

Prepared for

**Illinois Power Generating Company**

Document type

**2019 Annual Groundwater Monitoring and Corrective Action Report**

Date

**January 31, 2020**

# **2019 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT**

## **COFFEEN GYPSUM MANAGEMENT FACILITY RECYCLE POND, COFFEEN POWER STATION**

**2019 ANNUAL GROUNDWATER MONITORING AND  
CORRECTIVE ACTION REPORT  
COFFEEN GYPSUM MANAGEMENT FACILITY RECYCLE  
POND, COFFEEN POWER STATION**

Project name **Coffeen Power Station**  
Project no. **72752**  
Recipient **Illinois Power Generating Company**  
Document type **Annual Groundwater Monitoring and Corrective Action Report**  
Version **FINAL**  
Date **January 31, 2020**  
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Description **Annual Report in Support of the CCR Rule Groundwater Monitoring Program**

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## ACRONYMS AND ABBREVIATIONS

CCR	Coal Combustion Residuals
GMF	Gypsum Management Facility
GWPS	Groundwater Protection Standard
SAP	Sampling and Analysis Plan
SSL	Statistically Significant Level

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## EXECUTIVE SUMMARY

This report has been prepared to provide the information required by Title 40 of the Code of Federal Regulations (40 C.F.R.) § 257.90(e) for Coffeen Gypsum Management Facility (GMF) Recycle Pond located at Coffeen Power Station near Coffeen, Illinois.

Groundwater is being monitored at Coffeen GMF Recycle Pond in accordance with the Assessment Monitoring Program requirements specified in 40 C.F.R. § 257.95.

No changes were made to the monitoring system in 2019 (no wells were installed or decommissioned).

No Statistically Significant Levels (SSLs) of 40 C.F.R. Part 257 Appendix IV parameters were determined in 2019 and Coffeen GMF Recycle Pond remains in the Assessment Monitoring Program.

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## 1. INTRODUCTION

This report has been prepared by Ramboll on behalf of Illinois Power Generating Company, to provide the information required by 40 C.F.R. § 257.90(e) for Coffeen GMF Recycle Pond located at Coffeen Power Station near Coffeen, Illinois.

In accordance with 40 C.F.R. § 257.90(e), the owner or operator of a 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 relative to background levels).
5. Other information required to be included in the Annual Report as specified in §§ 257.90 through 257.98.

This report provides the required information for Coffeen GMF Recycle Pond for calendar year 2019.

## **2. MONITORING AND CORRECTIVE ACTION PROGRAM STATUS**

No changes have occurred to the Monitoring Program status in calendar year 2019, and Coffeen GMF Recycle Pond remains in the Assessment Monitoring Program in accordance with 40 C.F.R. § 257.95.

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### 3. KEY ACTIONS COMPLETED IN 2019

The Assessment Monitoring Program is summarized in Table A. 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 system in 2019 (no wells were installed or decommissioned). In general, one groundwater sample was collected from each background and downgradient well during each monitoring event. All samples were collected and analyzed in accordance with the Sampling and Analysis Plan (SAP) (NRT/OBG, 2017a). All monitoring data obtained under 40 C.F.R. §§ 257.90 through 257.98 (as applicable) in 2019 are presented in Tables 1 and 2. Analytical data were evaluated in accordance with the Statistical Analysis Plan (NRT/OBG, 2017b) to determine any SSLs of Appendix IV parameters over Groundwater Protection Standards (GWPSs).

Statistical background values are provided in Table 3 and GWPSs in Table 4.

Analytical results for the May and August 2018 sampling events were provided in the 2018 Annual Groundwater Monitoring and Corrective Action Report.

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**Table A – 2018-2019 Assessment Monitoring Program Summary**

Sampling Dates	Analytical Data Receipt Date	Parameters Collected	SSL(s)	SSL(s) Determination Date
May 11, 16, 30, and 31, 2018	October 10, 2018	Appendix III Appendix IV	NA	NA
August 3 and 10, 2018	October 10, 2018	Appendix III Appendix IV Detected <sup>1</sup>	None	January 7, 2019
January 21-23, 2019	April 15, 2019	Appendix III Appendix IV	None	July 15, 2019
August 15 and 26, 2019	October 15, 2019	Appendix III Appendix IV Detected <sup>1</sup>	NA	TBD

**Notes:**

NA: Not Applicable

TBD: To Be Determined

1. Groundwater sample analysis was limited to Appendix IV parameters detected in previous events in accordance with 40 C.F.R. § 257.95(d)(1).

