

2018 Annual Groundwater Monitoring and Corrective Action Report

Coffeen GMF Recycle Pond – CCR Unit ID 104
Coffeen Power Station
134 Cips Lane
Coffeen, Illinois 62017

Illinois Power Generating Company

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2018 Annual Groundwater Monitoring and Corrective Action Report

Coffeen GMF Recycle Pond – CCR Unit ID 104
Coffeen Power Station
Coffeen, Illinois

Prepared for:
Illinois Power Generating Company



KRISTEN L. THEESFELD, PG
Hydrogeologist



ERIC J. TLACHAC, PE
Senior Engineer

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ACRONYMS AND ABBREVIATIONS

CCR	Coal Combustion Residuals
CFR	Code of Federal Regulations
GWPS	Groundwater Protection Standard
mg/L	milligrams per liter
NRT/OBG	Natural Resource Technology, an OBG Company
OBG	O'Brien & Gere Engineers, part of Ramboll
pCi/L	picoCuries per liter
SSI	Statistically Significant Increase
SSL	Statistically Significant Level
S.U.	Standard Units
TDS	Total Dissolved Solids

SECTION 1: INTRODUCTION

This report has been prepared on behalf of Illinois Power Generating Company by O'Brien & Gere Engineers, part of Ramboll (OBG), to provide the information required by the Code of Federal Regulations (CFR) found in 40 CFR 257.90(e) for the Coffeen GMF Recycle Pond located at Coffeen Power Station near Coffeen, Illinois.

In accordance with 40 CFR 257.90(e), the owner or operator of an existing Coal Combustion Residual (CCR) unit must prepare an annual groundwater monitoring and corrective action report, for the preceding calendar year, that documents the status of the groundwater monitoring and corrective action program for the CCR unit, summarizes key actions completed, describes any problems encountered, discusses actions to resolve the problems, and projects key activities for the upcoming year. At a minimum, the annual report must contain the following information, to the extent available:

1. A map, aerial image, or diagram showing the CCR unit and all background (or upgradient) and downgradient monitoring wells, to include the well identification numbers, that are part of the groundwater monitoring program for the CCR unit.
2. Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken.
3. In addition to all the monitoring data obtained under §§ 257.90 through 257.98, a summary including the number of groundwater samples that were collected for analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs.
4. A narrative discussion of any transition between monitoring programs (e.g., the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at a statistically significant increase over background levels).
5. Other information required to be included in the annual report as specified in §§ 257.90 through 257.98¹.

This report provides the required information for the Coffeen GMF Recycle Pond for calendar year 2018.

¹ For calendar year 2018, corrective action and other information required to be included in the annual report as specified in §§ 257.96 through 257.98 is not applicable.

SECTION 2: MONITORING AND CORRECTIVE ACTION PROGRAM STATUS

Detection Monitoring sampling event dates and parameters collected are provided in the detection monitoring program summary table. Analytical data was evaluated in accordance with the Statistical Analysis Plan, Coffeen Power Station, Illinois Power Generating Company (NRT/OBG, 2017a) to identify any statistically significant increases (SSIs) of Appendix III parameters over background concentrations. The dates the SSIs were evaluated are provided below.

Detection Monitoring Program Summary Table

Sampling Dates	Parameters Collected	SSIs	Assessment Monitoring Program Established
October 25, 2017 and November 4, 2017	Appendix III	Yes	April 9, 2018

Alternate source evaluations were inconclusive for one or more of the SSIs. Consequently, and in accordance with 40 CFR § 257.94(e)(2), an Assessment Monitoring Program was established for Coffeen GMF Recycle Pond on April 9, 2018 and the required notifications completed.

The first Assessment Monitoring sampling event was completed on May 11, 2018 and May 16, 2018. All wells were sampled for Appendix III and Appendix IV parameters. The sampling team did not collect adequate sample volume to analyze for Radium 226/228, so they returned to Coffeen GMF Recycle Pond on May 30-31, 2018 to collect an additional sample from each background and downgradient well in the monitoring system for Radium analysis.

