Illinois Power Generating Company
1500 Eastport Plaza Dr.
Collinsville, IL 62234

January 28, 2022

Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, IL 62794-9276

Re: Coffeen GMF Recycle Pond (IEPA ID: W1350150004-04) Annual Consolidated Report

Dear Mr. LeCrone:

In accordance with 35 IAC § 845.550, Illinois Power Generating Company (IPGC) is submitting the annual consolidated report for the GMF Recycle Pond (IEPA ID: W1350150004-04), as enclosed.

Sincerely,

Dianna Tickner

Dianna Tickner
Director Decommissioning & Demolition

Enclosures

Annual Consolidated Report
Illinois Power Generating Company
Coffeen Power Plant
GMF Recycle Pond; IEPA **ID: W1350150004-04**

In accordance with 35 IAC § 845.550, Illinois Power Generating Company (IPGC) has prepared the annual consolidated report. The report is provided in three sections as follows:

Section 1
1) Annual CCR fugitive dust control report (Section 845.500(c))

Section 2
2) Annual inspection report (Section 845.540(b)), including:

A) Annual hazard potential classification certification

B) Annual structural stability assessment certification

C) Annual safety factor assessment certification

D) Inflow design flood control system plan certification

It should be noted that the drawings and attachments of the certification report were included in the operating permit application submittal.

Section 3
3) Annual Groundwater Monitoring and Corrective Action Report (Section 845.610(e))

Section 1
Annual CCR Fugitive Dust Control Report

Annual CCR Fugitive Dust Control Report

for

Coffeen Power Station

Illinois Power Generating Company

Coffeen Power Plant
134 CIPS Lane
Coffeen, IL 62017

November 2021

Reporting Year: 4th Quarter 2020 through 3rd Quarter 2021

Approved by:  Director, Decommissioning and Demolition

Name Title

This Annual CCR Fugitive Dust Control Report has been prepared for the Coffeen Power Station in accordance with 40 CFR 257.80(c) and 35 I.A.C. 845.500. Section 1 provides a description of the actions taken to control CCR fugitive dust at the facility during the reporting year, including a summary of any corrective measures taken. Section 2 provides a record of citizen complaints received concerning CCR fugitive dust at the facility during the reporting year, including a summary of any corrective measures taken.

Section 1 Actions Taken to Control CCR Fugitive Dust

In accordance with the Coffeen Power Station CCR Fugitive Dust Control Plan (Plan), the following measures were used to control CCR fugitive dust from becoming airborne at the facility during the reporting year:

CCR Activity	Actions Taken to Control CCR Fugitive Dust
Management of CCR in the facility's CCR units	CCR to be emplaced in the landfill is conditioned before emplacement.
	Wet management of CCR bottom ash and flue gas desulfurization materials in CCR surface impoundments.
	Water areas of exposed CCR in CCR units, as necessary.
	Naturally occurring grass vegetation in areas of exposed CCR in CCR surface impoundments.
Handling of CCR at the facility	CCR bottom ash removed from CCR surface impoundments and loaded into trucks for transport remains conditioned during handling.
	CCR fly ash to be emplaced in the landfill is conditioned before emplacement.
	Load CCR transport trucks from the CCR fly ash silo using a chute with a sock (skirt).
	Perform housekeeping, as necessary, in the fly ash loading area.

CCR Activity	Actions Taken to Control CCR Fugitive Dust
Handling of CCR at the facility	CCR to be emplaced in the landfill is conditioned before emplacement.
	Cover or enclose trucks used to transport CCR fly ash.
	Limit the speed of vehicles to no more than 15 mph on facility roads.
Transportation of CCR at the facility	Cover or enclose trucks used to transport CCR other than fly ash, as necessary.
	Sweep or rinse off the outside of the trucks transporting CCR, as necessary.
	Remove CCR, as necessary, deposited on facility road surfaces during transport.
	Water CCR haul roads, including landfill roads, as necessary.

Based on a review of the Plan and inspections associated with CCR fugitive dust control performed in the reporting year, the control measures identified in the Plan as implemented at the facility effectively minimized CCR from becoming airborne at the facility. No revisions or additions to control measures identified in the Plan were needed.

No material changes occurred in the reporting year in site conditions potentially resulting in CCR fugitive dust becoming airborne at the facility that warrant an amendment of the Plan.

Section 2 Record of Citizen Complaints

No citizen complaints were received regarding CCR fugitive dust at Coffeen Power Station in the reporting year.

Section 2

Annual Inspection Report (Section 845.540(b)), including:

A) Annual Hazard Potential Classification Certification, if applicable (Section 845.440)

B) Annual Structural Stability Assessment Certification, if applicable (Section 845.450)

C) Annual Safety Factor Assessment Certification, if applicable (Section 845.460)

D) Inflow Design Flood Control System Plan Certification (Section 845.510(c))

ANNUAL INSPECTION BY A QUALIFIED PROFESSIONAL ENGINEER 35 IAC § 845.540
(b)(1) The CCR surface impoundment must be inspected on an annual basis by a qualified professional engineer to ensure that the design, construction, operation, and maintenance of the CCR surface impoundment is consistent with recognized and generally accepted engineering standards. The inspection must, at a minimum, include: A) A review of available information regarding the status and condition of the CCR surface impoundment, including files available in the operating record (e.g., CCR surface impoundment design and construction information required by Sections 845.220(a)(1) and 845.230(d)(2)(A), previous structural stability assessments required under Section 845.450, the results of inspections by a qualified person, and results of previous annual inspections); B) A visual inspection of the CCR surface impoundment to identify signs of distress or malfunction of the CCR surface impoundment and appurtenant structures; C) A visual inspection of any hydraulic structures underlying the base of the CCR surface impoundment or passing through the dike of the CCR surface impoundment for structural integrity and continued safe and reliable operation; D) The annual hazard potential classification certification, if applicable (see Section 845.440); E) The annual structural stability assessment certification, if applicable (see Section 845.450); F) The annual safety factor assessment certification, if applicable (see Section 845.460); and G) The inflow design flood control system plan certification (see Section 845.510(c)).

SITE INFORMATION	
Site Name / Address / Date of Inspection	Coffeen Power Station Montgomery County, Illinois 62017 10/18/2021
Operator Name / Address	Luminant Generation Company LLC 6555 Sierra Drive, Irving, TX 75039
CCR unit	Gypsum Recycle Pond

INSPECTION REPORT 35 IAC § 845.540 Date of Inspection 10/18/2021	
(b)(1)(D) The annual hazard potential classification certification, if applicable (see Section 845.440).	Based on a review of the CCR unit's annual hazard potential classification, the unit is classified as a Class III CCR surface impoundment.
(b)(2)(A) Any changes in geometry of the structure since the previous annual inspection.	Based on a review of the CCR unit's records and visual observation during the on-site inspection, no changes in geometry of the structure have taken place since the previous annual inspection.
(b)(2)(B) The location and type of existing instrumentation and the maximum recorded readings of each instrument since the previous annual inspection	No Instrumentation
b)(2)(C) The approximate minimum, maximum, and present depth and elevation of the impounded water and CCR since the previous annual inspection;	See the attached.
b)(2)(D) The storage capacity of the impounding structure at the time of the inspection	Approximately 470 acre-feet – plant closed in 2020
(b)(2)(E) The approximate volume of the impounded water and CCR contained in the unit at the time of the inspection.	Approximately 250 acre-feet – plant closed in 2020
(b)(2)(F) Any appearances of an actual or potential structural weakness of the CCR unit, in addition to any existing conditions that are disrupting or have the potential to disrupt the operation and safety of the CCR unit	Based on a review of the CCR unit's records and visual observation during the on-site inspection, there was no appearance of an actual or potential structural weakness of the CCR unit, nor an existing condition that is disrupting or would disrupt the operation and safety of the unit.

INSPECTION REPORT 35 IAC § 845.540 Date of Inspection 10/18/2021	
(b)(2)(G) Any other changes that may have affected the stability or operation of the impounding structure since the previous annual inspection.	Based on a review of the CCR unit's records and visual observation during the on-site inspection, no other changes which may have affected the stability or operation of the CCR unit have taken place since the previous annual inspection.
(b)(1)(G) The inflow design flood control system plan certification (see Section 845.510(c))	Based on a review of the CCR unit's records, the CCR unit is designed, operated, and maintained to adequately manage the flow from the CCR impoundment and control the peak discharge from the inflow design flood.

35 IAC § 845.540 - Annual inspection by a qualified professional engineer.

I, James Knutelski, P.E., certify under penalty of law that the information submitted in this report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the state of Illinois. The information submitted, is to the best of my knowledge and belief, true, accurate and complete. Based on the annual inspection, the design, construction, operation, and maintenance of the CCR Unit is consistent with recognized and generally accepted good engineering standards. Based on a review of the records for the CCR unit, the hazard potential classification was conducted in accordance with the requirements of Section 845.440 and the Safety Factor Assessment was conducted in accordance with the requirements of Section 845.460.

James Knutelski, PE
Illinois PE No. 062-054206, Expires: 11/30/2023
Date: 01/05/2022

Site Name: Coffeen Power Station

CCR Unit: Gypsum Recycle Pond

35 IAC § 845.540 (b)(2)(B)		
Instrument ID #	Type	Maximum recorded reading since previous annual inspection (ft)
None		

35 IAC § 845.540 (b)(2)(C)						
	Approximate Depth / Elevation					
Since previous inspection:	Elevation (ft)			Depth (ft)		
	Minimum	Present	Maximum	Minimum	Present	Maximum
Impounded Water					10	
CCR				0		8

Geosyntec consultants

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Chesterfield, MO 63005
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www.geosyntec.com

October 11, 2021

Illinois Power Generating Company
134 Cips Lane
Coffeen, Illinois 62017

Subject: USEPA CCR Rule and IEPA Part 845 Rule Applicability Cross-Reference
2021 USEPA CCR Rule Periodic Certification Report
GMF Recycle Pond, Coffeen Power Plant, Coffeen, Illinois

At the request of Illinois Power Generating Company (IPGC), Geosyntec Consultants (Geosyntec) has prepared this letter to document how the attached 2021 United States Environmental Protection Agency (USEPA) CCR Rule Periodic Certification Report (Report) was prepared in accordance with both the Federal USEPA CCR Rule[1] and the state-specific Illinois Environmental Protection Agency (IEPA) Part 845 Rule[2]. Specific sections of the report and the applicable sections of the USEPA CCR Rule and Illinois Part 845 Rule are cross-referenced in **Table 1**. A certification from a Qualified Professional Engineer for each of the CCR Rule sections listed in **Table 1** is provided in Section 10 of the attached Report. This certification statement is also applicable to each section of the Part 845 Rule listed in **Table 1.**

Table 1 – USEPA CCR Rule and Illinois Part 845 Rule Cross-Reference

Report Section	USEPA CCR Rule		Illinois Part 845 Rule	
3	§257.73 (a)(2)	Hazard Potential Classification	845.440	Hazard Potential Classification Assessment[3]
4	§257.73 (c)(1)	History of Construction	845.220(a)	Design and Construction Plans (Construction History)
5	§257.73 (d)(1)	Structural Stability Assessment	845.450 (a) and (c)	Structural Stability Assessment
6	§257.73 (e)(1)	Safety Factor Assessment	845.460 (a-b)	Safety Factor Assessment
7	§257.82 (a)(1-3)	Adequacy of Inflow Design Control System Plan	845.510(a), (c)(1), (c)(3)	Hydrologic and Hydraulic Capacity Requirements / Inflow Design Flood Control System Plan
	§257.82 (b)	Discharge from CCR Unit	845.510(b)	Discharge from CCR Surface Impoundment

[1] United Stated Environmental Protection Agency, 2015. *40 CFR Parts 257 and 261, Hazardous and Solid Waste Management System, Disposal of Coal Combustion Residuals from Electric Utilities, Final Rule.*
[2] State of Illinois, Joint Committee on Administrative Rule, Administrative Code (2021). *Title 35: Environmental Protection, Subtitle G: Waste Disposal, Chapter I: Pollution Control Board, Subchapter j: Coal Combustion Waste Surface Impoundment, Part 845 Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments.*
[3] "Significant" and "High" hazard, per the CCR Rule[1], are equivalent to Class II and Class I hazard potential, respectively, per Part 845[2].

CLOSING

This letter has been prepared to demonstrate that the content and Qualified Professional Engineer Certification of the 2021 Periodic USEPA CCR Rule Certification Report fulfills the corresponding requirements of Part 845 of Illinois Administrative Code listed in **Table 1**.

Sincerely,

Lucas P. Carr, P.E.
Senior Engineer

John Seymour, P.E.
Senior Principal

2021 USEPA CCR RULE CERTIFICATION REPORT
§257.73(a)(2), (c), (d), (e) and §257.82
GMF RECYCLE POND
Coffeen Power Plant
Coffeen, Illinois

Submitted to

Illinois Power Generating Company

134 Cips Lane
Coffeen, Illinois 62017

Submitted by

Geosyntec consultants

engineers | scientists | innovators

1 McBride and Son Center Drive, Suite 202
Chesterfield, Missouri 63005

October 11, 2021

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EXECUTIVE SUMMARY

This Periodic United States Environmental Protection Agency (USEPA) Coal Combustion Residuals (CCR) Rule [1] certification report (Periodic Certification Report) for the GMF Recycle Pond (GMF RP)[1] at the Coffeen Power Plant (CPP), also known as the Coffeen Power Station (COF), has been prepared in accordance with Rule 40, Code of Federal Regulations (CFR) §257. herein referred to as the "CCR Rule" [1]. The CCR Rule requires that initial certifications for existing CCR surface impoundment, completed in 2016 and subsequently posted on the Illinois Power Generating Company (IPGC) CCR Website ([2], [3], [4], [5], [6]) be updated on a five-year basis.

The initial certification reports developed in 2016 and 2017 ([2], [7], [3], [4], [5], [6]) were independently reviewed by Geosyntec. Additionally, field observations, interviews with plant staff, updated engineering analyses, and evaluations were performed to compare conditions in 2021 at the GMF RP relative to the 2016 and 2017 initial certifications. These tasks determined that updates are not required for the Initial Hazard Potential Classification. However, due to changes at the site and technical review comments, updated were required and were performed for the:

- History of Construction Report,
- Initial Structural Stability Assessment,
- Initial Safety Factor Assessment, and
- Initial Inflow Design Flood Control System Plan.

Table 1 provides a summary of the initial 2016 certifications and the updated 2021 periodic certifications.

[1] The GMF RP is also referred to as ID Number W4350150004-04, GMF Recycle Pond, by the Illinois Environmental Protection Agency (IEPA); CCR Unit ID 104 by IPGC; and IL50578 within the National Inventory of Dams (NID) maintained by the Illinois Department of Natural Resources. Within this document it is referred to as the GMF RP.

Table 1 – Periodic Certification Summary

	CCR Rule Reference	Requirement Summary	2016 Initial Certification		2021 Periodic Certification	
			Requirement Met?	Comments	Requirement Met?	Comments
Hazard Potential Classification						
3	§257.73(a)(2)	Document hazard potential classification	Yes	Impoundment was determined to have a Significant hazard potential classification [2].	Yes	No changes were identified that may affect this requirement.
History of Construction						
4	§257.73(c)(1)	Compile a history of construction	Yes	A History of Construction report was prepared for the GMF RP, Ash Pond 1, Ash Pond 2, and the GMF Gypsum Stack Pond [3].	Yes	A letter listing updates to the History of Construction report is provided in **Attachment C**.
Structural Stability Assessment						
5	§257.73(d)(1)(i)	Stable foundations and abutments	Yes	Foundations were found to be stable. Abutments were not present [4].	Yes	Foundations and abutments were found to be stable after performing updated slope stability analyses.
	§257.73(d)(1)(ii)	Adequate slope protection	Yes	Slope protection was adequate [4].	Yes	No changes were identified that may affect this requirement.
	§257.73(d)(1)(iii)	Sufficiency of dike compaction	Yes	Dike compaction was sufficient for expected ranges in loading conditions [4].	Yes	Dike compaction was found to be sufficient after performing updated slope stability analyses.
	§257.73(d)(1)(iv)	Presence and condition of slope vegetation	Yes	Vegetation was present on exterior slopes and was maintained. Interior slopes had alternate protection (geomembrane liner) [4].	Yes	No changes were identified that may affect this requirement.
	§257.73(d)(1)(v)(A) and (B)	Adequacy of spillway design and management	Yes	Spillways were adequately designed and constructed to adequately manage flow during the probable maximum flood [4].	Yes	Spillways were found to be adequately designed and constructed and are expected to adequately manger flow during the 1,000-year design flood, as long as the starting water surface elevation is maintained at El. 622.1 ft or below.
	§257.73(d)(1)(vi)	Structural integrity of hydraulic structures	Yes	Hydraulic structures are non-erodible, booted, and surrounded by compacted fill [4].	Yes	No changes were identified that may affect this requirement.
	§257.73(d)(1)(vii)	Stability of downstream slopes inundated by water body.	Not Applicable	Inundation of exterior slopes were not expected. This requirement was not applicable [4].	Not Applicable	No changes were identified that may affect this requirement.
Safety Factor Assessment						
6	§257.73(e)(1)(i)	Maximum storage pool safety factor must be at least 1.50	Yes	Safety factors were calculated to be 1.55 and higher [5].	Yes	Safety factors from updated slope stability analyses were calculated to be 2.40 and higher.
	§257.73(e)(1)(ii)	Maximum surcharge pool safety factor must be at least 1.40	Yes	Safety factors were calculated to be 1.51 and higher [5].	Yes	Safety factors from updated slope stability analyses were calculated to be 2.39 and higher.
	§257.73(e)(1)(iii)	Seismic safety factor must be at least 1.00	Yes	Safety factors were calculated to be 1.80 and higher [5].	Yes	Safety factors from updated slope stability analyses were calculated to be 1.05 and higher.
	§257.73(e)(1)(iv)	For dike construction of soils that have susceptible to liquefaction, safety factor must be at least 1.20	Not Applicable	Dike soils were not susceptible to liquefaction. This requirement was not applicable [5].	Not Applicable	No changes were identified that may affect this requirement.
Inflow Design Flood Control System Plan						
7	§257.82(a)(1), (2), (3)	Adequacy of inflow design control system plan.	Yes	Flood control system adequately managed inflow and peak discharge during the PMP, 24-hr Inflow Design Flood [6].	Yes	The flood control system was found to adequately manage inflow and peak discharge during the 1,000-year, 24-hour Inflow Design Flood, after performing updated hydrologic and hydraulic analyses, as long as the starting water surface elevation is maintained at El. 622.1 ft or below.
	§257.82(b)	Discharge from CCR Unit	Yes	Discharges into Waters of the United States were not expected to occur during normal and 1, 000-year, 24-hr, Inflow Design Flood conditions [6].	Yes	Discharge into Waters of the United States were not expected to occur during both normal and 1,000-year, 24-hour Inflow Design Flood conditions, after performing updated hydrologic and hydraulic analyses, as long as the starting water surface elevation is maintained at El. 622.1 ft or below.

