Electric Energy, Inc
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: Joppa East Ash Pond (IEPA ID: W127010004-02) Annual Consolidated Report

Dear Mr. LeCrone:

In accordance with 35 IAC § 845.550, Electric Energy, Inc (EEI) is submitting the annual consolidated report for the Joppa East Ash Pond (IEPA ID: W12701000004-02), as enclosed.

Sincerely,

Phil Morris
Senior Environmental Director

Enclosures

Annual Consolidated Report
Electric Energy, Inc
Joppa Power Plant
East Ash Pond; IEPA **ID: W127010004-02**

In accordance with 35 IAC § 845.550, Electric Energy, Inc (EEI) 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

Joppa Power Plant

Prepared for:

Electric Energy, Inc.

Joppa Power Plant
2100 Portland Road
Joppa, IL 62953

November 2021

Joppa Power Plant
ANNUAL CCR FUGITIVE DUST CONTROL REPORT

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

Signed by: _____ Plant Manager

Name Title

This Annual CCR Fugitive Dust Control Report has been prepared for the Joppa Power Plant in accordance with 40 CFR 257.80(c) and 35 IAC 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 Joppa 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 will be conditioned before loading into vehicles for transport to the landfill.
	Wet management of CCR 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 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 fly ash to be emplaced in the landfill will be conditioned before loading into trucks for transport to the landfill.

CCR Activity	Actions Taken to Control CCR Fugitive Dust
Handling of CCR at the facility	CCR fly ash to be placed in the surface impoundments is conditioned before loading into trucks for transport to the surface impoundments.
	Load CCR dry fly ash to transport trucks from the CCR fly ash silos using a telescoping chute.
	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 to be emplaced in the landfill will be conditioned before loaded into vehicles for transport to the landfill.
	CCR fly ash to be placed in the surface impoundments is conditioned before loading into trucks for transport to the surface impoundments
	Cover or enclose trucks used to transport CCR onsite, as necessary.
	Limit the speed of vehicles to no more than 15 mph on facility roads.
	Sweep or rinse off the outside of the trucks transporting CCR, as necessary.
	Cover or enclose trucks used to transport CCR offsite.
	Water CCR haul roads, as necessary.
	Remove CCR deposited on facility road surfaces during transport as necessary.

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

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

Section 2 Record of Citizen Complaints

No citizen complaints were received regarding CCR fugitive dust at Joppa 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	Electric Energy, Inc. Massac County, Illinois 62017 10/29/2021
Operator Name / Address	Luminant Generation Company LLC 6555 Sierra Drive, Irving, TX 75039
CCR unit	East Ash Pond

INSPECTION REPORT 35 IAC § 845.540 Date of Inspection 10/29/2021	
(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 I 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	See the attached.
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 6400 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 4015 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 10/29/2021	
(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: Electric Energy, Inc.
CCR Unit: East Ash Pond

35 IAC § 845.540 (b)(2)(B)		
Instrument ID #	Type	Maximum recorded reading since previous annual inspection (ft)
JOP-P004	Piezometer	349.1'
JOP-P005	Piezometer	356.3'
JOP-P007	Piezometer	326.3'
JOP-P008	Piezometer	352.8'
JOP-P009	Piezometer	359.9'
JOP-P011	Piezometer	334.0'
JOP-P012	Piezometer	347.3'
JOP-P014	Piezometer	329.4'
JOP-P015	Piezometer	abandoned
JOP-P016	Piezometer	651.0'
JOP-P020	Piezometer	353.6'
JOP-P023	Piezometer	364.3'

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		374			28	
CCR	375		385	66		76

Geosyntec consultants

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Chesterfield, MO 63005
PH 636-812-0800
www.geosyntec.com

October 11, 2021

Electric Energy, Inc.
2100 Portland Road
Joppa, Illinois 62953

Subject: USEPA CCR Rule and IEPA Part 845 Rule Applicability Cross-Reference
2021 USEPA CCR Rule Periodic Certification Report
East Ash Pond, Joppa Power Plant, Joppa, Illinois

At the request of Electric Energy Incorporated (EEI), 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[1]), (e) and §257.82 EAST ASH POND Joppa Power Plant Joppa, Illinois

Submitted to

Electric Energy, Inc.

2100 Portland Road
Joppa, Illinois 62953

Submitted by

Geosyntec consultants

engineers | scientists | innovators

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

October 11, 2021

[1] Except for §257.73(d)(1)(vi).

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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 East Ash Pond (EAP)[2] at the Joppa Power Plant (JPP), also referred to as Joppa Power Station, 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 Electric Energy, Incorporated (EEI) CCR Website ([2], [3], [4], [5], [6]) be updated on a five-year basis.

The initial certification reports developed in 2016 were independently reviewed by Geosyntec ([2], [3], [4], [5], [6], [7], [8]). Additionally, field observations, interviews with plant staff, and evaluations were performed to compare conditions in 2021 at the EAP relative to the 2016 initial certifications. These tasks determined that updates are not required for the Initial Hazard Potential Classification. However, due to changes at the site and technical review comments, updates were required and were performed for the:

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

Geosyntec's evaluations of the initial certification reports and updated analyses identified that the EAP meets all requirements for hazard potential classification, history of construction reporting, structural stability, safety factor assessment, and hydrologic and hydraulic control, with the exception of the structural integrity of hydraulic structures (§257.73(d)(1)(vi)), which was certified by others. **Table 1** provides a summary of the initial 2016 certifications and the 2021 periodic certifications.

[2] The EAP is also referred to as ID Number W1270100004-02, East Ash Pond 2 by the Illinois Environmental Protection Agency (IEPA); CCR unit ID 401 by EEI; and IL50714 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 EAP.

Table 1 – Periodic Certification Summary

Section	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	The East Ash Pond was determined to have a High hazard potential classification [2].	Yes	Updates were not determined to be necessary. Geosyntec recommends retaining the High 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 EAP [3].	Yes	A letter listing updates to the History of Construction report is provided in **Attachment C**.
Structural Stability Assessment						
5	§257.73(d)(1)(i)	Stable foundations and abutments	Yes	Foundations 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 was found to be sufficient after performing updated slope stability analyses.
	§257.73(d)(1)(iv)	Presence and condition of slope vegetation	Yes	Vegetation was present on exterior slopes and 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 probable maximum flood (PMF) [8].	Yes	Spillways were found to be adequately designed and constructed and are expected to adequately manager flow during the PMF, after performing updated hydrologic and hydraulic analyses.
	§257.73(d)(1)(vi)	Structural integrity of hydraulic structures	No	Requirement could not be certified in 2016 due to inability to complete a CCTV inspection of the 26-inch diameter south outlet pipe due to water-filled pipe portions. AECOM recommended inspecting this pipe as soon as feasible to address the issue [8].	Periodic certification of §257.73(d)(1)(vi) was performed independently Luminant in 2020 [9].	
	§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].	Yes	No changes were identified that may affect this requirement.
Safety Factor Assessment						
6	§257.73(e)(1)(i)	Maximum storage pool safety factor must be at least 1.50	Yes	Safety factors were calculated to be 1.59 and higher [8].	Yes	Safety factors from updated slope stability analyses were calculated to be 1.53 and higher.
	§257.73(e)(1)(ii)	Maximum surcharge pool safety factor must be at least 1.40	Yes	Safety factors were calculated to be 1.57 and higher [8].	Yes	No changes were identified that may affect this requirement.
	§257.73(e)(1)(iii)	Seismic safety factor must be at least 1.00	Yes	Safety factors were calculated to be 1.01 and higher [8].	Yes	Safety factors from updated slope stability analyses were calculated to be 1.00 and higher.
	§257.73(e)(1)(iv)	For dike construction of soils that have susceptible to liquefaction, safety factor must be at least 1.20	Not Applicable	Dike soils were not susceptible to liquefaction. This requirement was not applicable [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 PMP, 24-hour, Inflow Design Flood [8].	Yes	The flood control system was found to adequately manage inflow and peak discharge during the PMP, 24-hour, Inflow Design Flood, after performing updated hydrologic and hydraulic analyses.
	§257.82(b)	Discharge from CCR Unit	Yes	Discharge from the CCR Unit is routed through a NPDES-permitted outfall during both normal and PMP, 24-hour Inflow Design Flood conditions [8].	Yes	Discharge from the CCR Unit is routed through a NPDES-permitted outfall during both normal and PMP, 24-hour Inflow Design Flood conditions, after performing updated hydrologic and hydraulic analyses.

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 Electric Energy Incorporated (EEI) to document the periodic certification of the East Ash Pond (EAP) at the Joppa Power Plant, also known as the Joppa Power Station, (JOP), located at 2100 Portland Road in Joppa, Illinois, 62953. The location of JPP is provided in **Figure 1**, and a site plan showing the location of the EAP is provided in **Figure 2**.

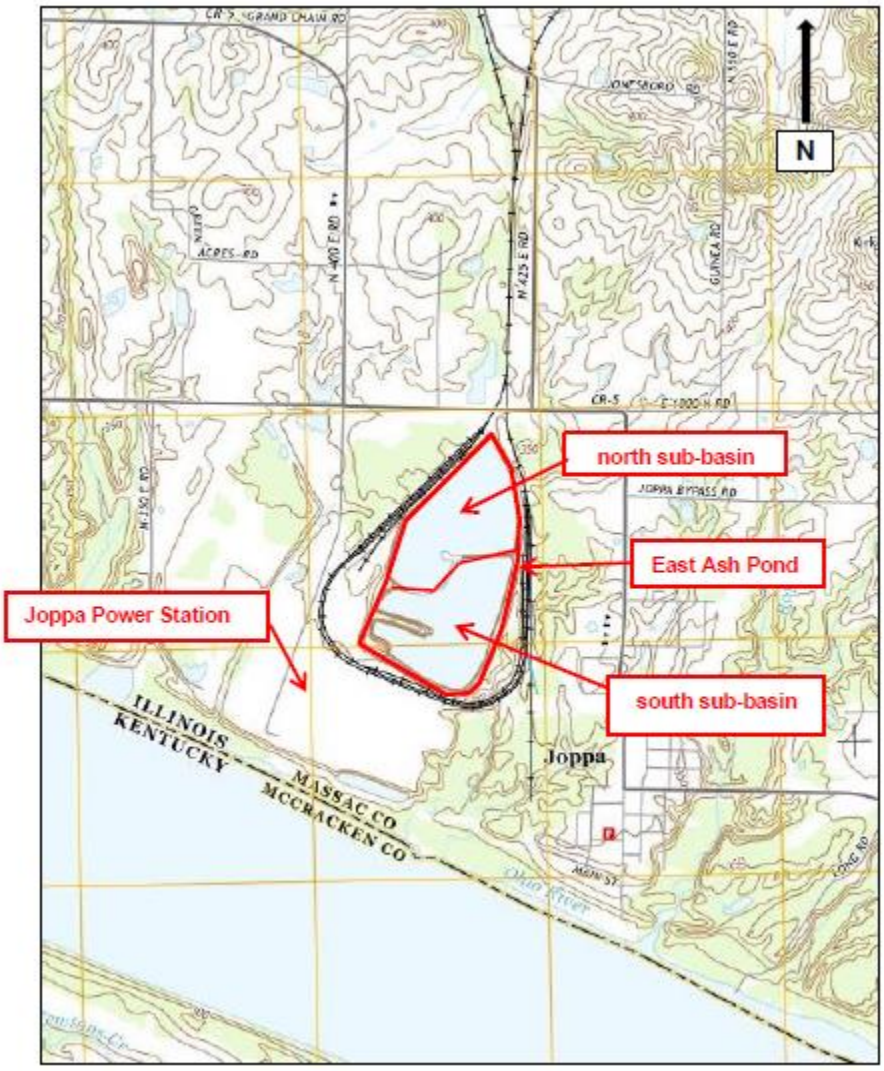


Figure 1 – Joppa Power Plant Location Map (from AECOM, 2016)

Figure 2 – Joppa Power Plant Site Plan (from AECOM, 2016)

1.1 EAP Description

The East Ash Pond serves as the sole wet ash impoundment basin for the Joppa Power Plant and contains materials such as bottom ash, fly ash and other non-CCR waste streams from the Joppa Power Plant. The East Ash Pond receives sluiced CCRs from the power plant which discharges into the southwest corner of the south sub-basin. A third-party recycling company recovers acceptable fly ash and bottom ash for beneficial reuse, and unacceptable materials are left in the East Ash Pond [8].

