Department of Energy
Savannah River Operations Office
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JAN 16 2020

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: Savannah River Site's Responses to the Regulatory Comments on the R-Area Groundwater (NBN) Biennial Effectiveness Monitoring Report in Support of R Area Operable Unit (U) January 2017 through December 2018 (SRNS-RP-2019-00267, Revision 0, June 2019) SEMS Number: 95

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. The South Carolina Department of Health and Environmental Control (SCDHEC) and the U.S. Environmental Protection Agency (EPA) provided comments on the Revision 0 document on October 23, 2019 and October 28, 2019 respectively. This report will not be revised; however, all comment responses will be included in the next report, as applicable. The next report submittal will be on or before June 30, 2021. Please review these responses and provide your approval thirty (30) days from receipt. The effort and time that the SCDHEC and the EPA have given on the subject operable unit are greatly appreciated.

Comments or questions from your staff may be directed to me at (803) 952-8365, or the DOE Project Manager, Mr. Philip Prater, at (803) 952-9333.

Sincerely,

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

IACD-20-124

Enclosures:

1. SRS Responses to EPA comments on the R-Area Groundwater (NBN) Biennial Effectiveness Monitoring Report in Support of R Area Operable Unit (U) January 2017 through December 2018, SEMS Number: 95, (SRNS-RP-2019-00267, Revision 0, June 2019)
2. SRS Responses to SCDHEC comments on: R-Area Groundwater (NBN) Biennial Effectiveness Monitoring Report in Support of R Area Operable Unit (U) January 2017 through December 2018, SEMS Number: 95, (SRNS-RP-2019-00267, Revision 0, June 2019)

cc w/o encl:
D. Scaturo, SCDHEC-Columbia
S. French, SCDHEC-Columbia
M. Reece, SCDHEC-Columbia
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B. Cameron, SCDHEC–Aiken Environmental Affairs Office
R. H. Pope, EPA

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

SRS Responses to SCDHEC comments on: R-Area Groundwater (NBN) Biennial Effectiveness Monitoring Report in Support of R Area Operable Unit (U) - January 2017 through December 2018, SEMS Number: 95 (SRNS-RP-2019-00267, Revision 0, June 2019) received June 27, 2019.

Received October 23, 2019

SPECIFIC COMMENTS

1. Section 4.1.4, Northern Tritium Plume, page 11. The last sentence of the second paragraph of this section states that the Action Limit for tritium at well RSE 10DU is 252 pCi/mL. Table 2 lists an Action Limit of 168 pCi/mL. Please correct.

   Agree.

   Table 2 will be corrected in the next report to list the correct action limit (252 pCi/mL) for well RSE 10DU.

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

2. Table 2, RCOC Maximum Results for 2018 by Plume, page 37. Plume definition well RAG008B is listed in this table with an Action Limit of 37 µg/L for TCE. According to discussion in the first paragraph of Section 3.4 and footnote "a" for Table 2, Action Limits apply to source area zone wells. It is unclear what this value represents for RAG008B since it is a plume definition well. Please explain and/or correct. Also, the listed MCL of 70 µg/L for TCE is incorrect and should be 5 µg/L instead.

   Agree.

   Table 2 will be corrected in the next report to include TCE source zone well RWT003C, which has an action limit of 37 ug/L. Table 2 will also include the well (if different that RWT003C) with the maximum TCE concentration for the reporting period, and no action limit will be listed for that well. The MCL for TCE will be corrected to 5 ug/L in the next report.

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

Received October 28, 2019

TECHNICAL REVIEW COMMENTS

1. In section 3 on page 6, the text states well RDB 2D will be an auxiliary ISD monitoring well during the five year time period (i.e., 2018 through 2022). However, the EMR does not discuss or state what conditions would warrant the sampling of auxiliary ISD monitoring well RDB-2D. As such, the purpose of the auxiliary well is not clear. Additionally, this well is not depicted in Figure 4 (ISD Monitoring Wells 5-Yrs). Revise the R-Area Groundwater (NBN) Biennial Effectiveness Monitoring Report in Support of R-Area Operable Unit (U), January 2017 through December 2018, SEMS Number: 95, SRNS-RP-2019-00267, Revision 0, dated June 2019 (EMR) to address this issue to ensure the purpose and location of auxiliary well RDB-2D is clearly documented.

   Clarification.