SECTION 1

INTRODUCTION AND BACKGROUND

This Periodic United States Environmental Protection Agency (USEPA) Coal Combustion Residual (CCR) Rule [1] Certification Report was prepared by Geosyntec Consultants (Geosyntec) for Illinois Power Generating Company (IPGC) to document the re-certification of the GMF Recycle Pond at the Coffeen Power Plant (CPP), also known as the Coffeen Power Station (COF), located at 134 Cips Lane in Coffeen, Illinois, 62017. The location of CPP is provided in **Figure 1**, and a site plan showing the location of the GMF RP, among other closed and active CCR units and non-CCR surface impoundments, is provided in **Figure 2**.

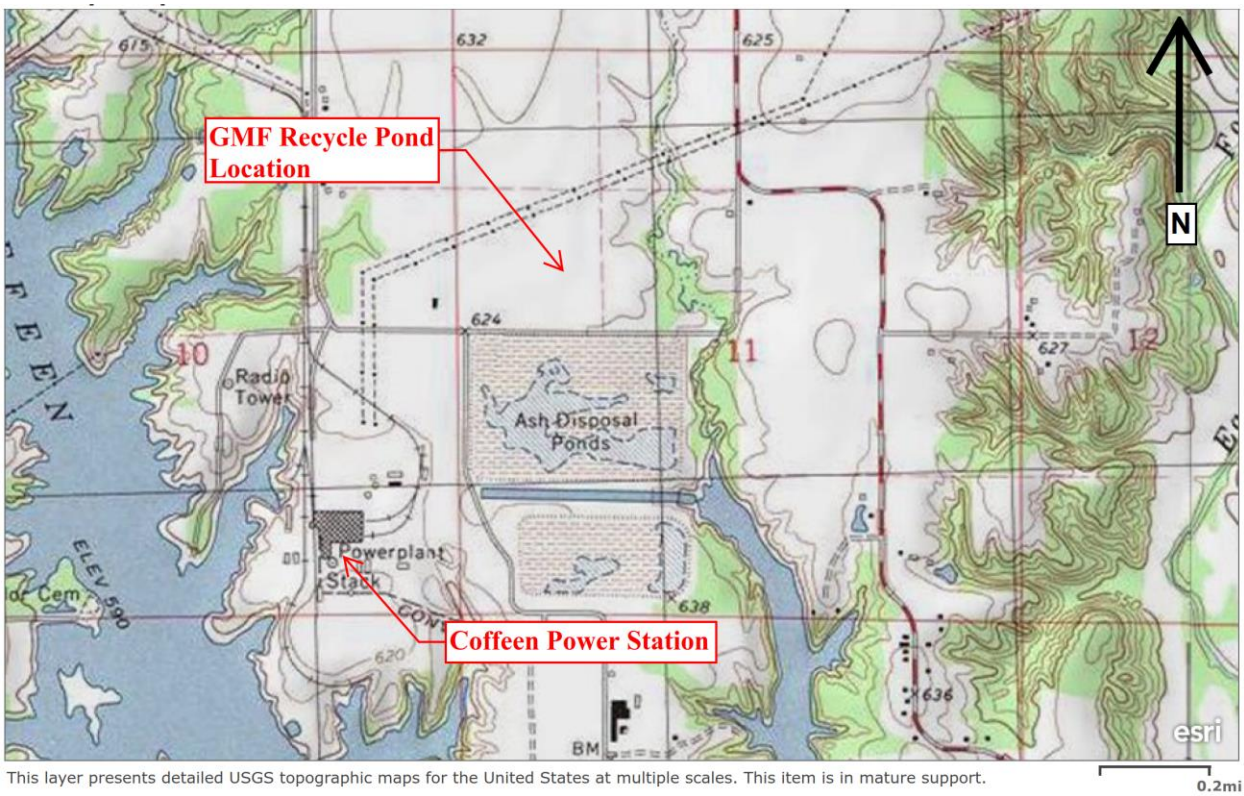


Figure 1 – Site Location Map (from esri.com, 2021)

Figure 2 – Site Plan (adapted from AECOM, 2016)

1.1 GMF RP Description

CPP was retired in 2019. Prior to retirement, three active CCR surface impoundments – the GMF RP, the GMF Gypsum Stack Pond (GMF GSP), and AP1 – and one CCR landfill – were used for managing CCRs generated at CPP. This certification report only pertains to the GMF RP. The GMF RP has a Significant hazard potential, based on the initial hazard potential classification assessment performed by Stantec in 2017 in accordance with §257.73(a)(2) ([2], [7]).

The GMF RP formerly served as the primary polishing pond for process water associated with gypsum produced by the wet scrubber system at CPP [8]. The GMF RP received clear water outflow from the GMF GSP via a lined channel (transfer channel) that connected the two ponds. Water was pumped out from the GMF RP via the pump house and transmitted back to the CPP for recycling. The GMF RP was operated in a closed-loop (e.g., zero discharge) fashion. Approximately 43,000 cubic yards (CY) of gypsum was sluiced directly into the GMF RP prior to construction completion for the GMF GSP circa 2009, although the GMF RP has not since been used for the primary disposal of gypsum [9]. This gypsum has remained within the GMF RP.

The GMF RP has a 60-mil high-density polyethylene (HDPE) single liner system that extends up to elevation 629.0 ft and is present beneath the entire footprint of the pond. The geomembrane liner is exposed at the pond bottom and side slopes [10].

As formerly operated, the maximum operating pool elevation of the GMF RP was elevation (El). 624.0 ft, based on the invert elevation of the emergency spillway system [10], which was intended only to discharge under emergency high-water conditions. The water elevation in the GMF RP was 617.6 ft in the periodic survey conducted in December of 2020 [11], after retirement of the CPP, the cessation of regular inflow and outflow pumping, and the construction of a berm in the transfer channel leading from the GMF GSP to the GMF RP [12]. Normal outflow from the GMF RP was formerly controlled by a decant structure and pump house located at the southeast corner of the embankment, in addition to an emergency spillway consisting of three drop inlets and three, 48-in. diameter HDPE pipes leading to a riprap-lined stilling basin [10]. Valves were installed and closed on the intake pipes leading to the pump house after closure of CPP. As currently operated, the GMF RP and GMF GSP only receive inflow from direct precipitation, and do not outflow, although outflow could occur from the GMF RP emergency spillways if the level were to rise above El. 624 ft. Water levels vary seasonably based on precipitation and evaporation.

The GMF RP is approximately 18.3 acres in size and was formed with a continuous embankment, a ring dike, which has a total length of approximately 3,600 ft. The perimeter dike has a crest width of approximately 30 ft and 5H:1V orientations on both the interior and exterior side slopes. The embankment crest elevation is El. 629 ft [11] and the maximum height above exterior grades is approximately 16 ft [13].

Initial certifications for the GMF RP for Hazard Potential Classification (§257.73(a)(2)), History of Construction (§257.73(c)), Structural Stability Assessment (§257.73(d)), Safety Factor Assessment (§257.73(e)(1)), and Inflow Design Flood Control System Plan (§257.82) were completed by Stantec, AECOM, and Hanson in 2016 and 2017 and subsequently posted to IPGC's CCR Website ([2], [3], [4], [5], [6]). Additional documentation for the initial certifications included detailed operating record reports containing calculations and other information prepared for the hazard potential classification by Stantec [7] and for the structural stability assessment, safety factor assessment, and inflow design flood control system plan by Hanson [13]. These operating record reports were not posted to IPGC's CCR Website.

1.2 Report Objectives

These following objectives are associated with this report:

- Compare site conditions from 2015/2016 to site conditions in 2020/2021, and evaluate if updates are required to the:
    - §257.73(a)(2) Hazard Potential Classification [2];
    - §257.73(c) History of Construction [3];
    - §257.73(d) Structural Stability Assessment [4];
    - §257.73(e) Safety Factor Assessment [5], and/or
    - §257.82 Inflow Design Flood Control System Plan [6].
- Independently review the Hazard Potential Classification ([2], [7]), Structural Stability Assessment ([4], [13]), Safety Factor Assessment ([5], [13]), and Inflow Design Flood Control System Plan ([6], [13]) to determine if updates may be required based on technical considerations.
    - The History of Construction report [3] was not independently reviewed for technical considerations as this report contained historical information primarily developed prior to promulgation of the CCR Rule [1] for the CCR units at CPP, and did not include calculations or other information used to certify performance and/or integrity of the impoundments under §257.73(a)(2)-(3), §257.73(c)-(e), or §257.82.
- Confirm that the GMF RP meets all of the requirements associated with §257.73(a)(2)-(3), (c), (d), (e), and §257.82, or, if the GMF RP does not meet all requirements, provide recommendations for compliance with these sections of the CCR Rule [1].

SECTION 2

COMPARISION OF INITIAL AND PERIODIC SITE CONDITIONS

2.1 Overview

This section describes the comparison of conditions at the GMF RP between the start of the initial CCR certification program in 2015 and subsequent collection of periodic certification site data in 2020 and 2021.

2.2 Review of Annual Inspection Reports

Annual onsite inspections of the GMF RP were performed between 2016 and 2020 ([14], [15], [16], [17], [18]) and were certified by a licensed professional engineer in accordance with §257.83(b). Each inspection report stated the following information, relative to the previous inspection:

- A statement that no changes in geometry of the impounding structure were observed since the previous inspection;
- A statement that no geotechnical instrumentation was present;
- Approximate volumes of impounded water and CCR at the time of inspection;
- A statement that no appearances of actual or potential structural weakness or other disruptive conditions were observed; and
- A statement that no other changes which may have affected the stability or operation of the impounding structure were observed.

In summary, the reports did not indicate any significant changes to the GMF RP between 2015 and 2020. No signs of instability, structural weakness, or changes which may have affected the operation or stability of the GMF RP were noted in the inspection reports.

2.3 Review of Instrumentation Data

Eleven groundwater monitoring wells (G270, G271, G272, G273, G274, G275, G276, G277, G278, G279, and G280) are present around the GMF RP. Groundwater level readings were collected generally on a quarterly basis and provided from February 17, 2016 to January 27, 2021. Geosyntec reviewed the groundwater level data to evaluate if significant fluctuations, particularly increases in phreatic levels, may have occurred after development of the initial structural stability and factor of safety certifications ([4], [5], [13]) Available water level readings are plotted in **Attachment A,** and **Figure 3** provides approximate locations of the monitoring wells.

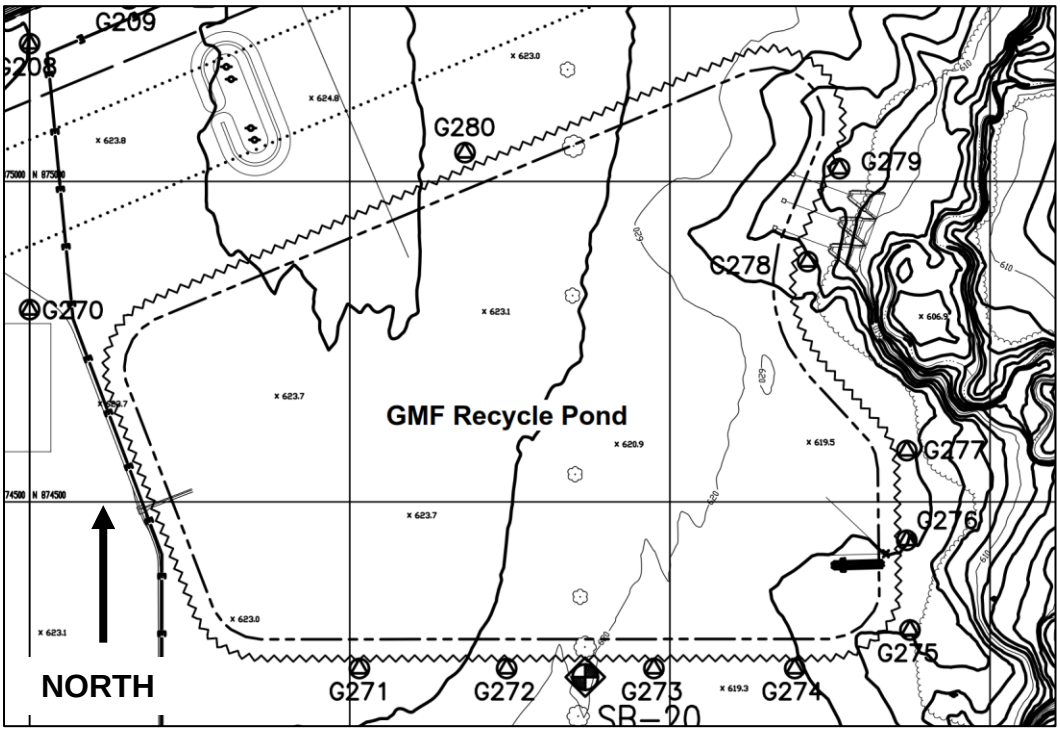


Figure 3 – GMF RP Monitoring Well Locations
(Not to Scale, adapted from Hanson, 2021)

In summary, groundwater levels in the monitoring well network were observed to be up to 20 ft different between individual wells. Seasonal fluctuations were relatively consistent between the wells, typically increasing or decreasing by 5 to 7 ft. These water levels are approximately 10 ft lower than water levels utilized in the slope stability analyses prepared to support the initial structural stability and safety factor assessments ([4], [5], [13]), therefore the water levels in the initial slope stability analyses are conservative relative to current conditions.

2.4 Comparison of Initial to Periodic Surveys

The initial survey of the GMF RP, conducted at the site by Hanson Professional Services Inc. (Hanson) in 2016 [19] and included a bathymetric but not a topographic survey. This survey was compared to the periodic topographic and bathymetric survey of the GMF RP, conducted by IngenAE, LLC (IngenAE) in 2020 [11], using AutoCAD Civil3D 2021 software.

The comparison quantified changes in the volume of CCR placed within the GMF RP and considered volumetric changes above and below the starting water surface elevation (SWSE) used for the 2016 §257.82 inflow design flood control plan hydraulic analysis ([6], [13]). This comparison is presented in a side-by-side comparison of the surveys in **Drawing 1** and a plan view isopach map denoting changes in ground surface elevation in **Drawing 2**. A summary of the water elevations and changes in CCR volumes is provided in **Table 2**.

Table 2 – Initial to Periodic Survey Comparison

Periodic Surveyed Pool Elevation (ft)	617.5
Initial §257.82 Starting Water Surface Elevation (SWSE) (ft)	624.0
Total Change in CCR Volume (CY)	+1,200
Change in CCR Volume Above SWSE (CY)	0
Change in CCR Volume Below SWSE (CY)	+1,200

The comparison indicated that approximately 1,200 CY of CCR may have been placed in the GMF RP between 2015 and 2020, with all of the CCR placed below the SWSE. However, reportedly no CCR was placed in the GMF RP between collection of the initial and periodic surveys, so it may be possible that the estimate change in CCR volume is due to minor differences in the initial and periodic bathymetric surveys. The indicated changes in CCR volumes are below the SWSE and are therefore unlikely to affect area-capacity curve of the GMF RP.

2.5 Comparison of Initial to Periodic Aerial Photography

Initial aerial photographs of the GMF RP collected by Weaver Consultants, Inc. (Weaver) in 2015 [20] were compared to periodic aerial photographs collected by IngenAE in 2020 [11] to visually evaluate if potential site changes (i.e., changes to the embankment, outlet structures, limits of CCR, other appurtenances) may have occurred between. A comparison of these aerial photographs is provided in **Drawing 3**. No significant changes were identified as part of this comparison.

2.6 Comparison of Initial to Periodic Site Visits

An initial site visit to the GMF RP was conducted by AECOM in 2015 and documented with a Site Visit Summary and corresponding photographs [21]. A periodic site visit was conducted by Geosyntec on May 28, 2021, with Mr. Lucas P. Carr, P.E. conducting the site visit. The periodic site visit was intended to evaluate potential changes at the site since 2015 (i.e., modification to the embankment, outlet structures or other appurtenances, limits of CCR, maintenance programs, repairs), and to perform visual observations of the GMF RP to evaluate if the structural stability requirements (§257.73(d)) were still met. The site visit included driving the perimeter of the GMF RP, periodically stopping to exist the vehicle and visually observe conditions, recording field notes, and collecting photographs. The site visit is documented in a photographic log provided in **Appendix B**. No significant changes were identified as part of this comparison.