Only the south sub-basin includes a free-water pool under normal operating conditions. The north sub-basin is mostly filled with CCR materials and free water is limited to the interior drainage channel that occasionally flows from the south sub-basin through an overflow pipe. Outflow from

the north sub-basin of the East Ash Pond is discharged to the effluent control tank, which is a concrete basin used for water quality mixing purposes located at the northern toe of the East Ash Pond dike. Water discharged from the effluent control tank is via a concrete weir is conveyed approximately 650 feet southward to the Ohio River at the site's NPDES-permitted outfall [8].

Outflow from the south sub-basin of the East Ash Pond is discharged directly to the mixing tank through a 24-inch vertical ductile iron tee (invert elevation 372.7 feet[3]) located on the east side of the impoundment. Flow enters the tee from the bottom of the structure, although the tee is also open on the top and includes a corrugated metal skimmer that allows for additional flow to enter the tee during high water conditions. The 24-inch diameter tee is connected to the end of a horizontal 26-inch high-density polyethylene (HDPE) pipe that penetrates the East Ash Pond embankment before dropping in elevation and transporting discharge water approximately 900 feet northward into the 48-inch RCP spillway pipe for the north sub-basin. The south and north sub-basins are connected with a 36-inch corrugated HDPE pipe (invert elevation 373.2 feet) that allows for flow between the two basins during stormwater conditions when the pool level in the south sub-basin exceeds the El. 373.2 ft normal level [8].

In 2016, an approximately 800-foot-long zone of foundation of the East Ash Pond was improved using deep-mixing method (DMM) ground improvement technology and buttressing. This zone, located at the southeast corner of the East Ash Pond dike, was installed to improve the seismic factor of safety within a zone of liquefaction-susceptible sluiced fly ash over which the East Ash Pond dike was originally constructed. The zone was installed at and partially underneath the downstream toe of the East Ash Pond embankment, and consisted of the placement of columns, arranged into transverse shear walls, consisting of native embankment and foundation soil and CCRs mechanically mixed with Portland cement to improve the shear strength within the foundation soils at the East Ash Pond. The zone was designed and constructed to improve seismic and post-earthquake (i.e., "liquefaction" or "post-liquefaction") slope stability to meet the criteria listed in §257.73(e) of the CCR Rule [1]. Sluiced fly ash was not identified within the foundation of the East Ash Pond in any other areas than where the DMM was installed [8].

An engineered liner system is not present beneath the East Ash Pond. The surface area of the impoundment is approximately 111 acres, and the embankment portion of the East Ash Pond has a total length of approximately 8,950 feet and a maximum height above the exterior grade of 43 feet. The embankment was constructed as a homogenous earthen structure with well-compacted clayey fill. The exterior slopes are graded at a slope of approximately 1.5H:1V and predominately covered in crushed stone or vegetation. The interior slopes are graded at a s approximately 1.5H:1V and are covered with either vegetation or mechanically stacked CCRs. Embankment crest width ranges from approximately 15 to 35 feet, and the crest is covered with a gravel access road. As currently operated, the normal pool of the East Ash Pond was El. 373.5 feet in the south sub-basin, as controlled by the 36-inch diameter HDPE pipe connecting the north and south sub-basins, the

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

invert of the 24-inch ductile iron pipe tee spillway structure is El. 372.7, and process flow volumes [10]. The north sub-basin does not have a free water pool during normal conditions and only includes the 36-inch overflow structure and open stormwater collection channel.

Initial certifications for the EAP 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 EEI'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 EEI's CCR Website.

1.2 Report Objectives

These 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 JOP, 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 EAP meets all of the requirements associated with §257.73(a)(2), (c), (d), (e), and §257.82, or, if the EAP does not meet all requirements, provide recommendations for compliance with these sections of the CCR Rule [1].

SECTION 2

COMPARISION OF INITIAL AND PEROIDIC SITE CONDITIONS

2.1 Overview

This section describes the comparison of conditions at the EAP 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 EAP were performed between 2016 and 2020 ([11], [12], [13], [14], [15]) and were certified by a licensed professional engineer in accordance with §257.83(b). Each inspection report stated the following information, relative to the previous inspection:

- A statement that no changes in geometry of the impounding structure were observed since the previous inspection;
- Information on maximum recorded instrumentation readings and water levels;
- 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 EAP between 2015 and 2020. No signs of instability, structural weakness, or changes which may have affected the operation or stability of the EAP were noted in the inspection reports.

2.3 Review of Instrumentation Data

Twenty-three piezometers, JOP-P001 through JOP-P023, are present at the EAP and are monitored monthly by EEI. Data collected between August 6, 2015 and May 6, 2021 were provided to Geosyntec. Geosyntec reviewed the piezometer data 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 ([8], [4], [5]) and May 6, 2021. Available piezometer readings are plotted in **Attachment A**.

In summary, only minor changes in phreatic conditions were observed in the available piezometric data. Phreatic levels typically varied by 2 to 5 ft, although levels for JOP-P007, JOP-P014, and

JOP-P020 exhibited consistent seasonal variations of approximately 10 to 20 ft. These changes do not indicate significantly different phreatic levels than those utilized for the initial structural stability and factor of safety certifications ([8], [4], [5]).

2.4 Comparison of Initial to Periodic Surveys

The initial survey of the EAP, conducted by Weaver Consultants (Weaver) in 2015 [16], was compared to the periodic survey of the EAP, conducted by IngenAE, LLC (IngenAE) in 2020 [10], using AutoCAD Civil3D 2021 software. This comparison quantified changes in the volume of CCR placed within the EAP 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], [8]). Potential changes to embankment geometry were also evaluated. This comparison is presented in a plan view in **Drawing 1** and in an 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)	372.7
Periodic Surveyed Pool Elevation (ft)	373.5
Initial §257.82 Starting Water Surface Elevation (SWSE) (ft)	373.2
Total Change in CCR Volume, North and South Sub-Basins (CY)	+38,674 (fill)
Change in CCR Volume Above SWSE, North Sub-Basin (CY)	+77,554 (fill)
Change in CCR Volume Above SWSE, South Sub-Basin (CY)	+18,182 (fill)
Change in Volume Below SWSE, North Sub-Basin (CY)	+1,661 (fill)
Change in Volume Below SWSE, South Sub-Basin (CY)	-58,677 (cut)

The comparison indicated that approximately 39,000 CY (net cut and fill) of CCR was placed in the EAP between the initial and periodic surveys. However, this comparison also indicated approximately 59,000 CY of cut below the SWSE in the south sub-basin. As CCR was unlikely to have been removed below the SWSE, this apparent cut may be due to differences in bathymetric survey equipment and/or survey data processing between bathymetry measured by the initial and periodic surveys, rather than an actual change in volume.

The comparison also indicated a total placement of CCR above the SWSE of approximately 78,000 CY in the north sub-basin and 18,000 CY in the south sub-basin. thereby leading to a potential for the peak water surface elevation (PWSE) to increase during the inflow design PMP flood event. Furthermore, the comparison indicated that the water surface elevation (WSE) in the south-sub basin was approximately 0.3 ft higher than the SWSE from the 2016 IDF ([6], [8]), thereby also leading to a potential for the PWSE to increase during the inflow design PMP flood event.

No significant changes to embankment geometry appeared to have occurred between the initial and periodic surveys, outside of embankment buttressing and armoring associated with construction of the DMM zone in 2016 [8].

2.5 Comparison of Initial to Periodic Aerial Photography

Initial aerial photographs of the EAP collected by Weaver in 2015 [16] were compared to periodic aerial photographs collected by IngenAE in 2020 [10] 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**. The following changes were noted in the comparison:

- Standing water was no longer present in the north sub-basin, and
- Embankment buttressing and armoring associated with the construction of the DMM zone in 2016 [8] were also apparent.

2.6 Comparison of Initial to Periodic Site Visits

An initial site visit to the EAP was conducted by AECOM in 2015 and documented with a Site Visit Summary and corresponding photographs [17]. A periodic site visit was conducted by Geosyntec on May 26, 2021, with Mr. Lucas P. Carr, P.E. and Mr. Pourya Kargar 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 EAP to evaluate if the structural stability requirements (§257.73(d)) were still met. The stie visit included walking the perimeter of the EAP, visually observing conditions, recording filed notes, and collecting photographs. The site visit is documented in a photographic log provided in **Attachment B**. A summary of significant findings from the periodic site visit is provided below:

- No new development was observed in the vicinity of the EAP, although the observation was limited to the portions of the vicinity visible on foot from the crest of the EAP dikes.
- No signs of structural instability or erosion were observed during the site visit.
- Embankment buttressing and armoring associated with the construction of the DMM zone in 2016 [8] were observed.

2.7 Interview with Power Plant Staff

An interview with Mr. Bruce Parker and Mr. Roger Faughn of JPP was conducted by Mr. Lucas P. Carr of Geosyntec on May 26, 2021. Mr. Parker had been employed at JPP for 32 years as the manager of environmental and chemistry, with the responsibility of managing the EAP from an environmental standpoint. Mr. Faughn had been employed by JPP for one year and is part of the JPP environmental group, with the responsibility of supporting EAP environmental compliance. The interview included a discussion of potential changes that may have occurred at the EAP since

development of the initial certifications ([2], [3], [4], [5], [6]). A summary of the interview is provided below.

