Illinois Power Resources Generating, LLC
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: Duck Creek GMF Pond (IEPA ID: W0578010001-04) Annual Consolidated Report

Dear Mr. LeCrone:

In accordance with 35 IAC § 845.550, Illinois Power Resources Generating, LLC (IPRG) is submitting the annual consolidated report for the Duck Creek GMF Pond (IEPA ID: W0578010001-04), as enclosed.

Sincerely,

Dianna Tickner

Dianna Tickner
Director Decommissioning & Demolition

Enclosures

Annual Consolidated Report
Illinois Power Resources Generating, LLC
Duck Creek Power Plant
GMF Pond; IEPA **ID: W0578010001-04**

In accordance with 35 IAC § 845.550, Illinois Power Resources Generating, LLC (IPRG) 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

Duck Creek Power Plant

Prepared for:

Illinois Power Resources Generating, LLC

Duck Creek Power Plant
17751 North Cilco Road
Canton, IL 61520

November 2021

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

Completed by:____Dianna Tickner___ ____Director, Decommissioning & Demolition_

Name Title

This Annual CCR Fugitive Dust Control Report has been prepared for the Duck Creek Power Plant 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 Duck Creek Power Plant 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.
	Cover exposed dry CCR in the landfill.
	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.
	Apply chemical dust suppressant on areas of exposed CCR in CCR units, as necessary.
Handling of CCR at the facility	Wet sluice CCR bottom ash and flue gas desulfurization materials to CCR surface impoundments.
	CCR bottom ash removed from CCR surface impoundments and loaded into trucks for transport remains conditioned during handling.
	Pneumatically convey dry CCR fly ash to storage silos in an enclosed system.

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.
	Load CCR transport trucks from the CCR fly ash silos in a partially enclosed area.
	Load CCR transport trucks from the CCR fly ash silos using a telescoping chute.
	Maintain and operate the bin vent filters on each CCR fly ash silo as needed during fly ash loadout.
	Perform housekeeping, as necessary, in the fly ash loading area.
	Operate fly ash handling system in accordance with good operating practices.
	Maintain and repair as necessary dust controls on the fly ash handling system.
Transportation of CCR at the facility	CCR from the CCR fly ash silos 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.
	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.

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.

The Illinois Environmental Protection Agency rule 35 IAC 212.314 does not require fugitive dust controls when the wind speed is greater than 25 mph.

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.

Duck Creek ceased operation in December of 2019. Not all the CCR activities that are listed in the table occurred after the plant was permanently shut down. For the activities that did occur, the actions taken to control CCR Fugitive Dust that are listed in the table were followed and were adequate to effectively minimize fugitive dust.

Section 2 Record of Citizen Complaints

No citizen complaints were received regarding CCR fugitive dust at Duck Creek Power Plant 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	Duck Creek Power Station Fulton County, Illinois 61520 10/19/2021
Operator Name / Address	Luminant Generation Company LLC 6555 Sierra Drive, Irving, TX 75039
CCR unit	GMF Pond

INSPECTION REPORT 35 IAC § 845.540 Date of Inspection 10/19/2021	
(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 II 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	None
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 1100 acre-feet
(b)(2)(E) The approximate volume of the impounded water and CCR contained in the unit at the time of the inspection.	Approximately 900 acre-feet
(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 10/19/2021	
(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: Duck Creek Power Station

CCR Unit: GMF 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		616			26	
CCR	590		620	10		40

Geosyntec consultants

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www.geosyntec.com

October 11, 2021

Illinois Power Resources Generating, LLC
17751 North Cilco Road
Canton, Illinois 61520

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

At the request of Illinois Power Resources Generating, LLC (IPRG), 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 9 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 PERIODIC CERTIFICATION REPORT §257.73(a)(2), (c), (d), (e) and §257.82 GMF POND Duck Creek Power Plant Fulton County, Illinois

Submitted to

Illinois Power Resources Generating, LLC

17751 North Cilco Road
Canton, Illinois 61520

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 Pond[1] at the Duck Creek Power Plant (DCPP) 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 Resources Generating, LLC (IPRG) 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], [8]) were independently reviewed by Geosyntec. Additionally, field observations, interviews with plant staff, and evaluations were performed to compare conditions in 2021 at the GMF Pond relative to the 2016 initial certifications. These tasks determined that updates are not required for the Initial Hazard Potential Classification or Inflow Design Flood Control Plan. However, due to changes at the site and technical review comments, updates were required and were performed for the:

- History of Construction Report,
- Initial Structural Stability Assessment, and
- Initial Safety Factor Assessment.

Geosyntec's evaluations of the initial certification reports and updated engineering evaluations determined that the GMF Pond meets all requirements for hazard potential classification, history of construction reporting, structural stability assessment, safety factor assessment, and hydrologic and hydraulic control. **Table 1** provides a summary of the initial 2016 certifications and the updated 2021 periodic certifications.

[1] The GMF Pond is also referred to as ID Number W05780100001-04, GMF Pond by the Illinois Environmental Protection Agency (IEPA); CCR unit ID 203 by IPRG, and IL50573 within the National Inventory of Dams (NID) maintained by the Illinois Department of Natural Resources (IDNR). Within this document it is referred to as the GMF Pond or the GMFP.

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 Significant hazard potential classification [2].	Yes	Updates were not determined to be necessary. Geosyntec recommends retaining the Significant hazard potential classification.
History of Construction						
4	§257.73(c)(1)	Compile a history of construction	Yes	A history of Construction report was prepared for the GMF Pond [3].	Yes	The Duck Creek Power Plant closed and CCR materials are no longer being placed in the GMF Pond. 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 and abutments were found to be stable [8].	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 [8].	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 [8].	Yes	Dike compaction 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 is maintained. Interior slopes had alternate protection (geomembrane liner) [8].	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 and were expected to adequately manage flow during 1,000-year flood [8].	Yes	No changes were identified that may affect this requirement.
	§257.73(d)(1)(vi)	Structural integrity of hydraulic structures	Not Applicable	Hydraulic structures penetrating the dikes or underlying the base of the GMF Pond were not present [8].	Not Applicable	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 was not expected; this requirement was not applicable [8].	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 4.27 and higher [8].	Yes	Safety factors from an updated slope stability analyses were calculated to be 3.47 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 4.26 and higher [8].	Yes	Safety factors from an updated slope stability analyses were calculated to be 3.47 and higher.
	§257.73(e)(1)(iii)	Seismic safety factor must be at least 1.00	Yes	Safety factors were calculated to be 2.37 and higher [8].	Yes	Safety factors from an updated slope stability analyses were calculated to be 1.88 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 [8].	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 1,000-year, 24-hour, Inflow Design Flood [8].	Yes	No changes were identified that may affect this requirement.
	§257.82(b)	Discharge from CCR Unit	Yes	Discharge into Waters of the United States is not expected during 1,000-year, 24-hour Inflow Design Flood conditions [8].	Yes	No changes were identified that may affect this requirement.

SECTION 1

INTRODUCTION AND BACKGROUND

This Periodic United States Environmental Protection Agency (USPA) Coal Combustion Residual (CCR) Rule [1] Certification Report was prepared by Geosyntec Consultants (Geosyntec) for Illinois Power Resources Generations, LLC (IPRG) to document the periodic certification of the GMF Pond at the Duck Creek Power Plant (DCPP) located at 17751 North Cilco Road in Canton, Illinois, 61520. The location of Duck Creek is provided in **Figure 1**, and a site plan showing the location of the GMF Pond, among other closed and open CCR units and non-CCR surface impoundments, is provided in **Figure 2**.

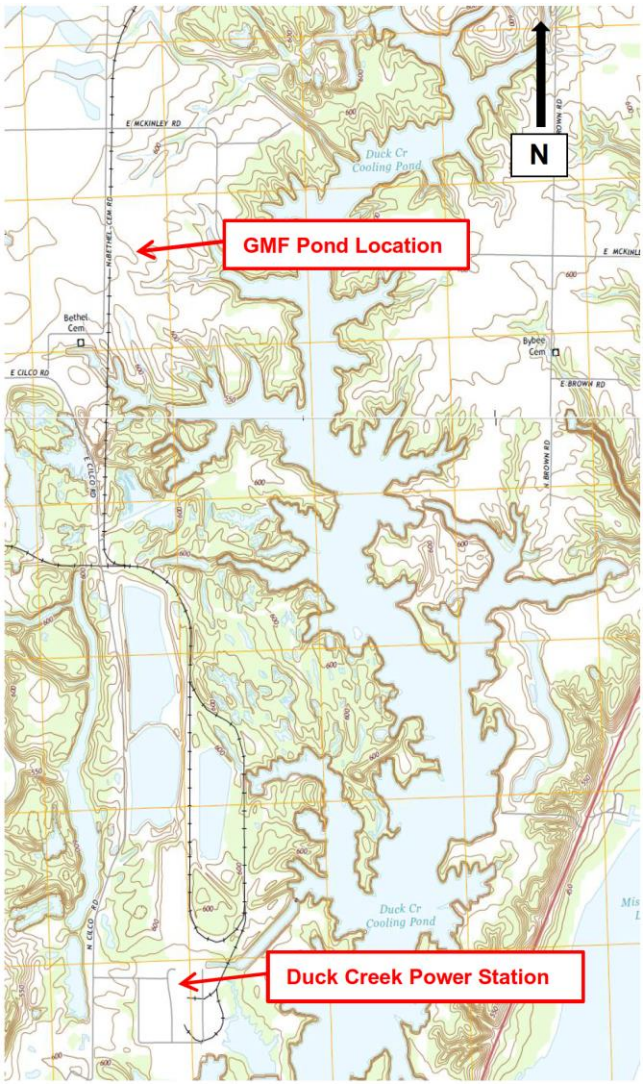


Figure 1 – Site Location Map (from AECOM, 2016)

Figure 2 – Site Plan

1.1 GMF Pond Description

DCPP was retired in 2019. Prior to retirement, two active CCR surface impoundments – the GMF Pond and the Bottom Ash Basin, and one CCR landfill, were used for managing CCRs generated at DCPP [8]. This certification report only pertains to the GMF Pond. The GMF Pond has a "Significant" hazard potential, based on the initial hazard potential classification assessment performed by Stantec in 2016 in accordance with §257.73(a)(2) ([2], [7]).

