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2020 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

COFFEEN GMF RECYCLE POND, COFFEEN POWER STATION



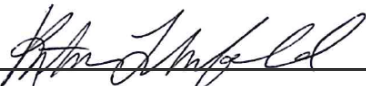
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**2020 ANNUAL GROUNDWATER MONITORING AND
CORRECTIVE ACTION REPORT
COFFEEN GMF RECYCLE POND, COFFEEN POWER STATION**

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Prepared by **Kristen L. Theesfeld**
Checked by **Eric J. Tlachac, PE**
Approved by **Lauren D. Cook**
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Ramboll
234 W. Florida Street
Fifth Floor
Milwaukee, WI 53204
USA

T 414-837-3607
F 414-837-3608
<https://ramboll.com>



Kristen L. Theesfeld
Hydrogeologist



Eric J. Tlachac, PE
Managing Engineer

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ACRONYMS AND ABBREVIATIONS

40 C.F.R.	Title 40 of the Code of Federal Regulations
ASD	Alternate Source Demonstration
CCR	Coal Combustion Residuals
CMA	Corrective Measures Assessment
GMF	Gypsum Management Facility
GWPS	Groundwater Protection Standard
SSI	Statistically Significant Increase
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. Assessment Monitoring was initiated at Coffeen GMF Recycle Pond on April 9, 2018.

No changes were made to the monitoring system in 2020 (no wells were installed or decommissioned).

No Statistically Significant Levels (SSLs) of 40 C.F.R. Part 257 Appendix IV parameters were determined. Consequently, a Corrective Measures Assessment (CMA) is not required, and Coffeen GMF Recycle Pond remains in the Assessment Monitoring Program.

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1. INTRODUCTION

This report has been prepared by Ramboll Americas Engineering Solutions Inc. (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 [SSI] relative to background levels).
5. Other information required to be included in the annual report as specified in §§ 257.90 through 257.98.
6. A section at the beginning of the annual report that provides an overview of the current status of groundwater monitoring and corrective action programs for the CCR unit. At a minimum, the summary must specify all of the following:
 - i. At the start of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in §257.94 or the assessment monitoring program in §257.95.
 - ii. At the end of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in §257.94 or the assessment monitoring program in §257.95.
 - iii. If it was determined that there was a SSI over background for one or more constituents listed in Appendix III of §257 pursuant to §257.94(e):
 - A. Identify those constituents listed in Appendix III of §257 and the names of the monitoring wells associated with the SSI(s).

- B. Provide the date when the assessment monitoring program was initiated for the CCR unit.
- iv. If it was determined that there was a SSL above the Groundwater Protection Standard (GWPS) for one or more constituents listed in Appendix IV of §257 pursuant to §257.95(g) include all of the following:
 - A. Identify those constituents listed in Appendix IV of §257 and the names of the monitoring wells associated with the SSL(s).
 - B. Provide the date when the CMA was initiated for the CCR unit.
 - C. Provide the date when the public meeting was held for CMA for the CCR unit.
 - D. Provide the date when the CMA was completed for the CCR unit.
- v. Whether a remedy was selected pursuant to §257.97 during the current annual reporting period, and if so, the date of remedy selection.
- vi. Whether remedial activities were initiated or are ongoing pursuant to §257.98 during the current annual reporting period.

This report provides the required information for Coffeen GMF Recycle Pond for calendar year 2020.

2. MONITORING AND CORRECTIVE ACTION PROGRAM STATUS

No changes have occurred to the Monitoring Program status in calendar year 2020, 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 2020

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 2020. 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 (NRT/OBG, 2017a). All monitoring data obtained under 40 C.F.R. §§ 257.90 through 257.98 (as applicable) in 2020, and analytical results for the August 2019 sampling event, 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 GWPSs.

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

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Table A – 2019-2020 Assessment Monitoring Program Summary

Sampling Dates	Analytical Data Receipt Date	Parameters Collected	SSL(s)	SSL(s) Determination Date
August 15 - 26, 2019	October 15, 2019	Appendix III Appendix IV Detected ¹	None	January 13, 2020
January 22 - 24, 2020	April 15, 2020	Appendix III Appendix IV	None	July 14, 2020
August 11 - 13, 2020	October 15, 2020	Appendix III Appendix IV Detected ¹	TBD	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).