In accordance with 40 CFR 257.95(d)(1), all wells were resampled on August 3, 2018 and August 10, 2018 for all Appendix III parameters and Appendix IV parameters detected during the first Assessment Monitoring sampling event. Analytical data from the resampling event was evaluated in accordance with the statistical analysis plan (NRT/OBG, 2017a) to determine any SSIs of Appendix III parameters over background concentrations or statistically significant levels (SSLs) of Appendix IV parameters over Groundwater Protection Standards (GWPSs). The assessment monitoring program summary table below provides a summary of the Assessment Monitoring Program and results of SSL determinations.

Assessment Monitoring Program Summary Table

Sampling Dates	Parameters Collected	SSLs
May 11, 16, 30, and 31, 2018	Appendix III Appendix IV	Not Applicable
August 3 and 10, 2018	Appendix III Appendix IV Detected	To Be Determined

Statistical background values are provided in Table 1 and GWPSs in Table 2. Analytical results from the events summarized in the detection and assessment monitoring summary tables above are included in Tables 3 and 4.

The Coffeen GMF Recycle Pond remains in the Assessment Monitoring Program in accordance with 40 CFR 257.95.

SECTION 3: KEY ACTIONS COMPLETED IN 2018

Two groundwater monitoring events were completed in 2018 under the Assessment Monitoring Program. These events occurred in May and August and are detailed in Section 2.

In general, one groundwater sample was collected from each background and downgradient well in the monitoring system during each event. The sampling team did not collect adequate sample volume during the May sampling event to analyze for Radium 226/228, so they returned to Coffeen GMF Recycle Pond later that month to collect an additional sample from each background and downgradient well in the monitoring system for Radium analysis.

All samples were collected and analyzed in accordance with the Sampling and Analysis Plan (NRT/OBG, 2017b). All monitoring data obtained under 40 CFR §§ 257.90 through 257.98 (as applicable) in 2018 are presented in Tables 3 and 4

The groundwater monitoring system, including the CCR unit and all background and downgradient monitoring wells is presented in Figure 1.

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SECTION 4: PROBLEMS ENCOUNTERED AND ACTIONS TO RESOLVE THE PROBLEMS

No problems were encountered with the groundwater monitoring program during 2018. Groundwater samples were collected and analyzed in accordance with the Sampling and Analysis Plan (NRT/OBG, 2017b), and all data was accepted.

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SECTION 5: KEY ACTIVITIES PLANNED FOR 2019

The following key activities are planned for 2019:

- Continuation of the Assessment Monitoring Program with semi-annual sampling scheduled for the first and third quarters of 2019.
- Complete evaluation of analytical data from the downgradient wells, using GWPSs to determine whether an SSL of Appendix IV parameters has occurred.
- If an SSL is identified, potential alternate sources (i.e., a source other than the CCR unit caused the SSL or that SSL resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality) will be evaluated. If an alternate source is demonstrated to be the cause of the SSL, a written demonstration will be completed within 90 days of SSL determination and included in the annual groundwater monitoring and corrective action report for 2019.
- » If an alternate source(s) is not identified to be the cause of the SSL, the applicable requirements of 40 CFR §§ 257.94 through 257.98 (e.g., assessment of corrective measures) as may apply in 2019 will be met, including associated recordkeeping/notifications required by 40 CFR §§ 257.105 through 257.108.

REFERENCES

Natural Resource Technology, an OBG Company, 2017a, Statistical Analysis Plan, Coffeen Power Station, Newton Power Station, Illinois Power Generating Company, October 17, 2017.

