

2018 Annual Groundwater Monitoring and Corrective Action Report

Coffeen Ash Pond No. 1 – CCR Unit ID 101
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 Ash Pond No. 1 – CCR Unit ID 101
Coffeen Power Station
Coffeen, Illinois

Prepared for:
Illinois Power Generating Company



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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

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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 Title 40 of the Code of Federal Regulations (40 CFR), Section 257.90(e) for Coffeen Ash Pond No. 1 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 Residuals (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 Coffeen Ash Pond No. 1 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 Program sampling event dates and parameters collected are provided in the detection monitoring program summary table below. One sample was collected from each background and downgradient well in the monitoring system during each sampling event. Analytical data was evaluated after each event in accordance with the Statistical Analysis Plan, Coffeen Power Station, Newton Power Station, Illinois Power Generating Company (NRT/OBG, 2017a) to identify any statistically significant increases (SSIs) of Appendix III parameters over background concentrations.

Downgradient monitoring well G304 was abandoned on July 26, 2016 due to concerns for proper construction. G307 was installed on July 27, 2016 as a replacement, and monitors the same hydrologic unit, at a similar elevation, as G304. Data from nine total sampling rounds will be pooled between MW304 and MW307 for statistical evaluation.

The dates the SSIs were evaluated are provided in the detection monitoring program summary table below.

Detection Monitoring Program Summary			
Sampling Dates	Parameters Collected	SSIs	Assessment Monitoring Program Established
October 25, 26, and 27, 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 Ash Pond No. 1 on April 9, 2018 and the required notifications completed.

The first Assessment Monitoring sampling event was completed in May. One sample was collected from each background and downgradient well in the monitoring system on May 11, and 14, 2018 and analyzed for Appendix III and IV parameters. The sampling team did not collect adequate sample volume to analyze for Radium 226/228, so they returned to Coffeen Ash Pond No. 1 on May 30, 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 for all Appendix III parameters and Appendix IV parameters detected during the first Assessment Monitoring sampling event. One sample was collected from each background and downgradient well in the monitoring system. Analytical data from the resampling event was evaluated in accordance with the Statistical Analysis Plan 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		
Sampling Dates	Parameters Collected	SSLs
May 11, 14, and 30, 2018	Appendix III Appendix IV	Not Applicable
August 3, 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.

Coffeen Ash Pond No. 1 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 initial May sampling event to analyze for Radium 226/228, so they returned to Coffeen Ash Pond No. 1 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. No changes were made to the monitoring well network in 2018.

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 first and third quarters of 2019.
- Complete evaluation of analytical data from the downgradient wells, using GWPSs to determine whether an SSL of an Appendix IV parameter 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.