2.7 Interview with Power Plant Staff

An interview with Mr. John Romang of CPP was conducted by Mr. Lucas P. Carr, P.E. of Geosyntec on May 28, 2021. Mr. Romang, at the time of the interview, had been employed at CPP for approximately 20 years as the environmental and chemistry manager or supervisor and was responsible for general oversight and compliance for the GMF RP since development of the initial certifications ([2], [7], [3], [4], [5], [6], [13]). A summary of the interview is provided below.

- Were any construction projects completed for the GMF RP between 2015 and 2021, and, if so, are design drawings and/or details available?
    - A berm was constructed in the transfer channel leading from the GMF GSP to the GMF RP.
    - Shutoff valves were installed and closed on the intake pipes leading to the outfall pump house, as part of power plant closure.
- Were there any changes to the purpose of the GMF RP between 2015 and 2017?
    - CPP was retired and plant inflows or outflows no longer occur into or out of the GMF RP.
    - Outflow from dewatering wells in Ash Pond No. 2 (AP2) were formerly discharged into the GMF RP. This discharge was ceased upon closure of AP2 in 2020.
- Were there any changes to the to the instrumentation program and/or physical instruments for the GMF RP between 2015 and 2021?
    - No instruments are present at the GMF RP.
- Were there any changes to spillways and/or diversion features for the GMF RP completed between 2015 and 2021?
    - No changes occurred.
- Have any area-capacity curves been developed for the GMF RP since 2015?
    - No known curves have been developed.
- Were there any changes to construction specifications, surveillance, maintenance, and repair procedures for the GMF RP between 2015 and 2021?
    - No.
- Were there any instances of dike and/or structural instability for the GMF RP between 2015 and 2021?
    - No known instances occurred.

SECTION 3

HAZARD POTENTIAL CLASSIFICATION - §257.73(A)(2)

3.1 Overview of Initial HPC

The Initial Hazard Potential Classification (Initial HPC) was prepared by Stantec Consulting Services, Inc. (Stantec) in 2016 ([2], [7]), following the requirements of §257.73(a)(2). The Initial HPC included the following information:

- Performing two breach analysis using HEC-HMS software, using pool levels estimated within the GMF RP during the Probable Maximum Precipitation (PMP) rainfall event, for a single breach occurring at the eastern side of the GMF RP, where the embankment is at its maximum height.
- Evaluating potential effects of flooding in multiple areas, including breach flood wave velocities, flood depths, and/or pool increases, or the following locations:
    - County Road 450 N,
    - The eastern cove of Coffeen Lake,
    - Coffeen Lake Dam, and
    - Coffeen Lake itself.
- While a breach map is not included within the Initial HPC, it included within the §257.73(a)(3) Initial Emergency Action Plan (Initial EmAP) [22].

The breach analysis concluded that a breach of the GMF RP would impact intermittently used County Road 450N, but that a loss of life was not probable due to the only transient occupation of the roadway. County Road 450N is paved but is a dead-end road leading to a supplemental entry to CPP, as of 2016. After closure of the CPP, Country Road 450N became the primary entry to CPP, however use of the road is still considered transient due to CPP having a reduced onsite staff, typically consisting of two personnel, although contractors or other visitors may also visit the site on an intermittent basis. The Initial HPC concluded that the breach would be unlikely to result in a probable loss of human life, although the breach could cause CCR to be released into the Coffeen Lake, thereby causing environmental damage. The Initial HPC therefore recommended a "Significant" hazard potential classification for the GMF RP [2].

3.2 Review of Initial HPC

Geosyntec performed a review of the Initial HPC ([2], [7]), in terms of technical approach, input parameters, and assessment of results. The review included the following tasks:

- Reviewing the breach assessment inputs for appropriateness,
- Reviewing the selected HPC for appropriateness based on the results of the breach analysis, including flow velocities and depths;
- Reviewing the HPC vs. applicable requirements of the CCR Rule [1].

No significant technical issues were noted within the technical review, although a detailed review (e.g., check) of the calculations was not performed.

3.3 Summary of Site Changes Affecting the Initial HPC

Geosyntec performed a visual assessment to evaluate if any new structures, infrastructure, frequently occupied facilities/areas, or waterways were present within mapped breach areas for the GMF RP, as identified in the Initial Emergency Action Plan [22], in addition to evaluating if downstream site topography in the probable breach area may have changed. The visual assessment considered a comparison of the 2015 to 2020 aerial imagery (**Drawing 3**) and photographs collected by Geosyntec in May of 2021 (**Attachment B**).

Geosyntec did not identify any changes at the site that may affect the HPC. No new structures, infrastructure, frequently occupied facilities/areas, or waterways were present in the probable breach area indicated in the Initial EmAP [22]. Additionally, no significant changes to the topography in the probable breach were identified.

3.4 Periodic HPC

Geosyntec recommends retaining the "Significant" hazard potential classification for the GMF RP, per §257.73(a)(2), based on the lack of site changes potentially affecting the Initial HPC occurring since the Initial HPC was developed, as described in **Section 3.3** and the lack of significant technical review comments, as described in **Section 3.2**. Updates to the Initial HPC reports ([2], [7]) are not recommended at this time.

SECTION 4

HISTORY OF CONSTRUCTION REPORT - §257.73(C)

4.1 Overview of Initial HoC

The Initial History of Construction report (Initial HoC) was prepared by AECOM in 2016 [3], following the requirements of §257.73(c), and included information on all CCR surface impoundments at CPP, including the GMF RP, the GMF GSP, AP1, and AP2. The Initial HoC included the following information for the GMF RP:

- The name and address of the owner/operator,
- Location maps,
- Statements of purpose,
- The names and size of the surrounding watershed,
- A description of the foundation and abutment materials,
- A description of the dike materials,
- Approximate dates and stages of construction,
- Available design and engineering drawings,
- A summary of instrumentation,
- A statement that area-capacity curves for the GMF RP were not readily available,
- Information on spillway structures,
- Construction specifications,
- Inspection and surveillance plans,
- Information on operational and maintenance procedures, and
- A statement that no known instability has occurred at the GMF RP.

4.2 Summary of Site Changes Affecting the Initial HoC

Several significant changes were identified at the site that occurred after development of the Initial HoC [3] report and are described below:

- A state identification number (ID) of W1350150004-04 was assigned to the GMF RP by the Illinois Environmental Protection Agency (IEPA).
- Electricity generation at the CPP ceased in 2019. The purpose of the GMF RP changed as it no actively longer receives process water from the CPP and GMF RP and water is no longer pumped from the GMF RP back to the CPP.
- Valves were installed on the intake pipes for the outfall structure and the valves were closed due to the cessation of power generation at CPP.
- Dewatering discharge from AP2 into the GMF RP was ceased due to closure of AP2.
- Revised area-capacity curves and spillway design calculations for the GMF RP were prepared as part of the updated periodic Inflow Design Flood Control System Plan, as described in **Section 7**.

A letter documenting changes to the HoC report is provided in **Attachment C**.

SECTION 5

STRUCTURAL STABILITY ASSESSMENT - §257.73(D)

5.1 Overview of Initial SSA

The Initial Structural Stability Assessment (Initial SSA) was prepared by Hanson in 2016 ([4], [13]), following the requirements of §257.73(d)(1), and included the following evaluations:

- Stability of dike foundations, dike abutments, slope protection, dike compaction, and slope vegetation;
- Spillway stability including capacity, structural stability and integrity; and
- An evaluation to determine if downstream water bodies that could induce a sudden drawdown condition to the exterior slopes could be present.

The Initial SSA concluded that the GMF RP met all structural stability requirements for §257.73(d)(1)(i)-(vii).

The Initial SSA referenced the results of the Initial Structural Factor Assessment (Initial SFA) ([5], [13]), to demonstrate stability of the stability of foundations and abutments (§257.73(d)(1)(i)) and sufficiency of dike compaction (§257.73(d)(1)(iii)) portions of the SSA criteria. This included stating that slope stability analyses for slip surfaces passing through the foundation met or exceeded the criteria listed in §257.73(e)(1), for the stability of foundations and abutments. For the sufficiency of dike compaction, this included stating that slope stability analyses for slip surfaces passing through the dike also met or exceeded the §257.73(e)(1) criteria.

5.2 Review of Initial SSA

Geosyntec performed a review of the Initial SSA ([4], [13]) in terms of technical approach, calculation input parameters and methodology, recommendations, and completeness. The review included the following tasks:

- Reviewing photographs collected in 2015 and used to demonstrate compliance with §257.73(d)(1)(i)-(vii).
- Reviewing geotechnical calculations used to demonstrate the stability of foundations, per §257.73(d)(1)(i) and sufficiency of dike compaction, per §257.73(d)(1)(iii), in terms of supporting geotechnical investigation and testing data, input parameters, analysis methodology, selection of critical cross-sections, and loading conditions.

- Review of the methodology used to demonstrate that a downstream water body that could induce a sudden drawdown condition, per §257.73(d)(1)(vii), is not present.

- Completeness and technical approach used to evaluate the stability of hydraulic structures, per §257.73(d)(1)(vi).

Several review comments and corresponding recommended technical updates were identified during review of the geotechnical analyses supporting the sufficiency of dike compaction and foundation and abutment stability portions of the Initial SSA. Review comments were also identified during review of the hydrologic and hydraulic analyses supporting the adequacy of the spillway management system. Specific review comments and associated with these analyses are discussed in **Sections 6.2** and **7.2**.

5.3 Summary of Site Changes Affecting Initial SSA

Several changes at the site that occurred after development of the Initial SSA were identified. These changes required updates to the Initial SSA and are described below.

- The Initial SSA utilized the results of the Initial Inflow Design Flood Control System Plan (IDF) to demonstrate compliance with the adequacy of spillway design and management (§257.73(d)(1)(v)(A)-(B)). The Initial IDF was subsequently updated to develop a Periodic IDF, based on site changes and review comments, as discussed in **Section 7**.

- The Initial SSA utilized the slope stability analysis results of the Initial Safety Factor Assessment (SFA) as part of the compliance demonstration for the stability of foundations and abutments (§257.73(d)(1)(i)) and sufficiency of dike compaction (§257.73(d)(1)(iii)) as discussed in **Section 5.1.** The Initial SFA slope stability analyses were subsequently updated to develop a Periodic SFA, based on site changes and review comments, as discussed in **Section 6**.

5.4 Periodic SSA

The Periodic SFA (**Section 6**) indicates that the foundations and abutments are stable and dike compaction is sufficient for expected ranges in loading conditions, as slope stability factors of safety were found to meet or exceed the requirements of §257.73(e)(1), including for post-earthquake (i.e., liquefaction) loading conditions considering seismically-induced strength loss in the foundation soils. Therefore, the requirements of §257.73(d)(1)(i) and §257.73(d)(1)(iii) are met for the Periodic SSA.

The Periodic IDF (**Section 7**) indicates that spillways are adequately designed and constructed to adequately manage flow during the 1,000-year design flood, as the spillways can adequately manager flow during peak discharge from the 1,000-year design flood without overtopping of the embankments, as long as the normal operating pool (e.g., SWSE) within the GMF RP is maintained

at El. 622.1 and below. Therefore, the requirements of §257.73(d)(1)(v)(A)-(B) are met for the Periodic SSA.

SECTION 6

SAFETY FACTOR ASSESSMENT - §257.73(E)(1)

6.1 Overview of Initial SFA

The Initial Safety Factor Assessment (Initial SFA) was prepared by Hanson in 2016 ([5], [13]), following the requirements of §257.73(e)(1). The Initial SFA included the following information:

- A geotechnical investigation program laboratory testing used to support the initial design of the GMF RP;
- An assessment of the potential for liquefaction in the dike and foundation soils;
- The development of one (1) slope stability cross-sections for limit equilibrium stability analysis utilizing GeoStudio SLOPE/W and PCSTABL5 software;
- The analysis of each cross-sections for maximum storage pool, maximum surcharge pool, and seismic loading conditions.
    - Liquefaction loading conditions were not evaluated as liquefaction-susceptible soil layers were not identified in the embankments' soils.

The Initial SFA concluded that the GMF Recycle Pond met all safety factor requirements, per §257.73(e), as all calculated safety factors were equal to or higher than the minimum required values.

6.2 Review of Initial SFA

Geosyntec performed a review of the Initial SFA ([5], [13]) in terms of technical approach, calculation input parameters and methodology, recommendations, and completeness. The review included the following tasks:

- Reviewing geotechnical calculations used to demonstrate the acceptable safety factors, per §257.73(e)(1), in terms of:
    - Completeness and adequacy of supporting geotechnical investigation and testing data;
    - Completeness and approach of liquefaction triggering assessments; and
    - Input parameters, analysis methodology, selection of critical cross-sections, and loading conditions utilized for slope stability analyses;

- Comparison of geotechnical parameters selected by Hanson with geotechnical investigations performed by and subsequent parameters developed by AECOM in 2015 and 2016 for Ash Pond No. 1 (AP1), Ash Pond No. 2 (AP2), and the GMF GSP at Coffeen ([8], [23]) as these ponds are located adjacent to the GMF RP on the north and the south and subsurface conditions are relatively consistent across the CPP site; and

- Phreatic conditions assumed in the analyses relative to available monitoring well groundwater level data collected from 2016 through 2021, as discussed in **Section 2.3**.

Several comments were identified during review of the Initial SFA. Each comment required updates to the Initial SFA is described below:

- The geotechnical investigation program utilized to develop subsurface stratigraphy at the GMF RP consisted of 6 borings used to support the initial design of the GMF RP. Only one of the borings was located along the perimeter embankment of the GMF RP. Subsurface stratigraphic data from the eleven monitoring wells located around the GMF RP perimeter were not utilized to support the geotechnical investigation. Additionally, laboratory testing and CPT data collected for Ash Pond No. 1, Ash Pond No. 2, and the GMF GSP the CPP site by AECOM in 2015 ([8], [23]) were not considered in the investigation and assessment; the AECOM data included refined shear strength testing.

- Geotechnical analyses used to support the Initial SSA, which were contained within the Initial SFA, concluded that the soils at the site were not susceptible to liquefaction based on fines content and blowcounts. However, the 2015 and 2016 AECOM Initial SFAs for AP1 and the GMF GSP identified the presence of a low-strength soft clay layer at the transition between overburden loess soils and underlying glacial till and identified that this material may be susceptible to cyclic softening. A review of available borings for the GMF RP indicated that this layer is present beneath the GMF RP based on low blowcounts in the transition zone.

- The Initial SFA evaluated sudden drawdown and end-of-construction loading conditions, however the sudden drawdown loading condition is not applicable as the interior slopes are lined and a downstream water body is not present on the exterior slopes. Additionally, the Initial SFA included end-of-construction conditions, which are not currently applicable for the GMF RP as the pond was constructed approximately 12 years ago, as of the date of this report.

- Groundwater levels utilized in the Initial SFA were approximately 10 ft higher than groundwater levels measured from the monitoring wells.

6.3 Summary of Site Changes Affecting Initial SFA

Several changes at the site that occurred after development of the Initial SFA were identified. These changes required updates to the Initial SFA and are described below:

- The normal pool levels within the GMF RP decreased from 623.0 ft to 622.1 ft, due to the construction of a berm in the transfer channel and the cessation of process water pumping (**Section 7**), resulting in 1.9 ft of lower water loading on the embankment dikes for the maximum storage pool and seismic loading conditions (§257.73(e)(1)(i) and (iii)), relative to the Initial SFA.

- Peak pool levels in the GMF RP during the PMP design flood event decreased from 627.5 ft to 623.9 ft, per the updated Periodic IDF (**Section 7**), resulting in 3.6 ft of lower water loading on the embankment dikes for the maximum surcharge pool loading conditions (§257.73(e)(1)(iv)), relative to the initial SFA.

6.4 Periodic SFA

Following review of the Initial SFA ([5], [13]), Geosyntec developed a new slope stability analysis cross-section (C) at the northeast corner of the GMF RP embankment. This cross-section was selected as the critical cross-section based on the maximum height of the embankment and the location and thickness of the soft clay layer within the foundation soils. The cross-section was developed and analyzed utilizing the following approach and input data:

- Ground surface geometry was obtained from the 2020 survey of the GMF RP [11].

- Subsurface stratigraphy was obtained from the available well boring logs at the vicinity of the cross-section [10] and the Initial SFA for the GMF GSP [8], as the GMF GSP is adjacent to the GMF RP and also considered data collected at AP1 and AP2 [23]. Geosyntec evaluated the boring data and concluded that soil shear strength parameters were similar to those used by Initial SFA for the GMF GSP. Therefore, the soil properties (i.e., strength, unit weight) from the Initial SFA of GMF GSP were utilized for cross-section C.

- Piezometric levels in the foundation soils were assumed to follow the ground surface past the embankment toe, per providing readings from the available monitoring wells (see **Section 2.3**).

- The low-strength soft clay layer at the transition between overburden loess soils and underlying glacial till was assumed to be susceptible to seismically-induced strength losses (i.e., liquefaction and or cyclic softening) and post-liquefaction slope stability model was analyzed to support the Periodic SSA (§257.73(d)(1)(i))) using post-liquefaction shear strength utilized in the Initial SFA for the GMF GSP [8].

- Water levels in the GMF RP for the maximum storage pool, and seismic slope stability analysis loading conditions were considered at El. 622.1 ft, based on the Periodic IDF (**Section 7.4**).

- Water levels in the GMF RP for the maximum surcharge pool slope stability analysis loading conditions were considered at El. 623.9 ft based on the Periodic IDF (**Section 7.4)**.

- The cross-section was analyzed using GeoStudio SLOPE/W 2012 software, with analysis settings including, but not limited to software package and version, slip surface search routines and methods, and pseudostatic seismic coefficients, selected to be consistent with the Initial SFA for the adjacent GMF GSP [8].

