2018 Annual Groundwater Monitoring and Corrective Action Report

Coffeen Ash Pond No. 2 – CCR Unit ID 102
Coffeen Power Station
134 Cips Lane
Coffeen, Illinois 62017

Illinois Power Generating Company

January 31, 2019

OBG
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JANUARY 31, 2019 | PROJECT #70099

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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

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 the Coffeen Ash Pond No. 2 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 257.98[1].

This report provides the required information for the Coffeen Ash Pond No. 2 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, 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 in the detection monitoring program summary table below.

Detection Monitoring Program Summary

Sampling Dates	Parameters Collected	SSIs	Assessment Monitoring Program Established
October 25, 27, and 28, 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. 2 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 11-12, 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. 2 on May 29-31, 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 and 4, 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, 12, 29, 30, and 31, 2018	Appendix III Appendix IV	Not Applicable
August 3 and 4, 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. 2 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. 2 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.

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.

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 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. 2, Coffeen Power Station, Coffeen, Illinois, Project No. 2285, Revision 0, October 17, 2017.

Figures

GROUNDWATER SAMPLING WELL LOCATION MAP
COFFEEN ASH POND NO. 2
UNIT ID: 102

2018 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
VISTRA CCR RULE GROUNDWATER MONITORING
COFFEEN POWER STATION
COFFEEN, ILLINOIS

DRAWN BY/DATE:
SDS 12/18/18
REVIEWED BY/DATE:
RAB 12/18/18
APPROVED BY/DATE:
KLT 1/24/19

PROJECT NO: 70099

FIGURE NO: 1

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Tables

Table 1. Statistical Background Values

2018 Annual Groundwater Monitoring and Corrective Action Report
Coffeen Power Station
Unit ID 102 - Coffeen Ash Pond No. 2

Parameter	Statistical Background Value
Appendix III	
Boron (mg/L)	0.022
Calcium (mg/L)	150
Chloride (mg/L)	75
Fluoride (mg/L)	0.483
pH (STD)	6.7 / 7.3
Sulfate (mg/L)	370
TDS (mg/L)	840

[O: KLS 8/28/18, C: RAB 8/28/18]

Notes:

mg/L = milligrams per liter
STD = 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 102 - Coffeen Ash Pond No. 2

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: KLS 8/28/18, C: RAB 8/28/18]

Notes:

mg/L = milligrams per liter
pCi/L = picoCuries per liter

Table 3. Appendix III Analytical Results

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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	0.36	7.1	54	420
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
Downgradient Monitoring Wells								
G401	10/27/2017	4.4	490	3.2	<0.25	6.3	2000	2900
	5/12/2018	3.7	450	2.2	<0.25	6.2	2200	2700
	8/4/2018	3.9	690	2.1	<0.25	6.2	2200	2900
G402	10/27/2017	7.3	260	3.5	0.322	6.7	1000	1700
	5/12/2018	5.9	240	2.2	0.370	6.6	1000	1700
	8/4/2018	5.7	270	2.3	0.337	6.7	940	1700
G403	10/28/2017	0.060	67	4.1	0.544	7.2	7.0	340
	5/12/2018	0.010	70	3.7	0.404	6.9	15	310
	8/4/2018	0.037	71	3.9	0.375	7.0	20	360
G404	10/28/2017	5.8	160	57	0.290	6.9	390	950
	5/12/2018	4.1	150	82	<0.25	7.1	370	1000
	8/4/2018	4.8	180	69	<0.25	7.2	410	1000
G405	10/28/2017	11	300	26	0.613	7.0	1300	2000
	5/12/2018	9.1	260	23	0.497	6.9	1200	1900
	8/4/2018	7.8	220	22	0.665	6.6	790	1400

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

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

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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																
G270	5/11/2018	<0.003	<0.001	0.038	<0.001	<0.001	<0.004	<0.002	0.270	<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
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	0.10	NA	<0.001	0.0059	0.0036	0.364	0.0030	<0.01	NA	<0.001	1.05	NA	NA
Downgradient Monitoring Wells																
G401	5/12/2018	<0.003	0.015	0.14	<0.001	0.0032	0.030	0.30	<0.25	0.022	0.057	<0.0002	0.0024	NA	0.0031	<0.001
	5/31/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.12	NA	NA
	8/4/2018[a]	NA	0.13	1.5	NA	0.018	0.44	0.42	<0.25	NA	0.32	NA	0.016	1.68	0.021	NA
G402	5/12/2018	<0.003	0.0052	0.041	<0.001	<0.001	0.0046	0.0077	0.370	0.0030	0.029	<0.0002	0.0029	NA	<0.001	<0.001
	5/31/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.98	NA	NA
	8/4/2018[a]	NA	0.0076	0.062	NA	<0.001	0.0093	0.010	0.337	NA	0.03	NA	0.0029	2.61	<0.001	NA
G403	5/12/2018	<0.003	0.0023	0.15	<0.001	<0.001	<0.004	0.0031	0.404	<0.001	<0.01	<0.0002	0.001	NA	<0.001	<0.001
	5/31/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.20	NA	NA
	8/4/2018[a]	NA	0.0018	0.15	NA	<0.001	<0.004	0.0034	0.375	NA	<0.01	NA	<0.001	0.767	<0.001	NA
G404	5/12/2018	<0.003	<0.001	0.042	<0.001	<0.001	<0.004	<0.002	<0.25	<0.001	0.013	<0.0002	<0.001	NA	<0.001	<0.001
	5/31/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.905	NA	NA
	8/4/2018[a]	NA	<0.001	0.036	NA	<0.001	<0.004	<0.002	<0.25	NA	<0.01	NA	<0.001	0.553	<0.001	NA
G405	5/12/2018	<0.003	0.0046	0.026	<0.001	<0.001	<0.004	0.0030	0.497	0.0067	0.034	<0.0002	0.0016	NA	<0.001	<0.001
	5/31/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.918	NA	NA
	8/4/2018[a]	NA	0.0013	0.020	NA	<0.001	<0.004	<0.002	0.665	NA	<0.01	NA	0.0015	1.35	<0.001	NA

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