The GMF Pond served as the wet impoundment basin for gypsum proceeded by the emissions scrubbers at DCPP. The GMF Pond was constructed between 2008 and 2009 and received inflow from three pairs of 10-in diameter high-density polyethylene (HDPE) gypsum slurry pipes. Clear water discharge from the GMF Pond flows downstream into the approximately 8.5-acre GMF Recycle Pond, which is a non-CCR unit, via a lined channel (transfer channel). The transfer channel is approximately 150-ft long, trapezoidal in shape, lined with 60-mil HDPE, has 3H:1V (horizontal to vertical) side slopes, and a depth of 6 ft. Stoplogs are present within the transfer channel that would allow the pool level to be maintained as high as El. 616.0 ft[2]. The channel transitions from a 16-ft bottom width at an invert elevation of 614.0 ft at the upstream end to a 35-ft bottom width at an invert elevation of 609.0 ft at the downstream end. Outflow from the GMF Recycle Pond was formerly pumped back to DCPP to be recycled for use in the wet scrubber system [8]. Currently, the GMF Pond and GMF Recycle Pond are maintained in a zero-discharge configuration, where the only inflows are precipitation flowing directly into the impoundments and the only outflows are evaporation.

The GMF Pond has a composite liner system that is present underneath the entire footprint of the pond and extends up the interior slopes. The liner system includes, from bottom to top, a 3-ft thick layer of compacted clay that is overlain by a geosynthetic clay liner (GCL) and a 60-mil textured HDPE geomembrane, all of which serve as the lower liner. Above the lower liner, a 10-oz

[2] All elevations are in the North American Vertical Datum of 1988 (NAVD88), unless otherwise noted.

geotextile is overlain by a 1-ft thick granular drainage layer and a 4-oz geotextile filter. The upper liner is comprised from bottom to top of a 1-ft thick soil cushion layer and a 60-mil textured HDPE geomembrane. The upper geomembrane liner is exposed at the pond bottom and side slopes [8].

As formerly operated, the normal pool of the GMF Pond was El. 615.0 ft, as controlled by the stoplog structure at the top of the transfer channel. The GMF Pond is approximately 31.6 acres in size and has a total perimeter embankment length of approximately 4,560 ft. The perimeter dike was constructed to include a crest width of approximately 30 ft and crest height ranging from approximately 5 to 10 ft along the eastern side of the pond. The interior of the ponds extends deeper than the exterior slopes; the maximum interior slope height is approximately 45 ft in the southwest corner of the pond. The design elevation of the embankment crest is 620 ft. Both interior and exterior slopes have an orientation of 3.5H:1V (horizontal to vertical).

Initial certifications for the GMF Pond 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 and AECOM in 2016 and 2017 and subsequently posted to IPRG's CCR Website ([2], [3], [4], [5], [6]). Additional documentation for the initial certifications included a 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 AECOM [8]. These operating record reports were not posted to IPRG's CCR Website.

1.2 Report Objectives

The following objectives are associated with this report:

- Compare site conditions from 2015/2016, when the initial certifications were developed, to site conditions in 2020/2021, when data for the periodic certification was obtained, 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], [8]), Safety Factor Assessment ([5], [8]), and Inflow Design Flood

Control System Plan ([6], [8]) reports 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 DCPP, and did not include calculations or other information used to certify performance and/or integrity of the impoundments under §257.73(a)(2), §257.73(c)-(e), or §257.82.

- Confirm that the GMF Pond meets all of the requirements associated with §257.73(a)(2), (c), (d), (e), and §257.82, or, if the GMF Pond does not meet any of these requirements, provide recommendations for compliance with those 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 Pond between the start of the initial CCR certification program in 2015 and 2016 (initial conditions) and subsequent collection of periodic certification site data in 2020 and 2021 (periodic conditions).

2.2 Review of Annual Inspection Reports

Annual onsite inspections for the GMF Pond were performed between 2016 and 2020 ([9], [10], [11], [12], [13]) 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 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 Pond between 2015 and 2020. No signs of instability, structural weakness, or changes which may have affected the operation or stability of the GMF Pond were noted in the inspection reports.

2.3 Review of Instrumentation Data

Multiple groundwater monitoring wells are present around the GMF Pond. Eight of the groundwater monitoring wells, G50S, G51S, G54C, G57C, G57S, G60S, G64S, and X301 have been monitored periodically since by IPRG. Water level readings were provided from December 2, 2015 through June 21, 2021 for most of the wells, with the exception of X301, for which water level readings were provided starting on March 2, 2015, and G54C, for which readings were provided starting on April 14, 2021. Geosyntec reviewed the water levels to evaluate if significant fluctuations, partially increases in phreatic levels, may have occurred between development of the

initial structural stability and factor of safety certifications ([4], [5], [8]) and June 21, 2021. Available monitoring well water levels are plotted in **Attachment A**.

In summary, only minor changes in phreatic conditions were observed in the available monitoring well level data. Phreatic levels typically exhibited consistent seasonal variations of 5 to 10 ft, with the exception of X301 and G54C, which varied by approximately 2 ft. These levels do not significantly differ from those utilized for the initial structural stability and factor of safety certifications ([4], [5], [8]).

2.4 Comparison of Initial to Periodic Surveys

The initial survey of the GMF Pond, conducted by Weaver Consultants (Weaver) in 2015 [14], was compared to the periodic survey of the GMF Pond, conducted by IngenAE, LLC (IngenAE) in 2020 [15], using AutoCAD Civil3D 2021 software. This comparison quantified changes in the volume of CCR placed within the GMF Pond 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]. Potential changes to embankment geometry were also evaluated. This comparison is presented in side-by-side comparison of the two 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

Initial Surveyed Pool Elevation (ft)	614.2
Periodic Surveyed Pool Elevation (ft)	613.9
Initial §257.82 Starting Water Surface Elevation (SWSE) (ft)	616.0
Total Change in CCR Volume* (CY)	+ 8,000 (Fill)
Change in CCR Volume Above SWSE* (CY)	- 9,000 (Cut)
Change in CCR Volume Below SWSE* (CY)	+ 17,000 (Fill)

*All volumes rounded to the nearest 1,000 CY

The comparison indicated that approximately 8,000 CY of CCR was placed in the GMF Pond between the initial and periodic surveys. The CCR was placed entirely below the SWSE and a net cut occurred above the SWSE. CCR grades above the SWSE were generally similar to the initial survey (e.g., within +/- 2 ft). These changes are considered unlikely to result in increase in the peak water surface elevation (PWSE) during a flood event, as additional flood storage is present relative to conditions observed in 2015. No significant changes to embankment geometry appeared to have occurred between the initial and periodic surveys.

2.5 Comparison of Initial to Periodic Aerial Photography

Initial aerial photographs of the GMF Pond collected by Weaver in 2015 [14] were compared to periodic aerial photographs collected by IngenAE in 2020 [15] to visually evaluate if potential site changes (i.e., changes to the embankment, outlet structures, limits of CCR, other appurtenances)

may have occurred. A comparison of these aerial photographs is provided in **Drawing 3**. No significant changes were noted during this comparison.

2.6 Comparison of Initial to Periodic Site Visits

An initial site visit to the GMF Pond was conducted by AECOM in 2015 and documented with a Site Visit Summary and corresponding photographs [16]. A periodic site visit was conducted by Geosyntec on May 27, 2021, with Mr. Lucas P. Carr, P.E. conducting the site visit. The site visit was intended to evaluate potential changes at the site since the initial certifications were prepared (i.e., modification to the embankment, outlet structures or other appurtenances, limits of CCR, maintenance programs, repairs), in addition to performing visual observations of the GMF Pond to evaluate if the structural stability requirements (§257.73(d)) were still met. The stie visit included walking the perimeter of the GMF Pond, visually observing conditions, recording field notes, and collecting photographs. The site visit is documented in a photographic log provided in **Appendix A**. A summary of significant findings from the periodic site visit is provided below:

- Overall site maintenance appears to be similar to conditions observed in 2015.
- No signs or structural stability, erosion, or required maintenance items were observed during the stie visit.