- Were any construction projects completed for the EAP since 2015, and, if so, can you please describe the work, reason for the work, and provide any design drawings and/or details available?
    - The DMM zone was installed in 2016.
    - Wet spots were noted on the road at the east side of the embankment in 2020 and were evaluated by both EEI and Hanson Professional Services (Hanson). The wetness was addressed by over-excavating an approximately 100-ft long area, putting down (from bottom to top) filter fabric, sand, filter fabric, and then gravel, based on a repair plan developed by Hanson ([18], [19]). The area has since been dry.
- Were there any changes to the purpose or operation of the EAP since 2015?
    - No changes have occurred.
- Were there any changes to the to the instrumentation program and/or physical instruments for the EAP between 2015 and 2021, and, if so, are records available?
    - Several piezometers have been abandoned since 2015 due to access difficulties or problems with the instrument no longer functioning. These piezometers are marked as abandoned in the monthly piezometer reading spreadsheet maintained by EEI.
- Have area-capacity curves for the EAP been prepared since 2015?
    - No known curves have been prepared.
- Were there any changes to spillways and/or diversion features for the EAP completed since 2015, and, if so, are records available?
    - No known changes have occurred.
- Were there any changes to construction specifications, surveillance, maintenance, and repair procedures for the EAP since 2015, and, if so, are records available?
    - No changes have occurred.
- Were there any instances of dike and/or structural instability for the EAP since 2015, and, if so, are records available?

- No known instances of dike and/or structural instability have occurred.

SECTION 3

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

3.1 Overview of Initial HPC

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

- Performing six breach analyses using HEC-RAS Version 5.0.1 software [20], using pool levels estimated within the EAP during the probable Maximum Precipitation (PMP) rainfall event, for multiple locations around the east, south, and west embankments of the EAP.

- Evaluating potential effects of flooding in multiple areas, including breach flood wave velocities and/or flood depths, for areas north, east, west, and south of the EAP.

- While a breach map is not included in the Initial HPC, it is included within the §257.73(a)(3) Initial Emergency Action Plan prepared by Stantec [21].

The breach analysis concluded that a breach of the EAP could impact multiple occupied structures on the north, east, west, and south of the EAP, with maximum flood depths of greater than 2 ft and velocities of greater than 5 ft/sec. Based on the finding of impacts to occupied structures, a breach of the EAP represented a probable threat to human life. The Initial HPC therefore recommended a "High" hazard potential classification for the EAP [2].

3.2 Review of Initial HPC

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

- Reviewing the rainfall depths utilized in the breach analysis for appropriateness,

- Reviewing breach assessment inputs for appropriateness,

- Reviewing the selected HPC for appropriateness based on the results of the breach analysis, including flow velocities and depths, and

- Reviewing the HPC vs. applicable requirements of the CCR Rule.

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

3.3 Summary of Site Changes Affecting the Initial HPC

Geosyntec did not identify any changes at the site that may affect the HPC. No new structures, infrastructure, frequently occupied facilities/areas, or waterways were present in the probable breach area indicated in the Initial EmAP [21], although Geosyntec's evaluation of new structures was limited to visual observations completed from the dike crest during the site visit and a review of available aerial imagery provided by EEI ([16], [10]). Additionally, no significant changes to the topography within the EAP nor in the probable breach area were identified.

3.4 Periodic HPC

Geosyntec recommends retaining the "High" hazard potential classification for the EAP, per §257.73(a)(2), based on a 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 the EAP at JOP. The Initial HoC included the following information for the CCR surface impoundment:

- The name and address of the owner/operator,
- Location maps,
- A statement of purpose,
- The names and size of the surrounding watershed,
- A description of the foundation and abutment materials,
- Available design and engineering drawings,
- A summary of instrumentation,
- Area capacity curves for the north and south sub-basins,
- Information on spillway structures,
- A statement that construction specifications are not reasonably and readily available,
- A statement that an operations and maintenance plan is currently being prepared; and
- A summary of eight separate surficial movements that occurred along the downstream slope of the perimeter embankment, followed by a statement that other historical structural instability had not occurred at the CCR surface impoundment.

4.2 Summary of Site Changes Affecting the Initial HoC

Several significant changes were identified at the site that occurred after development of the initial HoC report [4] and are described below:

- A state identification number (ID) of W1270100004-02 was assigned to the EAP by the Illinois Environmental Protection Agency (IEPA).

- A wet area was observed at the eastern toe of the perimeter dike and was repaired by excavating the area and backfill it with geotextile, sand, and crushed stone in 2020, in accordance with a memo and design prepared by Hanson ([18], [19]).

- Several piezometers were abandoned or have become inaccessible between 2015 and 2020. These piezometers are no longer being monitored.

- Revised area-capacity curves and spillway design calculations for the EAP were prepared as part of the periodic Inflow Design Flood Control System Plan, as described in **Section 6.3**.

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 an adjacent, downstream water body.

The Initial SSA concluded that all EAP met all structural stability requirements for §257.73(d)(1)(i)-(v) and (vii), but recommended inspection of the 26-inch diameter HDPE spillway pipe to verify that the EAP meets the structural stability and structural integrity criteria for hydraulic outfall structures, per §257.73(d)(1)(vi). A complete inspection of the pipe was not performed in 2015 or 2016 due to the pipe being full of water as necessary for plant operations.

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

A periodic certification of the structural stability and structural integrity for hydraulic outfall structures (§257.73(d)(1)(vi)) was performed by Luminant in 2020 [9]. This certification independently determined that the criteria was met due to the condition of the spillway pipes and the soil types within the embankment. Therefore, the review and certification of §257.73(d)(1)(vi) is not included within the scope of this report.

5.2 Review of Initial 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.

- Reviewing the contents vs. the applicable CCR Rule requirements [1].

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

5.3 Summary of Site Changes Affecting Initial SSA

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

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

- The Initial SFA utilized the results of the Initial Safety Factor Assessment (SFA), in addition to separate slope stability analyses to evaluate the effects of foundation liquefaction and cyclic softening, to demonstrate compliance with the stability of foundations and abutments (§257.73(d)(1)(i)) and sufficiency of dike compaction (§257.73(d)(1)(iii)). The Initial SFA was subsequently updated to develop a Periodic SFA, based on site changes, as discussed in **Section 6**.

5.4 Periodic SSA

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

The Periodic IDF (**Section 7**) indicates that spillways are adequately designed and constructed to adequately manage flow during the PMF flood, as the spillways can adequately manage flow

during peak discharge from the PMP storm event without overtopping of the embankments. Therefore, the requirements of §257.73(d)(1)(v)(A)-(B) are met for the Periodic SSA.

Certification of §257.73(d)(1)(vi) was performed independently by Luminant [9].

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 foundations soils;
- The development of six slope stability cross-sections for limit equilibrium stability analysis using GeoStudio SLOPE/W software;
- The analysis of each cross-section for maximums storage pool, maximum surcharge pool, seismic, and post-earthquake (i.e., liquefaction) location conditions;
- Calculations used to design the DMM zone installed in 2016; and
- Simplified seismic deformation analyses to estimate seismically-induced deformations occurring after an earthquake event.

The Initial SFA concluded that the EAP 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 August 6, 2015 and May 6, 2021, as discussed in **Section 2.3**.

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

6.3 Summary of Site Changes Affecting the Initial SFA

Several changes at the site that occurred after the development of the Initial SFA ([5], [8]) were identified. These changes required updates to the Initial SFA and are described below:

- The normal pool elevation within the south sub-basin of the EAP increased from 373.2 ft to 373.5 ft, resulting in a 0.3 ft of additional water loading on the embankment dikes for the maximum storage pool and seismic loading conditions (§257.73(e)(1)(i) and (iii), relative the Initial SFA.

6.4 Periodic SFA

Geosyntec revised existing slope stability analyses associated with the Initial SFA ([5], [8]) for cross-sections adjacent to the south sub-basin of the EAP to account for the increase in normal pool loading, as described in **Section 6.3**. The following approach and input data were used to revise the analyses:

- Analyses were updated for cross-sections B-B and K-K, as they are directly adjacent to the south sub-basin and subjected to increased pool loading.
    - Water levels in the EAP for the maximum storage pool, seismic, and liquefaction slope stability analysis loading conditions were increased to El. 373.5 ft.
    - Section H-H is also near the south sub-basin, but not adjacent to the free water pool, as CCR is located directly behind the dike. The phreatic water level assumed in the slope stability analyses for the initial SFA was above El. 373.5 ft. Therefore, slope stability analyses for Section H-H were not updated.
    - The seismic deformation analysis performed in the Initial SFA for Section K-K utilized the Bray and Travasarou (2007) methodology [22], including a spreadsheet that was, at the time of the Initial SFA, posted on a website hosted by Prof. Bray [23]. This spreadsheet has since been updated following Bray and Macedo (2019) methodology [24], and the spreadsheet utilized for the initial IDF is no longer available on Prof. Bray's website. Therefore, the seismic deformation analyses were updated to use the currently available Bray and Macedo (2019) method and spreadsheet.

- All other analysis input data and settings form the Initial SFA ([5], [8]) were utilized, including, but not limited to, subsurface stratigraphy and soil strengths, phreatic conditions, ground surface geometry, software package and version, slip surface search routines and methods, and input data for the seismic analyses (i.e., acceleration, magnitudes, probability of exceedances, maximum tolerable deformation).

Factors of safety from the Periodic SFA (cross-sections B-B and K-K) and the Initial SFA (A-A, C-C, G-G, and H-H) are summarized in **Table 3** and confirm that the EAP meets the requirements of §257.73(e)(1). Slope stability analysis output associated with the Initial SFA 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[1] §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[2]	1.83	1.83	1.05	N/A	1.63
B-B[3]	1.77	1.78	1.13	N/A	2.12
C-C[2]	1.77	1.71	1.26	N/A	N/A
G-G[2]	1.68	1.68	1.16	N/A	N/A
H-H[2]	1.72	1.70	1.04	N/A	1.39
K-K[3]	1.53*	1.57*	1.00*	N/A	1.22*

Notes:
[1]Maximum surcharge pool analyses were not updated as the Periodic IDF water levels did not increase above the Initial IDF water levels and water levels used within the Initial SFA analyses.
[2]Denotes cross-section where results from the Initial SFA are presented due to no observed changes relative to the Initial IDF.
[3]Denotes cross-section where changes are occurred, and results are presented from the 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 probable maximum flood event because of the hazard potential classification of "high", which corresponded to 36 inches of rainfall over a 24-hour period.
- The Initial IDF utilized a HydroCAD Version 10.0 model to evaluate spillway flows and pool level increases during the design flood, with a SWSE of 370 ft in the North Sub-Basin and 373.2 ft in the South Sub-Basin of the EAP.

The Initial IDF concluded that the EAP met the requirements of §257.82, as the peak water surface estimated by the HydroCAD model was El. 376.2 ft in the North Sub-Basin and El. 377.6 ft in the South Sub-Basin, relative to a minimum EAP dike crest elevation of 378.0 ft in both subbasins. Therefore, overtopping was not expected. The Initial IDF also evaluated the potential for discharge from the CCR unit and determined that discharge in violation of the existing NDPES for the EAP was not expected, as all discharge from the EAP during both normal and inflow design flood conditions was expected to be routed through the existing spillway and NDPES-permitted outfall.

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].