#### **4. PROBLEMS ENCOUNTERED AND ACTIONS TO RESOLVE THE PROBLEMS**

No problems were encountered with the Groundwater Monitoring Program during 2019. Groundwater samples were collected and analyzed in accordance with the SAP (NRT/OBG, 2017a), and all data were accepted.

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## 5. KEY ACTIVITIES PLANNED FOR 2020

The following key activities are planned for 2020:

- Continuation of the Assessment Monitoring Program with semi-annual sampling scheduled for the first and third quarters of 2020.
- 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 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 2020 Annual Groundwater Monitoring and Corrective Action Report.
  - If an alternate source(s) is not identified to be the cause of the SSL, the applicable requirements of 40 C.F.R. §§ 257.94 through 257.98 (e.g., assessment of corrective measures) as may apply in 2020 will be met, including associated recordkeeping/notifications required by 40 C.F.R. §§ 257.105 through 257.108.

## 6. REFERENCES

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

Natural Resource Technology, an OBG Company (NRT/OBG), 2017b. Statistical Analysis Plan, Coffeen Power Station, Newton Power Station, Illinois Power Generating Company, October 17, 2017.

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**TABLES**

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**TABLE 1.**  
**2019 ANALYTICAL RESULTS - GROUNDWATER ELEVATION AND APPENDIX III PARAMETERS**  
**2019 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT**  
COFFEEN POWER STATION  
UNIT ID 104 - GMF RECYCLE POND  
COFFEEN, ILLINOIS  
ASSESSMENT MONITORING PROGRAM

Well Identification Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Date & Time Sampled	Depth to Groundwater (ft) <sup>1</sup>	Groundwater Elevation (ft NAVD88)	40 C.F.R. Part 257 Appendix III						
						Boron, total (mg/L)	Calcium, total (mg/L)	Chloride, total (mg/L)	Fluoride, total (mg/L)	pH (field) (S.U.)	Sulfate, total (mg/L)	Total Dissolved Solids (mg/L)
						6020A <sup>2</sup>	6020A <sup>2</sup>	9251 <sup>2</sup>	9214 <sup>2</sup>	SM 4500 H+B <sup>2</sup>	9036 <sup>2</sup>	SM 2540C <sup>2</sup>
Background / Upgradient Monitoring Wells												
G270	39.066564	-89.397403	1/21/2019 16:49	7.46	618.46	<0.010	56	9.6	0.375	7.0	49	480
			8/15/2019 12:21	3.80	622.12	<0.010	54	9.8	0.461	7.1	50	470
G280	39.067211	-89.394997	1/22/2019 10:42	9.61	616.24	0.026	82	52	0.373	7.1	69	500
			8/26/2019 12:04	9.76	616.09	0.011	72	60	0.438	7.1	81	480
Downgradient Monitoring Wells												
G271	39.06500	-89.395597	1/22/2019 11:45	8.17	617.40	0.88	100	21	0.53	7.2	420	770
			8/26/2019 15:31	7.94	617.63	0.78	100	21	0.57	7.2	340	690
G273	39.064986	-89.393972	1/22/2019 14:35	12.74	610.28	0.40	170	54	0.462	7.1	590	1300
			8/26/2019 14:41	12.79	610.23	0.14	150	59	0.432	7.0	440	1000
G276	39.065533	-89.392628	1/22/2019 16:41	28.00	604.00	0.027	120	26	0.42	7.1	240	860
			8/26/2019 13:50	28.04	603.96	0.028	140	21	0.44	7.2	260	880
G279	39.067153	-89.393014	1/23/2019 7:55	25.25	606.79	0.021	120	7.3	0.626	7.0	240	740
			8/26/2019 12:55	26.14	605.90	0.048	120	4.7	0.635	7.0	170	560

[O: RAB 12/9/19, C: KLT 12/23/19]

**Notes:**

40 C.F.R. = Title 40 of the Code of Federal Regulations

ft = foot/feet

mg/L = milligrams per liter

NAVD88 = North American Vertical Datum of 1988

S.U. = Standard Units

< = concentration is less than the concentration shown, which corresponds to the reporting limit for the method; estimated concentrations below the reporting limit and associated qualifiers are not provided since not utilized in statistics to determine Statistically Significant Increases (SSIs) over background.