2.7 Interview with Power Plant Staff

An interview with Mr. Daryl Johnson and Mr. Brandon Potter of the DCPP was conducted by Lucas P. Carr, P.E. of Geosyntec on May 27, 2021. Mr. Johnson, at the time of the interview, had been employed at the DCPP for 8 years and was responsible for environmental compliance and completed weekly CCR inspections on some years, including for the GMF Pond, in addition to managing vegetation maintenance. Mr. Potter, at the time of the interview, had been employed at DCPP for 10 years and assisted in the inspection and operation of the GMF Pond. The interview included a discussion of included a discussion of potential changes that that may have occurred at the GMF Pond since development of the initial certifications ([2], [7], [3], [4], [5], [6], [8]).

- Were any construction projects completed for the GMF Pond since 2015, and, if so, are design drawings and/or details available?
    - No.
- Were there any changes to the purpose of the GMF Pond since 2015?
    - The DCPP was closed in December of 2019. Sluicing into the GMF Pond and pumping of water from the GMF Recycle Pond was stopped at this time.
- Were there any changes to the to the instrumentation program and/or physical instruments for the GMF Pond since 2015?

- The GMF Pond does not have instrumentation, so no changes occurred.

- Have area-capacity curves for the GMF Pond been prepared since 2015?
  - No known area-capacity curves have been developed.

- Were there any changes to spillways and/or diversion features for the GMF Pond completed since 2015?
  - No.

- Were there any changes to construction specifications, surveillance, maintenance, and repair procedures for the GMF Pond since 2015?
  - No.

- Were there any instances of dike and/or structural instability for the GMF Pond since 2015?
  - 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:

- Visual analysis to evaluate potential hazards associated with a failure of the GMF Pond perimeter dike, along the north, south, east, and west embankments of the GMF Pond.
- Evaluation of potential breach flow paths using elevation data and aerial imagery to assess potential impacts to downstream structures, infrastructure, and waterways.
- 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) [17].

The visual analysis indicated that only structures owned by DCPP were within the potential breach path, and that public impacts were limited to portions of North Bethel Cemetery Road and the railroad leading to the Power Plant. The reported noted that North Bethel Cemetery Road is intermittently used, and the at-risk population was considered transient. The Initial HPC concluded that breach of the GMF pond would be unlikely to result in a probable loss of human life, although the breach could cause CCR to be released into downstream waterways, thereby causing environmental damage. The Initial HPC therefore recommended a “Significant” hazard potential classification for the GMF Pond [2].

3.2 Review of Initial HPC

Geosyntec performed a review of the Initial HPC ([2], [7]), in terms of technical approach, assessment of the results, and 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 as the initial HPC utilized a visual assessment.

3.3 Summary of Site Changes Affecting the Initial HPC

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 observed to be present in the probable breach area indicated in the Initial EmAP [17]. 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 Pond, 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 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 non-incised CCR surface impoundments at DCPP, including the GMF Pond, Ash Pond No. 1, and Ash Pond No. 2. This report only discusses the HoC as it pertains to the GMF Pond. The Initial HoC included the following information for the GMF Pond:

- 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,
- Area-capacity curves for the GMF Pond,
- Information on spillway structures,
- Construction specifications,
- Inspection and surveillance plans,
- A statement that operations and maintenance plans are being generated or revised, and that the report will be updated when the new plans are available,
- A statement that no known historical structural instability has occurred at the CCR surface impoundments.

4.2 Summary of Site Affecting the Initial HoC

One significant change at the site that occurred after development of the initial HoC report [3] was identified and is described below:

- Electricity generation at the DCPP ceased in December of 2019 and the pumping of inflow and outflow into and from the GMF Recycle Pond ceased at this time.
    - An update to the HoC report was performed to state that the DCPP is no longer active and the GMF Pond is no lower receiving inflows and outflow is no longer pumped back to the DCPP. 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 AECOM in 2016 ([4], [8]), 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
- Downstream slope stability under sudden drawdown conditions for a downstream water body.

The Initial SSA ([4], [8]) concluded that the GMF Pond met all structural stability requirements for §257.73(d)(1)(i)-(vii). This included noting that the structural integrity of hydraulic structures (§257.73(d)(1)(vi)) was not applicable, due to no hydraulic structures penetrating or underlying the base of the GMF Pond. Additionally, it was noted that the stability of downstream slopes inundated by water bodies (§257.73(d)(1)(vii) was also not applicable, due to inundation of the downstream slopes not being expected.

5.2 Review of Initial SSA and Updated Periodic SSA

Geosyntec performed a review of the Initial SSA ([4], [8]) 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.

One review comment and corresponding recommended technical update was identified during review of the geotechnical analyses supporting the sufficiency of dike compaction

(§257.73(d)(1)(i)) and foundation and abutment stability (§257.73(d)(1)(iii) portions of the Initial SSA. These analyses were performed for the Initial Safety Factor Assessment (SFA) but also utilized to support the initial SSA. The review comment and subsequent updates the Initial SFA, are discussed in **Section 6.**

5.3 Summary of Site Changes Affecting the Initial SSA

No changes since development of the Initial SSA were identified that would require updates to the Initial SSA ([4], [8]).

5.4 Periodic SSA

The updated Periodic SFA (**Section 7**) indicates that foundations and abutments are stable and dike compaction is sufficient for expected ranges in loading conditions, as slope stability factors of safety for slip surfaces passing through the dike and foundation were found to meet or exceed the requirements of §257.73(e)(1), including for static maximum storage pool conditions and 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.

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 AECOM in 2016 ([5], [8]) following the requirements of §257.73(e)(1). The Initial SFA included the following information:

- A geotechnical investigation program with in-situ and laboratory testing;
- An assessment of the potential for liquefaction in the dike and foundation soils;
- The development of a single slope stability cross-sections for limit equilibrium stability analysis utilizing GeoStudio SLOPE/W software; and
- The analysis of the cross-section 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 either the embankments or foundation soils.

The Initial SFA concluded that the GMF 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], [8]) 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.
    - Phreatic conditions based on piezometric data collected between March 2, 2015 June 21, 2021, as discussed in **Section 2.3**.

One review comment was identified during review of the Initial SFA. The comment and the is described below:

- The Initial SFA utilized a single cross-section (A-A') along the eastern embankment where the exterior slope is approximately 8 ft tall. However, the maximum height of the exterior slope is approximately 11 ft at the southwest corner of the embankment.

6.3 Summary of Site Changes Affecting the Initial SFA

No changes since development of the Initial SFA were identified that would require updates to the Initial SFA ([5], [8]).

6.4 Periodic SFA

Following review of the Initial SFA ([5], [8]), Geosyntec developed a new slope stability analysis cross-section (B-B') at the southwest corner of the GMF Pond embankment to account for the maximum embankment height of 11 ft. The model was developed utilizing the following approach and input data:

- Ground surface geometry was obtained from the 2020 survey of the GMF Pond [15].

- Subsurface stratigraphy was obtained from 2007 borings B-53 and B-67, as provided in the Initial SFA report [8]. Geosyntec reviewed the boring data and determined that subsurface conditions were similar to conditions at cross-section A-A'. Therefore, the soil properties (i.e., strength, unit weight) from the Initial SFA ([5], [8]) were utilized for cross-section B-B',

- Piezometric levels in the foundation soils were assumed to follow the ground surface past the embankment toe, per providing readings from monitoring wells G51S and G54C; and,

- All other analysis settings and input data from the Initial SFA ([5], [8]) was utilized, including, but not limited to, software package and version, slip surface search routines and methods, and pseudostatic seismic coefficients.

Factors of safety form the Periodic SFA (cross-section B-B') and Initial SFA (cross-section A-A') are summarized in **Table 3** and confirm that the GMF Pond meets the requirements of §257.73(e)(1). A location of the cross-section B-B' in plan and analysis output data for cross-section B-B' 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**
A-A'	4.27	4.26	2.37	N/A	N/A
B-B'	3.47*	3.47*	1.88*	N/A	N/A

Notes:
[1]Denotes cross-section where results from the Initial SFA are presented due to no observed changes relative to the Initial IDF.
[2]Denotes cross-section where changes are occurred, and results are presented from the updated Periodic SFA.
*Indicates critical cross-section (i.e., lowest calculated factor of safety out of the two cross-sections analyzed)
N/A – Loading condition is not applicable.

SECTION 7

INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN - §257.82

7.1 Overview of Initial IDF

The Initial Inflow Design Flood Control System Plan (Initial IDF) was prepared by AECOM in 2016 ([6], [8]) following the requirements of §257.82. The Initial IDF included the following information:

- A hydraulic and hydrologic analysis, performed for the 1,000-year design flood event because of the hazard potential classification of "significant", which corresponded to 9.37 inches of rainfall over a 24-hour period.
- The Initial IDF utilized a HydroCAD Version 8.5 model to evaluate spillway flows and pool level increases during the design flood, with a SWSE of 616.0 ft.

The Initial IDF ([6], [8]) concluded that the GMF Pond met the requirements of §257.82, as the peak water surface estimated by the HydroCAD model was El. 618.3 ft, relative to a minimum GMF Pond dike crest elevation of 620.0 ft. Therefore, overtopping was not expected. The Initial IDF also evaluated the potential for discharge from the CCR unit and determined that discharge into Waters of the United States and no overtopping was expected during the 1,000-year design flood.

