	ND	ND	ND
5/14/2018	ND	ND	ND	ND	ND	ND	ND
9/18/2018	ND	ND	ND	ND	ND	ND	ND
12/17/2018	ND	ND	ND	ND	ND	ND	ND
2/11/2019	0.039	0.067	ND	ND	ND	ND	ND
5/13/2019	ND	ND	ND	ND	ND	ND	ND
9/23/2019	ND	ND	ND	ND	ND	ND	ND
12/10/2019	ND	ND	ND	ND	ND	ND	ND
2/10/2020	ND	ND	ND	ND	ND	ND	ND
5/11/2020	ND	ND	ND	ND	ND	ND	ND
9/21/2020	ND	0.016	ND	ND	ND	ND	ND
12/14/2020	ND	0.023	ND	ND	ND	ND	ND
2/22/2021	0.020	0.017	ND	ND	ND	ND	ND
5/10/2021	NA	NA	NA	NA	NA	NA	NA
8/20/2021	ND	0.013	ND	ND	ND	ND	ND
11/17/2021	0.010	0.021	ND	ND	ND	ND	ND

Responsible Party: Eric Schiefer, (803) 952-6273, eric.schiefer@srs.gov

Specific Comments

1. Section 1.0, Introduction, page 1. In the second paragraph, please state that the remedial actions for the remaining nine subunits are complete or were not required..

Response: Agree

The text in Section 1.0 second paragraph will be revised in the next PER similar to the following:

"The ABRP/MCB/MBP OU is located approximately 2.4-kilometers (km [1.5-miles {mi}]) south of M Area and 4.8-km (3-mi) east of the Savannah River Site (SRS) boundary, in the Upper Three Runs watershed (Figure 1). The ABRP/MCB/MBP OU comprises several subunits. This PER specifically addresses the remedial actions (RAs) conducted at the ABRP Trench (vadose zone soil) Subunit and the 731-4A MCB Vadose Zone Subunit and are summarized in Section 2.0. Remedial actions for the remaining nine subunits are complete or were not required."

Responsible Party: Eric Schiefer, (803) 952-6273, eric.schiefer@srs.gov

2. Section 2.1.4, Sampling Methods and Results, page 5. The first sentence below the first table shown on this page states: "In CY2021 at ABRP four of 13 wells with MicroBlowersTM had detectable sample results (maximum value was 1.41 ppmV at ASH-06) and only two of 13 wells with BaroBallTM had detectable sample results (maximum value was 0.589 ppmV at AHT-06)." According to Table 4, only 2 wells equipped with MicroBlowersTM (AHT-05 and ASH-06) showed detections of TCE in CY2021 with a max value of 0.841 ppmV at ASH-06. Also, according to Table 5, there were 3 wells equipped with BaroBallTM (AHT-06, -07A and -09B) that showed detections of TCE in CY2021 with a max value of 0.581 ppmV at AHT-06. This statement also appears to contradict Section 4.3, Overall Recommendations, which states that in CY2021 there were 10 of 26 wells at ABRP with detections of TCE. Please correct these discrepancies.

Response: Agree

The statement in Section 4.3 is correct. The missing data discussed in the response to General Comment 1 provides the information to support the overall

recommendations in Section 4.3. The statement in Section 2.1.4 will be revised to be consistent with Section 4.3. The text in Section 2.1.4 second paragraph will be revised in future reports similar to the following:

"In CY2021 at ABRP ~~four~~ five of 13 wells with MicroBlowers™ had detectable sample results (maximum value was ~~1.41~~ 0.841 ppmV at ASH-06) and ~~only two~~ five of 13 wells with BaroBall™ had detectable sample results (maximum value was 0.589~~1~~ ppmV at AHT-06). Quarterly MicroBlowers™ wells …"

Responsible Party: Eric Schiefer, (803) 952-6273, eric.schiefer@srs.gov