   Excluding RDB003DU, well RDB 2D is the closest well horizontally to RDB 3D (EMR Figure 5) and RDB 2D has the same screen zone as RDB 3D (EMR Table 1). Well RDB 2D was not included in the original ISD monitoring network, which is why it was not included in EMR Figure 4 and labeled as an "Auxillary ISD Well", but it may be useful in determining the extent of C-14 in the groundwater if it is more than just an isolated spill detected at well RDB 3D. It will be identified as a "Temporary ISD Well" to better clarify its function in the next RAOU EMR, as EMRs are considered secondary documents and not typically revised by agreed protocols.

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

2. The EMR indicates Mill Creek surface water station MCSW-03 was not sampled due to dry conditions in 2017. The EMR also indicates two surface water locations, PASL-01 and PASL-02 along Pond A, were also not sampled in 2017 and 2018 due to dry conditions at these locations. It is noted that text in Section 3.3 (Groundwater Flow Direction) states the rainfall measured during 2017 and 2018 was 54.41 inches (in) and 55.37 in, respectively, greater than the 30 year average (1986-2016) of 46.6 in/year. As such, it is not clear if the current locations of surface water stations MCSW-03, PASL-01 and PASL-02 remain appropriate to adequately monitor plume(s) migration, or if they should be relocated considering these locations were dry during years with greater than average annual rainfall. Revise the EMR to address this issue to ensure the surface water monitoring stations are appropriately located.

   Agree with Clarification.

   PASL-01 and PASL-02 are LUC Boundary Surface Water stations, and were intended to collect groundwater discharging into intermittent tributaries to Pond A. However, these stations rarely have water at those locations. SRS proposes reclassifying

RAG013 and RSP 5DL as a Plume Boundary Wells to replace PASL-01 and PASL-02, respectively, and discontinue monitoring attempts at PASL-01 and PASL-02 (Table 1).

In contrast, MCSW-03 is where groundwater first outcrops into Mill Creek, a sample was collected in 2018, and it was below detection for tritium. MCSW-04 is the next station downstream of MCSW-03 and it typically yields samples except in extreme droughts, and it is believed to be where tritiated groundwater first outcrops into Mill Creek. Station MCSW-03 helps delineate the RAOU northern tritium groundwater plume, and SRS would like to retain station MCSW-03.

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

3. Section 5.1.1 (Eastern VOC Plume) states, "Based on the 2017 and 2018 monitoring data, monitored natural attenuation (MNA) continues to be an effective remedy for the RAGW Eastern VOC Plume. The key source area well RWT003C and all plume definition wells except for RAG008B show decreasing VOC trends." It is noted the trichloroethylene (TCE) trend in RAG008B as illustrated in Figure 12 (RAGW Easter VOC Plume Wells) indicates increasing TCE trend in lower aquifer zone (LAZ) well RAG008B. The most recent TCE concentration in RAG008B is 22.1 micrograms per liter (µg/L). Currently, it is not clear if the increasing TCE trend indicates vertical plume migration. Additionally, the vertical extent of dissolved TCE contamination within the Eastern VOC Plume is poorly defined at RAG008B. Revise the EMR to address this issue to ensure MNA is effectively mitigating vertical TCE plume migration considering the vertical extent of TCE contamination is poorly defined in the Eastern volatile organic compound (VOC) Plume at RAG008B.

Agree with clarification.

SRS proposes installing a deeper well (RAG008BL) between the RAG008B screen zone and the top of the Gordon Confining Unit (AKA "Green Clay") in FY2021 to determine vertical extent of TCE in the RAOU eastern tritium plume. SRS proposes collecting core samples in the LAZ below the RAG008B screen zone to the top of the GCU and rapidly analyzing for TCE to determine the best location (highest TCE concentration) for a screen zone below RBP008B. The proposed well (RAG008BL) will be a plume definition well, but it is noteworthy that Joyce Branch samples remain below detection for TCE indicating MNA is still an effective remedy for the RAOU RAGW TCE plume.

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

4. The text in Section 5.2 (ISD Conclusions) states the 2017 increase in tritium and carbon-14 at well RDB 3D may be due to mobilization of a small shallow legacy spill near the disassembly basin, related to the recent high-water table levels. The EMR also notes that

greater than average rainfall was measured at the Savannah River Site during 2017 and 2018. As such, it is recommended the annual monitoring event be scheduled during seasons of high rainfall when high water table conditions exists to ensure representative groundwater samples are collected to monitor potential source mobilization near the disassembly basin.