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

- The Initial IDF utilized the National Resource Conservation Service (NRCS) Type II rainfall distribution type [25]. Geosyntec recommend utilizing the NRCS 24-hour Emergency Spillway and Freeboard (ESFB) distribution [26] which is a distribution that NRCS utilizes in making determination and analysis of auxiliary spillway flow depth and duration, for the reasons listed below.
    - The ESFB rainfall distribution was determined by NRCS to be a more accurate representation of a 24-hour Probable Maximum Precipitation (PMP) event per a study applying different rainfall distributions to 24-hour PMP storm events for purposes of evaluating existing high-hazard dams east of the 105th meridian [26]:
        - *For the area east of the 105th meridian, the Type II and Type III patterns used with 24-hour PMP values consistently produces one-hour and two-hour intensities that far exceeded any known or documented rates…Because the Type II and Type III distributions over-predicted the maximum one-hour intensity for PMP events, they were excluded from further study.*
        - *The dimensionless conversion of the ESFB distribution from a 6-hour to a 24-hour pattern has been used with PMP events in a number of states where 24-hour storms are required as a part of the State's dam safety criteria and approval process……Although the ESFB Distribution and the World Curve distribution were developed from entirely independent data sources, the distributions are similar when compared on a volume-duration basis. The world curve supports the ESFB.*
        - *The World Curve Distribution is a valid basis for design of high hazard structures…It would seem logical to use the World Curve distribution for PMP size event.*
    - The NRCS study [26] determined that the NRCS ESFB is comparable to the World Curve. The World Curve is developed from worldwide maximum rainfall records and deemed by NRCS to be logical to use for a PMP size event and valid for design of high hazard structures.
    - The NRCS study [26] deemed the NRCS Type II (and III) distributions to overpredict PMP maximum 1-hr intensities, which typically control dam capacity design, and therefore were not considered further as a basis for rainfall distributions of PMP size events.

7.3 Summary of Site Changes Affecting the Initial IDF

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

- Approximately 18,000 CY and 78,000 CY of CCR were placed above the SWSE utilized for the Initial IDF certification in the south and north sub-basins of the EAP, respectively, thereby altering the stage-storage curve for both sub-basins, relative to the Initial IDF.

- The surveyed water surface elevation (WSE) within the south sub-basin of the EAP was 373.5 ft in 2020 [10]; this is 0.3 ft higher than the SWSE used in the Initial IDF and 0.5 ft above the WSE surveyed in 2016 [16], thereby the SWSE utilized in the Initial IDF was no longer consistent with conditions observed in 2020.

7.4 Periodic IDF

Geosyntec revised the HydroCAD model associated with the Initial IDF to account for the revised rainfall distribution type, increase in SWSE, and additional CCR placement, as described in **Sections 7.2** and **7.3**. The following approach and input data were used for the revised analyses:

- Stage-storage (i.e., area-capacity) curves for both the north and south sub-basins of the EAP were updated based on the 2020 site survey [10].

    - A revised stage-volume curve for the EAP was prepared based on measuring the area of both north and south subbasins within the EAP at every one-foot increment of depth from an elevation just beneath the normal pool elevation (369.0 ft) to the perimeter dike embankment crest elevation (378.0 ft). This elevation-surface area curve was input to HydroCAD, which computed a stage-volume curve for the subbasins using the conic volume method. The survey showed a total overall loss of 78 ac-ft of storage volume from the EAP from 2016 to 2020.

- The SWSE within the south sub-basin of the EAP was updated from 373.2 ft to 373.5 ft to reflect the 2020 site survey [10].

- The rainfall distribution type was updated to the "Spillway Emergency" storm type provided by HydroCAD [23], which replicates the NRCS 24-hour ESFB distribution.

- All other input data and settings from the Initial IDF HydroCAD model were utilized, including, but not limited to software package and version, runoff method, analysis time span and analysis time step.

The results of the Updated IDF are summarized in **Table 4** and confirm that the EAP sill meets the requirements of §257.82(a)-(b), as the peak water surface elevation does not exceed the minimum perimeter dike crest elevations. Additionally, all discharge from the EAP is routed through the existing spillway system to the NPDES-permitted outfall, during both normal and IDF

conditions. Updated area-capacity curves and HydroCAD model output is provided in **Attachment E**.

Table 4 – Water Levels from Periodic IDF

	North Sub-Basin		South Sub-Basin		
Analysis	**Starting Water Surface Elevation (ft)**	**Peak Water Surface Elevation (ft)**	**Starting Water Surface Elevation (ft)**	**Peak Water Surface Elevation (ft)**	**Minimum Dike Crest Elevation (ft)**
Initial IDF	370.0	376.2	373.2	377.6	378.0
Periodic IDF	370.0	376.0	373.5	377.3	378.0
Initial to Periodic Change[1]	0.0	-0.2	+0.3	-0.3	

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

SECTION 8

CONCLUSIONS

The EAP at JPP 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)), with the exception of §257.73(d)(1)(vi) that was independently certified by Luminant [9],
- 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

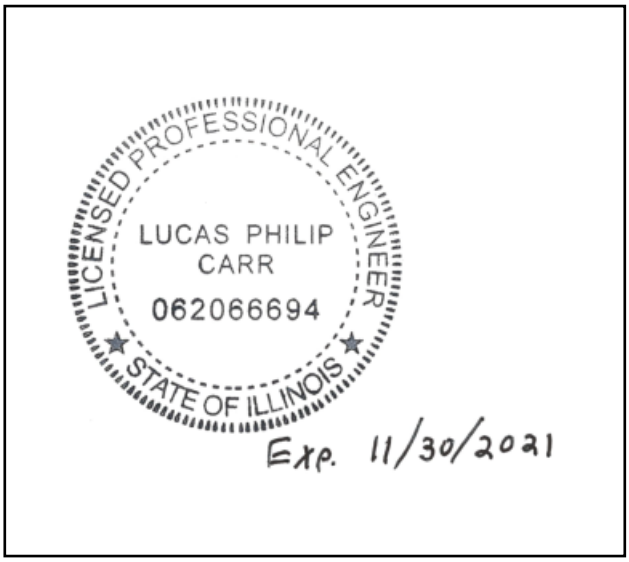
CCR Unit: Electric Energy Incorporated, Joppa Power Plant, East Ash Pond

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, 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, with the exception of §257.73(d)(1)(vi)) that was independently certified by others.

Lucas P. Carr

10/11/2021

Date



SECTION 10

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Section 3

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

Prepared for
Electric Energy, Inc.

Date
January 31, 2022

Project No.
1940100711-009

2021 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

EAST ASH POND

JOPPA POWER PLANT

JOPPA, ILLINOIS

RAMBOLL Bright ideas. Sustainable change.

2021 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
JOPPA POWER PLANT EAST ASH POND

Project name	**Joppa Power Plant East Ash Pond**
Project no.	**1940100711-009**
Recipient	**Electric Energy, Inc.**
Document type	**Annual Groundwater Monitoring and Corrective Action Report**
Version	**FINAL**
Date	**January 31, 2022**
Prepared by	**Scott S. Woods**
Checked by	**Lauren Cook**
Approved by	**Brian Hennings**
Description	**Annual Report in Support of Part 845**

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ACRONYMS AND ABBREVIATIONS

§	Section
35 I.A.C.	Title 35 of the Illinois Administrative Code
40 C.F.R.	Title 40 of the Code of Federal Regulations
bgs	below ground surface
CCR	coal combustion residuals
EAP	East Ash Pond
EE	Electric Energy, Inc.
GMP	Groundwater Monitoring Plan
GWPS	groundwater protection standard
HCR	Hydrogeologic Site Characterization Report
ID	identification
IEPA	Illinois Environmental Protection Agency
JPP	Joppa Power Plant
NA	not applicable
NID	National Inventory of Dams
No.	number
Part 845	35 I.A.C. § 845: Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments
Ramboll	Ramboll Americas Engineering Solutions, Inc.
SI	surface impoundment
SSI	statistically significant increase
TDS	total dissolved solids
UA	uppermost aquifer
WLO	water level only

EXECUTIVE SUMMARY

This report has been prepared to provide the information required by Title 35 of the Illinois Administrative Code (35 I.A.C.) Section (§) 845.610(e) (*Annual Groundwater Monitoring and Corrective Action Report*) for East Ash Pond (EAP) located at Joppa Power Plant (JPP) near Joppa, Illinois.

An operating permit application for the EAP was submitted by Electric Energy, Inc. (EE) 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 EAP is recognized by Vistra identification (ID) Number (No.) 401, IEPA ID No. W1270100004-02, and National Inventory of Dams (NID) No. IL50714.

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

1. INTRODUCTION

This report has been prepared by Ramboll on behalf of EE, to provide the information required by 35 I.A.C. § 845.610(e) for the EAP located at JPP near Joppa, 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 EAP was submitted by EE 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 EAP 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 EAP.

3. KEY ACTIONS COMPLETED IN 2021

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

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

Table A. Proposed Part 845 Monitoring Well Network

Well ID	Monitored Unit	Well Screen Interval (feet bgs)	Well Type [1]
G01D	UA	54.2 - 63.9	Background
G02D	UA	62.2 - 71.8	Background
G03	UA	55 - 65	Compliance
G05	UA	50 - 60	Compliance
G06	UA	75 - 85	Compliance
G07	UA	50 - 60	Compliance
G08	UA	75 - 85	Compliance
G09	UA	59.5 - 69.5	Compliance
G10	UA	60.3 - 70.3	Compliance
G11	UA	55.7 - 65.7	Compliance
G51D	UA	49.6 - 59.3	Compliance
G52D	UA	69.9 - 79.6	Compliance
G53D	UA	47.3 - 56.9	Compliance
G54D	UA	70.0 - 79.7	Compliance
XSG01 [2,3]	Surface Water	NA	WLO
SG02 [2,3]	Surface Water	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.
bgs = below ground surface
NA = not applicable
UA = uppermost aquifer
WLO = water level only

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

(Ramboll, 2021b). Groundwater elevation contour maps representative of the independent sampling events are presented in **Figures 2 through 4**.