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4. PROBLEMS ENCOUNTERED AND ACTIONS TO RESOLVE THE PROBLEMS

No problems were encountered with the Groundwater Monitoring Program during 2020. Groundwater samples were collected and analyzed in accordance with the Sampling and Analysis Plan (NRT/OBG, 2017a), and all data were accepted.

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5. KEY ACTIVITIES PLANNED FOR 2021

The following key activities are planned for 2021:

- Continuation of the Assessment Monitoring Program with semi-annual sampling scheduled for the first and third quarters of 2021.
- 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 2021 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 2021 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.
ANALYTICAL RESULTS - GROUNDWATER ELEVATION AND APPENDIX III PARAMETERS
2020 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
 COFFEEN POWER STATION
 104 - GMF RECYCLE POND
 COFFEEN, IL

Well ID	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Date	Depth to Groundwater (ft)	Groundwater Elevation (ft NAVD88)	Boron, total (mg/L)	Calcium, total (mg/L)	Chloride, total (mg/L)	Fluoride, total (mg/L)	pH (field) (STD)	Sulfate, total (mg/L)	Total Dissolved Solids (mg/L)	
				6020A	6020A	6020A	6020A	9251	9214	SM4500 H+B	9036	SM 2540C	
G270 Background	39.0665638	-89.3974031	8/5/2019	3.8	622.12								
			8/15/2019			<0.01	54	9.8	0.461	7.1	50	470	
			1/20/2020	3.81	622.11								
			1/24/2020			0.015	59	10	0.383	7.3	51	480	
			8/10/2020	7.81	618.11								
			8/12/2020			0.1	58	12	0.349	7.1	53	380	
G271 Downgradient	39.0650072	-89.3955874	8/5/2019	7.94	617.63								
			8/26/2019			0.78	100	21	0.57	7.2	340	690	
			1/20/2020	7.74	617.83								
			1/22/2020			2.5	180	51	0.278	7.2	610	1100	
			8/13/2020	11.39	614.18	2.4	150	44	0.385	7.2	470	900	
G273 Downgradient	39.0649852	-89.3939733	8/5/2019	12.79	610.23								
			8/26/2019			0.14	150	59	0.432	7.0	440	1000	
			1/20/2020	8.82	614.2								
			1/22/2020			0.18	170	59	0.252	7.1	510	1000	
			8/13/2020	11.5	611.52	0.064	150	64	0.34	7.1	410	890	
G276 Downgradient	39.0655345	-89.3926172	8/5/2019	28.04	603.96								
			8/26/2019			0.028	140	21	0.443	7.2	260	880	
			1/20/2020	26.92	605.08								
			1/23/2020			0.037	140	25	0.255	7.0	270	1400	
			8/12/2020	27.37	604.63	0.041	140	23	0.396	6.9	280	820	
G279 Downgradient	39.0671555	-89.3929983	8/5/2019	26.14	605.9								
			8/26/2019			0.048	120	4.7	0.635	7.0	170	560	
			1/20/2020	20.96	611.08								
			1/23/2020			0.33	190	72	0.537	7.0	400	830	
			8/12/2020	24.87	607.17	1.4	480	410	0.313	6.8	1600	3000	
G280 Background	39.0672155	-89.3949916	8/5/2019	9.76	616.09								
			8/26/2019			0.011	72	60	0.438	7.1	81	480	
			1/20/2020	3.52	622.33								
			1/23/2020			0.015	73	64	0.486	7.7	84	1100	
			8/11/2020	6.35	619.5	0.52	220	68	0.289	7.3	86	440	

TABLE 1.
ANALYTICAL RESULTS - GROUNDWATER ELEVATION AND APPENDIX III PARAMETERS
2020 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
COFFEEN POWER STATION
104 - GMF RECYCLE POND
COFFEEN, IL

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.

4-digit numbers below parameter represent SW-846 analytical methods and alpha-numeric values that begin with SM represent Standard Methods for the Examination of Water and Wastewater.