Clarification.

Long-term trends indicate that precipitation is fairly uniform throughout the year, with drought or wet periods lasting years as reflected by the attached comment response (CR) Figure 1 R-Reactor Water Table History. Due to the shallow water table and low permeability sediments in the water table aquifer, RAOU wells exhibit greater short-term water level fluctuations than many other SRS water table wells, but these short-term changes (typically +/- 2 feet) are not expected to significantly impact contaminant levels as compared to the increase of 5 to 7 feet as observed between 2012 and 2018. As such, SRS believes the groundwater samples collected around the R-Reactor Disassembly Basin are representative of groundwater conditions.

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5. Table 2 (RCOC Maximum Results for 2018 by Plume) incorrectly reports the maximum contaminant level (MCL) for TCE for well RAG008B in the Eastern VOC Plume as 70 micrograms per liter (µg/L). The MCL for TCE is 5 µg/L. Revise the table accordingly to address this issue.

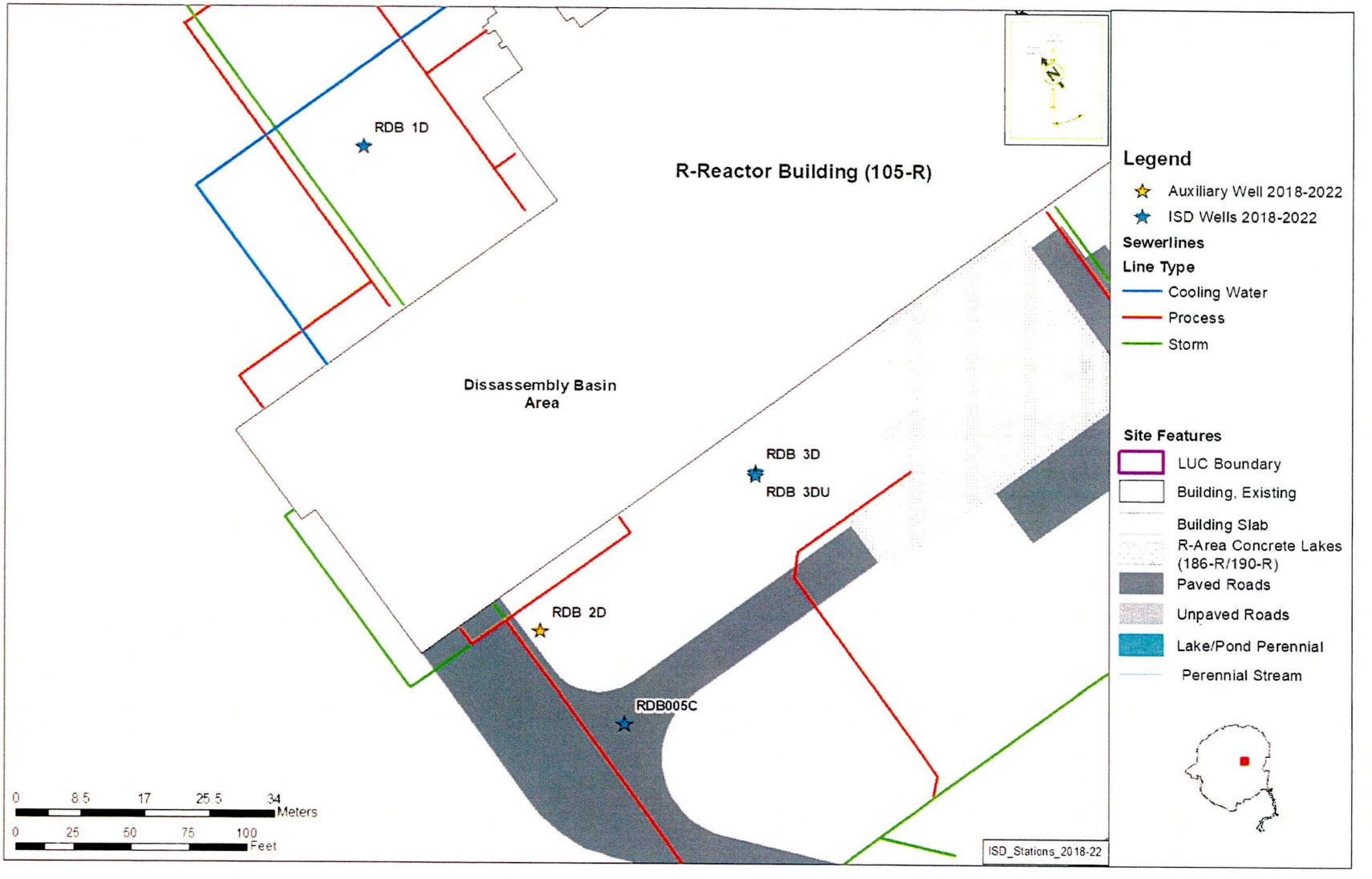
Agree.