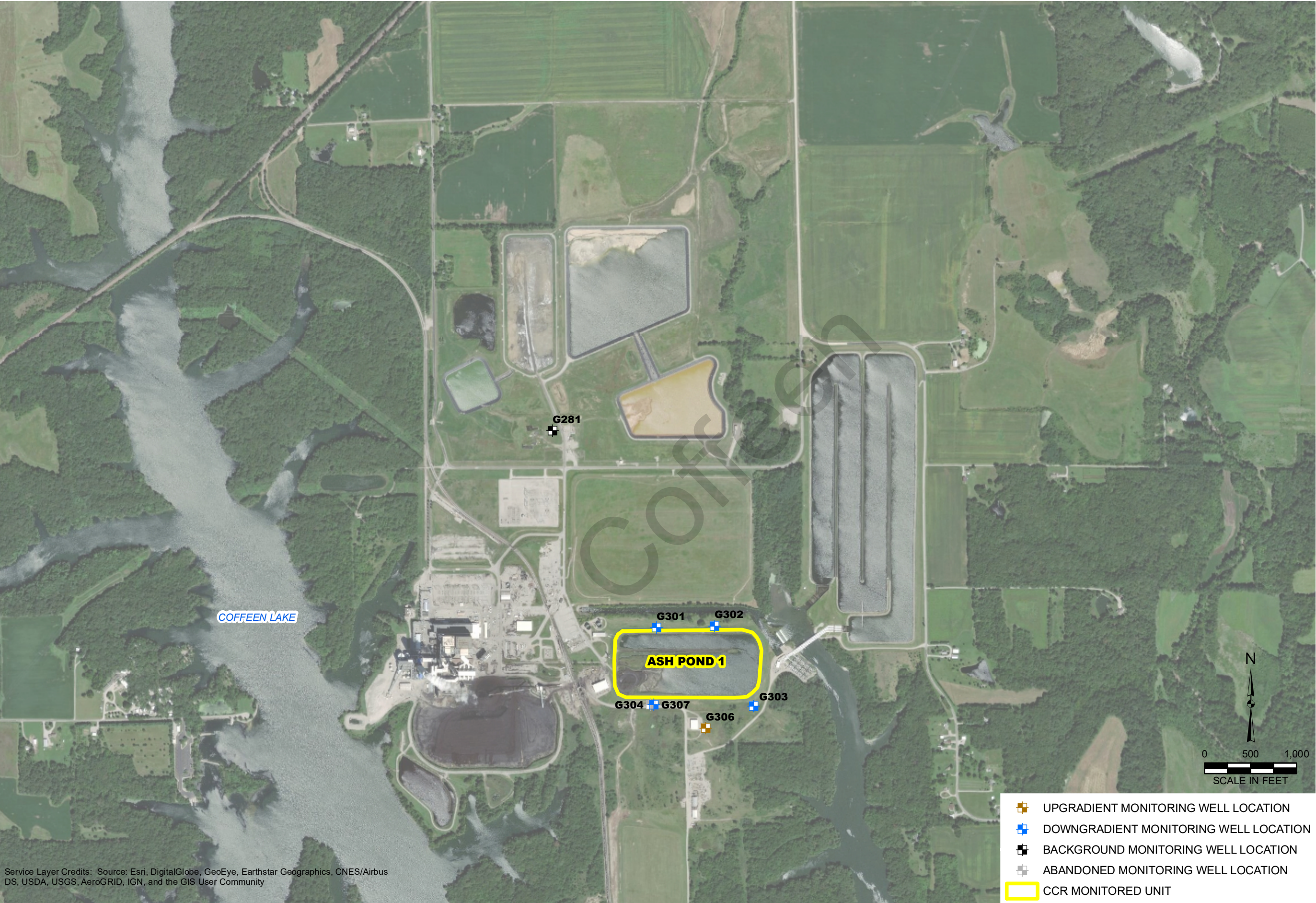
Natural Resource Technology, an OBG Company, 2017b, Sampling and Analysis Plan, Coffeen Ash Pond No. 1, Coffeen Power Station, Coffeen, Illinois, Project No. 2285, Revision 0, October 17, 2017.

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Figures

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Y:\Mapping\Projects\222285\MXD\2018_AnnualGWM_CAR\Figure 1_GWS_WellLoc_CoffeenAshPond1.mxd Author: stobzsd; Date/Time: 1/28/2019, 3:32:13 PM



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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 ASH POND NO. 1
UNIT ID: 101
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 101 - Ash Pond No. 1

Parameter	Statistical Background Value
Appendix III	
Boron (mg/L)	2.9
Calcium (mg/L)	150.901
Chloride (mg/L)	75
Fluoride (mg/L)	0.459
pH (S.U.)	6.5 / 7.1
Sulfate (mg/L)	700
TDS (mg/L)	884

[O: EJT 11/20/18, 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

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Unit ID 101 - Ash Pond No. 1

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)	0.0064
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: EJT 11/20/18, C: RAB 12/28/18]

Notes:

mg/L = milligrams per liter

pCi/L = picoCuries per liter

Table 3. Appendix III Analytical Results

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Unit ID 101 - Ash Pond No. 1