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TABLE 2.
ANALYTICAL RESULTS - APPENDIX IV PARAMETERS
2020 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
 COFFEEN POWER STATION
 104 - GMF RECYCLE POND
 COFFEEN, IL

Well ID	Date	Antimony, total (mg/L) 6020A	Arsenic, total (mg/L) 6020A	Barium, total (mg/L) 6020A	Beryllium, total (mg/L) 6020A	Cadmium, total (mg/L) 6020A	Chromium, total (mg/L) 6020A	Cobalt, total (mg/L) 6020A	Fluoride, total (mg/L) 6020A	Lead, total (mg/L) 6020A	Lithium, total (mg/L) 6020A	Mercury, total (mg/L) 7470A	Molybdenum, total (mg/L) 6020A	Radium-226 + Radium 228, total (pCi/L) 6020A	Selenium, total (mg/L) 6020A	Thallium, total (mg/L) 6020A
G270 Background	8/15/2019		<0.001	0.04	<0.001	<0.001	<0.004	<0.002	0.461	<0.001	0.012		<0.001	1.34	<0.001	
	1/24/2020	<0.003	<0.001	0.038	<0.001	<0.001	<0.004	<0.002	0.383	<0.001	<0.02	<0.0002	<0.001	0.471	0.0014	<0.001
	8/12/2020		<0.001	0.042	<0.001	<0.001	<0.004	<0.002	0.349	<0.001	<0.02	<0.0002	<0.001	0.248	<0.001	<0.001
G271 Downgradient	8/26/2019		0.002	0.042			0.0049	<0.002	0.57	0.0068	<0.01		0.0011	0.813	0.002	
	1/22/2020	<0.003	<0.001	0.024	<0.001	<0.001	<0.004	<0.002	0.278	<0.001	<0.02	<0.0002	<0.001	0.922	0.001	<0.001
	8/13/2020		<0.001	0.025			<0.004	<0.002	0.385	<0.001	<0.02		<0.001	0.338	<0.001	<0.001
G273 Downgradient	8/26/2019		<0.001	0.027			<0.004	<0.002	0.432	<0.001	0.011		0.0011	0.151	<0.001	
	1/22/2020	<0.003	0.0011	0.03	<0.001	<0.001	<0.004	<0.002	0.252	<0.001	<0.02	<0.0002	<0.001	0.641	<0.001	0.0012
	8/13/2020		<0.001	0.027			<0.004	<0.002	0.34	<0.001	<0.02		<0.001	0.232	<0.001	<0.001
G276 Downgradient	8/26/2019		<0.001	0.066			<0.004	<0.002	0.443	<0.001	0.016		<0.001	0.339	0.0023	
	1/23/2020	<0.003	<0.001	0.063	<0.001	<0.001	<0.004	<0.002	0.255	<0.001	<0.02	<0.0002	<0.001	1.12	0.0026	<0.001
	8/12/2020		<0.001	0.053			<0.004	<0.002	0.396	<0.001	<0.02		<0.001	0.497	0.0019	<0.001
G279 Downgradient	8/26/2019		<0.001	0.05			<0.004	<0.002	0.635	<0.001	<0.01		<0.001	0.618	<0.001	
	1/23/2020	<0.003	<0.001	0.062	<0.001	<0.001	<0.004	<0.002	0.537	<0.001	<0.02	<0.0002	<0.001	1.44	0.0036	<0.001
	8/12/2020		<0.001	0.032			<0.004	<0.002	0.313	<0.001	<0.02		<0.001	0.914	0.0094	<0.001
G280 Background	8/26/2019		<0.001	0.045			<0.004	<0.002	0.438	<0.001	<0.01		0.0014	1.01	<0.001	
	1/23/2020	<0.003	<0.001	0.041	<0.001	<0.001	<0.004	<0.002	0.486	<0.001	<0.02	<0.0002	0.0015	0.484	0.0012	<0.001
	8/11/2020		0.0034	0.21			0.015	0.006	0.289	0.0054	0.03		0.0023	0.472	<0.001	<0.001

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.
 4-digit numbers below parameter represent SW-846 analytical methods and 3-digit numbers represent Clean Water Act analytical methods.

TABLE 3.
STATISTICAL BACKGROUND VALUES
2020 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
 COFFEEN POWER STATION
 104 - GMF RECYCLE POND
 COFFEEN, ILLINOIS
 ASSESSMENT MONITORING PROGRAM

Parameter	Statistical Background Value (UPL)
40 C.F.R. Part 257 Appendix III	
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
2020 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
 COFFEEN POWER STATION
 104 - GMF RECYCLE POND
 COFFEEN, ILLINOIS
 ASSESSMENT MONITORING PROGRAM

Parameter	Groundwater Protection Standard ¹
40 C.F.R. Part 257 Appendix IV	
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