7.2 Review of Initial IDF

Geosyntec performed a review of the Initial IDF ([6], [8]) 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 for appropriateness.
- Performing a high-level review of the inputs to the hydrological modeling.
- Reviewing the hydrologic model parameters for spillway parameters, starting pool elevation, and storage vs. the reference data.
- Reviewing the overall Initial IDF vs. the 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.

7.3 Summary of Site Changes Affecting the Initial IDF

No changes since development of the Initial IDF were identified that would require updates to the Initial IDF ([6], [8]).

SECTION 8

CONCLUSIONS

The GMF Pond at DCPP was evaluated relative to the USEPA 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.

SECTION 9

CERTIFICATION STATEMENT

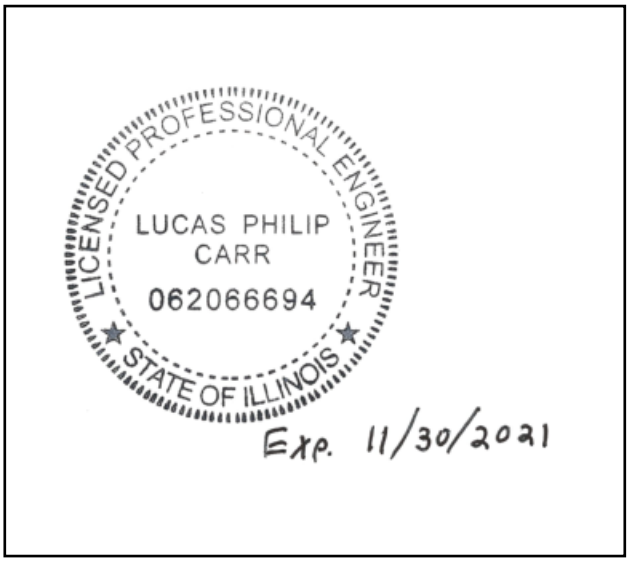
CCR Unit: Illinois Power Resources Generation, LLC; Duck Creek Power Plant, GMF Pond

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, emergency action plan, safety factors, and inflow design flood control system planning, dated October 2021, 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

REFERENCES

[1] United States Environmental Protection Agency, 40 CFR Parts 257 and 261; Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule, 2015.

[2] Stantec Consulting Services Inc., "Initial Hazard Potential Classification Assessment, EPA Final CCR Rule, GMF Pond, Duck Creek Power Station, Fulton County, Illinois," Fenton, MO, October 12, 2016.

[3] AECOM, "History of Construction, USEPA Final CFR Rule, 40 CFR §257.73(c), Duck Creek Power Station, Canton, Illinois," October 2016.

[4] AECOM, "CCR Rule Report: Initial Structural Stability Assessment for GMF Pond at Duck Creek Power Station," October 2016.

[5] AECOM, "CCR Rule Report: Initial Safety Factor Assessment for GMF Pond at Duck Creek Power Station," St. Louis, MO, October 2016.

[6] AECOM, "CCR Rule Report: Initial Inflow Design Flood Control System Plan for GMF Pond at Duck Creek Power Station," October 2016.

[7] Stantec Consulting Services Inc., "Documentation of Initial Hazard Potential Classification Assessment, GMF Pond, Duck Creek Power Station, Fulton County, Illinois," October 12, 2016.

[8] AECOM, "CCR Certification Report: Initial Structural Stability Assessment, Initial Safety Factor Assessment, and Initial Inflow Design Flood Control System Plan for GMF Pond at Duck Creek Power Station," October 2016.

[9] J. Knutelski and J. Campbell, "Annual CCR Surface Impoundment Inspection Report (per 40 CFR 257.83(b)(2)), Duck Creek Power Station, GMF Pond," January 18, 2017.

[10] J. Knutelski and J. Campbell, "Annual CCR Surface Impoundment Inspection Report (per 40 CFR 257.83(b)(2)), Duck Creek Power Station, GMF Pond," February 7, 2018.

[11] J. Knutelski, "Annual Inspection by a Qualified Professional Engineer, 40 CFR §2357.83(b), Duck Creek Power Station, GMF Pond," January 10, 2019.

[12] J. Knutelski, "Annual Inspection by a Qualified Professional Engineer, 40 CFR §257.83(b), Duck Creek Power Station, GMF Pond," January 8, 2020.

[13] J. Knutelski, "Annual Inspection by a Qualified Professional Engineer, 40 CFR §257.83(b), Duck Creek Power Station, GMF Pond," January 6, 2021.

[14] Weaver Consultants Group, "Dynegy, Collinsville, Illinois, 2015 - Duck Creek Existing Topography," December 1, 2015.

[15] IngenAE, "Luminant, Illinois Power Resrouces Generating, LLC, Duck Creek Power Station, December 2020 Topography," February 9, 2021.

[16] AECOM, "Initial Site Visit CCR Unit Summary, Dynegy CCR Compliance Program - Duck Creek, Duck Creek GMF Primary Pond," June 23, 2015.

[17] Stantec Consulting Services Inc., "Duck Creek Power Station, Emergency Action Plan (EAP)," April 13, 2017.

Section 3

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

Prepared for
Illinois Power Resources Generating, LLC

Date
January 31, 2022

Project No.
1940100711-005

2021 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

GYPSUM MANAGEMENT FACILITY POND
DUCK CREEK POWER PLANT
CANTON, ILLINOIS

RAMBOLL Bright ideas. Sustainable change.

2021 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
DUCK CREEK POWER PLANT GYPSUM MANAGEMENT FACILITY POND

Project name	**Duck Creek Power Plant Gypsum Management Facility Pond**
Project no.	**1940100711-005**
Recipient	**Illinois Power Resources Generating, LLC**
Document type	**Annual Groundwater Monitoring and Corrective Action Report**
Version	**FINAL**
Date	**January 31, 2022**
Prepared by	**Terra A. Dalton**
Checked by	**Lauren Cook**
Approved by	**Brian Hennings**
Description	**Annual Report in Support of Part 845**

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TABLES (IN TEXT)

FIGURES

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
GMF Pond	Gypsum Management Facility Pond
bgs	below ground surface
CCR	coal combustion residuals
DCPP	Duck Creek Power Plant
GMP	Groundwater Monitoring Plan
GWPS	groundwater protection standard
HCR	Hydrogeologic Site Characterization Report
ID	identification
IEPA	Illinois Environmental Protection Agency
IPRG	Illinois Power Resources Generating, LLC
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
PMP	potential migration pathway
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 Pond (GMF Pond) located at Duck Creek Power Plant (DCPP) near Canton, Illinois.

An operating permit application for the GMF Pond was submitted by Illinois Power Resources Generating, LLC (IPRG) 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 Pond is recognized by Vistra identification (ID) Number (No.) 203, IEPA ID No. W0578010001-04, and National Inventory of Dams (NID) No. IL50573.

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 Pond 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 Pond, submitted to IEPA by October 31, 2021, which is pending IEPA approval.

1. INTRODUCTION

This report has been prepared by Ramboll on behalf of IPRG, to provide the information required by 35 I.A.C. § 845.610(e) for the GMF Pond located at DCPP near Canton, 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 Pond was submitted by IPRG 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 Pond 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 Pond.

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 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]
G02S	UA	23 - 28	Background
G50S	UA	29.2 - 34.0	Background
G51S	UA	24.0 - 28.8	Background
G54L*	UA	27.3 - 36.8	Compliance
G54S	UA	43.5 - 48.0	Compliance
G57S	UA	29.7 - 34.2	Compliance
G60L*	UA	20.1 - 24.9	Compliance
G60S	UA	31.1 - 35.9	Compliance
G64L*	UA	18.1 - 27.5	Compliance
G64S	UA	34.5 - 39.0	Compliance
X301 [2, 3]	CCR	NA	WLO

[1] Well type refers to the role of the well in the monitoring network.
[2] Surface water level measuring point.
[3] Location is temporary pending implementation of impoundment closure per an approved construction permit application.
* Well has been identified to monitor the potential migration pathway (PMP).
bgs = below ground surface
CCR = coal combustion residuals
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 February to August 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]
February 19 - 22, 2021	Appendix III [2], field parameters [3]	G02S, G50S, G51S, G54S, and G57S
April 14, 2021	Metals [4], mercury, inorganic parameters [5], radium 226 and 228, field parameters [3]	G02S, G50S, G51S, G54C, G54L, and G60L
April 29, 2021	Metals [4], mercury, inorganic parameters [5], radium 226 and 228, field parameters [3]	G02S, G50S, G51S, G54C, G54L, and G60L
May 12 - 13, 2021	Metals [4], mercury, inorganic parameters [5], radium 226 and 228, field parameters [3]	G02S, G50S, G51S, G54C, G54L, and G60L
June 1, 2021	Metals [4], mercury, inorganic parameters [5], radium 226 and 228, field parameters [3]	G02S, G50S, G51S, G54C, G54L, and G60L
June 10 - 15, 2021	Metals [4], mercury, inorganic parameters [5], radium 226 and 228, field parameters [3]	G02S, G50S, G51S, G54C, G54L, and G60L
June 21, 2021	pH; TDS	G54S and G64S
June 21, 2021	Metals [4], mercury, inorganic parameters [5], radium 226 and 228, field parameters [3]	G02S, G50S, G51S, G54L, and G60L
July 12 - 13, 2021	Metals [4], mercury, inorganic parameters [5], radium 226 and 228, field parameters [3]	G02S, G50S, G51S, G54L, and G60L
July 27 - 28, 2021	Metals [4], mercury, inorganic parameters [5], radium 226 and 228, field parameters [3]	G02S, G50S, G51S, G54L, and G60L

[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] Field parameters include pH, dissolved oxygen, temperature, oxidation/reduction potential, specific conductance, and turbidity.
[4] Metals include antimony, arsenic, barium, beryllium, boron, cadmium, calcium, chromium, cobalt, lead, lithium, molybdenum, selenium, and thallium.
[5] 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 Pond.