Factors of safety from the Periodic SFA are summarized in **Table 3** and confirm that the GMF RP meets the requirements of §257.73(e)(1). The location of critical cross-section C in plan and analysis output data is provided in **Attachment D**.

Table 3 – Factors of Safety from Periodic SFA

	Structural Stability Assessment (§257.73(d)) and Safety Factor Assessment (§257.73(e))				**Structural Stability Assessment (§257.73(d))**
Cross-Section	**Maximum Storage Pool §257.73(e)(1)(i) Minimum Required = 1.50**	**Maximum Surcharge Pool §257.73(e)(1)(ii) Minimum Required = 1.40**	**Seismic §257.73(e)(1)(iii) Minimum Required = 1.00**	**Dike Liquefaction §257.73(e)(1)(iv) Minimum Required = 1.20**	**Foundation Liquefaction §257.73(d)(1)(i) Minimum Required = 1.20**
C	2.40*	2.39*	1.05*	N/A	1.42*

Notes:
N/A – Loading condition is not applicable.
* - Denotes critical cross-section for each loading condition

SECTION 7

INFLOW DESIGN FLOOD CONROL SYSTEM PLAN - §257.82

7.1 Overview of 2016 Inflow Design Flood Control System Plan

The Initial Inflow Design Flood Control System Plan (Initial IDF) was prepared by Hanson in 2016 ([6], [13]), following the requirements of §257.82. The Initial IDF included the following information:

- A hydraulic and hydrologic analysis, performed for the Probable Maximum Flood (PMF) design flood event and the 100-year, 12-hour storm event. Specific rainfall depths associated with both flood events were not indicated in the Initial IDF.
- The Initial IDF utilized a HEC-HMS model to evaluate spillway flows and pool level increases during the design flood, with a SWSE of 624.0 ft.

The Initial IDF concluded that AP1 met the requirements of §257.82, as the peak water surface estimated by the HEC-HMS model was El. 627.45 ft, relative to the minimum GMF RP dike crest elevation of 629.0 ft. Therefore, overtopping was not expected.

The Initial IDF also evaluated the potential for discharge from the CCR unit and determined that discharge from the unit was not expected during normal operations, as the GMF RP was operated as a closed-loop system with no discharges during normal conditions.

7.2 Review of Initial IDF

Geosyntec performed a review of the Initial IDF ([6], [13]) in terms of technical approach, calculation input parameters and methodology, recommendations, and completeness. The review included the following tasks:

- Reviewing the return interval used vs. the hazard potential classification.
- Reviewing the rainfall depth and distribution or appropriateness.
- Performing a high-level review of the inputs to the hydrologic modeling.
- Reviewing hydrologic model parameters for spillway parameters, starting pool elevation, and storage vs. the reference data.
- Reviewing the overall IDF vs. the applicable requirements of the CCR Rule [1].

Several comments were identified during review of the Initial IDF. The comment is described below:

- The Initial IDF considered the PMF and 100-year flood events, as opposed to the 1,000-year flood event that would typically be utilized for a Significant hazard potential CCR Surface Impoundment, per the CCR Rule.

- The Initial IDF utilized the National Resource Conservation Service (NRCS) Type II rainfall distribution type [24]. Geosyntec recommends utilizing the Huff 3rd Quartile distribution for areas less than 10 square miles [25] for the reasons listed below.

    - Huff 3rd Quartile distribution was identified to be a more appropriate representation of a 1,000-year, 24-hour storm event per the Illinois State Water Survey (ISWS) Circular 173 [25] which developed standardized rainfall distributions from compiled rainfall data at sites throughout Illinois.

    - Illinois Department of Natural Resources, Office of Water Resources (IDNR-OWR) [26] recommends use of the Huff Quartile distributions in Circular 173 when using frequency events to determine the spillway design flood inflow hydrograph, "*The suggested method to distribute this rainfall is described in the ISWS publication, Circular 173, "Time Distributions of Heavy Rainstorms in Illinois".*

7.3 Summary of Site Changes Affecting the Initial IDF

Several changes at the site that occurred after development of the Initial IDF were identified. These changes required updates to the Initial IDF and are described below:

- A berm was constructed in the transfer channel between the GMF RP and the upstream GMF GSP [27].

- Approximately 30,000 CY of gypsum were placed above the SWSE in the upstream GMF GSP, thereby altering the stage-storage curve of the upstream pond relative to the Initial IDF [27].

- Due to closure of the CPP, the cessation of process water pumping activities, and the construction of a berm in the transfer channel, the surveyed water surface elevation in in the GMF RP 2020 [11] was lower than the SWSE utilized in the Initial IDF.

7.4 Periodic IDF

Geosyntec revised the Initial IDF to account for the technical review comments and stie changes, as described in **Section 7.2** and **Section 7.3**. The Periodic IDF was prepared using HydroCAD software [28] for consistency with other studies and certifications performed at CPP.

The HydroCAD model for the GMF RP is based on the updated model used for the periodic IDF certification of the GMF GSP [27] . Both models include the GMF RP, the GMF GSP, the transfer channel between the two ponds, and the drainage areas of both ponds.

For the purposes of analyzing the GMF RP, updates to the model included the following:

- The Runoff Method was selected to be "SCS TR-20" [29] for consistency with other models at CPP.

- The Reach Routing Method and the Pond Routing Method for the model were both selected to be "Dynamic Storage Indication" for consistency with other models at CPP and to more accurately account for routing between the connected ponds. Due to the selected routing methods, all tailwater conditions were automated.

- The rainfall depth was updated from the probable maximum precipitation (PMP), 24-hour rainfall depth to the 1,000-year, 24-hour rainfall depth, which is consistent with the Significant hazard potential for of the GMF RP. This rainfall depth is 9.13 inches based on NOAA Atlas 14 [30].

- The rainfall distribution type was updated to the "Huff 3rd Quartile" storm type provided by HydroCAD [28].

- The stage-storage curve was updated for both the GMF RP and GMF GSP based on the 2020 site survey [11].

    - Revised stage-volume curves for the GMF RP and GMF GSP were prepared based on measuring the storage volume of the impoundments at every one-foot increment of depth from an elevation at the bottom of the ponds (621.1 ft for GMF GSP; 604.9 ft for GMF RP) to the approximate minimum perimeter dike embankment crest elevation (632 ft for GMF GSP; 629 ft for GMF RP). This analysis identified an overall decrease of 24.9 ac-ft of storage volume at the GMF RP, with a 2.34 ac-ft decrease above the previous SWSE of 624.0 ft from the storage used in the 2016 Initial IDF Certification.

- The SWSE within the GMF GSP was updated from 621.2 ft to 625.2 ft to reflect the 2020 site survey [11]. The discharge structure invert elevation is 619.0 ft; however, the greater elevation of the invert structure and the surveyed WSE was used as the SWSE to provide conservatism in the model if the level increases seasonally due to precipitation inflow.

- The subcatchment area draining to the GMF RP was updated from 17.12 ac to 18.3 ac to reflect the 2020 site survey [11]. The Curve Number (CN) of the subcatchment area was increased from 91 to 98 to reflect that the majority of the drainage area is water.

- The subcatchment area draining to the GMF GSP was updated from 33.8 ac to 36.2 ac to reflect the 2020 site survey [11].

- The time of concentration (ToC) for drainage areas to the GMF GSP and GMF RP was updated from 5 minutes to 6 minutes to reflect direct run-on inflow in accordance with TR-20 [29].

- The GMF GSP and transfer channel geometry were updated to reflect the new berm at the inlet to the transfer channel.

    - The outlet invert from the GMF GSP to the transfer channel between the GMF GSP and the GMF RP was raised from 625 ft to 626 ft per the 2020 site survey [11]. The geometry of the outlet was updated as follows based on the 2020 site survey, as listed in **Table 4**.

Table 4 – GMF GSP Outlet Geometry Attributes in Periodic IDF

Head (ft)	Channel Width (ft)
0	45
2	60
4	75

    - The transfer channel geometry was updated as follows based on the 2020 site survey, as listed in **Table 5**.

Table 5 – Transfer Channel Attributes in Periodic IDF

Parameter	Value
Bottom Width (ft)	32.7
Channel Depth (ft)	6
Left Side Slope	3
Right Side Slope	1.6
Channel Length (ft)	450

- The three outlet structures in the GMF RP were updated from 24 ft broad-crested weirs to horizontal, rectangular orifices with dimensions of 5 ft by 5 ft to reflect the riser structures existing on site. The inlet elevation of the orifices was set to 624 ft per the initial certification reports.

The results of the Periodic IDF are summarized in **Table 6** and confirm that the GMF RP meets the requirements of §257.82(a)-(b), as the peak water surface elevation does not exceed the minimum perimeter dike crest elevations. Additionally, discharge from the GMF RP is not expected to activate the existing spillway system during both normal and IDF conditions, as long as the SWSE is maintained at El. 622.1 ft or below. Updated area-capacity curves and HydroCAD model output are provided in **Attachment E**.

Table 6 – Water Levels from Periodic IDF

Analysis	Starting Water Surface Elevation (ft)	Peak Water Surface Elevation (ft)	Invert Elevation of Emergency Spillway (ft)	Minimum Dike Crest Elevation (ft)
Initial IDF	624.0	627.5	624.0	629.0
Periodic IDF Update	622.1	623.9	624.0	629.0
Initial to Periodic Change[1]	-1.9	-3.6		

Notes:
[1]Postive change indicates increase in the WSE relative to the Initial IDF, negative change indicates decrease in the WSE, relative to the Initial IDF.

SECTION 8

CONCLUSIONS

The GMF RP at CPP was evaluated relative to the USPEPA CCR Rule periodic assessment requirements for:

- Hazard potential classification (§257.73(a)(2)),
- History of Construction reporting (§257.73(d)),
- Structural stability assessment (§257.73(d)),
- Safety factor assessment (§257.73(e)), and
- Inflow design flood control system planning (§257.82).

Based on the evaluations presented herein, the referenced requirements are satisfied, as long as the starting water surface elevation in the GMF RP is maintained at El. 622.1 ft or lower.

SECTION 9

CERTIFICATION STATEMENT

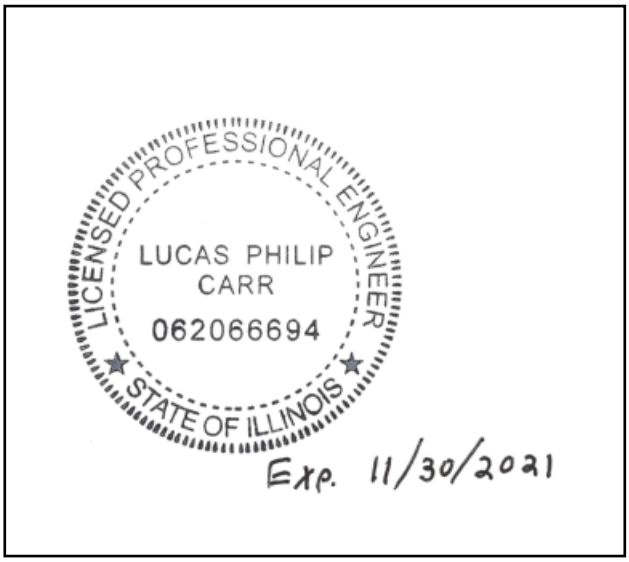
CCR Unit: Illinois Power Generating Company, Coffeen Power Plant, GMF RP

I, Lucas P. Carr, being a Registered Professional Engineer in good standing in the State of Illinois, do hereby certify, to the best of my knowledge, information, and belief that the information contained in this 2021 USEPA CCR Rule Periodic Certification Report, has been prepared in accordance with the accepted practice of engineering. I certify, for the above-referenced CCR Unit, that the periodic assessment of the hazard potential classification, history of construction report, structural stability, safety factors, and inflow design flood control system planning, dated October 2016, were conducted in accordance with the requirements of 40 CFR §257.73(a)(2), (c), (d), (e), and §257.82.

Lucas P. Carr

10/11/2021

Date



SECTION 10

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Section 3

Annual Groundwater Monitoring and Corrective Action Report (Section 845.610(e))

Prepared for
Illinois Power Generating Company

Date
January 31, 2022

Project No.
1940100711-003

2021 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

GMF RECYCLE POND

COFFEEN POWER PLANT

COFFEEN, ILLINOIS

RAMBOLL Bright ideas. Sustainable change.

2021 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
COFFEEN POWER PLANT GMF RECYCLE POND

Project name	**Coffeen Power Plant GMF Recycle Pond**
Project no.	**1940100711-003**
Recipient	**Illinois Power Generating Company**
Document type	**Annual Groundwater Monitoring and Corrective Action Report**
Version	**FINAL**
Date	**January 31, 2022**
Prepared by	**Kristen L. Theesfeld**
Checked by	**Lauren Cook**
Approved by	**Brian Hennings**
Description	**Annual Report in Support of Part 845**

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APPENDICES

ACRONYMS AND ABBREVIATIONS

§	Section
35 I.A.C.	Title 35 of the Illinois Administrative Code
40 C.F.R.	Title 40 of the Code of Federal Regulations
bgs	below ground surface
CCR	coal combustion residuals
CPP	Coffeen Power Plant
DA	deep aquifer
GMF RP	Gypsum Management Facility Recycle Pond
GMP	Groundwater Monitoring Plan
GWPS	groundwater protection standard
HCR	Hydrogeologic Site Characterization Report
ID	identification
IEPA	Illinois Environmental Protection Agency
IPGC	Illinois Power Generating Company
LCU	lower confining unit
NA	not applicable
NID	National Inventory of Dams
No.	number
Part 845	35 I.A.C. § 845: Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments
Ramboll	Ramboll Americas Engineering Solutions, Inc.
SI	surface impoundment
SSI	statistically significant increase
TDS	total dissolved solids
UA	uppermost aquifer
WLO	water level only

EXECUTIVE SUMMARY

This report has been prepared to provide the information required by Title 35 of the Illinois Administrative Code (35 I.A.C.) Section (§) 845.610(e) (*Annual Groundwater Monitoring and Corrective Action Report*) for the Gypsum Management Facility Recycle Pond (GMF RP) located at Coffeen Power Plant (CPP) near Coffeen, Illinois.

An operating permit application for the GMF RP was submitted by Illinois Power Generating Company (IPGC) to the Illinois Environmental Protection Agency (IEPA) by October 31, 2021 in accordance with the requirements specified in 35 I.A.C. § 845.230(d), and is pending approval. The GMF RP is recognized by Vistra identification (ID) Number (No.) 104, IEPA ID No. W1350150004-04, and National Inventory of Dams (NID) No. IL50578.

A Groundwater Monitoring Plan (GMP; Ramboll Americas Engineering Solutions, Inc. [Ramboll], 2021a), which included a Statistical Analysis Plan, was developed and submitted as part of the operating permit application to propose a monitoring well network and monitoring program specific to the GMF RP that will comply with 35 I.A.C. § 845: Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments (Part 845; IEPA, 2021). The proposed groundwater protection standards (GWPS), as presented in the GMP, are shown in **Appendix A**.

Groundwater concentrations observed from 2015 to 2021 were presented in the Hydrogeologic Site Characterization Report (HCR; Ramboll, 2021b) and evaluated in the presentation of the History of Potential Exceedances (Ramboll, 2021c) included in the operating permit application, as required by 35 I.A.C. § 845.230(d). Groundwater concentrations from 2015 to 2021 that exceeded the GWPS set forth in 35 I.A.C. § 845.600(a) are considered potential exceedances because the methodology used to determine them is proposed in the Statistical Analysis Plan, which is pending IEPA approval. The determination of potential historical exceedances of 35 I.A.C. § 845.600(a) and a summary of potential historical exceedances of proposed GWPS are shown in **Appendix B**.

Evaluation of background groundwater quality was presented in the GMP (Ramboll, 2021a), and compliance with Part 845 will be determined after the first round of groundwater sampling following IEPA's issuance of an operating permit.

This report summarizes only the information presented in the operating permit application for the GMF RP, submitted to IEPA by October 31, 2021, which is pending IEPA approval.

1. INTRODUCTION

This report has been prepared by Ramboll on behalf of IPGC, to provide the information required by 35 I.A.C. § 845.610(e) for the GMF RP located at CPP near Coffeen, Illinois. The owner or operator of a coal combustion residuals (CCR) surface impoundment (SI) must prepare and submit to IEPA by January 31st of each year an Annual Groundwater Monitoring and Corrective Action Report for the preceding calendar year as part of the Annual Consolidated Report required by 35 I.A.C. § 845.550. The Annual Groundwater Monitoring and Corrective Action Report shall document the status of the groundwater monitoring and corrective action plan for the CCR SI, summarize key actions completed, including the status of permit applications and Agency approvals, describe any problems encountered and actions to resolve the problems, and project 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 SI and all background (or upgradient) and downgradient monitoring wells, including the well ID Nos., that are part of the groundwater monitoring program for the CCR SI, and a visual delineation of any exceedances of the GWPS.
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. A potentiometric surface map for each groundwater elevation sampling event required by 35 I.A.C. § 845.650(b)(2).
4. In addition to all the monitoring data obtained under 35 I.A.C. §§ 845.600-680, a summary including the number of groundwater samples that were collected for analysis for each background and downgradient well, and the dates the samples were collected.
5. A narrative discussion of any statistically significant increases (SSIs) over background levels for the constituents listed in 35 I.A.C. § 845.600.
6. Other information required to be included in the annual report as specified in 35 I.A.C. §§ 845.600-680.
7. A section at the beginning of the annual report that provides an overview of the current status of the groundwater monitoring program and corrective action plan for the CCR SI. At a minimum, the summary must:
    i. Specify whether groundwater monitoring data shows a SSI over background concentrations for one or more constituents listed in 35 I.A.C. § 845.600.
    ii. Identify those constituents having a SSI over background concentrations and the names of the monitoring wells associated with the SSI(s).
    iii. Specify whether there have been any exceedances of the GWPS for one or more constituents listed in 35 I.A.C. § 845.600.
    iv. Identify those constituents with exceedances of the GWPS in 35 I.A.C. § 845.600 and the names of the monitoring wells associated with the exceedance.
    v. Provide the date when the assessment of corrective measures was initiated for the CCR SI.

vi. Provide the date when the assessment of corrective measures was completed for the CCR SI.

vii. Specify whether a remedy was selected under 35 I.A.C. § 845.670 during the current annual reporting period, and if so, the date of remedy selection.

viii. Specify whether remedial activities were initiated or are ongoing under 35 I.A.C. § 845.780 during the current annual reporting period.