<sup>1</sup>All depths to groundwater were measured on the first day of the sampling event.

<sup>2</sup>4-digit numbers represent SW-846 analytical methods.

TABLE 2.  
2019 ANALYTICAL RESULTS - APPENDIX IV PARAMETERS  
2019 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT  
COFFEEN POWER STATION  
UNIT ID 104 - GMF RECYCLE POND  
COFFEEN, ILLINOIS  
ASSESSMENT MONITORING PROGRAM

Well Identification Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Date & Time Sampled	40 C.F.R. Part 257 Appendix IV														
				Antimony, total (mg/L)	Arsenic, total (mg/L)	Barium, total (mg/L)	Beryllium, total (mg/L)	Cadmium, total (mg/L)	Chromium, total (mg/L)	Cobalt, total (mg/L)	Fluoride, total (mg/L)	Lead, total (mg/L)	Lithium, total (mg/L)	Mercury, total (mg/L)	Molybdenum, total (mg/L)	Radium 226/228, Combined (pCi/L)	Selenium, total (mg/L)	Thallium, total (mg/L)
				6020A <sup>1</sup>	6020A <sup>1</sup>	6020A <sup>1</sup>	6020A <sup>1</sup>	6020A <sup>1</sup>	6020A <sup>1</sup>	6020A <sup>1</sup>	6020A <sup>1</sup>	6020A <sup>1</sup>	6020A <sup>1</sup>	7470A <sup>1</sup>	6020A <sup>1</sup>	903/904 <sup>1</sup>	6020A <sup>1</sup>	6020A <sup>1</sup>
Background / Upgradient Monitoring Wells																		
G270 <sup>2</sup>	39.066564	-89.397403	1/21/2019 16:49	<0.0030	<0.0010	0.047	<0.0010	<0.0010	0.0043	<0.0020	0.375	0.0013	<0.010	<0.00020	<0.0010	0.651	<0.0010	<0.0010
			8/15/2019 12:21 <sup>3</sup>	NA	<0.0010	0.040	<0.0010	<0.0010	<0.0040	<0.0020	0.461	<0.0010	0.012	NA	<0.0010	1.34	<0.0010	NA
G280	39.067211	-89.394997	1/22/2019 10:42	<0.0030	0.0035	0.070	<0.0010	<0.0010	0.011	0.0033	0.373	0.0061	<0.010	<0.0002	0.0016	1.283	0.0029	<0.0010
			8/26/2019 12:04 <sup>3</sup>	NA	<0.0010	0.045	NA	NA	<0.0040	<0.0020	0.438	<0.0010	<0.010	NA	0.0014	1.01	<0.0010	NA
Downgradient Monitoring Wells																		
G271	39.065000	-89.395597	1/22/2019 11:45	<0.0030	<0.0010	0.023	<0.0010	<0.0010	<0.0040	<0.0020	0.530	0.0012	<0.010	<0.00020	0.0014	0.644	0.0022	<0.0010
			8/26/2019 15:31 <sup>3</sup>	NA	0.0020	0.042	NA	NA	0.0049	<0.0020	0.570	0.0068	<0.010	NA	0.0011	0.813	0.0020	NA
G273	39.064986	-89.393972	1/22/2019 14:35	<0.0030	0.0015	0.049	<0.0010	<0.0010	<0.0040	<0.0020	0.462	<0.0010	<0.010	<0.00020	<0.0010	0.487	<0.0010	<0.0010
			8/26/2019 14:41 <sup>3</sup>	NA	<0.0010	0.027	NA	NA	<0.0040	<0.0020	0.432	<0.0010	0.011	NA	0.0011	0.151	<0.0010	NA
G276	39.065533	-89.392628	1/22/2019 16:41	<0.0030	<0.0010	0.076	<0.0010	<0.0010	<0.0040	<0.0020	0.421	<0.0010	<0.010	<0.00020	<0.0010	0.510	0.0014	<0.0010
			8/26/2019 13:50 <sup>3</sup>	NA	<0.0010	0.066	NA	NA	<0.0040	<0.0020	0.443	<0.0010	0.016	NA	<0.0010	0.339	0.0023	NA
G279	39.067153	-89.393014	1/23/2019 7:55	<0.0030	0.0030	0.083	<0.0010	<0.0010	0.010	0.0022	0.626	0.0063	<0.010	<0.00020	<0.0010	1.80	0.0020	<0.0010
			8/26/2019 12:55 <sup>3</sup>	NA	<0.0010	0.050	NA	NA	<0.0040	<0.0020	0.635	<0.0010	<0.010	NA	<0.0010	0.618	<0.0010	NA