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 Pond, 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

Illinois Environmental Protection Agency (IEPA), 2021. *In the Matter of: Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Title 35 Illinois Administration Code 845, Addendum*. April 15, 2021.

Ramboll Americas Engineering Solutions, Inc. (Ramboll), 2021a. *Groundwater Monitoring Plan. Duck Creek Power Plant, Gypsum Management Facility Pond, Canton, Illinois*. Illinois Power Resources Generating, LLC. October 25, 2021.

Ramboll Americas Engineering Solutions, Inc. (Ramboll), 2021b. *Hydrogeologic Site Characterization Report. Duck Creek Power Plant, Gypsum Management Facility Pond, Canton, Illinois*. Illinois Power Resources Generating, LLC. October 25, 2021.

Ramboll Americas Engineering Solutions, Inc. (Ramboll), 2021c. *History of Potential Exceedances. Duck Creek Power Plant, Gypsum Management Facility Pond, Canton, Illinois*. Illinois Power Resources Generating, LLC. October 25, 2021.

FIGURES

BACKGROUND WELL
COMPLIANCE WELL
SOURCE SAMPLE LOCATION
PART 845 REGULATED UNIT (SUBJECT UNIT)
SITE FEATURE
PROPERTY BOUNDARY

0 150 300
Feet

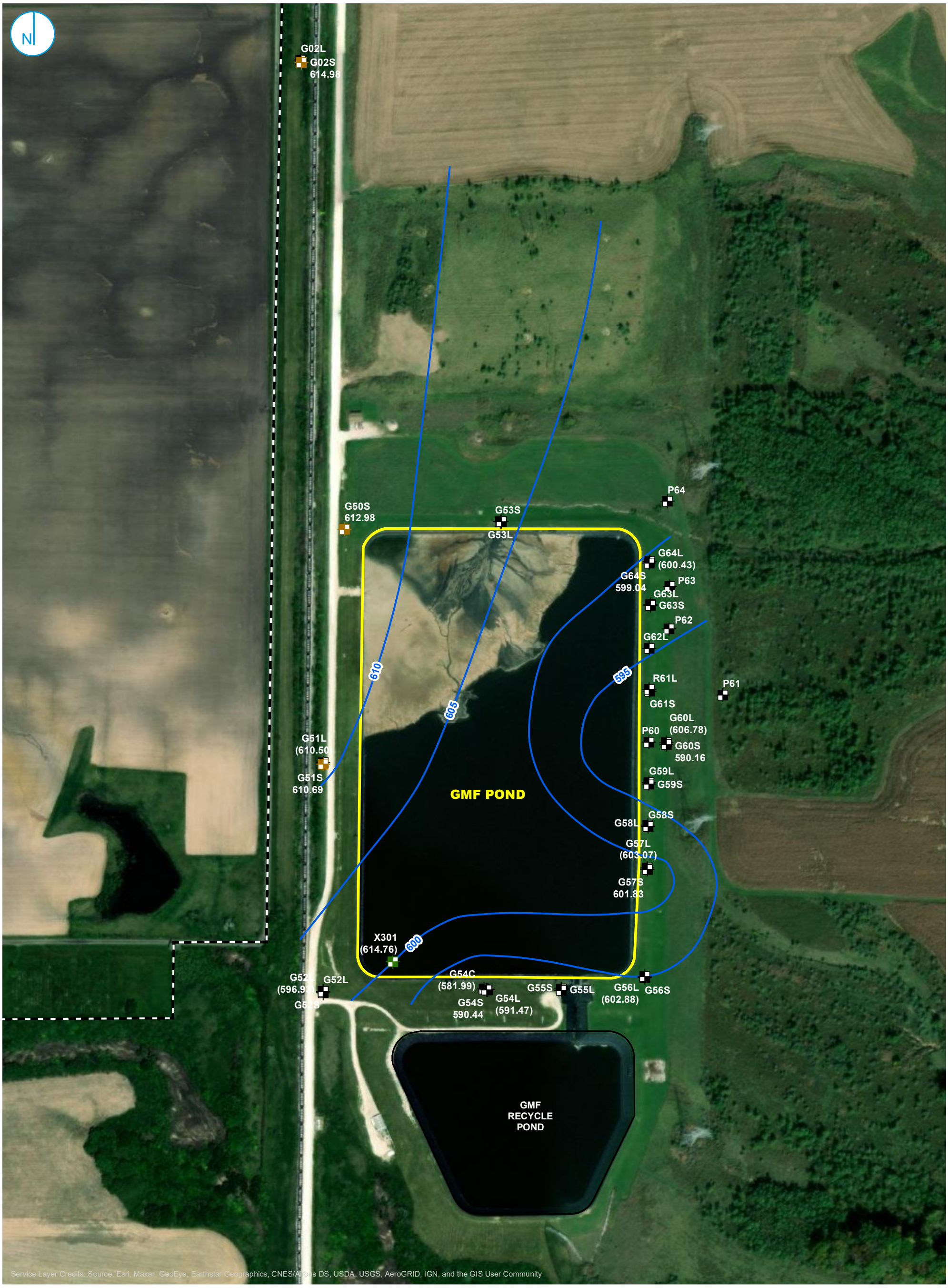
PROPOSED PART 845 GROUNDWATER MONITORING WELL NETWORK

FIGURE 1

2021 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
GMF POND
DUCK CREEK POWER PLANT
CANTON, ILLINOIS

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL



BACKGROUND WELL
MONITORING WELL
SOURCE SAMPLE LOCATION
GROUNDWATER ELEVATION CONTOUR (5-FT CONTOUR INTERVAL, NAVD88)
PART 845 REGULATED UNIT (SUBJECT UNIT)
SITE FEATURE
PROPERTY BOUNDARY

0 150 300
Feet

POTENTIOMETRIC SURFACE MAP
APRIL 14, 2021

2021 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
GMF POND

DUCK CREEK POWER PLANT
CANTON, ILLINOIS

FIGURE 2

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL

BACKGROUND WELL
MONITORING WELL
SOURCE SAMPLE LOCATION
GROUNDWATER ELEVATION CONTOUR (5-FT CONTOUR INTERVAL, NAVD88)
PART 845 REGULATED UNIT (SUBJECT UNIT)
SITE FEATURE
PROPERTY BOUNDARY

0 150 300 Feet

POTENTIOMETRIC SURFACE MAP
MAY 10, 2021

FIGURE 3

2021 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
GMF POND
DUCK CREEK POWER PLANT
CANTON, 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
DUCK CREEK POWER PLANT
GMF POND
CANTON, ILLINOIS

Parameter	Background Concentration	845 Limit	Groundwater Protection Standard	Unit
Antimony, total	0.003	0.006	0.006	mg/L
Arsenic, total	0.0092	0.010	0.010	mg/L
Barium, total	0.28	2.0	2.0	mg/L
Beryllium, total	0.001	0.004	0.004	mg/L
Boron, total	0.21	2	2	mg/L
Cadmium, total	0.001	0.005	0.005	mg/L
Chloride, total	17	200	200	mg/L
Chromium, total	0.0059	0.1	0.1	mg/L
Cobalt, total	0.002	0.006	0.006	mg/L
Fluoride, total	0.498	4.0	4.0	mg/L
Lead, total	0.015	0.0075	0.015	mg/L
Lithium, total	0.02	0.04	0.04	mg/L
Mercury, total	0.00098	0.002	0.002	mg/L
Molybdenum, total	0.0023	0.1	0.1	mg/L
pH (field)	7.4 / 6.6	9.0 / 6.5	9.0 / 6.5	SU
Radium 226 and 228 combined	2	5	5	pCi/L
Selenium, total	0.0012	0.05	0.05	mg/L
Sulfate, total	55	400	400	mg/L
Thallium, total	0.001	0.002	0.002	mg/L
Total Dissolved Solids	483	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

generated 10/07/2021, 6:48:34 AM CDT

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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 Duck Creek Power Plant GMF Pond, Illinois Environmental Protection Agency (IEPA) ID No. W0578010001-04.

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 G02S, G50S, and G51S.