An operating permit application for the GMF RP was submitted by IPGC to IEPA by October 31, 2021 in accordance with the requirements specified in 35 I.A.C. § 845.230(d), and is pending approval. Therefore, the Part 845 groundwater monitoring program has not yet been initiated. This report summarizes the data collected for the GMF RP as it was presented in the operating permit application, and includes the following:

- A map showing the CCR SI and all proposed background (or upgradient) and downgradient monitoring wells, including their identification numbers, that are part of the proposed groundwater monitoring program for the CCR SI presented in the GMP included in the operating permit application (Ramboll, 2021a).
- Identification of monitoring wells that were installed during 2021 to fulfill the requirements of 35 I.A.C. § 845.620(b).
- Representative potentiometric surface maps from the independent sampling events conducted in 2021 to meet the requirements of 35 I.A.C. § 845.650(b)(1)(A), as presented in the HCR included in the operating permit application (Ramboll, 2021b).
- A summary from the independent sampling events completed in 2021, including the number of groundwater samples that were collected for analysis for each proposed background and downgradient well and the dates the samples were collected.
- The proposed GWPS as presented in the GMP.
- A summary of the History of Potential Exceedances included in the operating permit application (Ramboll, 2021c), as required by 35 I.A.C. § 845.230(d), summarizing groundwater concentrations from 2015 to 2021 that exceeded the proposed GWPS.
  - These are considered potential exceedances because the methodology used to determine them is proposed in the Statistical Analysis Plan (Appendix A of the GMP), which is pending IEPA approval.

2. MONITORING AND CORRECTIVE ACTION PROGRAM STATUS

The Part 845 groundwater monitoring program will commence the quarter following IEPA approval and issuance of the operating permit for the GMF RP.

3. KEY ACTIONS COMPLETED IN 2021

Work was completed in 2021 to meet the requirements of Part 845 and details were provided in the operating permit application submitted to IEPA. The boring logs and well construction forms are included in the HCR provided with the operating permit application (Ramboll, 2021b).

The proposed Part 845 monitoring well network is presented in **Figure 1** and summarized below in **Table A**. The proposed Part 845 monitoring well network also includes wells previously installed for other programs.

Table A. Proposed Part 845 Monitoring Well Network

Well ID	Monitored Unit	Well Screen Interval (feet bgs)	Well Type [1]
G270	UA	13.1 - 17.9	Background
G271	UA	10.0 - 14.3	Compliance
G273	UA	9.1 - 14.6	Compliance
G275	UA	8.2 - 12.6	Compliance
G275D	DA	49.8 - 59.6	Compliance
G276	UA	22.4 - 27.2	Compliance
G277	UA	14.3 - 18.8	Compliance
G279	UA	22.4 - 26.8	Compliance
G280	UA	12.8 - 17.6	Background
G283	LCU	8.4 - 18.2	Compliance
G284	UA	8.1 - 12.9	Compliance
G285	LCU	13.7 - 23.5	Compliance
X201 [2]	CCR	NA	WLO
SG-04 [2]	Surface Water	NA	WLO

[1] Well type refers to the role of the well in the monitoring network.
[2] Location is temporary pending implementation of impoundment closure per an approved construction permit application.
bgs = below ground surface
CCR = coal combustion residuals
DA = deep aquifer
LCU = lower confining unit
NA = not applicable
UA = uppermost aquifer
WLO = water level only

Proposed Part 845 monitoring wells were sampled for eight rounds of independent groundwater samples from March to July 2021 and the results were analyzed for the parameters listed in 35 I.A.C. § 845.600. Select proposed Part 845 monitoring wells are also monitored as part of the monitoring system for the requirements of Title 40 of the Code of Federal Regulations (40 C.F.R.) § 257. A summary of the samples collected from background and compliance monitoring wells for determination of the history of potential exceedances is included in **Table B** below. All groundwater elevation data and analytical results obtained in 2021 are presented in the HCR

(Ramboll, 2021b). Groundwater elevation contour maps representative of the independent sampling events are presented in **Figures 2 and 3**.

Table B. Summary of Groundwater Samples Collected

Sampling Dates	Parameters Collected	Monitoring Wells Sampled [1]
January 21 - February 1, 2021	Appendix III [2], Appendix IV [3], field parameters [4]	G270, G271, G273, G279, G280, and R201
March 29 - 31, 2021	Metals [5], mercury, inorganic parameters [6], radium 226 and 228, field parameters [4]	G270, G275D, G280, G283, G284, G285, G286, G287, G288, and R201
April 21 - 22, 2021	Metals [5], mercury, inorganic parameters [6], radium 226 and 228, field parameters [4]	G270, G275D, G283, G284, G285, G286, G287, G288, and R201
May 5 - 6, 2021	Metals [5], mercury, inorganic parameters [6], radium 226 and 228, field parameters [4]	G270, G275D, G280, G283, G284, G285, G286, G287, G288, and R201
May 17 - 19, 2021	Metals [5], mercury, inorganic parameters [6], radium 226 and 228, field parameters [4]	G270, G275D, G280, G283, G284, G285, G286, G287, G288, and R201
June 14 - 16, 2021	Metals [5], mercury, inorganic parameters [6], radium 226 and 228, field parameters [4]	G270, G275D, G280, G283, G284, G285, G286, G287, G288, and R201
June 28, 2021	Appendix III [2], Appendix IV [3], field parameters [4]	G276
June 28 - 29, 2021	Metals [5], mercury, inorganic parameters [6], radium 226 and 228, field parameters [4]	G270, G280, G283, G284, G285, G286, G287, G288, and R201
July 12 - 13, 2021	Metals [5], mercury, inorganic parameters [6], radium 226 and 228, field parameters [4]	G270, G280, G283, G284, G285, G286, G287, G288, and R201
July 27 - 28, 2021	Metals [5], mercury, inorganic parameters [6], radium 226 and 228, field parameters [4]	G270, G275D, G280, G283, G284, G285, G286, G287, G288, and R201

[1] In general, one sample was collected per monitoring well per event.
[2] Appendix III parameters include boron, calcium, chloride, fluoride, pH, sulfate, and total dissolved solids (TDS).
[3] Appendix IV parameters include antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, fluoride, lead, lithium, mercury, molybdenum, radium 226 and 228 combined, selenium, and thallium.
[4] Field parameters include pH, dissolved oxygen, temperature, oxidation/reduction potential, specific conductance, and turbidity.
[5] Metals include antimony, arsenic, barium, beryllium, boron, cadmium, calcium, chromium, cobalt, lead, lithium, molybdenum, selenium, and thallium.
[6] Inorganic parameters include fluoride, chloride, sulfate, and TDS.

Evaluation of background groundwater quality is presented in the GMP and the proposed GWPSs are included in **Appendix A.** Compliance with Part 845 will be determined after the first round of groundwater sampling following IEPA's issuance of the operating permit for the GMF RP.

Groundwater concentrations from 2015 to 2021 were presented in the HCR and evaluated in the presentation of the History of Potential Exceedances included in the operating permit application. Groundwater concentrations that exceeded the proposed GWPS are considered potential exceedances because the methodology used to determine them is proposed in the Statistical Analysis Plan, which is pending IEPA approval. Tables summarizing how potential historical exceedances were determined and the potential exceedances themselves are provided in **Appendix B**.

4. PROBLEMS ENCOUNTERED AND ACTIONS TO RESOLVE THE PROBLEMS

The first round of groundwater sampling for compliance with the Part 845 groundwater monitoring program will commence the quarter following IEPA approval and issuance of the operating permit for the GMF RP, and in accordance with the GMP.

5. KEY ACTIVITIES PLANNED FOR 2022

The following key activities are planned for 2022:

- Groundwater sampling and reporting for compliance will be initiated the quarter following issuance of the operating permit at all monitoring wells in the approved monitoring well network as presented in the GMP and required by 35 I.A.C. § 845.610(b)(3), including:
  - Monthly groundwater elevations.
  - Quarterly groundwater sampling.

6. REFERENCES

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FIGURES

BACKGROUND WELL
COMPLIANCE WELL
SOURCE SAMPLE LOCATION
STAFF GAGE

PART 845 REGULATED UNIT (SUBJECT UNIT)
SITE FEATURE
LIMITS OF FINAL COVER
PROPERTY BOUNDARY

0 150 300 Feet

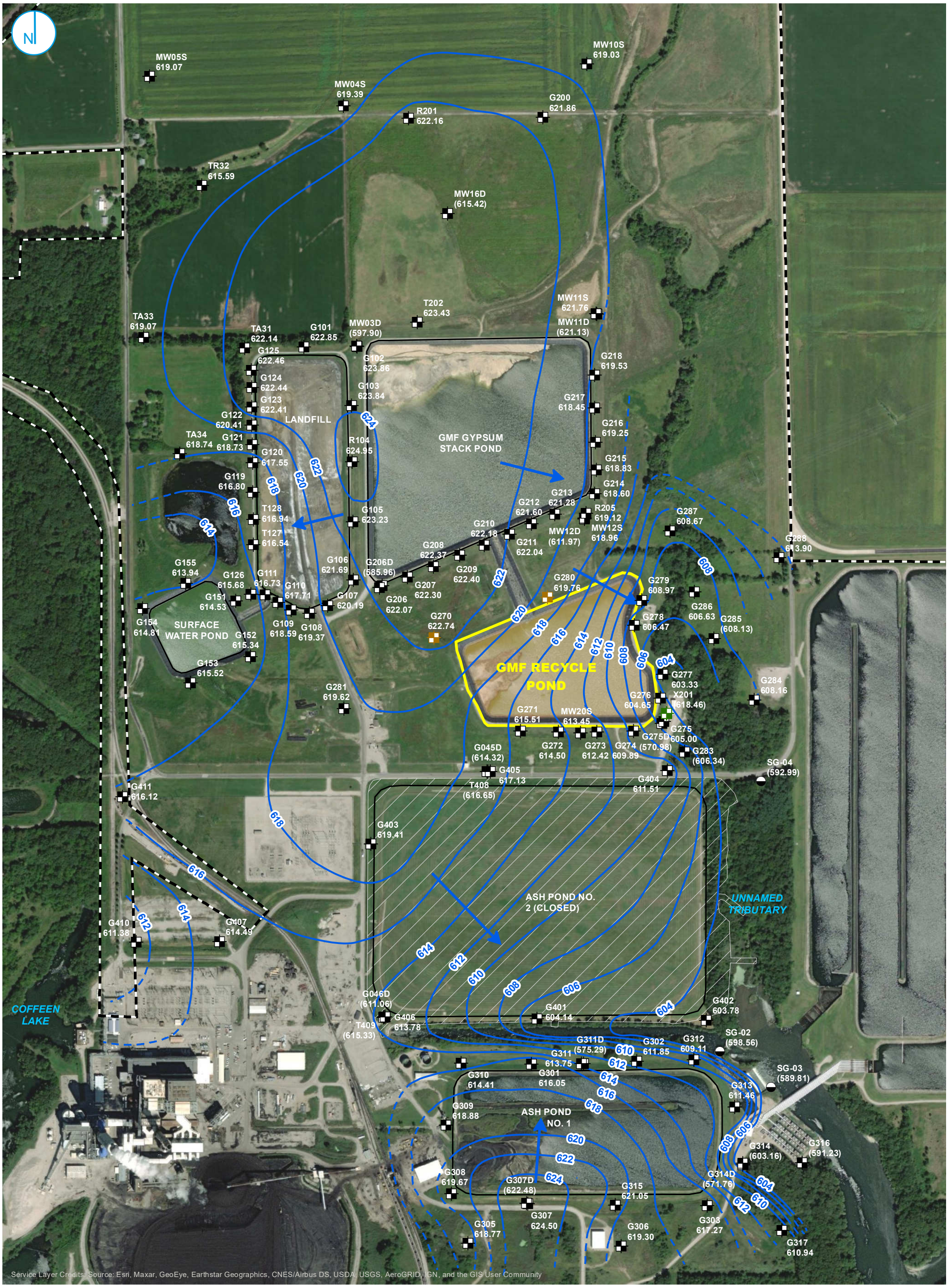
PROPOSED PART 845 GROUNDWATER MONITORING WELL NETWORK

2021 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
GMF RECYCLE POND
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

FIGURE 1

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL



Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

- BACKGROUND WELL
- MONITORING WELL
- SOURCE SAMPLE LOCATION
- STAFF GAGE
- GROUNDWATER ELEVATION CONTOUR (2-FT CONTOUR INTERVAL, NAVD88)
- INFERRED GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION

0 275 550 Feet

- PART 845 REGULATED UNIT (SUBJECT UNIT)
- SITE FEATURE
- LIMITS OF FINAL COVER
- PROPERTY BOUNDARY

NOTE:
ELEVATIONS IN PARENTHESES WERE NOT USED FOR CONTOURING.
NM = NOT MEASURED

POTENTIOMETRIC SURFACE MAP APRIL 20, 2021

2021 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT GMF RECYCLE POND

COFFEEN POWER PLANT
COFFEEN, ILLINOIS

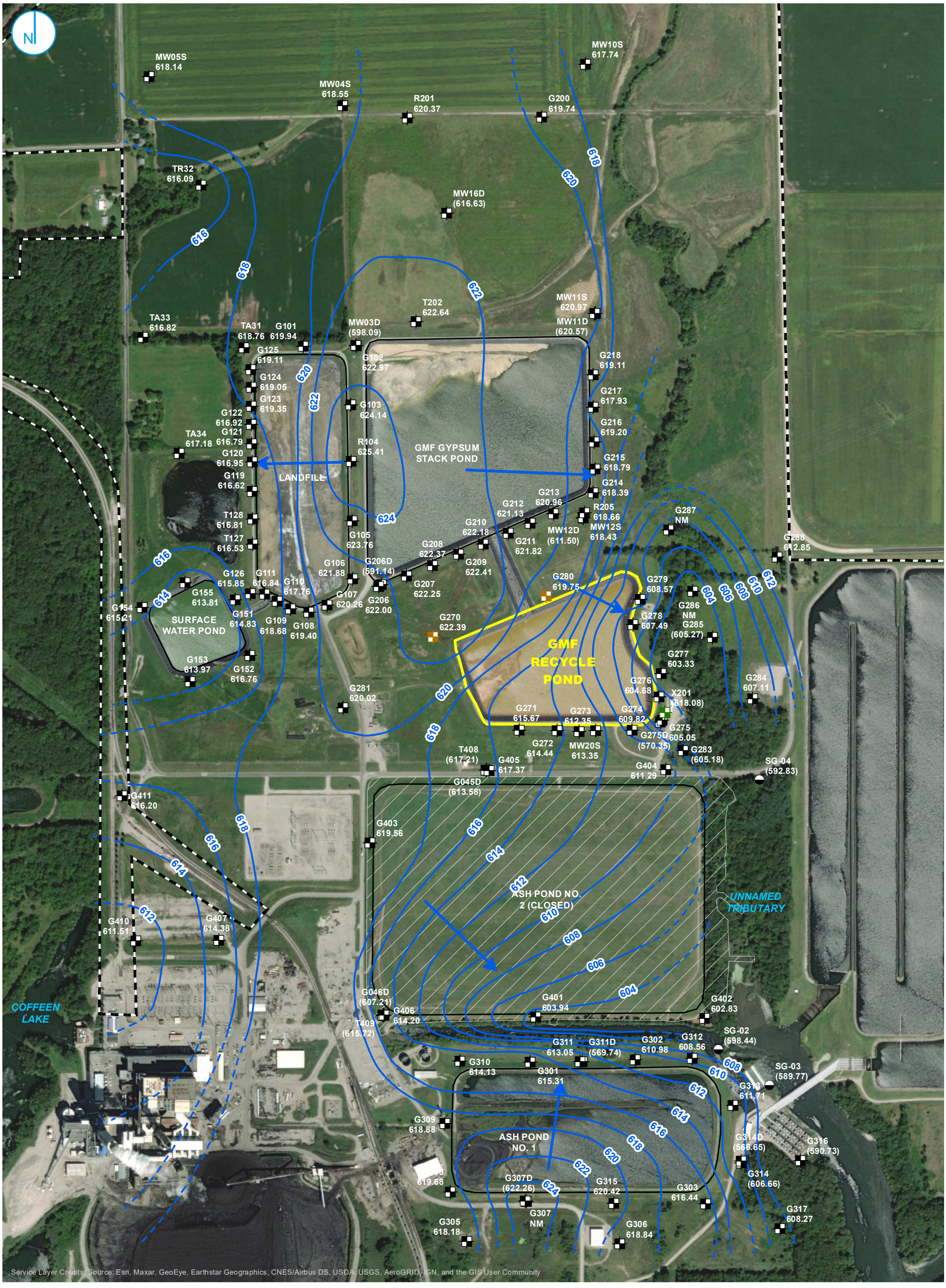
FIGURE 2

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.