Table B. Summary of Groundwater Samples Collected

Sampling Dates	Parameters Collected	Monitoring Wells Sampled [1]
March 3 - 5, 2021	Metals [2], mercury, inorganic parameters [3], radium 226 and 228, field parameters [4]	G01D, G02D, G03, G04, G05, G06, G06S, G07, G08, G09, G09M, G10, G11, G54S, G151, G152B, and G153
March 24 - 25, 2021	Appendix III [5], Appendix IV [6], field parameters [4]	G01D, G02D, G51D, G52D, G53D, and G54D
March 24 - 25, 2021	Metals [2], mercury, inorganic parameters [3], radium 226 and 228, field parameters [4]	G03, G04, G05, G06, G06S, G07, G08, G09, G09M, G10, G11, G54S, G151, G152B, and G153
April 13 - 14, 2021	Metals [2], mercury, inorganic parameters [3], radium 226 and 228, field parameters [4]	G01D, G02D, G03, G04, G05, G06, G06S, G07, G08, G09, G09M, G10, G11, G54S, G151, G152B, and G153
May 11 - 12, 2021	Metals [2], mercury, inorganic parameters [3], radium 226 and 228, field parameters [4]	G01D, G02D, G03, G04, G05, G06, G06S, G07, G08, G09, G09M, G10, G11, G54S, G151, G152B, and G153
June 1, 2021	Metals [2], mercury, inorganic parameters [3], radium 226 and 228, field parameters [4]	G01D, G02D, G03, G05, G06, G07, G08, G09, G10, and G11
June 14 - 15, 2021	Metals [2], mercury, inorganic parameters [3], radium 226 and 228, field parameters [4]	G01D, G02D, G03, G05, G06, G07, G08, G09, G10, and G11
July 6, 2021	Metals [2], mercury, inorganic parameters [3], radium 226 and 228, field parameters [4]	G01D, G02D, G03, G05, G06, G07, G08, G09, G10, and G11
July 20 - 21, 2021	Metals [2], mercury, inorganic parameters [3], radium 226 and 228, field parameters [4]	G01D, G02D, G03, G04, G05, G06, G06S, G07, G08, G09, G09M, G10, G11, G54S, G151, G152B, and G153

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

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 EAP.

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 EAP, and in accordance with the GMP.

5. KEY ACTIVITIES PLANNED FOR 2022

The following key activities are planned for 2022:

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

6. REFERENCES

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FIGURES

COMPLIANCE WELL
BACKGROUND WELL
STAFF GAUGE
PART 845 REGULATED UNIT (SUBJECT UNIT)
PROPERTY BOUNDARY

0 200 400 Feet

PROPOSED PART 845 GROUNDWATER MONITORING WELL NETWORK

2021 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
EAST ASH POND

JOPPA POWER PLANT
JOPPA, ILLINOIS

FIGURE 1

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

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BACKGROUND WELL
MONITORING WELL
SOURCE SAMPLE LOCATION
STAFF GAGE
GROUNDWATER ELEVATION CONTOUR (1-FT CONTOUR INTERVAL, NAVD88)
PART 845 REGULATED UNIT (SUBJECT UNIT)
PROPERTY BOUNDARY

0 200 400 Feet

NOTES:
1.ELEVATIONS IN PARENTHESIS WERE NOT USED FOR CONTOURING.
2. ELEVATION CONTOURS SHOWN IN FEET, NORTH AMERICAN VERTICAL DATUM OF 1988

POTENTIOMETRIC SURFACE MAP MARCH 3 AND 4, 2021

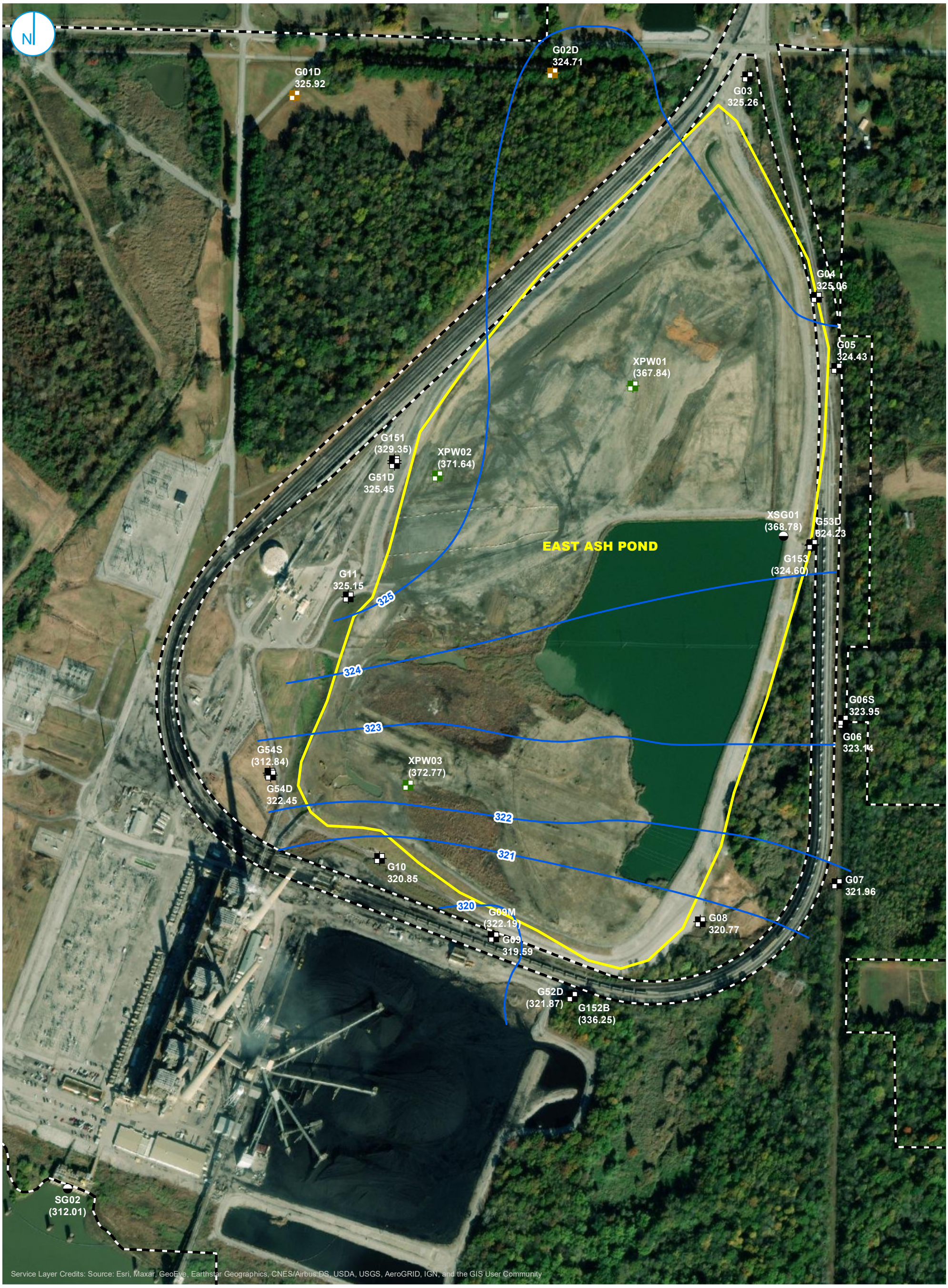
2021 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT EAST ASH POND

JOPPA POWER PLANT
JOPPA, ILLINOIS

FIGURE 2

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.

RAMBOLL



BACKGROUND WELL
MONITORING WELL
SOURCE SAMPLE LOCATION
STAFF GAGE
GROUNDWATER ELEVATION CONTOUR (1-FT CONTOUR INTERVAL, NAVD88)
PART 845 REGULATED UNIT (SUBJECT UNIT)
PROPERTY BOUNDARY

0 200 400 Feet

NOTES:
1.ELEVATIONS IN PARENTHESIS WERE NOT USED FOR CONTOURING.
2. ELEVATIONS SHOWN IN FEET, NORTH AMERICAN VERTICAL DATUM OF 1988

POTENTIOMETRIC SURFACE MAP APRIL 13 AND 14, 2021

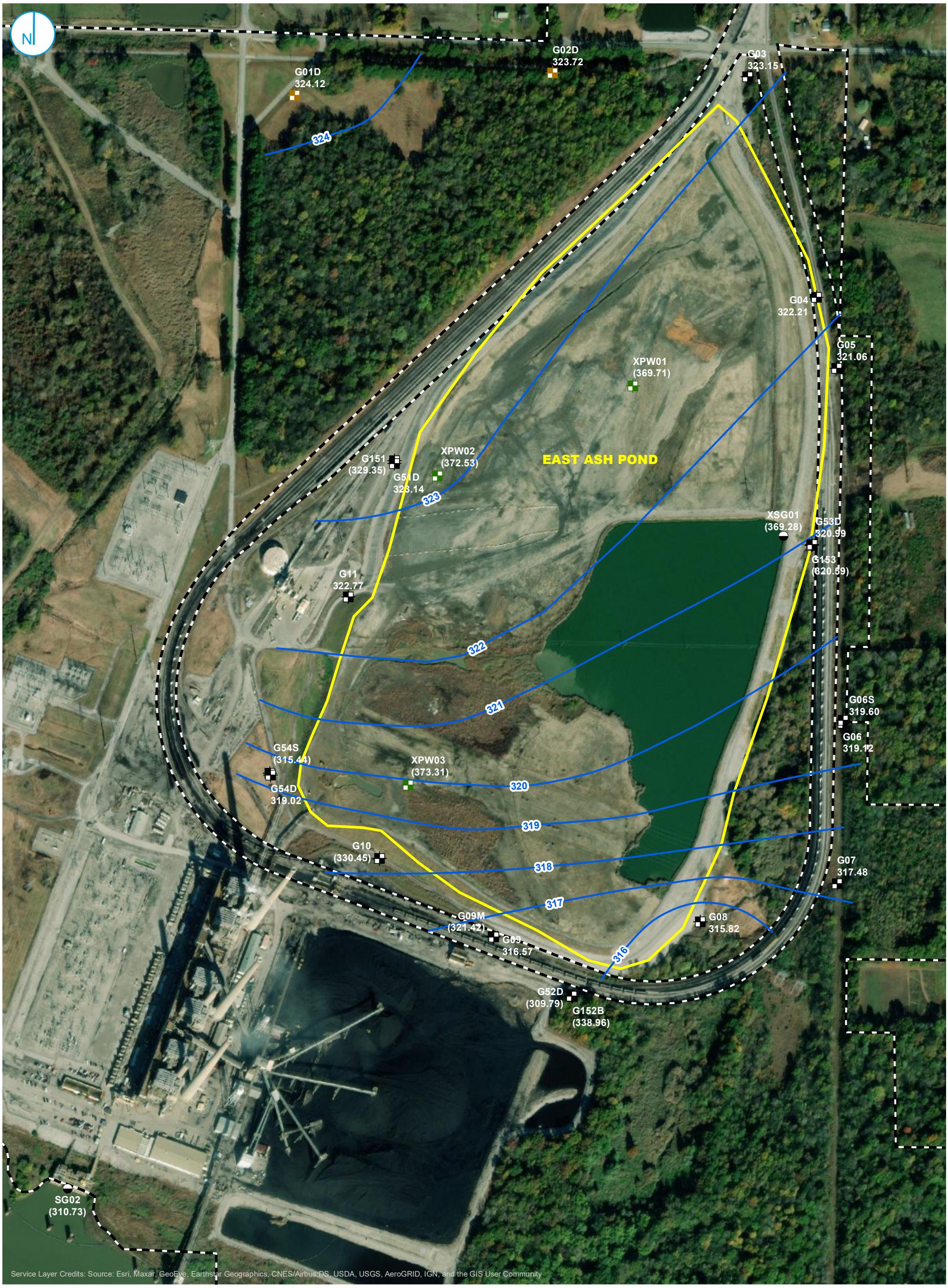
2021 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT EAST ASH POND