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
DUCK CREEK POWER PLANT
GMF POND
CANTON, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G51L	PMP	845	pH (field)	SU	02/19/2021 - 02/19/2021	Most recent sample	6.8	6.5/9.0	6.6/7.4	6.5/9	Standard/Standard
G52L	PMP	845	pH (field)	SU	02/19/2021 - 02/19/2021	Most recent sample	6.4	6.5/9.0	6.6/7.4	6.5/9	Standard/Standard
G53L	PMP	845	pH (field)	SU	02/22/2021 - 02/22/2021	Most recent sample	6.8	6.5/9.0	6.6/7.4	6.5/9	Standard/Standard
G53S	UA	845	pH (field)	SU	02/22/2021 - 02/22/2021	Most recent sample	6.8	6.5/9.0	6.6/7.4	6.5/9	Standard/Standard
G54C	BR	845	Antimony, total	mg/L	04/14/2021 - 06/01/2021	All ND - Last	0.003	0.006	0.003	0.006	Standard
G54C	BR	845	Arsenic, total	mg/L	04/14/2021 - 06/01/2021	CI around mean	0.000774	0.010	0.0092	0.01	Standard
G54C	BR	845	Barium, total	mg/L	04/14/2021 - 06/01/2021	CI around mean	0.31	2.0	0.28	2	Standard
G54C	BR	845	Beryllium, total	mg/L	04/14/2021 - 06/01/2021	All ND - Last	0.001	0.004	0.001	0.004	Standard
G54C	BR	845	Boron, total	mg/L	04/14/2021 - 06/01/2021	CI around mean	-0.0552	2.0	0.21	2	Standard
G54C	BR	845	Cadmium,total	mg/L	04/14/2021 - 06/01/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
G54C	BR	845	Chloride, total	mg/L	04/14/2021 - 06/01/2021	CI around mean	1.4	200	17	200	Standard
G54C	BR	845	Chromium, total	mg/L	04/14/2021 - 06/01/2021	CI around median	0	0.10	0.0059	0.1	Standard
G54C	BR	845	Cobalt, total	mg/L	04/14/2021 - 06/01/2021	CI around median	0	0.006	0.002	0.006	Standard
G54C	BR	845	Fluoride, total	mg/L	04/14/2021 - 06/01/2021	CI around mean	0.34	4.0	0.50	4	Standard
G54C	BR	845	Lead, total	mg/L	04/14/2021 - 06/01/2021	Future median	0.001	0.015	0.015	0.0075	Background
G54C	BR	845	Lithium, total	mg/L	04/14/2021 - 06/01/2021	All ND - Last	0.020	0.040	0.020	0.04	Standard
G54C	BR	845	Mercury, total	mg/L	04/14/2021 - 06/01/2021	All ND - Last	0.0002	0.002	0.00098	0.002	Standard
G54C	BR	845	Molybdenum, total	mg/L	04/14/2021 - 06/01/2021	CI around mean	0.024	0.10	0.0023	0.1	Standard
G54C	BR	845	pH (field)	SU	04/14/2021 - 06/01/2021	CI around mean	7.1	6.5/9.0	6.6/7.4	6.5/9	Standard/Standard
G54C	BR	845	Radium-226 + Radium 228, tot	pCi/L	04/14/2021 - 06/14/2021	CI around mean	-2.06	5.0	2.0	5	Standard
G54C	BR	845	Selenium, total	mg/L	04/14/2021 - 06/01/2021	CI around median	0	0.050	0.0012	0.05	Standard
G54C	BR	845	Sulfate, total	mg/L	04/14/2021 - 06/01/2021	CI around mean	39	400	55	400	Standard
G54C	BR	845	Thallium, total	mg/L	04/14/2021 - 06/01/2021	All ND - Last	0.001	0.002	0.001	0.002	Standard
G54C	BR	845	Total Dissolved Solids	mg/L	04/14/2021 - 06/01/2021	CI around mean	616	1200	483	1200	Standard

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
DUCK CREEK POWER PLANT
GMF POND
CANTON, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G54L	PMP	845	Antimony, total	mg/L	04/14/2021 - 07/27/2021	All ND - Last	0.003	0.006	0.003	0.006	Standard
G54L	PMP	845	Arsenic, total	mg/L	04/14/2021 - 07/27/2021	CI around mean	0.00259	0.010	0.0092	0.01	Standard
G54L	PMP	845	Barium, total	mg/L	04/14/2021 - 07/27/2021	CI around mean	0.14	2.0	0.28	2	Standard
G54L	PMP	845	Beryllium, total	mg/L	04/14/2021 - 07/27/2021	All ND - Last	0.001	0.004	0.001	0.004	Standard
G54L	PMP	845	Boron, total	mg/L	04/14/2021 - 07/27/2021	CI around mean	0.020	2.0	0.21	2	Standard
G54L	PMP	845	Cadmium,total	mg/L	04/14/2021 - 07/27/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
G54L	PMP	845	Chloride, total	mg/L	04/14/2021 - 07/27/2021	CI around median	5.2	200	17	200	Standard
G54L	PMP	845	Chromium, total	mg/L	04/14/2021 - 07/27/2021	CI around median	0.004	0.10	0.0059	0.1	Standard
G54L	PMP	845	Cobalt, total	mg/L	04/14/2021 - 07/27/2021	CI around mean	0.00178	0.006	0.002	0.006	Standard
G54L	PMP	845	Fluoride, total	mg/L	04/14/2021 - 07/27/2021	CI around median	0.25	4.0	0.50	4	Standard
G54L	PMP	845	Lead, total	mg/L	04/14/2021 - 07/27/2021	All ND - Last	0.001	0.015	0.015	0.0075	Background
G54L	PMP	845	Lithium, total	mg/L	04/14/2021 - 07/27/2021	All ND - Last	0.020	0.040	0.020	0.04	Standard
G54L	PMP	845	Mercury, total	mg/L	04/14/2021 - 07/27/2021	CI around median	0.0002	0.002	0.00098	0.002	Standard
G54L	PMP	845	Molybdenum, total	mg/L	04/14/2021 - 07/27/2021	CI around mean	0.000575	0.10	0.0023	0.1	Standard
G54L	PMP	845	pH (field)	SU	02/22/2021 - 07/27/2021	CI around mean	6.5	6.5/9.0	6.6/7.4	6.5/9	Standard/Standard
G54L	PMP	845	Radium-226 + Radium 228, tot	pCi/L	04/14/2021 - 07/27/2021	CI around mean	0.25	5.0	2.0	5	Standard
G54L	PMP	845	Selenium, total	mg/L	04/14/2021 - 07/27/2021	All ND - Last	0.001	0.050	0.0012	0.05	Standard
G54L	PMP	845	Sulfate, total	mg/L	04/14/2021 - 07/27/2021	CI around mean	54	400	55	400	Standard
G54L	PMP	845	Thallium, total	mg/L	04/14/2021 - 07/27/2021	All ND - Last	0.001	0.002	0.001	0.002	Standard
G54L	PMP	845	Total Dissolved Solids	mg/L	04/14/2021 - 07/27/2021	CI around mean	631	1200	483	1200	Standard
G54S	UA	257	Antimony, total	mg/L	12/04/2015 - 06/28/2017	All ND - Last	0.003	0.006	0.003	0.006	Standard
G54S	UA	257	Arsenic, total	mg/L	01/30/2015 - 06/28/2017	CI around geomean	0.00107	0.010	0.00959	0.01	Standard
G54S	UA	257	Barium, total	mg/L	12/04/2015 - 06/28/2017	CI around mean	0.21	2.0	0.32	2	Standard
G54S	UA	257	Beryllium, total	mg/L	12/04/2015 - 06/28/2017	All ND - Last	0.001	0.004	0.0013	0.004	Standard

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
DUCK CREEK POWER PLANT
GMF POND
CANTON, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G54S	UA	257	Boron, total	mg/L	01/30/2015 - 02/22/2021	CI around mean	0.032	2.0	0.059	2	Standard
G54S	UA	257	Cadmium,total	mg/L	12/04/2015 - 06/28/2017	All ND - Last	0.001	0.005	0.001	0.005	Standard
G54S	UA	257	Chloride, total	mg/L	01/30/2015 - 02/22/2021	CI around median	2.2	200	22	200	Standard
G54S	UA	257	Chromium, total	mg/L	12/04/2015 - 06/28/2017	All ND - Last	0.004	0.10	0.0058	0.1	Standard
G54S	UA	257	Cobalt, total	mg/L	12/04/2015 - 06/28/2017	All ND - Last	0.002	0.006	0.002	0.006	Standard
G54S	UA	257	Fluoride, total	mg/L	12/04/2015 - 02/22/2021	CI around median	0.25	4.0	0.56	4	Standard
G54S	UA	257	Lead, total	mg/L	01/30/2015 - 06/28/2017	All ND - Last	0.001	0.0075	0.002	0.0075	Standard
G54S	UA	257	Lithium, total	mg/L	12/04/2015 - 06/28/2017	CI around median	0.010	0.040	0.010	0.04	Standard
G54S	UA	257	Mercury, total	mg/L	12/04/2015 - 06/28/2017	Future median	0.0002	0.0024	0.0024	0.002	Background
G54S	UA	257	Molybdenum, total	mg/L	12/04/2015 - 06/28/2017	CI around mean	0.00161	0.10	0.0042	0.1	Standard
G54S	UA	257	pH (field)	SU	01/30/2015 - 06/21/2021	CI around mean	6.9	6.5/9.0	6.5/7.5	6.5/9	Standard/Standard
G54S	UA	257	Radium-226 + Radium 228, tot	pCi/L	12/04/2015 - 06/28/2017	CI around mean	0.52	5.0	2.0	5	Standard
G54S	UA	257	Selenium, total	mg/L	12/04/2015 - 06/28/2017	All ND - Last	0.001	0.050	0.0014	0.05	Standard
G54S	UA	257	Sulfate, total	mg/L	01/30/2015 - 02/22/2021	CI around median	42	400	97	400	Standard
G54S	UA	257	Thallium, total	mg/L	12/04/2015 - 06/28/2017	All ND - Last	0.001	0.0028	0.0028	0.002	Background
G54S	UA	257	Total Dissolved Solids	mg/L	12/04/2015 - 06/21/2021	CI around mean	492	1200	499	1200	Standard
G55L	PMP	845	pH (field)	SU	02/22/2021 - 02/22/2021	Most recent sample	6.7	6.5/9.0	6.6/7.4	6.5/9	Standard/Standard
G55S	UA	845	pH (field)	SU	02/22/2021 - 02/22/2021	Most recent sample	6.8	6.5/9.0	6.6/7.4	6.5/9	Standard/Standard
G56L	PMP	845	pH (field)	SU	02/22/2021 - 02/22/2021	Most recent sample	6.6	6.5/9.0	6.6/7.4	6.5/9	Standard/Standard
G56S	UA	845	pH (field)	SU	02/22/2021 - 02/22/2021	Most recent sample	6.6	6.5/9.0	6.6/7.4	6.5/9	Standard/Standard
G57L	PMP	845	pH (field)	SU	02/22/2021 - 02/22/2021	Most recent sample	6.8	6.5/9.0	6.6/7.4	6.5/9	Standard/Standard
G57S	UA	257	Antimony, total	mg/L	12/04/2015 - 06/28/2017	CI around median	0.003	0.006	0.003	0.006	Standard
G57S	UA	257	Arsenic, total	mg/L	02/04/2015 - 06/28/2017	CI around median	0.001	0.010	0.00959	0.01	Standard
G57S	UA	257	Barium, total	mg/L	12/04/2015 - 06/28/2017	CI around median	0.13	2.0	0.32	2	Standard