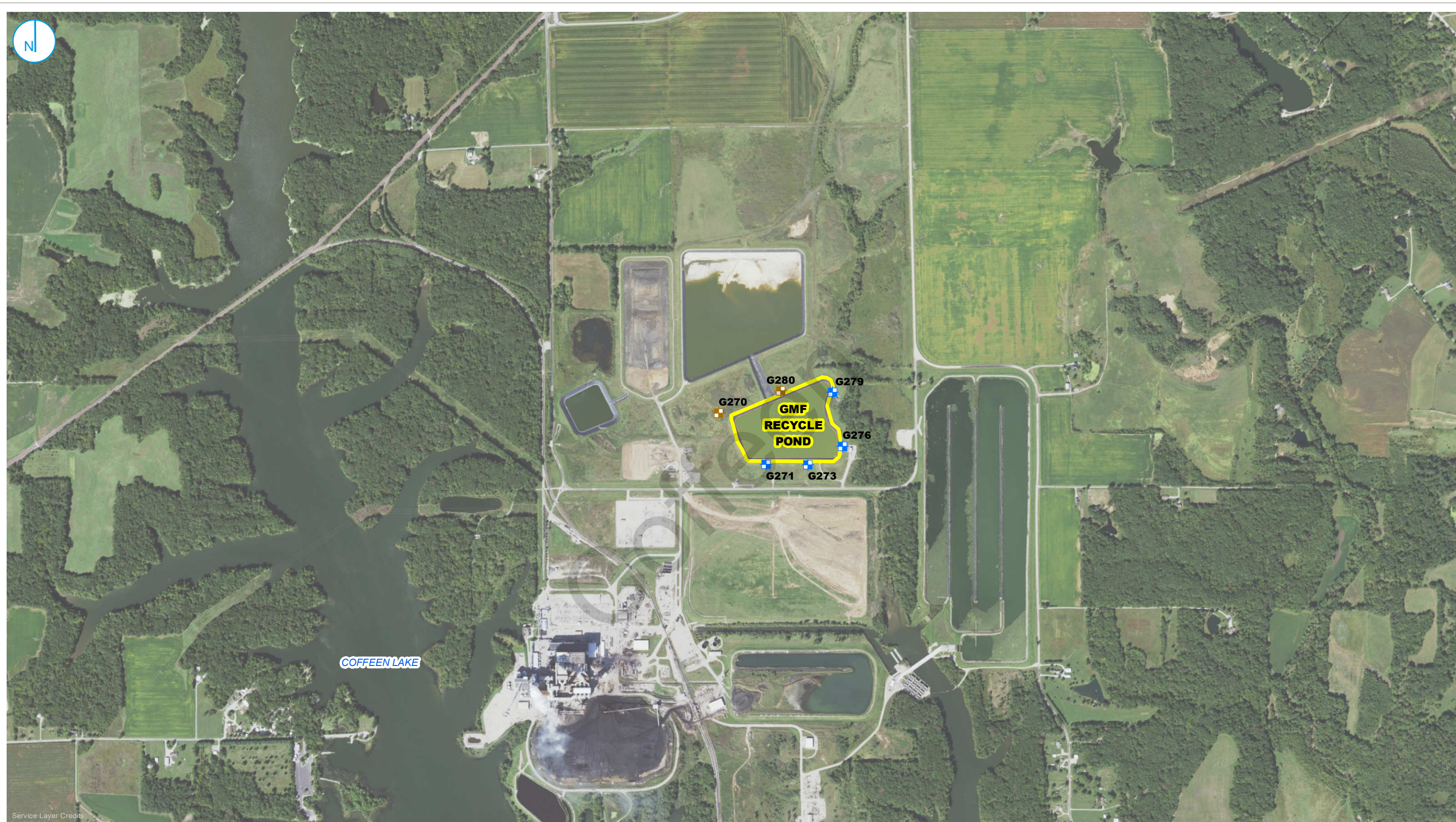
¹Groundwater Protection Standard is the higher of the Maximum Contaminant Level / Health-Based Level or background.

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FIGURES

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PROJECT: 169000XXXXX | DATED: 1/25/2021 | DESIGNER: galammc
Y:\Mapping\Projects\2212285\MXD\2020_Annual\GWM_CAR\Figure 1_GWS_WellLoc_CoffeenGMF_RP.mxd



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



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

2020 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
VISTRA CCR RULE GROUNDWATER MONITORING
COFFEEN POWER STATION
COFFEEN, ILLINOIS

FIGURE 1

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