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								
G281	10/25/2017	0.012	110	64	0.351	7.0	300	800
	5/11/2018	<0.01	120	69	0.268	7.1	310	840
	8/3/2018	0.013	130	66	0.364	7.0	280	840
G306	10/27/2017	3.1	120	4.7	0.332	6.9	350	720
	5/14/2018	2.8	130	3.9	0.319	6.9	320	720
	8/3/2018	2.7	160	3.7	0.313	7.0	290	820
Downgradient Monitoring Wells								
G301	10/26/2017	2.3	110	22	0.28	6.8	680	1100
	5/11/2018	2.1	130	22	0.302	6.9	810	1200
	8/3/2018	2.4	150	20	0.31	6.9	860	1200
G302	10/26/2017	1.1	180	8.3	0.319	7.1	320	840
	5/11/2018	2.1	170	17	0.329	7.1	510	1100
	8/3/2018	2.3	180	17	0.30	7.0	500	1200
G303	10/26/2017	2.5	130	28	0.311	7.0	600	1300
	5/14/2018	1.5	170	30	0.279	7.0	780	1500
	8/3/2018	1.6	200	28	0.275	7.0	780	1600
G307	10/27/2017	2.1	230	18	0.411	7.0	980	1400
	5/14/2018	2.2	220	17	0.389	7.1	1100	1400
	8/3/2018	2.0	270	17	0.391	7.0	1100	1500

[O: RAB 12/26/18, C: JQW 12/27/18]

Notes:

mg/L = milligrams per liter

S.U. = Standard Units

< = concentration is less than the reporting limit

Table 4. Appendix IV Analytical Results

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Unit ID 101 - Ash Pond No. 1

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)	Ra 226/228 Combined (pCi/L)	Se, total (mg/L)	Tl, total (mg/L)
Background / Upgradient Monitoring Wells																
G281	5/11/2018	<0.003	<0.001	0.081	<0.001	<0.001	<0.004	0.0023	0.268	0.0017	<0.01	<0.0002	<0.001	NA	<0.001	<0.001
	5/30/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.742	NA	NA
	8/3/2018 ^a	NA	0.0029	0.100	NA	<0.001	0.0059	0.0036	0.364	0.003	<0.01	NA	<0.001	1.05	NA	NA
G306	5/14/2018	<0.003	<0.001	0.060	<0.001	<0.001	<0.004	<0.002	0.319	<0.001	0.01	<0.0002	0.0013	NA	<0.001	<0.001
	5/30/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.31	NA	NA
	8/3/2018 ^a	NA	0.0093	0.170	NA	<0.001	0.035	0.0094	0.313	0.012	0.02	NA	0.0026	0.454	NA	NA
Downgradient Monitoring Wells																
G301	5/11/2018	<0.003	0.0016	0.060	<0.001	<0.001	0.0081	0.0042	0.302	0.0047	0.011	<0.0002	<0.001	NA	<0.001	<0.001
	5/30/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.54	NA	NA
	8/3/2018 ^a	NA	0.0035	0.084	NA	<0.001	0.014	0.0051	0.310	0.0058	0.012	NA	<0.001	1.28	NA	NA
G302	5/11/2018	<0.003	0.0053	0.039	<0.001	<0.001	<0.004	0.0034	0.329	0.0018	0.022	<0.0002	0.0024	NA	<0.001	<0.001
	5/30/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.76	NA	NA
	8/3/2018 ^a	NA	0.0051	0.054	NA	<0.001	0.0074	0.0046	0.300	0.0041	0.02	NA	0.0016	0.458	NA	NA
G303	5/14/2018	<0.003	0.0064	0.018	<0.001	<0.001	<0.004	0.0032	0.279	<0.001	0.05	<0.0002	0.0024	NA	<0.001	<0.001
	5/30/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.20	NA	NA
	8/3/2018 ^a	NA	0.0044	0.019	NA	<0.001	<0.004	0.0031	0.275	<0.001	0.041	NA	0.002	0.216	NA	NA
G307	5/14/2018	<0.003	0.0037	0.071	<0.001	0.0015	0.013	0.0059	0.389	0.007	0.02	<0.0002	0.0021	NA	<0.001	<0.001
	5/30/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.813	NA	NA
	8/3/2018 ^a	NA	0.0064	0.100	NA	0.0034	0.025	0.0078	0.391	0.013	0.02	NA	0.0022	0.0687	NA	NA

[O: RAB 12/26/18, C:JQW 12/17/18, U: AJB 1/28/19]

Notes:

mg/L = milligrams per liter

pCi/L = picoCuries per liter

< = concentration is less than the reporting limit

NA = Not Analyzed

^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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