JOPPA POWER PLANT
JOPPA, ILLINOIS

FIGURE 3

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL



BACKGROUND WELL
MONITORING WELL
SOURCE SAMPLE LOCATION
STAFF GAGE
GROUNDWATER ELEVATION CONTOUR (1-FT CONTOUR INTERVAL, NAVD88)
PART 845 REGULATED UNIT (SUBJECT UNIT)
PROPERTY BOUNDARY

0 200 400 Feet

NOTES:
1.ELEVATIONS IN PARENTHESIS WERE NOT USED FOR CONTOURING.
2. ELEVATIONS SHOWN IN FEET, NORTH AMERICAN VERTICAL DATUM OF 1988

POTENTIOMETRIC SURFACE MAP MAY 11 AND 12, 2021

2021 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT EAST ASH POND

JOPPA POWER PLANT
JOPPA, ILLINOIS

FIGURE 4

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
JOPPA POWER PLANT
EAST ASH POND
JOPPA, ILLINOIS

Parameter	Background Concentration	845 Limit	Groundwater Protection Standard	Unit
Antimony, total	0.001	0.006	0.006	mg/L
Arsenic, total	0.0017	0.010	0.010	mg/L
Barium, total	0.248	2.0	2.0	mg/L
Beryllium, total	0.0011	0.004	0.004	mg/L
Boron, total	0.0511	2	2	mg/L
Cadmium, total	0.001	0.005	0.005	mg/L
Chloride, total	31	200	200	mg/L
Chromium, total	0.0037	0.1	0.1	mg/L
Cobalt, total	0.0015	0.006	0.006	mg/L
Fluoride, total	0.25	4.0	4.0	mg/L
Lead, total	0.0015	0.0075	0.0075	mg/L
Lithium, total	0.003	0.04	0.04	mg/L
Mercury, total	0.0002	0.002	0.002	mg/L
Molybdenum, total	0.0015	0.1	0.1	mg/L
pH (field)	6.8 / 6.0	9.0 / 6.5	9.0 / 6.0	SU
Radium 226 and 228 combined	1.7	5	5	pCi/L
Selenium, total	0.0041	0.05	0.05	mg/L
Sulfate, total	39	400	400	mg/L
Thallium, total	0.002	0.002	0.002	mg/L
Total Dissolved Solids	332	1200	1200	mg/L

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

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APPENDIX B
HISTORY OF POTENTIAL EXCEEDANCES

HISTORY OF POTENTIAL EXCEEDANCES

This presentation of the History of Potential Exceedances, and any corrective action taken to remediate groundwater, is provided to meet the requirements of Title 35 of the Illinois Administrative Code (35 I.A.C.) § 845.230(d)(2)(M) for the Joppa Power Plant East Ash Pond, Illinois Environmental Protection Agency (IEPA) ID No. W1270100004-02.

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 G01D and G02D.

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
JOPPA POWER PLANT
EAST ASH POND
JOPPA, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G03	UA	845	Antimony, total	mg/L	03/05/2021 - 07/21/2021	All ND - Last	0.001	0.006	0.001	0.006	Standard
G03	UA	845	Arsenic, total	mg/L	03/05/2021 - 07/21/2021	CB around linear reg	-0.00081	0.010	0.0017	0.01	Standard
G03	UA	845	Barium, total	mg/L	03/05/2021 - 07/21/2021	CB around linear reg	0.035	2.0	0.25	2	Standard
G03	UA	845	Beryllium, total	mg/L	03/05/2021 - 07/21/2021	All ND - Last	0.001	0.004	0.0011	0.004	Standard
G03	UA	845	Boron, total	mg/L	03/05/2021 - 07/21/2021	CI around geomean	0.20	2.0	0.053	2	Standard
G03	UA	845	Cadmium, total	mg/L	03/05/2021 - 07/21/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
G03	UA	845	Chloride, total	mg/L	03/05/2021 - 07/21/2021	CI around mean	19	200	32	200	Standard
G03	UA	845	Chromium, total	mg/L	03/05/2021 - 07/21/2021	CB around linear reg	-0.00758	0.10	0.0039	0.1	Standard
G03	UA	845	Cobalt, total	mg/L	03/05/2021 - 07/21/2021	CB around linear reg	-0.00129	0.006	0.0015	0.006	Standard
G03	UA	845	Fluoride, total	mg/L	03/05/2021 - 07/21/2021	CI around mean	0.20	4.0	0.25	4	Standard
G03	UA	845	Lead, total	mg/L	03/05/2021 - 07/21/2021	CB around linear reg	-0.00104	0.0075	0.0015	0.0075	Standard
G03	UA	845	Lithium, total	mg/L	03/05/2021 - 07/21/2021	CI around median	0.003	0.040	0.003	0.04	Standard
G03	UA	845	Mercury, total	mg/L	03/05/2021 - 07/21/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
G03	UA	845	Molybdenum, total	mg/L	03/05/2021 - 07/21/2021	CI around median	0.001	0.10	0.0015	0.1	Standard
G03	UA	845	pH (field)	SU	03/05/2021 - 07/21/2021	CI around mean	6.2	6.0/9.0	6.0/6.8	6.5/9	Background/Standard
G03	UA	845	Radium-226 + Radium 228, tot	pCi/L	03/05/2021 - 07/21/2021	CI around mean	-0.0133	5.0	1.7	5	Standard
G03	UA	845	Selenium, total	mg/L	03/05/2021 - 07/21/2021	All ND - Last	0.001	0.050	0.0042	0.05	Standard
G03	UA	845	Sulfate, total	mg/L	03/05/2021 - 07/21/2021	CI around mean	62	400	39	400	Standard
G03	UA	845	Thallium, total	mg/L	03/05/2021 - 07/21/2021	All ND - Last	0.002	0.002	0.002	0.002	Standard
G03	UA	845	Total Dissolved Solids	mg/L	03/05/2021 - 07/21/2021	CI around geomean	273	1200	334	1200	Standard
G04	UA	845	Antimony, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.006	0.001	0.006	Standard
G04	UA	845	Arsenic, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.010	0.0017	0.01	Standard
G04	UA	845	Barium, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	0.19	2.0	0.25	2	Standard
G04	UA	845	Beryllium, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.004	0.0011	0.004	Standard

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HISTORY OF POTENTIAL EXCEEDANCES
JOPPA POWER PLANT
EAST ASH POND
JOPPA, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G04	UA	845	Boron, total	mg/L	03/04/2021 - 07/20/2021	CI around median	0	2.0	0.053	2	Standard
G04	UA	845	Cadmium, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
G04	UA	845	Chloride, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	22	200	32	200	Standard
G04	UA	845	Chromium, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.0015	0.10	0.0039	0.1	Standard
G04	UA	845	Cobalt, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	0.000558	0.006	0.0015	0.006	Standard
G04	UA	845	Fluoride, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	0.22	4.0	0.25	4	Standard
G04	UA	845	Lead, total	mg/L	03/04/2021 - 07/20/2021	CI around median	0	0.0075	0.0015	0.0075	Standard
G04	UA	845	Lithium, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.003	0.040	0.003	0.04	Standard
G04	UA	845	Mercury, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
G04	UA	845	Molybdenum, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	0.00292	0.10	0.0015	0.1	Standard
G04	UA	845	pH (field)	SU	03/04/2021 - 07/20/2021	CI around mean	6.2	6.0/9.0	6.0/6.8	6.5/9	Background/Standard
G04	UA	845	Radium-226 + Radium 228, tot	pCi/L	03/04/2021 - 07/20/2021	CI around mean	0.041	5.0	1.7	5	Standard
G04	UA	845	Selenium, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	0.0012	0.050	0.0042	0.05	Standard
G04	UA	845	Sulfate, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	-3.96	400	39	400	Standard
G04	UA	845	Thallium, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.002	0.002	0.002	0.002	Standard
G04	UA	845	Total Dissolved Solids	mg/L	03/04/2021 - 07/20/2021	CI around mean	228	1200	334	1200	Standard
G05	UA	845	Antimony, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.006	0.001	0.006	Standard
G05	UA	845	Arsenic, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.010	0.0017	0.01	Standard
G05	UA	845	Barium, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	0.13	2.0	0.25	2	Standard
G05	UA	845	Beryllium, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.004	0.0011	0.004	Standard
G05	UA	845	Boron, total	mg/L	03/04/2021 - 07/20/2021	CB around linear reg	0.11	2.0	0.053	2	Standard
G05	UA	845	Cadmium, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
G05	UA	845	Chloride, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	15	200	32	200	Standard
G05	UA	845	Chromium, total	mg/L	03/04/2021 - 07/20/2021	CI around geomean	0.00114	0.10	0.0039	0.1	Standard

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EAST ASH POND
JOPPA, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G05	UA	845	Cobalt, total	mg/L	03/04/2021 - 07/20/2021	CB around linear reg	0.00392	0.006	0.0015	0.006	Standard
G05	UA	845	Fluoride, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	0.30	4.0	0.25	4	Standard
G05	UA	845	Lead, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.0075	0.0015	0.0075	Standard
G05	UA	845	Lithium, total	mg/L	03/04/2021 - 07/20/2021	CI around median	0.003	0.040	0.003	0.04	Standard
G05	UA	845	Mercury, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
G05	UA	845	Molybdenum, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	0.00447	0.10	0.0015	0.1	Standard
G05	UA	845	pH (field)	SU	03/04/2021 - 07/20/2021	CI around mean	6.4	6.0/9.0	6.0/6.8	6.5/9	Background/Standard
G05	UA	845	Radium-226 + Radium 228, tot	pCi/L	03/04/2021 - 07/20/2021	CI around mean	0.14	5.0	1.7	5	Standard
G05	UA	845	Selenium, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	0.00118	0.050	0.0042	0.05	Standard
G05	UA	845	Sulfate, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	84	400	39	400	Standard
G05	UA	845	Thallium, total	mg/L	03/04/2021 - 07/20/2021	CI around median	0.001	0.002	0.002	0.002	Standard
G05	UA	845	Total Dissolved Solids	mg/L	03/04/2021 - 07/20/2021	CI around mean	347	1200	334	1200	Standard
G06	UA	845	Antimony, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.006	0.001	0.006	Standard
G06	UA	845	Arsenic, total	mg/L	03/04/2021 - 07/20/2021	CI around median	0.001	0.010	0.0017	0.01	Standard
G06	UA	845	Barium, total	mg/L	03/04/2021 - 07/20/2021	CB around linear reg	0.016	2.0	0.25	2	Standard
G06	UA	845	Beryllium, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.004	0.0011	0.004	Standard
G06	UA	845	Boron, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	3.0	2.0	0.053	2	Standard
G06	UA	845	Cadmium, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
G06	UA	845	Chloride, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	21	200	32	200	Standard
G06	UA	845	Chromium, total	mg/L	03/04/2021 - 07/20/2021	CI around geomean	0.00107	0.10	0.0039	0.1	Standard
G06	UA	845	Cobalt, total	mg/L	03/04/2021 - 07/20/2021	CI around median	0.001	0.006	0.0015	0.006	Standard
G06	UA	845	Fluoride, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	0.26	4.0	0.25	4	Standard
G06	UA	845	Lead, total	mg/L	03/04/2021 - 07/20/2021	CI around median	0.001	0.0075	0.0015	0.0075	Standard
G06	UA	845	Lithium, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	0.00334	0.040	0.003	0.04	Standard