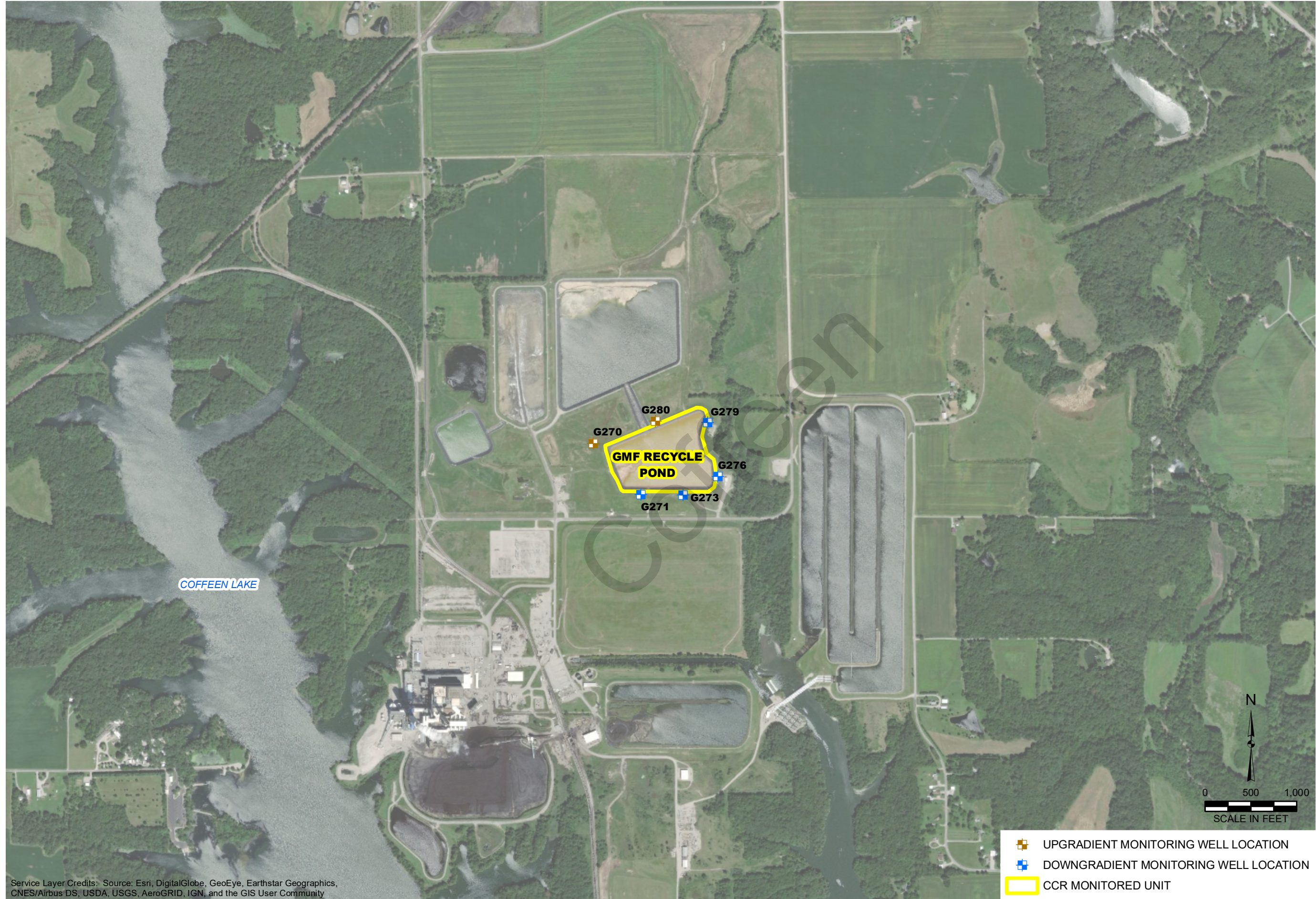
Natural Resource Technology, an OBG Company, 2017b, Sampling and Analysis Plan, Coffeen GMF Recycle Pond, Coffeen Power Station, Coffeen, Illinois, Project No. 2285, Revision 0, October 17, 2017.