RAMBOLL

PROJECT: 169000XXXX | DATED: 1/13/2022 | DESIGNER: galarnmc

Y:\Mapping\Projects\22\2285\MXD\845_2021_AnnualGWM\Coffeen\RP_104\Figure 3. Potentiometric Surface Map 20210726 RP.mxd



BACKGROUND WELL
MONITORING WELL
SOURCE SAMPLE LOCATION
STAFF GAGE
GROUNDWATER ELEVATION CONTOUR (2-FT CONTOUR INTERVAL, NAVD88)
INFERRED GROUNDWATER ELEVATION CONTOUR
GROUNDWATER FLOW DIRECTION

0 275 550 Feet

PART 845 REGULATED UNIT (SUBJECT UNIT)
SITE FEATURE
LIMITS OF FINAL COVER
PROPERTY BOUNDARY

NOTE:
ELEVATIONS IN PARENTHESES WERE NOT USED FOR CONTOURING.
NM = NOT MEASURED

POTENTIOMETRIC SURFACE MAP JULY 26, 2021

FIGURE 3

2021 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
GMF RECYCLE POND
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.

RAMBOLL

APPENDICES

APPENDIX A
TABLE 3-1. BACKGROUND GROUNDWATER QUALITY AND STANDARDS

TABLE 3-1. BACKGROUND GROUNDWATER QUALITY AND STANDARDS
GROUNDWATER MONITORING PLAN
COFFEEN POWER PLANT
GMF RECYCLE POND
COFFEEN, ILLINOIS

Parameter	Background Concentration	845 Limit	Groundwater Protection Standard	Unit
Antimony, total	0.003	0.006	0.006	mg/L
Arsenic, total	0.0066	0.010	0.010	mg/L
Barium, total	0.11	2.0	2.0	mg/L
Beryllium, total	0.001	0.004	0.004	mg/L
Boron, total	1	2	2	mg/L
Cadmium, total	0.001	0.005	0.005	mg/L
Chloride, total	67	200	200	mg/L
Chromium, total	0.019	0.1	0.1	mg/L
Cobalt, total	0.0059	0.006	0.006	mg/L
Fluoride, total	0.536	4.0	4.0	mg/L
Lead, total	0.012	0.0075	0.012	mg/L
Lithium, total	0.019	0.04	0.04	mg/L
Mercury, total	0.0002	0.002	0.002	mg/L
Molybdenum, total	0.0045	0.1	0.1	mg/L
pH (field)	7.6 / 6.7	9.0 / 6.5	9.0 / 6.5	SU
Radium 226 and 228 combined	1.6	5	5	pCi/L
Selenium, total	0.0048	0.05	0.05	mg/L
Sulfate, total	94	400	400	mg/L
Thallium, total	0.001	0.002	0.002	mg/L
Total Dissolved Solids	551	1200	1200	mg/L

Notes:
For pH, the values presented are the upper / lower limits
Groundwater protection standards for calcium and turbidity do not apply per 35 I.A.C. § 845.600(b)
mg/L = milligrams per liter
SU = standard units
pCi/L = picocuries per liter

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APPENDIX B
HISTORY OF POTENTIAL EXCEEDANCES

HISTORY OF POTENTIAL EXCEEDANCES

This presentation of the History of Potential Exceedances, and any corrective action taken to remediate groundwater, is provided to meet the requirements of Title 35 of the Illinois Administrative Code (35 I.A.C.) § 845.230(d)(2)(M) for the Coffeen Power Plant GMF Recycle Pond, Illinois Environmental Protection Agency (IEPA) ID No. W1350150004-04.

Note

Groundwater concentrations from 2015 to 2021 presented in the Hydrogeologic Site Characterization Report (HCR) Table 4-1, and evaluated and summarized in the following tables, are considered potential exceedances because the methodology used to determine them is proposed in the Statistical Analysis Plan (Appendix A to Groundwater Monitoring Plan [GMP]), which has not been reviewed or approved by IEPA at the time of submittal of the 35 I.A.C. § 845 Operating Permit application.

Alternate sources for potential exceedances as allowed by 35 I.A.C. § 845.650(e) have not yet been evaluated. These will be evaluated and presented in future submittals to IEPA as appropriate.

Table 1 summarizes how the potential exceedances were determined. Table 2 is a summary of all potential exceedances.

Background Concentrations

Background monitoring wells identified in the GMP include G270 and G280.

For monitoring wells that have been historically monitored in accordance with Title 40, Code of Federal Regulations, Part 257, Subpart D (Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments), background concentrations calculated from sampling events in 2015-2017 were compared to the standards identified in 35 I.A.C. § 845.600(a)(1). For constituents with calculated background concentrations in 2015-2017 greater than the standards in 35 I.A.C. § 845.600(a)(1), those calculated background concentrations were used as Groundwater Protection Standards (GWPSs) for comparing to statistical calculation results for each compliance well to determine potential exceedances. Compliance well statistical calculations consider concentrations from all sampling events in 2015-2021.

For all other monitoring wells, either newly constructed in 2021 or existing wells not monitored under Title 40, Code of Federal Regulations, Part 257, Subpart D, background concentrations calculated from the eight sampling events required by 35 I.A.C. § 845.650(b)(1)(A), to be collected within 180 days from April 21, 2021, were compared to the standards identified in 35 I.A.C. § 845.600(a)(1). For constituents with calculated background concentrations greater than the standards in 35 I.A.C. § 845.600(a)(1), those calculated background concentrations were used as GWPSs. Compliance well statistical calculations from that same time period were compared to the GWPSs to determine potential exceedances.

Corrective Action

No corrective actions have been taken to remediate the groundwater.

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
COFFEEN POWER PLANT
GMF RECYCLE POND
COFFEEN, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G271	UA	257	Antimony, total	mg/L	04/10/2015 - 02/01/2021	All ND - Last	0.003	0.006	0.003	0.006	Standard
G271	UA	257	Arsenic, total	mg/L	01/21/2015 - 02/01/2021	CI around median	0.001	0.010	0.0066	0.01	Standard
G271	UA	257	Barium, total	mg/L	04/10/2015 - 02/01/2021	CI around mean	0.025	2.0	0.11	2	Standard
G271	UA	257	Beryllium, total	mg/L	04/10/2015 - 02/01/2021	CI around median	0.001	0.004	0.001	0.004	Standard
G271	UA	257	Boron, total	mg/L	01/21/2015 - 02/01/2021	CB around linear reg	1.2	2.0	0.029	2	Standard
G271	UA	257	Cadmium,total	mg/L	01/21/2015 - 02/01/2021	CI around median	0.001	0.005	0.001	0.005	Standard
G271	UA	257	Chloride, total	mg/L	01/21/2015 - 02/01/2021	CI around mean	30	200	54	200	Standard
G271	UA	257	Chromium, total	mg/L	04/10/2015 - 02/01/2021	CI around median	0.004	0.10	0.019	0.1	Standard
G271	UA	257	Cobalt, total	mg/L	04/10/2015 - 02/01/2021	CI around median	0.002	0.006	0.0059	0.006	Standard
G271	UA	257	Fluoride, total	mg/L	04/10/2015 - 02/01/2021	CI around mean	0.33	4.0	0.50	4	Standard
G271	UA	257	Lead, total	mg/L	01/21/2015 - 02/01/2021	Future median	0.001	0.012	0.012	0.0075	Background
G271	UA	257	Lithium, total	mg/L	11/23/2015 - 02/01/2021	All ND - Last	0.020	0.040	0.019	0.04	Standard
G271	UA	257	Mercury, total	mg/L	04/10/2015 - 02/01/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
G271	UA	257	Molybdenum, total	mg/L	07/22/2015 - 02/01/2021	CI around median	0.001	0.10	0.0045	0.1	Standard
G271	UA	257	pH (field)	SU	01/21/2015 - 02/01/2021	CI around mean	7.2	6.5/9.0	6.6/7.5	6.5/9	Standard/Standard
G271	UA	257	Radium-226 + Radium 228, tot	pCi/L	11/23/2015 - 02/01/2021	CI around mean	0.42	5.0	1.9	5	Standard
G271	UA	257	Selenium, total	mg/L	04/10/2015 - 02/01/2021	CB around linear reg	0.00019	0.050	0.0048	0.05	Standard
G271	UA	257	Sulfate, total	mg/L	01/21/2015 - 02/01/2021	CI around mean	389	400	104	400	Standard
G271	UA	257	Thallium, total	mg/L	04/10/2015 - 02/01/2021	CI around median	0.001	0.002	0.001	0.002	Standard
G271	UA	257	Total Dissolved Solids	mg/L	01/21/2015 - 02/01/2021	CI around mean	856	1200	476	1200	Standard
G272	UA	845	Antimony, total	mg/L	04/10/2015 - 10/08/2015	Most recent sample	0.003	0.006	0.003	0.006	Standard
G272	UA	845	Arsenic, total	mg/L	01/21/2015 - 10/08/2015	All ND - Last	0.001	0.010	0.0066	0.01	Standard
G272	UA	845	Barium, total	mg/L	04/10/2015 - 10/08/2015	Most recent sample	0.058	2.0	0.11	2	Standard
G272	UA	845	Beryllium, total	mg/L	04/10/2015 - 10/08/2015	Most recent sample	0.001	0.004	0.001	0.004	Standard
G272	UA	845	Boron, total	mg/L	01/21/2015 - 10/08/2015	CI around mean	-0.0156	2.0	1.0	2	Standard
G272	UA	845	Cadmium,total	mg/L	01/21/2015 - 10/08/2015	All ND - Last	0.001	0.005	0.001	0.005	Standard

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HISTORY OF POTENTIAL EXCEEDANCES
COFFEEN POWER PLANT
GMF RECYCLE POND
COFFEEN, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G272	UA	845	Chloride, total	mg/L	01/21/2015 - 10/08/2015	CI around mean	25	200	67	200	Standard
G272	UA	845	Chromium, total	mg/L	04/10/2015 - 10/08/2015	Most recent sample	0.004	0.10	0.019	0.1	Standard
G272	UA	845	Cobalt, total	mg/L	04/10/2015 - 10/08/2015	Most recent sample	0.002	0.006	0.0059	0.006	Standard
G272	UA	845	Fluoride, total	mg/L	04/10/2015 - 10/08/2015	Most recent sample	0.36	4.0	0.56	4	Standard
G272	UA	845	Lead, total	mg/L	01/21/2015 - 10/08/2015	Future median	0.001	0.012	0.012	0.0075	Background
G272	UA	845	Mercury, total	mg/L	04/10/2015 - 10/08/2015	Most recent sample	0.0002	0.002	0.0002	0.002	Standard
G272	UA	845	Molybdenum, total	mg/L	07/23/2015 - 10/08/2015	Most recent sample	0.0024	0.10	0.0045	0.1	Standard
G272	UA	845	pH (field)	SU	01/21/2015 - 10/08/2015	CI around mean	6.8	6.5/9.0	6.6/7.6	6.5/9	Standard/Standard
G272	UA	845	Selenium, total	mg/L	04/10/2015 - 10/08/2015	Most recent sample	0.0016	0.050	0.0048	0.05	Standard
G272	UA	845	Sulfate, total	mg/L	01/21/2015 - 10/08/2015	CI around mean	229	400	94	400	Standard
G272	UA	845	Thallium, total	mg/L	04/10/2015 - 10/08/2015	Most recent sample	0.001	0.002	0.001	0.002	Standard
G272	UA	845	Total Dissolved Solids	mg/L	01/21/2015 - 10/08/2015	CI around mean	595	1200	551	1200	Standard
G273	UA	257	Antimony, total	mg/L	04/13/2015 - 02/01/2021	All ND - Last	0.003	0.006	0.003	0.006	Standard
G273	UA	257	Arsenic, total	mg/L	01/21/2015 - 02/01/2021	CI around median	0.001	0.010	0.0066	0.01	Standard
G273	UA	257	Barium, total	mg/L	04/13/2015 - 02/01/2021	CI around geomean	0.030	2.0	0.11	2	Standard
G273	UA	257	Beryllium, total	mg/L	04/13/2015 - 02/01/2021	All ND - Last	0.001	0.004	0.001	0.004	Standard
G273	UA	257	Boron, total	mg/L	01/21/2015 - 02/01/2021	CI around geomean	0.12	2.0	0.029	2	Standard
G273	UA	257	Cadmium,total	mg/L	01/21/2015 - 02/01/2021	CI around median	0.001	0.005	0.001	0.005	Standard
G273	UA	257	Chloride, total	mg/L	01/21/2015 - 02/01/2021	CB around T-S line	57	200	54	200	Standard
G273	UA	257	Chromium, total	mg/L	04/13/2015 - 02/01/2021	All ND - Last	0.004	0.10	0.019	0.1	Standard
G273	UA	257	Cobalt, total	mg/L	04/13/2015 - 02/01/2021	CI around median	0.002	0.006	0.0059	0.006	Standard
G273	UA	257	Fluoride, total	mg/L	04/13/2015 - 02/01/2021	CI around mean	0.29	4.0	0.50	4	Standard
G273	UA	257	Lead, total	mg/L	01/21/2015 - 02/01/2021	Future median	0.001	0.012	0.012	0.0075	Background
G273	UA	257	Lithium, total	mg/L	11/24/2015 - 02/01/2021	CB around linear reg	0.014	0.040	0.019	0.04	Standard
G273	UA	257	Mercury, total	mg/L	04/13/2015 - 02/01/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
G273	UA	257	Molybdenum, total	mg/L	07/23/2015 - 02/01/2021	CI around median	0.001	0.10	0.0045	0.1	Standard

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Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G273	UA	257	pH (field)	SU	01/21/2015 - 02/01/2021	CI around mean	7.0	6.5/9.0	6.6/7.5	6.5/9	Standard/Standard
G273	UA	257	Radium-226 + Radium 228, tot	pCi/L	11/24/2015 - 02/01/2021	CI around mean	0.35	5.0	1.9	5	Standard
G273	UA	257	Selenium, total	mg/L	04/13/2015 - 02/01/2021	CI around median	0.001	0.050	0.0048	0.05	Standard
G273	UA	257	Sulfate, total	mg/L	01/21/2015 - 02/01/2021	CI around mean	424	400	104	400	Standard
G273	UA	257	Thallium, total	mg/L	04/13/2015 - 02/01/2021	CI around median	0.001	0.002	0.001	0.002	Standard
G273	UA	257	Total Dissolved Solids	mg/L	01/21/2015 - 02/01/2021	CI around mean	934	1200	476	1200	Standard
G274	UA	845	Antimony, total	mg/L	04/13/2015 - 10/08/2015	Most recent sample	0.003	0.006	0.003	0.006	Standard
G274	UA	845	Arsenic, total	mg/L	01/21/2015 - 10/08/2015	CI around median	0	0.010	0.0066	0.01	Standard
G274	UA	845	Barium, total	mg/L	04/13/2015 - 10/08/2015	Most recent sample	0.061	2.0	0.11	2	Standard
G274	UA	845	Beryllium, total	mg/L	04/13/2015 - 10/08/2015	Most recent sample	0.001	0.004	0.001	0.004	Standard
G274	UA	845	Boron, total	mg/L	01/21/2015 - 10/08/2015	CI around mean	0.30	2.0	1.0	2	Standard
G274	UA	845	Cadmium,total	mg/L	01/21/2015 - 10/08/2015	All ND - Last	0.001	0.005	0.001	0.005	Standard
G274	UA	845	Chloride, total	mg/L	01/21/2015 - 10/08/2015	CI around mean	17	200	67	200	Standard
G274	UA	845	Chromium, total	mg/L	04/13/2015 - 10/08/2015	Most recent sample	0.004	0.10	0.019	0.1	Standard
G274	UA	845	Cobalt, total	mg/L	04/13/2015 - 10/08/2015	Most recent sample	0.002	0.006	0.0059	0.006	Standard
G274	UA	845	Fluoride, total	mg/L	04/13/2015 - 10/08/2015	Most recent sample	0.26	4.0	0.56	4	Standard
G274	UA	845	Lead, total	mg/L	01/21/2015 - 10/08/2015	Future median	0.001	0.012	0.012	0.0075	Background
G274	UA	845	Mercury, total	mg/L	04/13/2015 - 10/08/2015	Most recent sample	0.0002	0.002	0.0002	0.002	Standard
G274	UA	845	Molybdenum, total	mg/L	07/23/2015 - 10/08/2015	Most recent sample	0.0012	0.10	0.0045	0.1	Standard
G274	UA	845	pH (field)	SU	01/21/2015 - 10/08/2015	CI around mean	6.7	6.5/9.0	6.6/7.6	6.5/9	Standard/Standard
G274	UA	845	Selenium, total	mg/L	04/13/2015 - 10/08/2015	Most recent sample	0.001	0.050	0.0048	0.05	Standard
G274	UA	845	Sulfate, total	mg/L	01/21/2015 - 10/08/2015	CI around mean	202	400	94	400	Standard
G274	UA	845	Thallium, total	mg/L	04/13/2015 - 10/08/2015	Most recent sample	0.001	0.002	0.001	0.002	Standard
G274	UA	845	Total Dissolved Solids	mg/L	01/21/2015 - 10/08/2015	CI around median	0	1200	551	1200	Standard
G275	UA	845	Antimony, total	mg/L	04/13/2015 - 07/23/2015	Most recent sample	0.003	0.006	0.003	0.006	Standard
G275	UA	845	Arsenic, total	mg/L	01/21/2015 - 07/23/2015	Most recent sample	0.001	0.010	0.0066	0.01	Standard