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
DUCK CREEK POWER PLANT
GMF POND
CANTON, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G57S	UA	257	Beryllium, total	mg/L	12/04/2015 - 06/28/2017	CI around median	0.001	0.004	0.0013	0.004	Standard
G57S	UA	257	Boron, total	mg/L	02/04/2015 - 02/22/2021	CI around median	0.010	2.0	0.059	2	Standard
G57S	UA	257	Cadmium,total	mg/L	12/04/2015 - 06/28/2017	CI around median	0.001	0.005	0.001	0.005	Standard
G57S	UA	257	Chloride, total	mg/L	02/04/2015 - 02/22/2021	CI around median	18	200	22	200	Standard
G57S	UA	257	Chromium, total	mg/L	12/04/2015 - 06/28/2017	All ND - Last	0.004	0.10	0.0058	0.1	Standard
G57S	UA	257	Cobalt, total	mg/L	12/04/2015 - 06/28/2017	All ND - Last	0.002	0.006	0.002	0.006	Standard
G57S	UA	257	Fluoride, total	mg/L	12/04/2015 - 02/22/2021	CI around mean	0.26	4.0	0.56	4	Standard
G57S	UA	257	Lead, total	mg/L	02/04/2015 - 06/28/2017	CI around median	0.001	0.0075	0.002	0.0075	Standard
G57S	UA	257	Lithium, total	mg/L	12/04/2015 - 06/28/2017	All ND - Last	0.010	0.040	0.010	0.04	Standard
G57S	UA	257	Mercury, total	mg/L	12/04/2015 - 06/28/2017	All ND - Last	0.0002	0.0024	0.0024	0.002	Background
G57S	UA	257	Molybdenum, total	mg/L	12/04/2015 - 06/28/2017	CI around median	0.001	0.10	0.0042	0.1	Standard
G57S	UA	257	pH (field)	SU	02/04/2015 - 02/22/2021	CI around mean	7.0	6.5/9.0	6.5/7.5	6.5/9	Standard/Standard
G57S	UA	257	Radium-226 + Radium 228, tot	pCi/L	12/04/2015 - 06/28/2017	CI around mean	0.025	5.0	2.0	5	Standard
G57S	UA	257	Selenium, total	mg/L	12/04/2015 - 06/28/2017	All ND - Last	0.001	0.050	0.0014	0.05	Standard
G57S	UA	257	Sulfate, total	mg/L	02/04/2015 - 02/22/2021	CI around geomean	53	400	97	400	Standard
G57S	UA	257	Thallium, total	mg/L	12/04/2015 - 06/28/2017	Future median	0.001	0.0028	0.0028	0.002	Background
G57S	UA	257	Total Dissolved Solids	mg/L	12/04/2015 - 02/22/2021	CI around mean	492	1200	499	1200	Standard
G58L	PMP	845	pH (field)	SU	02/22/2021 - 02/22/2021	Most recent sample	6.8	6.5/9.0	6.6/7.4	6.5/9	Standard/Standard
G58S	UA	845	pH (field)	SU	02/22/2021 - 02/22/2021	Most recent sample	6.6	6.5/9.0	6.6/7.4	6.5/9	Standard/Standard
G59L	PMP	845	pH (field)	SU	02/22/2021 - 02/22/2021	Most recent sample	6.7	6.5/9.0	6.6/7.4	6.5/9	Standard/Standard
G59S	UA	845	pH (field)	SU	02/22/2021 - 02/22/2021	Most recent sample	6.8	6.5/9.0	6.6/7.4	6.5/9	Standard/Standard
G60L	PMP	845	Antimony, total	mg/L	04/14/2021 - 07/28/2021	All ND - Last	0.003	0.006	0.003	0.006	Standard
G60L	PMP	845	Arsenic, total	mg/L	04/14/2021 - 07/28/2021	All ND - Last	0.001	0.010	0.0092	0.01	Standard
G60L	PMP	845	Barium, total	mg/L	04/14/2021 - 07/28/2021	CI around mean	0.014	2.0	0.28	2	Standard

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
DUCK CREEK POWER PLANT
GMF POND
CANTON, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G60L	PMP	845	Beryllium, total	mg/L	04/14/2021 - 07/28/2021	All ND - Last	0.001	0.004	0.001	0.004	Standard
G60L	PMP	845	Boron, total	mg/L	04/14/2021 - 07/28/2021	CI around geomean	0.021	2.0	0.21	2	Standard
G60L	PMP	845	Cadmium,total	mg/L	04/14/2021 - 07/28/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
G60L	PMP	845	Chloride, total	mg/L	04/14/2021 - 07/28/2021	CI around mean	16	200	17	200	Standard
G60L	PMP	845	Chromium, total	mg/L	04/14/2021 - 07/28/2021	All ND - Last	0.004	0.10	0.0059	0.1	Standard
G60L	PMP	845	Cobalt, total	mg/L	04/14/2021 - 07/28/2021	CI around mean	0.00164	0.006	0.002	0.006	Standard
G60L	PMP	845	Fluoride, total	mg/L	04/14/2021 - 07/28/2021	All ND - Last	0.25	4.0	0.50	4	Standard
G60L	PMP	845	Lead, total	mg/L	04/14/2021 - 07/28/2021	All ND - Last	0.001	0.015	0.015	0.0075	Background
G60L	PMP	845	Lithium, total	mg/L	04/14/2021 - 07/28/2021	All ND - Last	0.020	0.040	0.020	0.04	Standard
G60L	PMP	845	Mercury, total	mg/L	04/14/2021 - 07/28/2021	All ND - Last	0.0002	0.002	0.00098	0.002	Standard
G60L	PMP	845	Molybdenum, total	mg/L	04/14/2021 - 07/28/2021	All ND - Last	0.001	0.10	0.0023	0.1	Standard
G60L	PMP	845	pH (field)	SU	02/23/2021 - 07/28/2021	CI around mean	6.1	6.5/9.0	6.6/7.4	6.5/9	Standard/Standard
G60L	PMP	845	Radium-226 + Radium 228, tot	pCi/L	04/14/2021 - 07/28/2021	CI around mean	-0.0854	5.0	2.0	5	Standard
G60L	PMP	845	Selenium, total	mg/L	04/14/2021 - 07/28/2021	All ND - Last	0.001	0.050	0.0012	0.05	Standard
G60L	PMP	845	Sulfate, total	mg/L	04/14/2021 - 07/28/2021	CI around median	125	400	55	400	Standard
G60L	PMP	845	Thallium, total	mg/L	04/14/2021 - 07/28/2021	All ND - Last	0.001	0.002	0.001	0.002	Standard
G60L	PMP	845	Total Dissolved Solids	mg/L	04/14/2021 - 07/28/2021	CI around mean	538	1200	483	1200	Standard
G60S	UA	257	Antimony, total	mg/L	12/04/2015 - 06/29/2017	All ND - Last	0.003	0.006	0.003	0.006	Standard
G60S	UA	257	Arsenic, total	mg/L	02/04/2015 - 06/29/2017	CI around geomean	0.00136	0.010	0.00959	0.01	Standard
G60S	UA	257	Barium, total	mg/L	12/04/2015 - 06/29/2017	CI around mean	0.12	2.0	0.32	2	Standard
G60S	UA	257	Beryllium, total	mg/L	12/04/2015 - 06/29/2017	All ND - Last	0.001	0.004	0.0013	0.004	Standard
G60S	UA	257	Boron, total	mg/L	02/04/2015 - 02/23/2021	CI around mean	0.016	2.0	0.059	2	Standard
G60S	UA	257	Cadmium,total	mg/L	12/04/2015 - 06/29/2017	All ND - Last	0.001	0.005	0.001	0.005	Standard
G60S	UA	257	Chloride, total	mg/L	02/04/2015 - 02/23/2021	CI around geomean	8.9	200	22	200	Standard