[O: RAB 12/9/19, C: KLT 12/23/19]

**Notes:**  
40 C.F.R. = Title 40 of the Code of Federal Regulations  
mg/L = milligrams per liter  
NA = Not Analyzed  
pCi/L = picoCuries per liter  
< = concentration is less than concentration shown, which corresponds to the reporting limit for the method; estimated concentrations below the reporting limit and associated qualifiers are not provided since not utilized in statistics to determine Statistically Significant Levels (SSLs) over Groundwater Protection Standards.  
<sup>1</sup>4-digit numbers represent SW-846 analytical methods and 3-digit numbers represent Clean Water Act analytical methods.  
<sup>2</sup>Well is a shared background/upgradient monitoring well. Parameter results presented that were no detecte in downgradient monitoring wells at the Coal Combustion Residuals (CCR) unit were analyzed dueto a detection at another CCR unit.  
<sup>3</sup>Only the parameters detected during the previous sampling events were analyzed during this sampling event, in accordance with 40 C.F.R. § 257.95(d)(1).

**TABLE 3.**  
**STATISTICAL BACKGROUND VALUES**  
**2019 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT**  
 COFFEEN POWER STATION  
 UNIT ID 104 - GMF RECYCLE POND  
 COFFEEN, ILLINOIS  
 ASSESSMENT MONITORING PROGRAM

Parameter	Statistical Background Value (UPL)
<b>40 C.F.R. Part 257 Appendix III</b>	
Boron (mg/L)	0.03
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
Total Dissolved Solids (mg/L)	470

[O: KLT 12/11/19, C: RAB 12/19/19]

**Notes:**

40 C.F.R. = Title 40 of the Code of Federal Regulations

mg/L = milligrams per liter

S.U. = Standard Units

UPL = Upper Prediction Limit

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**TABLE 4.**  
**GROUNDWATER PROTECTION STANDARDS**  
**2019 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT**  
 COFFEEN POWER STATION  
 UNIT ID 104 - GMF RECYCLE POND  
 COFFEEN, ILLINOIS  
 ASSESSMENT MONITORING PROGRAM

Parameter	Groundwater Protection Standard <sup>1</sup>
<b>40 C.F.R. Part 257 Appendix IV</b>	
Antimony (mg/L)	0.006
Arsenic (mg/L)	0.010
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)	0.040
Mercury (mg/L)	0.002
Molybdenum (mg/L)	0.10
Radium 226+228 (pCi/L)	5
Selenium (mg/L)	0.05
Thallium (mg/L)	0.002

[O: KLT 12/11/19, C: RAB 12/19/19]