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Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G275	UA	845	Barium, total	mg/L	04/13/2015 - 07/23/2015	Most recent sample	0.035	2.0	0.11	2	Standard
G275	UA	845	Beryllium, total	mg/L	04/13/2015 - 07/23/2015	Most recent sample	0.001	0.004	0.001	0.004	Standard
G275	UA	845	Boron, total	mg/L	01/21/2015 - 07/23/2015	Most recent sample	4.0	2.0	1.0	2	Standard
G275	UA	845	Cadmium,total	mg/L	01/21/2015 - 07/23/2015	Most recent sample	0.001	0.005	0.001	0.005	Standard
G275	UA	845	Chloride, total	mg/L	01/21/2015 - 07/23/2015	Most recent sample	30	200	67	200	Standard
G275	UA	845	Chromium, total	mg/L	04/13/2015 - 07/23/2015	Most recent sample	0.004	0.10	0.019	0.1	Standard
G275	UA	845	Cobalt, total	mg/L	04/13/2015 - 07/23/2015	Most recent sample	0.002	0.006	0.0059	0.006	Standard
G275	UA	845	Fluoride, total	mg/L	04/13/2015 - 07/23/2015	Most recent sample	0.31	4.0	0.56	4	Standard
G275	UA	845	Lead, total	mg/L	01/21/2015 - 07/23/2015	Most recent sample	0.001	0.012	0.012	0.0075	Background
G275	UA	845	Mercury, total	mg/L	04/13/2015 - 07/23/2015	Most recent sample	0.0002	0.002	0.0002	0.002	Standard
G275	UA	845	Molybdenum, total	mg/L	07/23/2015 - 07/23/2015	Most recent sample	0.0014	0.10	0.0045	0.1	Standard
G275	UA	845	pH (field)	SU	01/21/2015 - 07/23/2015	Most recent sample	7.1	6.5/9.0	6.6/7.6	6.5/9	Standard/Standard
G275	UA	845	Selenium, total	mg/L	04/13/2015 - 07/23/2015	Most recent sample	0.0014	0.050	0.0048	0.05	Standard
G275	UA	845	Sulfate, total	mg/L	01/21/2015 - 07/23/2015	Most recent sample	750	400	94	400	Standard
G275	UA	845	Thallium, total	mg/L	04/13/2015 - 07/23/2015	Most recent sample	0.001	0.002	0.001	0.002	Standard
G275	UA	845	Total Dissolved Solids	mg/L	01/21/2015 - 07/23/2015	Most recent sample	1500	1200	551	1200	Standard
G275D	DA	845	Antimony, total	mg/L	03/30/2021 - 07/28/2021	All ND - Last	0.003	0.006	0.003	0.006	Standard
G275D	DA	845	Arsenic, total	mg/L	03/30/2021 - 07/28/2021	CI around mean	0.00261	0.010	0.0066	0.01	Standard
G275D	DA	845	Barium, total	mg/L	03/30/2021 - 07/28/2021	CI around mean	0.28	2.0	0.11	2	Standard
G275D	DA	845	Beryllium, total	mg/L	03/30/2021 - 07/28/2021	All ND - Last	0.001	0.004	0.001	0.004	Standard
G275D	DA	845	Boron, total	mg/L	03/30/2021 - 07/28/2021	CI around mean	0.28	2.0	1.0	2	Standard
G275D	DA	845	Cadmium,total	mg/L	03/30/2021 - 07/28/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
G275D	DA	845	Chloride, total	mg/L	03/30/2021 - 07/28/2021	CI around mean	26	200	67	200	Standard
G275D	DA	845	Chromium, total	mg/L	03/30/2021 - 07/28/2021	CI around median	0	0.10	0.019	0.1	Standard
G275D	DA	845	Cobalt, total	mg/L	03/30/2021 - 07/28/2021	CI around mean	0.000968	0.006	0.0059	0.006	Standard
G275D	DA	845	Fluoride, total	mg/L	03/30/2021 - 07/28/2021	CI around mean	0.33	4.0	0.56	4	Standard

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Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G275D	DA	845	Lead, total	mg/L	03/30/2021 - 07/28/2021	Future median	0.001	0.012	0.012	0.0075	Background
G275D	DA	845	Lithium, total	mg/L	03/30/2021 - 07/28/2021	All ND - Last	0.020	0.040	0.019	0.04	Standard
G275D	DA	845	Mercury, total	mg/L	03/30/2021 - 07/28/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
G275D	DA	845	Molybdenum, total	mg/L	03/30/2021 - 07/28/2021	CI around mean	0.020	0.10	0.0045	0.1	Standard
G275D	DA	845	pH (field)	SU	03/30/2021 - 07/28/2021	CI around mean	7.0	6.5/9.0	6.6/7.6	6.5/9	Standard/Standard
G275D	DA	845	Radium-226 + Radium 228, tot	pCi/L	03/30/2021 - 07/28/2021	CI around mean	0.016	5.0	1.6	5	Standard
G275D	DA	845	Selenium, total	mg/L	03/30/2021 - 07/28/2021	All ND - Last	0.001	0.050	0.0048	0.05	Standard
G275D	DA	845	Sulfate, total	mg/L	03/30/2021 - 07/28/2021	CI around mean	208	400	94	400	Standard
G275D	DA	845	Thallium, total	mg/L	03/30/2021 - 07/28/2021	All ND - Last	0.001	0.002	0.001	0.002	Standard
G275D	DA	845	Total Dissolved Solids	mg/L	03/30/2021 - 07/28/2021	CI around mean	877	1200	551	1200	Standard
G276	UA	257	Antimony, total	mg/L	04/13/2015 - 06/28/2021	All ND - Last	0.003	0.006	0.003	0.006	Standard
G276	UA	257	Arsenic, total	mg/L	01/21/2015 - 06/28/2021	CI around median	0.001	0.010	0.0066	0.01	Standard
G276	UA	257	Barium, total	mg/L	04/13/2015 - 06/28/2021	CB around T-S line	0.032	2.0	0.11	2	Standard
G276	UA	257	Beryllium, total	mg/L	04/13/2015 - 06/28/2021	CI around median	0.001	0.004	0.001	0.004	Standard
G276	UA	257	Boron, total	mg/L	01/21/2015 - 06/28/2021	CI around mean	0.016	2.0	0.029	2	Standard
G276	UA	257	Cadmium,total	mg/L	01/21/2015 - 06/28/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
G276	UA	257	Chloride, total	mg/L	01/21/2015 - 06/28/2021	CI around mean	23	200	54	200	Standard
G276	UA	257	Chromium, total	mg/L	04/13/2015 - 06/28/2021	CI around median	0.004	0.10	0.019	0.1	Standard
G276	UA	257	Cobalt, total	mg/L	04/13/2015 - 06/28/2021	CI around median	0.002	0.006	0.0059	0.006	Standard
G276	UA	257	Fluoride, total	mg/L	04/13/2015 - 06/28/2021	CI around median	0.36	4.0	0.50	4	Standard
G276	UA	257	Lead, total	mg/L	01/21/2015 - 06/28/2021	Future median	0.001	0.012	0.012	0.0075	Background
G276	UA	257	Lithium, total	mg/L	11/24/2015 - 06/28/2021	CI around mean	0.012	0.040	0.019	0.04	Standard
G276	UA	257	Mercury, total	mg/L	04/13/2015 - 06/28/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
G276	UA	257	Molybdenum, total	mg/L	07/23/2015 - 06/28/2021	CI around median	0.001	0.10	0.0045	0.1	Standard
G276	UA	257	pH (field)	SU	01/21/2015 - 06/28/2021	CB around linear reg	6.8	6.5/9.0	6.6/7.5	6.5/9	Standard/Standard
G276	UA	257	Radium-226 + Radium 228, tot	pCi/L	11/24/2015 - 06/28/2021	CI around mean	0.47	5.0	1.9	5	Standard

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Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G276	UA	257	Selenium, total	mg/L	04/13/2015 - 06/28/2021	CI around mean	0.0013	0.050	0.0048	0.05	Standard
G276	UA	257	Sulfate, total	mg/L	01/21/2015 - 06/28/2021	CI around median	210	400	104	400	Standard
G276	UA	257	Thallium, total	mg/L	04/13/2015 - 06/28/2021	All ND - Last	0.001	0.002	0.001	0.002	Standard
G276	UA	257	Total Dissolved Solids	mg/L	01/21/2015 - 06/28/2021	CB around T-S line	726	1200	476	1200	Standard
G279	UA	257	Antimony, total	mg/L	04/13/2015 - 01/28/2021	All ND - Last	0.003	0.006	0.003	0.006	Standard
G279	UA	257	Arsenic, total	mg/L	01/21/2015 - 01/28/2021	CI around median	0.001	0.010	0.0066	0.01	Standard
G279	UA	257	Barium, total	mg/L	04/13/2015 - 01/28/2021	CI around mean	0.048	2.0	0.11	2	Standard
G279	UA	257	Beryllium, total	mg/L	04/13/2015 - 01/28/2021	All ND - Last	0.001	0.004	0.001	0.004	Standard
G279	UA	257	Boron, total	mg/L	01/21/2015 - 01/28/2021	CI around geomean	0.076	2.0	0.029	2	Standard
G279	UA	257	Cadmium,total	mg/L	01/21/2015 - 01/28/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
G279	UA	257	Chloride, total	mg/L	01/21/2015 - 01/28/2021	CI around median	46	200	54	200	Standard
G279	UA	257	Chromium, total	mg/L	04/13/2015 - 01/28/2021	CI around median	0.004	0.10	0.019	0.1	Standard
G279	UA	257	Cobalt, total	mg/L	04/13/2015 - 01/28/2021	CI around median	0.002	0.006	0.0059	0.006	Standard
G279	UA	257	Fluoride, total	mg/L	04/13/2015 - 01/28/2021	CI around mean	0.33	4.0	0.50	4	Standard
G279	UA	257	Lead, total	mg/L	01/21/2015 - 01/28/2021	Future median	0.001	0.012	0.012	0.0075	Background
G279	UA	257	Lithium, total	mg/L	11/24/2015 - 01/28/2021	CI around median	0.010	0.040	0.019	0.04	Standard
G279	UA	257	Mercury, total	mg/L	04/13/2015 - 01/28/2021	CI around median	0.0002	0.002	0.0002	0.002	Standard
G279	UA	257	Molybdenum, total	mg/L	07/23/2015 - 01/28/2021	CB around T-S line	-0.0183	0.10	0.0045	0.1	Standard
G279	UA	257	pH (field)	SU	01/21/2015 - 01/28/2021	CI around mean	7.0	6.5/9.0	6.6/7.5	6.5/9	Standard/Standard
G279	UA	257	Radium-226 + Radium 228, tot	pCi/L	11/24/2015 - 01/28/2021	CI around mean	0.67	5.0	1.9	5	Standard
G279	UA	257	Selenium, total	mg/L	04/13/2015 - 01/28/2021	CI around mean	0.00543	0.050	0.0048	0.05	Standard
G279	UA	257	Sulfate, total	mg/L	01/21/2015 - 01/28/2021	CI around mean	378	400	104	400	Standard
G279	UA	257	Thallium, total	mg/L	04/13/2015 - 01/28/2021	All ND - Last	0.001	0.002	0.001	0.002	Standard
G279	UA	257	Total Dissolved Solids	mg/L	01/21/2015 - 01/28/2021	CI around mean	909	1200	476	1200	Standard
G283	LCU	845	Antimony, total	mg/L	03/31/2021 - 07/27/2021	All ND - Last	0.003	0.006	0.003	0.006	Standard
G283	LCU	845	Arsenic, total	mg/L	03/31/2021 - 07/27/2021	CI around median	0.001	0.010	0.0066	0.01	Standard

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
COFFEEN POWER PLANT
GMF RECYCLE POND
COFFEEN, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G283	LCU	845	Barium, total	mg/L	03/31/2021 - 07/27/2021	CI around median	0.16	2.0	0.11	2	Standard
G283	LCU	845	Beryllium, total	mg/L	03/31/2021 - 07/27/2021	All ND - Last	0.001	0.004	0.001	0.004	Standard
G283	LCU	845	Boron, total	mg/L	03/31/2021 - 07/27/2021	CI around mean	0.033	2.0	1.0	2	Standard
G283	LCU	845	Cadmium,total	mg/L	03/31/2021 - 07/27/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
G283	LCU	845	Chloride, total	mg/L	03/31/2021 - 07/27/2021	CI around mean	37	200	67	200	Standard
G283	LCU	845	Chromium, total	mg/L	03/31/2021 - 07/27/2021	All ND - Last	0.004	0.10	0.019	0.1	Standard
G283	LCU	845	Cobalt, total	mg/L	03/31/2021 - 07/27/2021	All ND - Last	0.002	0.006	0.0059	0.006	Standard
G283	LCU	845	Fluoride, total	mg/L	03/31/2021 - 07/27/2021	CI around mean	0.27	4.0	0.56	4	Standard
G283	LCU	845	Lead, total	mg/L	03/31/2021 - 07/27/2021	All ND - Last	0.001	0.012	0.012	0.0075	Background
G283	LCU	845	Lithium, total	mg/L	03/31/2021 - 07/27/2021	All ND - Last	0.020	0.040	0.019	0.04	Standard
G283	LCU	845	Mercury, total	mg/L	03/31/2021 - 07/27/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
G283	LCU	845	Molybdenum, total	mg/L	03/31/2021 - 07/27/2021	CB around linear reg	0.000614	0.10	0.0045	0.1	Standard
G283	LCU	845	pH (field)	SU	03/31/2021 - 07/27/2021	CI around mean	7.0	6.5/9.0	6.6/7.6	6.5/9	Standard/Standard
G283	LCU	845	Radium-226 + Radium 228, tot	pCi/L	03/31/2021 - 07/27/2021	CI around mean	0.42	5.0	1.6	5	Standard
G283	LCU	845	Selenium, total	mg/L	03/31/2021 - 07/27/2021	All ND - Last	0.001	0.050	0.0048	0.05	Standard
G283	LCU	845	Sulfate, total	mg/L	03/31/2021 - 07/27/2021	CI around mean	235	400	94	400	Standard
G283	LCU	845	Thallium, total	mg/L	03/31/2021 - 07/27/2021	All ND - Last	0.001	0.002	0.001	0.002	Standard
G283	LCU	845	Total Dissolved Solids	mg/L	03/31/2021 - 07/27/2021	CI around mean	760	1200	551	1200	Standard
G284	UA	845	Antimony, total	mg/L	03/30/2021 - 07/27/2021	All ND - Last	0.003	0.006	0.003	0.006	Standard
G284	UA	845	Arsenic, total	mg/L	03/30/2021 - 07/27/2021	All ND - Last	0.001	0.010	0.0066	0.01	Standard
G284	UA	845	Barium, total	mg/L	03/30/2021 - 07/27/2021	CI around mean	0.062	2.0	0.11	2	Standard
G284	UA	845	Beryllium, total	mg/L	03/30/2021 - 07/27/2021	All ND - Last	0.001	0.004	0.001	0.004	Standard
G284	UA	845	Boron, total	mg/L	03/30/2021 - 07/27/2021	CI around mean	0.038	2.0	1.0	2	Standard
G284	UA	845	Cadmium,total	mg/L	03/30/2021 - 07/27/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
G284	UA	845	Chloride, total	mg/L	03/30/2021 - 07/27/2021	CI around mean	37	200	67	200	Standard
G284	UA	845	Chromium, total	mg/L	03/30/2021 - 07/27/2021	All ND - Last	0.004	0.10	0.019	0.1	Standard

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
COFFEEN POWER PLANT
GMF RECYCLE POND
COFFEEN, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G284	UA	845	Cobalt, total	mg/L	03/30/2021 - 07/27/2021	All ND - Last	0.002	0.006	0.0059	0.006	Standard
G284	UA	845	Fluoride, total	mg/L	03/30/2021 - 07/27/2021	CI around mean	0.46	4.0	0.56	4	Standard
G284	UA	845	Lead, total	mg/L	03/30/2021 - 07/27/2021	All ND - Last	0.001	0.012	0.012	0.0075	Background
G284	UA	845	Lithium, total	mg/L	03/30/2021 - 07/27/2021	All ND - Last	0.020	0.040	0.019	0.04	Standard
G284	UA	845	Mercury, total	mg/L	03/30/2021 - 07/27/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
G284	UA	845	Molybdenum, total	mg/L	03/30/2021 - 07/27/2021	CI around geomean	0.000972	0.10	0.0045	0.1	Standard
G284	UA	845	pH (field)	SU	03/30/2021 - 07/27/2021	CI around mean	7.0	6.5/9.0	6.6/7.6	6.5/9	Standard/Standard
G284	UA	845	Radium-226 + Radium 228, tot	pCi/L	03/30/2021 - 07/27/2021	CI around geomean	0.053	5.0	1.6	5	Standard
G284	UA	845	Selenium, total	mg/L	03/30/2021 - 07/27/2021	All ND - Last	0.001	0.050	0.0048	0.05	Standard
G284	UA	845	Sulfate, total	mg/L	03/30/2021 - 07/27/2021	CI around geomean	59	400	94	400	Standard
G284	UA	845	Thallium, total	mg/L	03/30/2021 - 07/27/2021	All ND - Last	0.001	0.002	0.001	0.002	Standard
G284	UA	845	Total Dissolved Solids	mg/L	03/30/2021 - 07/27/2021	CI around mean	430	1200	551	1200	Standard
G285	LCU	845	Antimony, total	mg/L	03/30/2021 - 07/27/2021	All ND - Last	0.003	0.006	0.003	0.006	Standard
G285	LCU	845	Arsenic, total	mg/L	03/30/2021 - 07/27/2021	CI around median	0.001	0.010	0.0066	0.01	Standard
G285	LCU	845	Barium, total	mg/L	03/30/2021 - 07/27/2021	CB around linear reg	0.058	2.0	0.11	2	Standard
G285	LCU	845	Beryllium, total	mg/L	03/30/2021 - 07/27/2021	All ND - Last	0.001	0.004	0.001	0.004	Standard
G285	LCU	845	Boron, total	mg/L	03/30/2021 - 07/27/2021	CI around mean	0.11	2.0	1.0	2	Standard
G285	LCU	845	Cadmium,total	mg/L	03/30/2021 - 07/27/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
G285	LCU	845	Chloride, total	mg/L	03/30/2021 - 07/27/2021	CB around linear reg	39	200	67	200	Standard
G285	LCU	845	Chromium, total	mg/L	03/30/2021 - 07/27/2021	All ND - Last	0.004	0.10	0.019	0.1	Standard
G285	LCU	845	Cobalt, total	mg/L	03/30/2021 - 07/27/2021	CB around linear reg	0.00409	0.006	0.0059	0.006	Standard
G285	LCU	845	Fluoride, total	mg/L	03/30/2021 - 07/27/2021	CI around mean	0.25	4.0	0.56	4	Standard
G285	LCU	845	Lead, total	mg/L	03/30/2021 - 07/27/2021	All ND - Last	0.001	0.012	0.012	0.0075	Background
G285	LCU	845	Lithium, total	mg/L	03/30/2021 - 07/27/2021	All ND - Last	0.020	0.040	0.019	0.04	Standard
G285	LCU	845	Mercury, total	mg/L	03/30/2021 - 07/27/2021	CI around median	0.0002	0.002	0.0002	0.002	Standard
G285	LCU	845	Molybdenum, total	mg/L	03/30/2021 - 07/27/2021	CB around linear reg	0.00428	0.10	0.0045	0.1	Standard