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
DUCK CREEK POWER PLANT
GMF POND
CANTON, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G60S	UA	257	Chromium, total	mg/L	12/04/2015 - 06/29/2017	CI around median	0.004	0.10	0.0058	0.1	Standard
G60S	UA	257	Cobalt, total	mg/L	12/04/2015 - 06/29/2017	CI around median	0.002	0.006	0.002	0.006	Standard
G60S	UA	257	Fluoride, total	mg/L	12/04/2015 - 02/23/2021	CI around mean	0.27	4.0	0.56	4	Standard
G60S	UA	257	Lead, total	mg/L	02/04/2015 - 06/29/2017	CB around linear reg	-0.0104	0.0075	0.002	0.0075	Standard
G60S	UA	257	Lithium, total	mg/L	12/04/2015 - 06/29/2017	CI around median	0.010	0.040	0.010	0.04	Standard
G60S	UA	257	Mercury, total	mg/L	12/04/2015 - 06/29/2017	All ND - Last	0.0002	0.0024	0.0024	0.002	Background
G60S	UA	257	Molybdenum, total	mg/L	12/04/2015 - 06/29/2017	CI around median	0.001	0.10	0.0042	0.1	Standard
G60S	UA	257	pH (field)	SU	02/04/2015 - 02/23/2021	CI around mean	6.7	6.5/9.0	6.5/7.5	6.5/9	Standard/Standard
G60S	UA	257	Radium-226 + Radium 228, tot	pCi/L	12/04/2015 - 06/29/2017	CI around mean	0.66	5.0	2.0	5	Standard
G60S	UA	257	Selenium, total	mg/L	12/04/2015 - 06/29/2017	CI around median	0.001	0.050	0.0014	0.05	Standard
G60S	UA	257	Sulfate, total	mg/L	02/04/2015 - 02/23/2021	CB around linear reg	94	400	97	400	Standard
G60S	UA	257	Thallium, total	mg/L	12/04/2015 - 06/29/2017	All ND - Last	0.001	0.0028	0.0028	0.002	Background
G60S	UA	257	Total Dissolved Solids	mg/L	12/04/2015 - 02/23/2021	CI around mean	534	1200	499	1200	Standard
G61S	UA	845	pH (field)	SU	02/23/2021 - 02/23/2021	Most recent sample	6.5	6.5/9.0	6.6/7.4	6.5/9	Standard/Standard
G62L	PMP	845	pH (field)	SU	02/24/2021 - 02/24/2021	Most recent sample	6.7	6.5/9.0	6.6/7.4	6.5/9	Standard/Standard
G63L	PMP	845	pH (field)	SU	02/24/2021 - 02/24/2021	Most recent sample	6.7	6.5/9.0	6.6/7.4	6.5/9	Standard/Standard
G63S	UA	845	pH (field)	SU	02/24/2021 - 02/24/2021	Most recent sample	7.0	6.5/9.0	6.6/7.4	6.5/9	Standard/Standard
G64L	PMP	845	pH (field)	SU	02/25/2021 - 02/25/2021	Most recent sample	7.0	6.5/9.0	6.6/7.4	6.5/9	Standard/Standard
G64S	UA	257	Antimony, total	mg/L	12/04/2015 - 06/29/2017	CI around median	0.003	0.006	0.003	0.006	Standard
G64S	UA	257	Arsenic, total	mg/L	02/04/2015 - 06/29/2017	CI around geomean	0.00251	0.010	0.00959	0.01	Standard
G64S	UA	257	Barium, total	mg/L	12/04/2015 - 06/29/2017	CI around mean	0.17	2.0	0.32	2	Standard
G64S	UA	257	Beryllium, total	mg/L	12/04/2015 - 06/29/2017	All ND - Last	0.001	0.004	0.0013	0.004	Standard
G64S	UA	257	Boron, total	mg/L	02/04/2015 - 02/24/2021	CI around mean	0.017	2.0	0.059	2	Standard
G64S	UA	257	Cadmium,total	mg/L	12/04/2015 - 06/29/2017	All ND - Last	0.001	0.005	0.001	0.005	Standard

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
DUCK CREEK POWER PLANT
GMF POND
CANTON, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G64S	UA	257	Chloride, total	mg/L	02/04/2015 - 02/24/2021	CB around linear reg	3.1	200	22	200	Standard
G64S	UA	257	Chromium, total	mg/L	12/04/2015 - 06/29/2017	CI around median	0.004	0.10	0.0058	0.1	Standard
G64S	UA	257	Cobalt, total	mg/L	12/04/2015 - 06/29/2017	All ND - Last	0.002	0.006	0.002	0.006	Standard
G64S	UA	257	Fluoride, total	mg/L	12/04/2015 - 02/24/2021	CI around median	0.30	4.0	0.56	4	Standard
G64S	UA	257	Lead, total	mg/L	02/04/2015 - 06/29/2017	CI around mean	0.00131	0.0075	0.002	0.0075	Standard
G64S	UA	257	Lithium, total	mg/L	12/04/2015 - 06/29/2017	All ND - Last	0.010	0.040	0.010	0.04	Standard
G64S	UA	257	Mercury, total	mg/L	12/04/2015 - 06/29/2017	All ND - Last	0.0002	0.0024	0.0024	0.002	Background
G64S	UA	257	Molybdenum, total	mg/L	12/04/2015 - 06/29/2017	CI around mean	0.00152	0.10	0.0042	0.1	Standard
G64S	UA	257	pH (field)	SU	02/04/2015 - 06/21/2021	CI around mean	6.9	6.5/9.0	6.5/7.5	6.5/9	Standard/Standard
G64S	UA	257	Radium-226 + Radium 228, tot	pCi/L	12/04/2015 - 06/29/2017	CI around mean	0.63	5.0	2.0	5	Standard
G64S	UA	257	Selenium, total	mg/L	12/04/2015 - 06/29/2017	CI around median	0.001	0.050	0.0014	0.05	Standard
G64S	UA	257	Sulfate, total	mg/L	02/04/2015 - 02/24/2021	CI around median	25	400	97	400	Standard
G64S	UA	257	Thallium, total	mg/L	12/04/2015 - 06/29/2017	All ND - Last	0.001	0.0028	0.0028	0.002	Background
G64S	UA	257	Total Dissolved Solids	mg/L	12/04/2015 - 06/21/2021	CI around mean	416	1200	499	1200	Standard
P60	PMP	845	Arsenic, total	mg/L	03/24/2021 - 03/24/2021	Most recent sample	0.020	0.010	0.0092	0.01	Standard
P60	PMP	845	Boron, total	mg/L	03/24/2021 - 03/24/2021	Most recent sample	0.056	2.0	0.21	2	Standard
P60	PMP	845	Cadmium,total	mg/L	03/24/2021 - 03/24/2021	Most recent sample	0.001	0.005	0.001	0.005	Standard
P60	PMP	845	Chloride, total	mg/L	03/24/2021 - 03/24/2021	Most recent sample	32	200	17	200	Standard
P60	PMP	845	Lead, total	mg/L	03/24/2021 - 03/24/2021	Most recent sample	0.036	0.015	0.015	0.0075	Background
P60	PMP	845	pH (field)	SU	02/24/2021 - 03/24/2021	Most recent sample	6.6	6.5/9.0	6.6/7.4	6.5/9	Standard/Standard
P60	PMP	845	Sulfate, total	mg/L	03/24/2021 - 03/24/2021	Most recent sample	53	400	55	400	Standard
R61L	PMP	845	pH (field)	SU	02/23/2021 - 02/23/2021	Most recent sample	6.6	6.5/9.0	6.6/7.4	6.5/9	Standard/Standard

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
DUCK CREEK POWER PLANT
GMF POND
CANTON, ILLINOIS

Notes:
Potential exceedance of GWPS
HSU = hydrostratigraphic unit:
  BR = Bedrock
  PMP = Potential Migration Pathway
  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
Sample Count = number of samples from Sampled Date Range used to calculate the Statistical Result
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
  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
DUCK CREEK POWER PLANT
GMF POND
CANTON, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G52L	PMP	845	pH (field)	SU	02/19/2021 - 02/19/2021	Most recent sample	6.4	6.5/9.0	6.6/7.4	6.5/9	Standard/Standard
G60L	PMP	845	pH (field)	SU	02/23/2021 - 07/28/2021	CI around mean	6.1	6.5/9.0	6.6/7.4	6.5/9	Standard/Standard
P60	PMP	845	Arsenic, total	mg/L	03/24/2021 - 03/24/2021	Most recent sample	0.020	0.010	0.0092	0.01	Standard
P60	PMP	845	Lead, total	mg/L	03/24/2021 - 03/24/2021	Most recent sample	0.036	0.015	0.015	0.0075	Background

Notes:
HSU = hydrostratigraphic unit:
PMP = Potential Migration Pathway
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
Sample Count = number of samples from Sampled Date Range used to calculate the Statistical Result
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)