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JOPPA POWER PLANT
EAST ASH POND
JOPPA, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G06	UA	845	Mercury, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
G06	UA	845	Molybdenum, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.0015	0.10	0.0015	0.1	Standard
G06	UA	845	pH (field)	SU	03/04/2021 - 07/20/2021	CB around linear reg	6.2	6.0/9.0	6.0/6.8	6.5/9	Background/Standard
G06	UA	845	Radium-226 + Radium 228, tot	pCi/L	03/04/2021 - 07/20/2021	CI around mean	0.32	5.0	1.7	5	Standard
G06	UA	845	Selenium, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.050	0.0042	0.05	Standard
G06	UA	845	Sulfate, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	212	400	39	400	Standard
G06	UA	845	Thallium, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.002	0.002	0.002	0.002	Standard
G06	UA	845	Total Dissolved Solids	mg/L	03/04/2021 - 07/20/2021	CI around median	500	1200	334	1200	Standard
G06S	UA	845	Antimony, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.006	0.001	0.006	Standard
G06S	UA	845	Arsenic, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.010	0.0017	0.01	Standard
G06S	UA	845	Barium, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	0.078	2.0	0.25	2	Standard
G06S	UA	845	Beryllium, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.004	0.0011	0.004	Standard
G06S	UA	845	Boron, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	0.23	2.0	0.053	2	Standard
G06S	UA	845	Cadmium, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
G06S	UA	845	Chloride, total	mg/L	03/04/2021 - 07/20/2021	CI around median	0	200	32	200	Standard
G06S	UA	845	Chromium, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.0015	0.10	0.0039	0.1	Standard
G06S	UA	845	Cobalt, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	-0.00119	0.006	0.0015	0.006	Standard
G06S	UA	845	Fluoride, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	0.25	4.0	0.25	4	Standard
G06S	UA	845	Lead, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.0075	0.0015	0.0075	Standard
G06S	UA	845	Lithium, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	0.0022	0.040	0.003	0.04	Standard
G06S	UA	845	Mercury, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
G06S	UA	845	Molybdenum, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.0015	0.10	0.0015	0.1	Standard
G06S	UA	845	pH (field)	SU	03/04/2021 - 07/20/2021	CI around mean	5.5	6.0/9.0	6.0/6.8	6.5/9	Background/Standard
G06S	UA	845	Radium-226 + Radium 228, tot	pCi/L	03/04/2021 - 07/20/2021	CI around mean	-0.187	5.0	1.7	5	Standard

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JOPPA POWER PLANT
EAST ASH POND
JOPPA, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G06S	UA	845	Selenium, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.050	0.0042	0.05	Standard
G06S	UA	845	Sulfate, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	28	400	39	400	Standard
G06S	UA	845	Thallium, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.002	0.002	0.002	0.002	Standard
G06S	UA	845	Total Dissolved Solids	mg/L	03/04/2021 - 07/20/2021	CI around mean	140	1200	334	1200	Standard
G07	UA	845	Antimony, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.006	0.001	0.006	Standard
G07	UA	845	Arsenic, total	mg/L	03/04/2021 - 07/20/2021	CI around median	0.001	0.010	0.0017	0.01	Standard
G07	UA	845	Barium, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	0.035	2.0	0.25	2	Standard
G07	UA	845	Beryllium, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.004	0.0011	0.004	Standard
G07	UA	845	Boron, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	4.2	2.0	0.053	2	Standard
G07	UA	845	Cadmium, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
G07	UA	845	Chloride, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	20	200	32	200	Standard
G07	UA	845	Chromium, total	mg/L	03/04/2021 - 07/20/2021	CI around geomean	0.00108	0.10	0.0039	0.1	Standard
G07	UA	845	Cobalt, total	mg/L	03/04/2021 - 07/20/2021	CB around linear reg	-0.00149	0.006	0.0015	0.006	Standard
G07	UA	845	Fluoride, total	mg/L	03/04/2021 - 07/20/2021	CI around median	0.20	4.0	0.25	4	Standard
G07	UA	845	Lead, total	mg/L	03/04/2021 - 07/20/2021	CI around median	0.001	0.0075	0.0015	0.0075	Standard
G07	UA	845	Lithium, total	mg/L	03/04/2021 - 07/20/2021	CI around median	0.003	0.040	0.003	0.04	Standard
G07	UA	845	Mercury, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
G07	UA	845	Molybdenum, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.0015	0.10	0.0015	0.1	Standard
G07	UA	845	pH (field)	SU	03/04/2021 - 07/20/2021	CB around linear reg	5.9	6.0/9.0	6.0/6.8	6.5/9	Background/Standard
G07	UA	845	Radium-226 + Radium 228, tot	pCi/L	03/04/2021 - 07/20/2021	CI around mean	0.088	5.0	1.7	5	Standard
G07	UA	845	Selenium, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.050	0.0042	0.05	Standard
G07	UA	845	Sulfate, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	246	400	39	400	Standard
G07	UA	845	Thallium, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.002	0.002	0.002	0.002	Standard
G07	UA	845	Total Dissolved Solids	mg/L	03/04/2021 - 07/20/2021	CI around mean	564	1200	334	1200	Standard

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EAST ASH POND
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Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G08	UA	845	Antimony, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.006	0.001	0.006	Standard
G08	UA	845	Arsenic, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	0.00634	0.010	0.0017	0.01	Standard
G08	UA	845	Barium, total	mg/L	03/04/2021 - 07/20/2021	CB around linear reg	-0.0117	2.0	0.25	2	Standard
G08	UA	845	Beryllium, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.004	0.0011	0.004	Standard
G08	UA	845	Boron, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	3.9	2.0	0.053	2	Standard
G08	UA	845	Cadmium, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
G08	UA	845	Chloride, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	13	200	32	200	Standard
G08	UA	845	Chromium, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	0.00083	0.10	0.0039	0.1	Standard
G08	UA	845	Cobalt, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	0.00213	0.006	0.0015	0.006	Standard
G08	UA	845	Fluoride, total	mg/L	03/04/2021 - 07/20/2021	CB around linear reg	0.27	4.0	0.25	4	Standard
G08	UA	845	Lead, total	mg/L	03/04/2021 - 07/20/2021	CI around median	0.001	0.0075	0.0015	0.0075	Standard
G08	UA	845	Lithium, total	mg/L	03/04/2021 - 07/20/2021	CI around median	0.003	0.040	0.003	0.04	Standard
G08	UA	845	Mercury, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
G08	UA	845	Molybdenum, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	0.0017	0.10	0.0015	0.1	Standard
G08	UA	845	pH (field)	SU	03/04/2021 - 07/20/2021	CI around mean	6.8	6.0/9.0	6.0/6.8	6.5/9	Background/Standard
G08	UA	845	Radium-226 + Radium 228, tot	pCi/L	03/04/2021 - 07/20/2021	CI around mean	0.23	5.0	1.7	5	Standard
G08	UA	845	Selenium, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.050	0.0042	0.05	Standard
G08	UA	845	Sulfate, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	202	400	39	400	Standard
G08	UA	845	Thallium, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.002	0.002	0.002	0.002	Standard
G08	UA	845	Total Dissolved Solids	mg/L	03/04/2021 - 07/20/2021	CI around mean	528	1200	334	1200	Standard
G09	UA	845	Antimony, total	mg/L	03/04/2021 - 07/21/2021	All ND - Last	0.001	0.006	0.001	0.006	Standard
G09	UA	845	Arsenic, total	mg/L	03/04/2021 - 07/21/2021	CI around mean	0.00125	0.010	0.0017	0.01	Standard
G09	UA	845	Barium, total	mg/L	03/04/2021 - 07/21/2021	CB around linear reg	-0.0084	2.0	0.25	2	Standard
G09	UA	845	Beryllium, total	mg/L	03/04/2021 - 07/21/2021	CI around median	0.001	0.004	0.0011	0.004	Standard

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
JOPPA POWER PLANT
EAST ASH POND
JOPPA, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G09	UA	845	Boron, total	mg/L	03/04/2021 - 07/21/2021	CI around median	0.28	2.0	0.053	2	Standard
G09	UA	845	Cadmium, total	mg/L	03/04/2021 - 07/21/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
G09	UA	845	Chloride, total	mg/L	03/04/2021 - 07/21/2021	CI around mean	20	200	32	200	Standard
G09	UA	845	Chromium, total	mg/L	03/04/2021 - 07/21/2021	CI around geomean	0.00115	0.10	0.0039	0.1	Standard
G09	UA	845	Cobalt, total	mg/L	03/04/2021 - 07/21/2021	CB around linear reg	-0.00201	0.006	0.0015	0.006	Standard
G09	UA	845	Fluoride, total	mg/L	03/04/2021 - 07/21/2021	CI around mean	0.28	4.0	0.25	4	Standard
G09	UA	845	Lead, total	mg/L	03/04/2021 - 07/21/2021	CI around median	0.001	0.0075	0.0015	0.0075	Standard
G09	UA	845	Lithium, total	mg/L	03/04/2021 - 07/21/2021	CI around mean	0.00298	0.040	0.003	0.04	Standard
G09	UA	845	Mercury, total	mg/L	03/04/2021 - 07/21/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
G09	UA	845	Molybdenum, total	mg/L	03/04/2021 - 07/21/2021	All ND - Last	0.0015	0.10	0.0015	0.1	Standard
G09	UA	845	pH (field)	SU	03/04/2021 - 07/21/2021	CI around mean	6.0	6.0/9.0	6.0/6.8	6.5/9	Background/Standard
G09	UA	845	Radium-226 + Radium 228, tot	pCi/L	03/04/2021 - 07/21/2021	CI around geomean	0.20	5.0	1.7	5	Standard
G09	UA	845	Selenium, total	mg/L	03/04/2021 - 07/21/2021	CI around median	0.001	0.050	0.0042	0.05	Standard
G09	UA	845	Sulfate, total	mg/L	03/04/2021 - 07/21/2021	CI around median	272	400	39	400	Standard
G09	UA	845	Thallium, total	mg/L	03/04/2021 - 07/21/2021	All ND - Last	0.002	0.002	0.002	0.002	Standard
G09	UA	845	Total Dissolved Solids	mg/L	03/04/2021 - 07/21/2021	CB around linear reg	576	1200	334	1200	Standard
G09M	LAU	845	Antimony, total	mg/L	03/04/2021 - 07/21/2021	All ND - Last	0.001	0.006	0.001	0.006	Standard
G09M	LAU	845	Arsenic, total	mg/L	03/04/2021 - 07/21/2021	CI around mean	0.00321	0.010	0.0017	0.01	Standard
G09M	LAU	845	Barium, total	mg/L	03/04/2021 - 07/21/2021	CI around mean	0.29	2.0	0.25	2	Standard
G09M	LAU	845	Beryllium, total	mg/L	03/04/2021 - 07/21/2021	All ND - Last	0.001	0.004	0.0011	0.004	Standard
G09M	LAU	845	Boron, total	mg/L	03/04/2021 - 07/21/2021	CI around mean	0.014	2.0	0.053	2	Standard
G09M	LAU	845	Cadmium, total	mg/L	03/04/2021 - 07/21/2021	CI around median	0	0.005	0.001	0.005	Standard
G09M	LAU	845	Chloride, total	mg/L	03/04/2021 - 07/21/2021	CI around median	0	200	32	200	Standard
G09M	LAU	845	Chromium, total	mg/L	03/04/2021 - 07/21/2021	CI around mean	-0.00498	0.10	0.0039	0.1	Standard