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
COFFEEN POWER PLANT
GMF RECYCLE POND
COFFEEN, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G285	LCU	845	pH (field)	SU	03/30/2021 - 07/27/2021	CI around median	6.7	6.5/9.0	6.6/7.6	6.5/9	Standard/Standard
G285	LCU	845	Radium-226 + Radium 228, tot	pCi/L	03/30/2021 - 07/27/2021	CI around mean	1.1	5.0	1.6	5	Standard
G285	LCU	845	Selenium, total	mg/L	03/30/2021 - 07/27/2021	All ND - Last	0.001	0.050	0.0048	0.05	Standard
G285	LCU	845	Sulfate, total	mg/L	03/30/2021 - 07/27/2021	CI around mean	528	400	94	400	Standard
G285	LCU	845	Thallium, total	mg/L	03/30/2021 - 07/27/2021	CI around median	0.001	0.002	0.001	0.002	Standard
G285	LCU	845	Total Dissolved Solids	mg/L	03/30/2021 - 07/27/2021	CI around mean	1410	1200	551	1200	Standard
G286	UA	845	Antimony, total	mg/L	03/31/2021 - 07/27/2021	All ND - Last	0.003	0.006	0.003	0.006	Standard
G286	UA	845	Arsenic, total	mg/L	03/31/2021 - 07/27/2021	All ND - Last	0.001	0.010	0.0066	0.01	Standard
G286	UA	845	Barium, total	mg/L	03/31/2021 - 07/27/2021	CI around mean	0.034	2.0	0.11	2	Standard
G286	UA	845	Beryllium, total	mg/L	03/31/2021 - 07/27/2021	All ND - Last	0.001	0.004	0.001	0.004	Standard
G286	UA	845	Boron, total	mg/L	03/31/2021 - 07/27/2021	CI around mean	0.033	2.0	1.0	2	Standard
G286	UA	845	Cadmium,total	mg/L	03/31/2021 - 07/27/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
G286	UA	845	Chloride, total	mg/L	03/31/2021 - 07/27/2021	CI around mean	2.0	200	67	200	Standard
G286	UA	845	Chromium, total	mg/L	03/31/2021 - 07/27/2021	All ND - Last	0.004	0.10	0.019	0.1	Standard
G286	UA	845	Cobalt, total	mg/L	03/31/2021 - 07/27/2021	All ND - Last	0.002	0.006	0.0059	0.006	Standard
G286	UA	845	Fluoride, total	mg/L	03/31/2021 - 07/27/2021	CI around median	0.25	4.0	0.56	4	Standard
G286	UA	845	Lead, total	mg/L	03/31/2021 - 07/27/2021	All ND - Last	0.001	0.012	0.012	0.0075	Background
G286	UA	845	Lithium, total	mg/L	03/31/2021 - 07/27/2021	All ND - Last	0.020	0.040	0.019	0.04	Standard
G286	UA	845	Mercury, total	mg/L	03/31/2021 - 07/27/2021	CI around median	0.0002	0.002	0.0002	0.002	Standard
G286	UA	845	Molybdenum, total	mg/L	03/31/2021 - 07/27/2021	CI around mean	0.000822	0.10	0.0045	0.1	Standard
G286	UA	845	pH (field)	SU	03/31/2021 - 07/27/2021	CI around mean	6.9	6.5/9.0	6.6/7.6	6.5/9	Standard/Standard
G286	UA	845	Radium-226 + Radium 228, tot	pCi/L	03/31/2021 - 07/27/2021	CI around mean	-0.0602	5.0	1.6	5	Standard
G286	UA	845	Selenium, total	mg/L	03/31/2021 - 07/27/2021	CI around median	0.001	0.050	0.0048	0.05	Standard
G286	UA	845	Sulfate, total	mg/L	03/31/2021 - 07/27/2021	CI around mean	11	400	94	400	Standard
G286	UA	845	Thallium, total	mg/L	03/31/2021 - 07/27/2021	All ND - Last	0.001	0.002	0.001	0.002	Standard
G286	UA	845	Total Dissolved Solids	mg/L	03/31/2021 - 07/27/2021	CI around mean	253	1200	551	1200	Standard

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
COFFEEN POWER PLANT
GMF RECYCLE POND
COFFEEN, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G287	UA	845	Antimony, total	mg/L	03/29/2021 - 07/27/2021	All ND - Last	0.003	0.006	0.003	0.006	Standard
G287	UA	845	Arsenic, total	mg/L	03/29/2021 - 07/27/2021	All ND - Last	0.001	0.010	0.0066	0.01	Standard
G287	UA	845	Barium, total	mg/L	03/29/2021 - 07/27/2021	CI around mean	0.058	2.0	0.11	2	Standard
G287	UA	845	Beryllium, total	mg/L	03/29/2021 - 07/27/2021	All ND - Last	0.001	0.004	0.001	0.004	Standard
G287	UA	845	Boron, total	mg/L	03/29/2021 - 07/27/2021	CI around median	0.010	2.0	1.0	2	Standard
G287	UA	845	Cadmium,total	mg/L	03/29/2021 - 07/27/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
G287	UA	845	Chloride, total	mg/L	03/29/2021 - 07/27/2021	CI around mean	21	200	67	200	Standard
G287	UA	845	Chromium, total	mg/L	03/29/2021 - 07/27/2021	All ND - Last	0.004	0.10	0.019	0.1	Standard
G287	UA	845	Cobalt, total	mg/L	03/29/2021 - 07/27/2021	All ND - Last	0.002	0.006	0.0059	0.006	Standard
G287	UA	845	Fluoride, total	mg/L	03/29/2021 - 07/27/2021	CI around mean	0.37	4.0	0.56	4	Standard
G287	UA	845	Lead, total	mg/L	03/29/2021 - 07/27/2021	Most recent sample	0.001	0.012	0.012	0.0075	Background
G287	UA	845	Lithium, total	mg/L	03/29/2021 - 07/27/2021	All ND - Last	0.020	0.040	0.019	0.04	Standard
G287	UA	845	Mercury, total	mg/L	03/29/2021 - 07/27/2021	CI around median	0.0002	0.002	0.0002	0.002	Standard
G287	UA	845	Molybdenum, total	mg/L	03/29/2021 - 07/27/2021	CI around median	0.001	0.10	0.0045	0.1	Standard
G287	UA	845	pH (field)	SU	03/29/2021 - 07/27/2021	CI around mean	7.1	6.5/9.0	6.6/7.6	6.5/9	Standard/Standard
G287	UA	845	Radium-226 + Radium 228, tot	pCi/L	03/29/2021 - 07/27/2021	CI around mean	-0.0345	5.0	1.6	5	Standard
G287	UA	845	Selenium, total	mg/L	03/29/2021 - 07/27/2021	All ND - Last	0.001	0.050	0.0048	0.05	Standard
G287	UA	845	Sulfate, total	mg/L	03/29/2021 - 07/27/2021	CI around mean	42	400	94	400	Standard
G287	UA	845	Thallium, total	mg/L	03/29/2021 - 07/27/2021	All ND - Last	0.001	0.002	0.001	0.002	Standard
G287	UA	845	Total Dissolved Solids	mg/L	03/29/2021 - 07/27/2021	CI around mean	390	1200	551	1200	Standard
G288	UA	845	Antimony, total	mg/L	03/30/2021 - 07/27/2021	All ND - Last	0.003	0.006	0.003	0.006	Standard
G288	UA	845	Arsenic, total	mg/L	03/30/2021 - 07/27/2021	CI around mean	0.00174	0.010	0.0066	0.01	Standard
G288	UA	845	Barium, total	mg/L	03/30/2021 - 07/27/2021	CB around linear reg	0.066	2.0	0.11	2	Standard
G288	UA	845	Beryllium, total	mg/L	03/30/2021 - 07/27/2021	All ND - Last	0.001	0.004	0.001	0.004	Standard
G288	UA	845	Boron, total	mg/L	03/30/2021 - 07/27/2021	CI around median	0.005	2.0	1.0	2	Standard
G288	UA	845	Cadmium,total	mg/L	03/30/2021 - 07/27/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
COFFEEN POWER PLANT
GMF RECYCLE POND
COFFEEN, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G288	UA	845	Chloride, total	mg/L	03/30/2021 - 07/27/2021	CI around mean	22	200	67	200	Standard
G288	UA	845	Chromium, total	mg/L	03/30/2021 - 07/27/2021	All ND - Last	0.004	0.10	0.019	0.1	Standard
G288	UA	845	Cobalt, total	mg/L	03/30/2021 - 07/27/2021	All ND - Last	0.002	0.006	0.0059	0.006	Standard
G288	UA	845	Fluoride, total	mg/L	03/30/2021 - 07/27/2021	CI around mean	0.38	4.0	0.56	4	Standard
G288	UA	845	Lead, total	mg/L	03/30/2021 - 07/27/2021	All ND - Last	0.001	0.012	0.012	0.0075	Background
G288	UA	845	Lithium, total	mg/L	03/30/2021 - 07/27/2021	All ND - Last	0.020	0.040	0.019	0.04	Standard
G288	UA	845	Mercury, total	mg/L	03/30/2021 - 07/27/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
G288	UA	845	Molybdenum, total	mg/L	03/30/2021 - 07/27/2021	CI around median	0.0013	0.10	0.0045	0.1	Standard
G288	UA	845	pH (field)	SU	03/30/2021 - 07/27/2021	CB around linear reg	7.2	6.5/9.0	6.6/7.6	6.5/9	Standard/Standard
G288	UA	845	Radium-226 + Radium 228, tot	pCi/L	03/30/2021 - 07/27/2021	CI around mean	0.14	5.0	1.6	5	Standard
G288	UA	845	Selenium, total	mg/L	03/30/2021 - 07/27/2021	All ND - Last	0.001	0.050	0.0048	0.05	Standard
G288	UA	845	Sulfate, total	mg/L	03/30/2021 - 07/27/2021	CI around median	29	400	94	400	Standard
G288	UA	845	Thallium, total	mg/L	03/30/2021 - 07/27/2021	All ND - Last	0.001	0.002	0.001	0.002	Standard
G288	UA	845	Total Dissolved Solids	mg/L	03/30/2021 - 07/27/2021	CI around median	310	1200	551	1200	Standard
R201	UA	845	Antimony, total	mg/L	04/10/2015 - 07/28/2021	All ND - Last	0.003	0.006	0.003	0.006	Standard
R201	UA	845	Arsenic, total	mg/L	01/20/2015 - 07/28/2021	CI around median	0.001	0.010	0.0066	0.01	Standard
R201	UA	845	Barium, total	mg/L	04/10/2015 - 07/28/2021	CI around median	0.078	2.0	0.11	2	Standard
R201	UA	845	Beryllium, total	mg/L	04/10/2015 - 07/28/2021	CI around median	0.001	0.004	0.001	0.004	Standard
R201	UA	845	Boron, total	mg/L	01/20/2015 - 07/28/2021	CI around median	0.010	2.0	1.0	2	Standard
R201	UA	845	Cadmium,total	mg/L	01/20/2015 - 07/28/2021	CI around median	0.001	0.005	0.001	0.005	Standard
R201	UA	845	Chloride, total	mg/L	01/20/2015 - 07/28/2021	CI around mean	55	200	67	200	Standard
R201	UA	845	Chromium, total	mg/L	04/10/2015 - 07/28/2021	CI around median	0.004	0.10	0.019	0.1	Standard
R201	UA	845	Cobalt, total	mg/L	04/10/2015 - 07/28/2021	CI around median	0.002	0.006	0.0059	0.006	Standard
R201	UA	845	Fluoride, total	mg/L	04/10/2015 - 07/28/2021	CI around mean	0.30	4.0	0.56	4	Standard
R201	UA	845	Lead, total	mg/L	01/20/2015 - 07/28/2021	Future median	0.001	0.012	0.012	0.0075	Background
R201	UA	845	Lithium, total	mg/L	11/23/2015 - 07/28/2021	All ND - Last	0.020	0.040	0.019	0.04	Standard

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
COFFEEN POWER PLANT
GMF RECYCLE POND
COFFEEN, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
R201	UA	845	Mercury, total	mg/L	04/10/2015 - 07/28/2021	CI around median	0.0002	0.002	0.0002	0.002	Standard
R201	UA	845	Molybdenum, total	mg/L	07/22/2015 - 07/28/2021	CI around median	0.001	0.10	0.0045	0.1	Standard
R201	UA	845	pH (field)	SU	01/20/2015 - 07/28/2021	CI around mean	7.0	6.5/9.0	6.6/7.6	6.5/9	Standard/Standard
R201	UA	845	Radium-226 + Radium 228, tot	pCi/L	11/23/2015 - 07/28/2021	CI around mean	0.40	5.0	1.6	5	Standard
R201	UA	845	Selenium, total	mg/L	04/10/2015 - 07/28/2021	CI around median	0.001	0.050	0.0048	0.05	Standard
R201	UA	845	Sulfate, total	mg/L	01/20/2015 - 07/28/2021	CI around mean	185	400	94	400	Standard
R201	UA	845	Thallium, total	mg/L	04/10/2015 - 07/28/2021	All ND - Last	0.001	0.002	0.001	0.002	Standard
R201	UA	845	Total Dissolved Solids	mg/L	01/20/2015 - 07/28/2021	CI around mean	689	1200	551	1200	Standard

Notes:
Potential exceedance of GWPS
HSU = hydrostratigraphic unit:
DA = deep aquifer
LCU = lower confining unit
UA = uppermost aquifer
Program = regulatory program data were collected under:
257 = 40 C.F.R. Part 257 Subpart D (Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments)
845 = 35 I.A.C. Part 845 (Sampling events completed to assess well locations for inclusion in the Part 845 monitoring well network)
mg/L = milligrams per liter
pCi/L = picocuries per liter
SU = standard units
Statistical Calculation = method used to calculate the statistical result:
All ND - Last = All results were below the reporting limit, and the last determined reporting limit is shown
CB around linear reg = Confidence band around linear regression
CB around T-S line = Confidence band around Thiel-Sen line
CI around geomean = Confidence interval around the geometric mean
CI around mean = Confidence interval around the mean
CI around median = Confidence interval around the median
Future median = Median of the three most recent samples
Most recent sample = Result for the most recently collected sample used due to insufficient data
Statistical Result = calculated in accordance with Statistical Analysis Plan using constituent concentrations observed at monitoring well during all sampling events within the specified date range
For pH, the values presented are the lower / upper limits
GWPS = Groundwater Protection Standard
GWPS Source:
Standard = standard specified in 35 I.A.C. § 845.600(a)(1)
Background = background concentration (see cover page for additional information)

TABLE 2. SUMMARY OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
COFFEEN POWER PLANT
GMF RECYCLE POND
COFFEEN, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G273	UA	257	Sulfate, total	mg/L	01/21/2015 - 02/01/2021	CI around mean	424	400	104	400	Standard
G275	UA	845	Boron, total	mg/L	01/21/2015 - 07/23/2015	Most recent sample	4.0	2.0	1.0	2	Standard
G275	UA	845	Sulfate, total	mg/L	01/21/2015 - 07/23/2015	Most recent sample	750	400	94	400	Standard
G275	UA	845	Total Dissolved Solids	mg/L	01/21/2015 - 07/23/2015	Most recent sample	1500	1200	551	1200	Standard
G285	LCU	845	Sulfate, total	mg/L	03/30/2021 - 07/27/2021	CI around mean	528	400	94	400	Standard
G285	LCU	845	Total Dissolved Solids	mg/L	03/30/2021 - 07/27/2021	CI around mean	1410	1200	551	1200	Standard

Notes:
HSU = hydrostratigraphic unit:
LCU = lower confining unit
UA = uppermost aquifer
Program = regulatory program data were collected under:
257 = 40 C.F.R. Part 257 Subpart D (Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments)
845 = 35 I.A.C. Part 845 (Sampling events completed to assess well locations for inclusion in the Part 845 monitoring well network)
mg/L = milligrams per liter
pCi/L = picocuries per liter
SU = standard units
Statistical Calculation = method used to calculate the statistical result:
CI around mean = Confidence interval around the mean
Most recent sample = Result for the most recently collected sample used due to insufficient data
Statistical Result = calculated in accordance with Statistical Analysis Plan using constituent concentrations observed at monitoring well during all sampling events within the specified date range
For pH, the values presented are the lower / upper limits
GWPS = Groundwater Protection Standard
GWPS Source:
Standard = standard specified in 35 I.A.C. § 845.600(a)(1)
Background = background concentration (see cover page for additional information)