**Notes:**

40 C.F.R. = Title 40 of the Code of Federal Regulations

mg/L = milligrams per liter

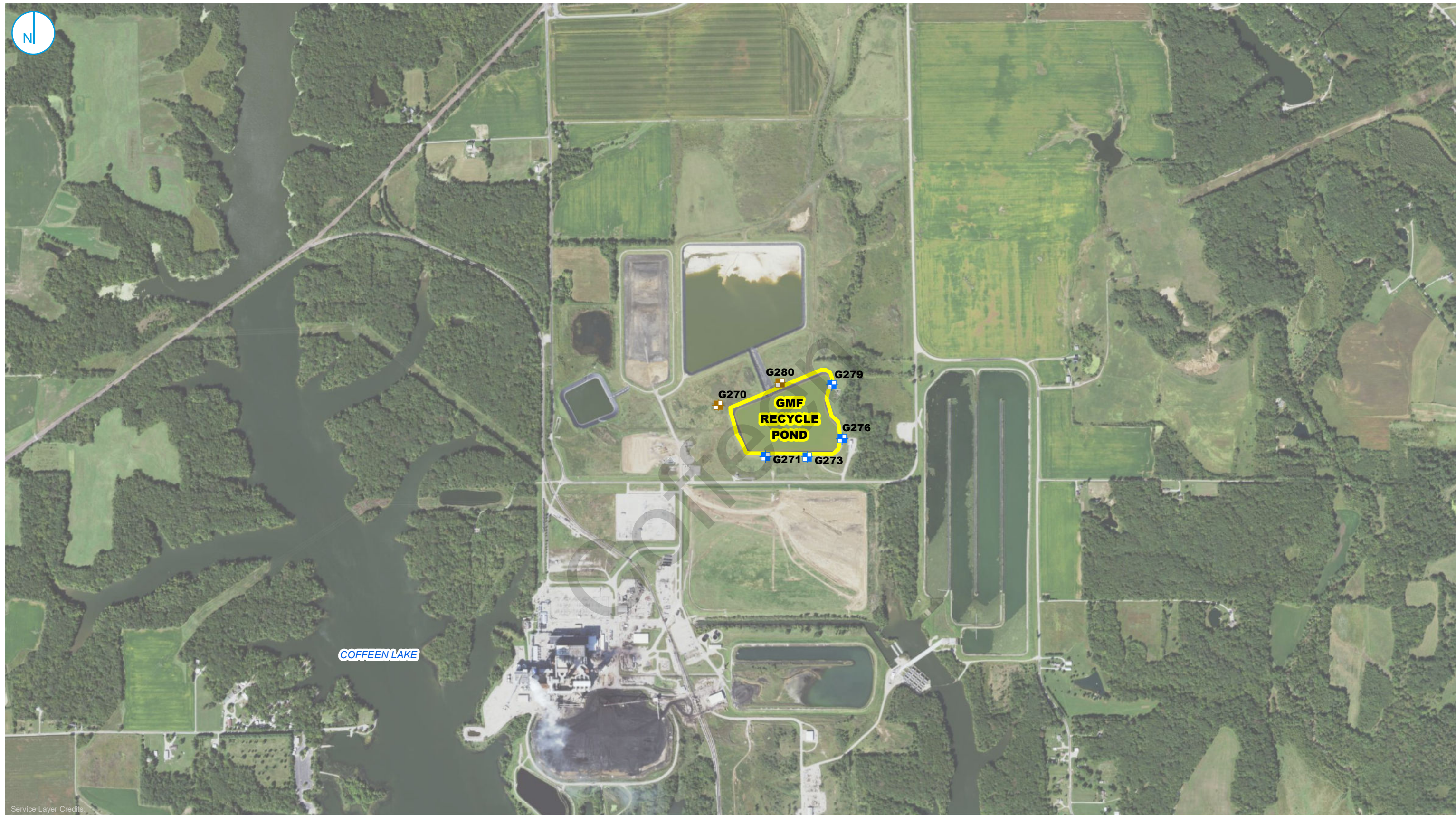
pCi/L = picoCuries per liter

<sup>1</sup>Groundwater Protection Standard is the higher of the Maximum Contaminant Level / Health-Based Level or background.

## FIGURES

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- UPGRADIENT MONITORING WELL LOCATION
- DOWNGRADIENT MONITORING WELL LOCATION
- CCR MONITORED UNIT

**MONITORING WELL LOCATION MAP  
COFFEEN GMF RECYCLE POND  
UNIT ID:104**

**2019 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT**  
VISTRA CCR RULE GROUNDWATER MONITORING  
COFFEEN POWER STATION  
COFFEEN, ILLINOIS

**FIGURE 1**

O'BRIEN & GERE ENGINEERS, INC.  
A RAMBOLL COMPANY