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Figures

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Y:\Mapping\Projects\222285M\XD\2018_AnnualGWM_CAR\Figure 1_GWS_WellLoc_CoffeeGMF_RP.mxd Author: stolzsd; Date/Time: 1/28/2019, 3:31:03 PM



DRAWN BY/DATE:
SDS 11/28/18
REVIEWED BY/DATE:
RAB 1/24/19
APPROVED BY/DATE:
KLT 1/28/19

GROUNDWATER SAMPLING WELL LOCATION MAP
COFFEEN GMF RECYCLE POND
UNIT ID: 104
2018 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
VISTRA CCR RULE GROUNDWATER MONITORING
COFFEEN POWER STATION
COFFEEN, ILLINOIS

PROJECT NO: 70099

FIGURE NO: 1



Tables

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Table 1. Statistical Background Values

2018 Annual Groundwater Monitoring and Corrective Action Report

Coffeen Power Station

Unit ID 104 - GMF Recycle Pond

Parameter	Statistical Background Value
Appendix III	
Boron (mg/L)	0.029
Calcium (mg/L)	120
Chloride (mg/L)	54
Fluoride (mg/L)	0.493
pH (S.U.)	6.6 / 7.5
Sulfate (mg/L)	101.4
TDS (mg/L)	470

[O: KLT 10/3/18, C: RAB 12/28/18]

Notes:

mg/L = milligrams per liter

S.U. = Standard Units

TDS = Total Dissolved Solids

Table 2. Groundwater Protection Standards

2018 Annual Groundwater Monitoring and Corrective Action Report

Coffeen Power Station

Unit ID 104 - GMF Recycle Pond

Parameter	Groundwater Protection Standard
Appendix IV	
Antimony (mg/L)	0.006
Arsenic (mg/L)	0.01
Barium (mg/L)	2
Beryllium (mg/L)	0.004
Cadmium (mg/L)	0.005
Chromium (mg/L)	0.10
Cobalt (mg/L)	0.006
Fluoride (mg/L)	4
Lead (mg/L)	0.015
Lithium (mg/L)	0.04
Mercury (mg/L)	0.002
Molybdenum (mg/L)	0.10
Selenium (mg/L)	0.05
Thallium (mg/L)	0.002
Radium 226+228 (pCi/L)	5

[O: KLT 10/3/18, C: RAB 12/28/18]

Notes:

mg/L = milligrams per liter

pCi/L = picoCuries per liter

Table 3. Appendix III Analytical Results**2018 Annual Groundwater Monitoring and Corrective Action Report**

Coffeen Power Station

Unit ID 104 - GMF Recycle Pond

Sample Location	Date Sampled	B, total (mg/L)	Ca, total (mg/L)	Cl, total (mg/L)	F, total (mg/L)	pH (field) (S.U.)	SO4, total (mg/L)	TDS (mg/L)
Background / Upgradient Monitoring Wells								
G270	10/25/2017	0.011	56	13	0.338	7.1	55	400
	5/11/2018	<0.01	53	7.9	0.270	7.1	53	400
	8/3/2018	<0.01	57	8.6	0.360	7.1	54	420
G280	11/4/2017	0.013	63	48	0.490	7.2	57	350
	5/16/2018	<0.01	57	43	0.288	7.2	52	360
	8/10/2018	<0.01	62	55	0.414	7.1	63	400
Downgradient Monitoring Wells								
G271	11/4/2017	0.67	100	24	0.426	7.3	360	820
	5/16/2018	0.41	76	38	0.602	7.3	330	820
	8/10/2018	0.45	86	32	0.439	7.1	470	880
G273	11/4/2017	0.079	120	50	0.333	7.0	380	820
	5/16/2018	0.25	160	50	0.390	7.2	490	1100
	8/10/2018	0.12	140	53	0.367	7.1	460	940
G276	11/4/2017	0.023	120	20	0.431	7.1	210	720
	5/16/2018	0.021	110	24	0.466	7.1	220	740
	8/10/2018	0.017	120	24	0.399	7.1	230	760
G279	11/4/2017	0.57	220	170	0.507	7.2	870	1600
	5/16/2018	0.25	180	76	0.492	7.1	540	1200
	8/10/2018	0.53	250	160	0.427	7.1	940	1800