This value will be corrected in the table in the next EMR.

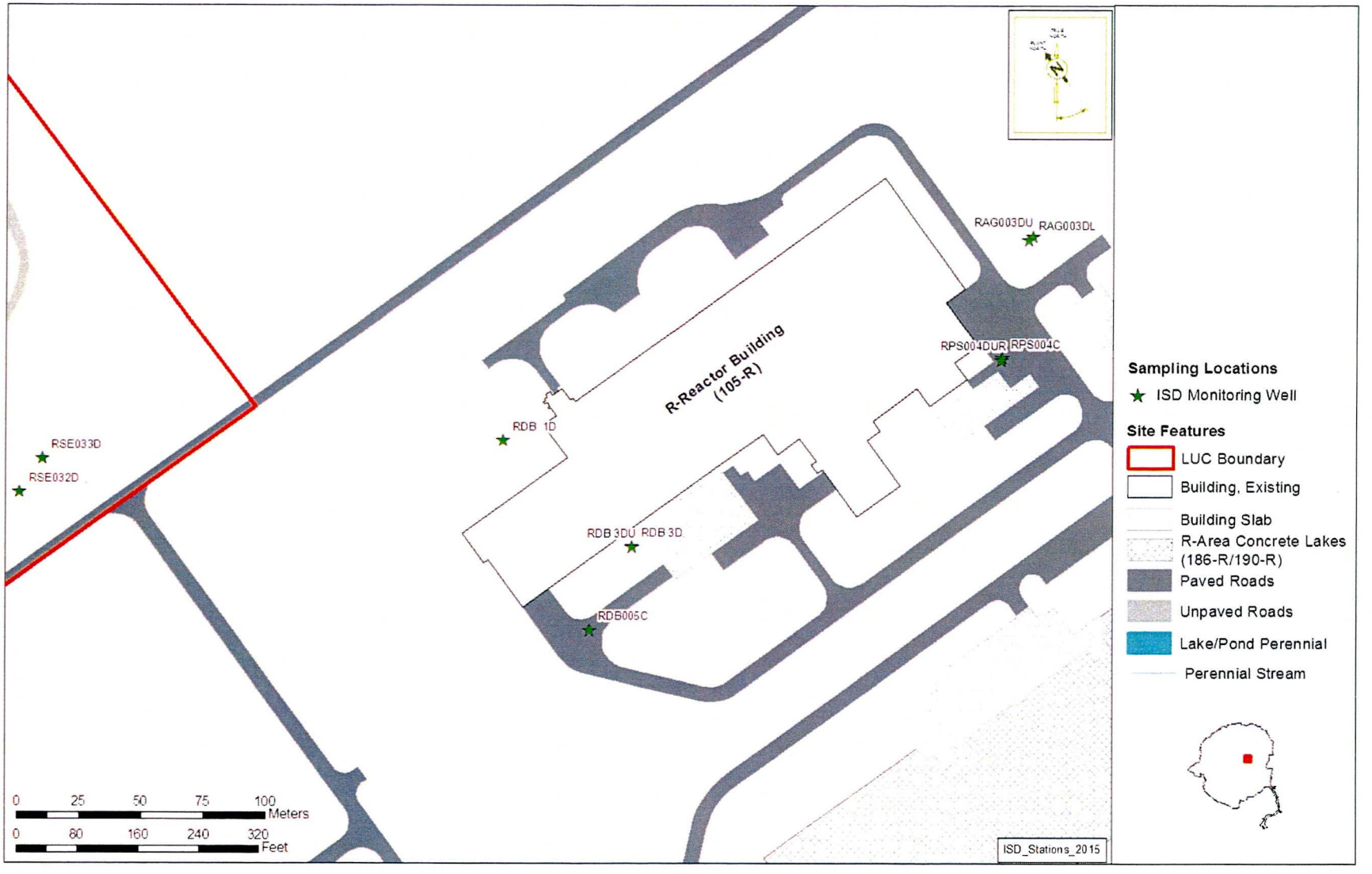
Contact: Terry Killeen, 803-952-6850 (terry.killeen@srs.gov)

EMR Table 1. RAGW Monitoring Stations *(Continued/End)*

Plume	Station ID	Aquifer Zone	Purpose	UTM-N	UTM-E	Top of Casing	Screen Top Elevation	Screen Bottom Elevation
						(ft msl)		
~~Northern Tritium~~	~~PASL-01~~	~~NA~~	~~LUC Boundary Surface Water~~	~~3682785.38~~	~~446144.36~~	~~NA~~	~~NA~~	~~NA~~
~~Northern Tritium~~	~~PASL-02~~	~~NA~~	~~LUC Boundary Surface Water~~	~~3682684.51~~	~~446163.32~~	~~NA~~	~~NA~~	~~NA~~
Northern Tritium	RAG009DL	TZ	Plume Definition Monitoring Well	3682353.32	445538.11	283.72	193.10	183.10
Northern Tritium	RAG009DU	A/AA	Plume Definition Monitoring Well	3682356.13	445542.13	283.66	241.13	231.13
Northern Tritium	RAG013	TZ	Plume ~~Definition~~Boundary Monitoring Well	3682760.27	446022.85	266.10	202.50	192.50
Northern Tritium	RAG014	TZ	Plume Definition Monitoring Well	3682629.87	445337.18	278.00	201.00	191.00
Northern Tritium	RGW 2C	LAZ	Plume Definition Monitoring Well	3682633.20	445665.82	306.83	151.83	141.83
Northern Tritium	RGW 2D	TZ	Plume Definition Monitoring Well	3682629.97	445666.21	307.48	200.00	190.00
Northern Tritium	RPC 2CL	LAZ	Plume Definition Monitoring Well	3682107.95	446064.67	294.85	107.35	97.35
Northern Tritium	RPC 2CU	LAZ	Plume Definition Monitoring Well	3682106.22	446067.51	294.87	158.67	148.67
Northern Tritium	RPC 2D	A/AA	Plume Definition Monitoring Well	3682111.08	446063.41	294.60	279.39	259.39
Northern Tritium	RPC 19C	LAZ	Plume Boundary Monitoring Well	3682324.35	445692.68	304.22	160.22	150.22
Northern Tritium	RSE 10DU	A/AA	Source Area Monitoring Well	3681962.80	445691.31	283.72	273.10	253.00
Northern Tritium	RSE027C	MAZ	Plume Definition Monitoring Well	3682586.20	445679.59	308.52	178.94	168.94
Northern Tritium	RSP 5DL	TZ	Plume ~~Definition~~Boundary Monitoring Well	3682306.51	445976.95	296.82	186.52	176.52
Western Tritium	RAG004B	LAZ	Plume Boundary Monitoring Well	3681524.54	446077.40	293.05	125.56	115.56
Western Tritium	RAG004DL	TZ	Plume Definition Monitoring Well	3681521.36	446080.81	293.49	218.80	208.80
Western Tritium	RDB004DL	TZ	Plume Boundary Monitoring Well	3681467.14	446236.70	294.11	213.40	203.40
Western Tritium, ISD Performance	RDB005C	TZ	Source Area Monitoring Well, ISD Source Well	3681560.48	445960.77	293.49	208.60	198.60
ISD Performance	RSE032D	A/AA	ISD Background Well	3681616.50	445731.16	301.9	262.6	252.6
ISD Performance	RSE033D	TZ	ISD Background Well	3681630.20	445740.30	302.5	221.1	211.1
ISD Performance	RAG003DL	TZ	ISD Source Well	3681719.82	446138.79	292.7	195.9	185.9
ISD Performance	RAG003DU	A/AA	ISD Source Well	3681721.20	446140.70	292.5	237.9	227.9
ISD Performance	RDB 1D	A/AA	ISD Source Well	3681637.70	445925.99	292.7	285.5	265.5
ISD Performance	RDB 2D	A/AA	ISD ~~Auxiliary~~Temporary	3681572.94	445949.65	292.9	285.7	265.7
ISD Performance	RDB 3D	A/AA	ISD Source Well	3681594.41	445978.05	293.0	285.8	265.8
ISD Performance	RDB003DU	A/AA	ISD Source Well	3681589.92	445981.24	293.1	238.7	228.7
ISD Performance	RPS004DUR	A/AA	ISD Source Well	3681676.74	446134.42	293.0	238.2	228.2