[O: RAB 12/27/18, C: JQW 12/28/18]

Notes:

mg/L = milligrams per liter

S.U. = Standard Units

TDS = Total Dissolved Solids

< = concentration is less than the reporting limit

Table 4. Appendix IV Analytical Results

2018 Annual Groundwater Monitoring and Corrective Action Report

Coffeen Power Station

Unit ID 104 - GMF Recycle Pond

Sample Location	Date Sampled	Sb, total (mg/L)	As, total (mg/L)	Ba, total (mg/L)	Be, total (mg/L)	Cd, total (mg/L)	Cr, total (mg/L)	Co, total (mg/L)	F, total (mg/L)	Pb, total (mg/L)	Li, total (mg/L)	Hg, total (mg/L)	Mo, total (mg/L)	Ra226/228 Combined (pCi/L)	Se, total (mg/L)	Tl, total (mg/L)
Background / Upgradient Monitoring Wells																
G270	5/11/2018	<0.003	<0.001	0.038	<0.001	<0.001	<0.004	<0.002	0.27	<0.001	<0.01	<0.0002	0.0014	NA	<0.001	<0.001
	5/30/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.283	NA	NA
	8/3/2018 ^a	NA	<0.001	0.036	NA	<0.001	<0.004	<0.002	0.360	<0.001	<0.01	NA	<0.001	0.990	NA	NA
G280	5/16/2018	<0.003	0.0011	0.038	<0.001	<0.001	<0.004	<0.002	0.288	0.0011	<0.01	<0.0002	0.0012	NA	0.0042	<0.001
	5/31/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.397	NA	NA
	8/10/2018 ^a	NA	<0.001	0.038	NA	NA	NA	NA	0.414	<0.001	<0.01	NA	<0.001	0.634	0.0022	NA
Downgradient Monitoring Wells																
G271	5/16/2018	<0.003	<0.001	0.021	<0.001	<0.001	<0.004	<0.002	0.602	<0.001	<0.01	<0.0002	0.0015	NA	0.0025	<0.001
	5/31/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.878	NA	NA
	8/10/2018 ^a	NA	<0.001	0.024	NA	NA	NA	NA	0.439	<0.001	<0.01	NA	0.0013	1.16	0.0022	NA
G273	5/16/2018	<0.003	<0.001	0.032	<0.001	<0.001	<0.004	<0.002	0.390	<0.001	0.012	<0.0002	<0.001	NA	<0.001	<0.001
	5/31/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.386	NA	NA
	8/10/2018 ^a	NA	<0.001	0.027	NA	NA	NA	NA	0.367	<0.001	<0.01	NA	<0.001	0.760	<0.001	NA
G276	5/16/2018	<0.003	<0.001	0.073	<0.001	<0.001	<0.004	<0.002	0.466	<0.001	0.015	<0.0002	<0.001	NA	0.0018	<0.001
	5/31/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.04	NA	NA
	8/10/2018 ^a	NA	<0.001	0.069	NA	NA	NA	NA	0.399	<0.001	0.013	NA	<0.001	0.325	0.0011	NA
G279	5/16/2018	<0.003	<0.001	0.052	<0.001	<0.001	<0.004	<0.002	0.492	<0.001	<0.01	<0.0002	<0.001	NA	0.0072	<0.001
	5/31/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.494	NA	NA
	8/10/2018 ^a	NA	<0.001	0.044	NA	NA	NA	NA	0.427	<0.001	0.011	NA	<0.001	0.799	0.0092	NA

[O: RAB 12/27/18, C: JQW 12/28/18, U: AJB 1/28/19]

Notes:

mg/L = milligrams per liter

NA = Not Analyzed

pCi/L = picoCuries per liter

< = concentration is less than the reporting limit

^aOnly the parameters detected during the previous sampling event were analyzed during this sampling event, in accordance with 40CFR § 257.95(d)(1).

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