EMR Figure 1. Annual ISD Monitoring Wells (2018 through 2022)



EMR Figure 2. ISD Monitoring Wells (5-yr)

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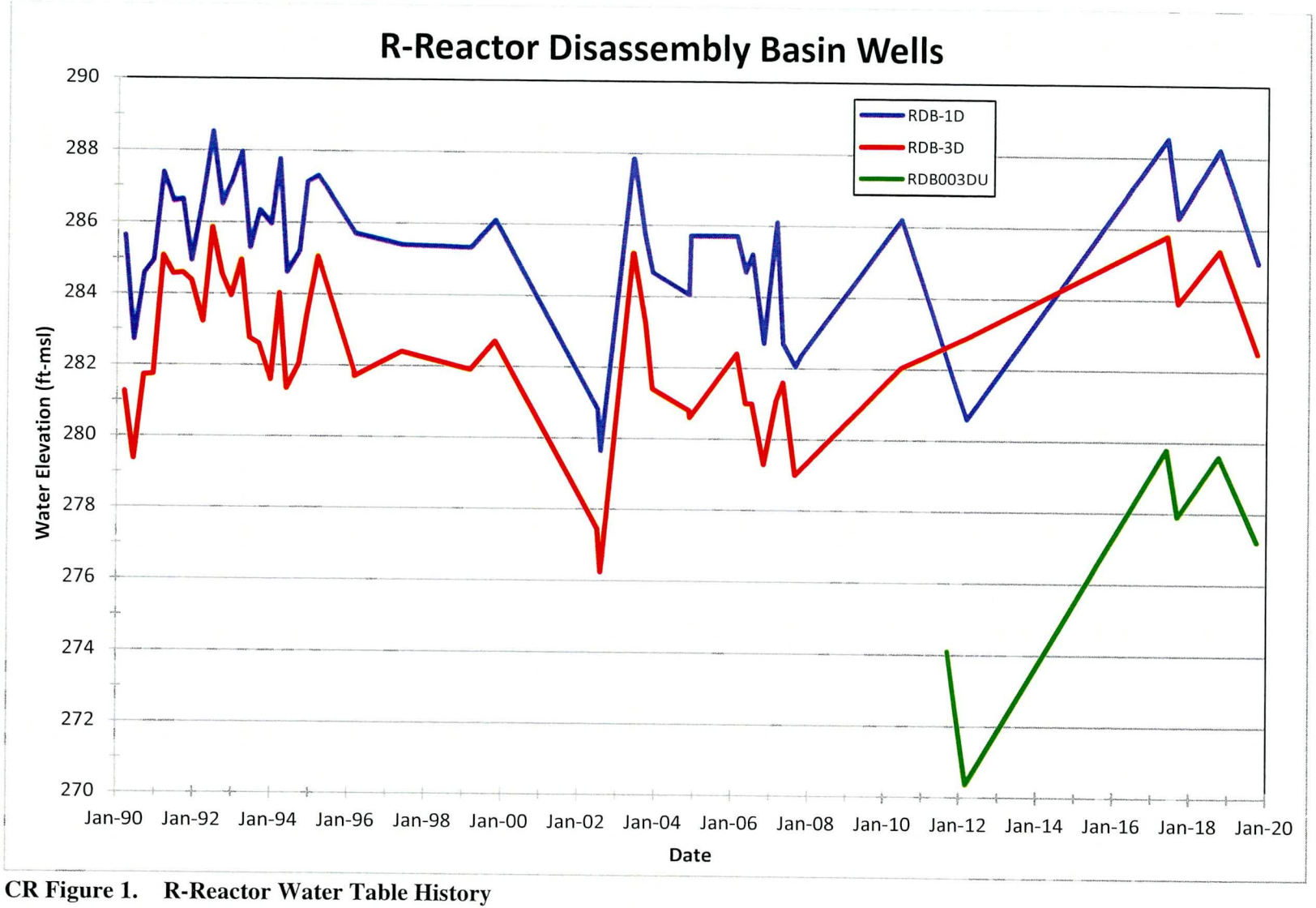

CR Figure 1. R-Reactor Water Table History