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
JOPPA POWER PLANT
EAST ASH POND
JOPPA, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G09M	LAU	845	Cobalt, total	mg/L	03/04/2021 - 07/21/2021	CI around mean	0.000244	0.006	0.0015	0.006	Standard
G09M	LAU	845	Fluoride, total	mg/L	03/04/2021 - 07/21/2021	CI around mean	0.26	4.0	0.25	4	Standard
G09M	LAU	845	Lead, total	mg/L	03/04/2021 - 07/21/2021	CI around mean	-0.00138	0.0075	0.0015	0.0075	Standard
G09M	LAU	845	Lithium, total	mg/L	03/04/2021 - 07/21/2021	CI around mean	0.0049	0.040	0.003	0.04	Standard
G09M	LAU	845	Mercury, total	mg/L	03/04/2021 - 07/21/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
G09M	LAU	845	Molybdenum, total	mg/L	03/04/2021 - 07/21/2021	CI around mean	0.00359	0.10	0.0015	0.1	Standard
G09M	LAU	845	pH (field)	SU	03/04/2021 - 07/21/2021	CI around mean	6.7	6.0/9.0	6.0/6.8	6.5/9	Background/Standard
G09M	LAU	845	Radium-226 + Radium 228, tot	pCi/L	03/04/2021 - 07/21/2021	CI around mean	0.17	5.0	1.7	5	Standard
G09M	LAU	845	Selenium, total	mg/L	03/04/2021 - 07/21/2021	CI around median	0	0.050	0.0042	0.05	Standard
G09M	LAU	845	Sulfate, total	mg/L	03/04/2021 - 07/21/2021	CI around median	0	400	39	400	Standard
G09M	LAU	845	Thallium, total	mg/L	03/04/2021 - 07/21/2021	CI around median	0	0.002	0.002	0.002	Standard
G09M	LAU	845	Total Dissolved Solids	mg/L	03/04/2021 - 07/21/2021	CI around mean	239	1200	334	1200	Standard
G10	UA	845	Antimony, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.006	0.001	0.006	Standard
G10	UA	845	Arsenic, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	0.000915	0.010	0.0017	0.01	Standard
G10	UA	845	Barium, total	mg/L	03/04/2021 - 07/20/2021	CB around linear reg	0.031	2.0	0.25	2	Standard
G10	UA	845	Beryllium, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.004	0.0011	0.004	Standard
G10	UA	845	Boron, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	3.9	2.0	0.053	2	Standard
G10	UA	845	Cadmium, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
G10	UA	845	Chloride, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	25	200	32	200	Standard
G10	UA	845	Chromium, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	0.000925	0.10	0.0039	0.1	Standard
G10	UA	845	Cobalt, total	mg/L	03/04/2021 - 07/20/2021	CB around linear reg	0.002	0.006	0.0015	0.006	Standard
G10	UA	845	Fluoride, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	0.27	4.0	0.25	4	Standard
G10	UA	845	Lead, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.0075	0.0015	0.0075	Standard
G10	UA	845	Lithium, total	mg/L	03/04/2021 - 07/20/2021	CI around median	0.003	0.040	0.003	0.04	Standard

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
JOPPA POWER PLANT
EAST ASH POND
JOPPA, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G10	UA	845	Mercury, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
G10	UA	845	Molybdenum, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	0.00128	0.10	0.0015	0.1	Standard
G10	UA	845	pH (field)	SU	03/04/2021 - 07/20/2021	CI around mean	6.4	6.0/9.0	6.0/6.8	6.5/9	Background/Standard
G10	UA	845	Radium-226 + Radium 228, tot	pCi/L	03/04/2021 - 07/20/2021	CI around mean	0.45	5.0	1.7	5	Standard
G10	UA	845	Selenium, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.050	0.0042	0.05	Standard
G10	UA	845	Sulfate, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	372	400	39	400	Standard
G10	UA	845	Thallium, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.002	0.002	0.002	0.002	Standard
G10	UA	845	Total Dissolved Solids	mg/L	03/04/2021 - 07/20/2021	CI around mean	743	1200	334	1200	Standard
G11	UA	845	Antimony, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.006	0.001	0.006	Standard
G11	UA	845	Arsenic, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.010	0.0017	0.01	Standard
G11	UA	845	Barium, total	mg/L	03/04/2021 - 07/20/2021	CB around linear reg	0.0062	2.0	0.25	2	Standard
G11	UA	845	Beryllium, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.004	0.0011	0.004	Standard
G11	UA	845	Boron, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	0.26	2.0	0.053	2	Standard
G11	UA	845	Cadmium, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
G11	UA	845	Chloride, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	32	200	32	200	Standard
G11	UA	845	Chromium, total	mg/L	03/04/2021 - 07/20/2021	CI around median	0.001	0.10	0.0039	0.1	Standard
G11	UA	845	Cobalt, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	0.000633	0.006	0.0015	0.006	Standard
G11	UA	845	Fluoride, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	0.17	4.0	0.25	4	Standard
G11	UA	845	Lead, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.001	0.0075	0.0015	0.0075	Standard
G11	UA	845	Lithium, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	0.00319	0.040	0.003	0.04	Standard
G11	UA	845	Mercury, total	mg/L	03/04/2021 - 07/20/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
G11	UA	845	Molybdenum, total	mg/L	03/04/2021 - 07/20/2021	CI around median	0.001	0.10	0.0015	0.1	Standard
G11	UA	845	pH (field)	SU	03/04/2021 - 07/20/2021	CI around mean	5.8	6.0/9.0	6.0/6.8	6.5/9	Background/Standard
G11	UA	845	Radium-226 + Radium 228, tot	pCi/L	03/04/2021 - 07/20/2021	CI around mean	0.16	5.0	1.7	5	Standard

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
JOPPA POWER PLANT
EAST ASH POND
JOPPA, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G11	UA	845	Selenium, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	0.00407	0.050	0.0042	0.05	Standard
G11	UA	845	Sulfate, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	443	400	39	400	Standard
G11	UA	845	Thallium, total	mg/L	03/04/2021 - 07/20/2021	CI around median	0.001	0.002	0.002	0.002	Standard
G11	UA	845	Total Dissolved Solids	mg/L	03/04/2021 - 07/20/2021	CI around mean	824	1200	334	1200	Standard
G51D	UA	257	Antimony, total	mg/L	12/03/2015 - 03/24/2021	All ND - Last	0.001	0.006	0.001	0.006	Standard
G51D	UA	257	Arsenic, total	mg/L	12/03/2015 - 03/24/2021	All ND - Last	0.001	0.010	0.0026	0.01	Standard
G51D	UA	257	Barium, total	mg/L	12/03/2015 - 03/24/2021	CB around T-S line	-0.0404	2.0	0.30	2	Standard
G51D	UA	257	Beryllium, total	mg/L	12/03/2015 - 03/24/2021	All ND - Last	0.001	0.004	0.001	0.004	Standard
G51D	UA	257	Boron, total	mg/L	12/03/2015 - 03/24/2021	CB around linear reg	0.61	2.0	0.055	2	Standard
G51D	UA	257	Cadmium, total	mg/L	12/03/2015 - 03/24/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
G51D	UA	257	Chloride, total	mg/L	12/03/2015 - 03/24/2021	CB around linear reg	3.7	200	29	200	Standard
G51D	UA	257	Chromium, total	mg/L	12/03/2015 - 03/24/2021	CB around linear reg	0.00138	0.10	0.0093	0.1	Standard
G51D	UA	257	Cobalt, total	mg/L	12/03/2015 - 03/24/2021	CB around linear reg	-0.00924	0.037	0.037	0.006	Background
G51D	UA	257	Fluoride, total	mg/L	12/03/2015 - 03/24/2021	CI around median	0.10	4.0	0.29	4	Standard
G51D	UA	257	Lead, total	mg/L	12/03/2015 - 03/24/2021	All ND - Last	0.001	0.0075	0.0018	0.0075	Standard
G51D	UA	257	Lithium, total	mg/L	12/03/2015 - 03/24/2021	CB around linear reg	0.00563	0.040	0.0024	0.04	Standard
G51D	UA	257	Mercury, total	mg/L	12/03/2015 - 03/24/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
G51D	UA	257	Molybdenum, total	mg/L	12/03/2015 - 03/24/2021	All ND - Last	0.0015	0.10	0.0018	0.1	Standard
G51D	UA	257	pH (field)	SU	12/03/2015 - 03/24/2021	CI around mean	5.6	6.2/9.0	6.2/6.9	6.5/9	Background/Standard
G51D	UA	257	Radium-226 + Radium 228, tot	pCi/L	12/03/2015 - 03/24/2021	CI around mean	0.39	5.0	1.5	5	Standard
G51D	UA	257	Selenium, total	mg/L	12/03/2015 - 03/24/2021	CB around linear reg	0.00498	0.050	0.0039	0.05	Standard
G51D	UA	257	Sulfate, total	mg/L	12/03/2015 - 03/24/2021	CI around mean	121	400	203	400	Standard
G51D	UA	257	Thallium, total	mg/L	12/03/2015 - 03/24/2021	All ND - Last	0.002	0.002	0.001	0.002	Standard
G51D	UA	257	Total Dissolved Solids	mg/L	12/03/2015 - 03/24/2021	CI around mean	314	1200	541	1200	Standard

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
JOPPA POWER PLANT
EAST ASH POND
JOPPA, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G52D	UA	257	Antimony, total	mg/L	12/03/2015 - 03/25/2021	All ND - Last	0.001	0.006	0.001	0.006	Standard
G52D	UA	257	Arsenic, total	mg/L	12/03/2015 - 03/25/2021	CB around linear reg	-0.00145	0.010	0.0026	0.01	Standard
G52D	UA	257	Barium, total	mg/L	12/03/2015 - 03/25/2021	CB around T-S line	0.14	2.0	0.30	2	Standard
G52D	UA	257	Beryllium, total	mg/L	12/03/2015 - 03/25/2021	All ND - Last	0.001	0.004	0.001	0.004	Standard
G52D	UA	257	Boron, total	mg/L	12/03/2015 - 03/25/2021	All ND - Last	0.025	2.0	0.055	2	Standard
G52D	UA	257	Cadmium, total	mg/L	12/03/2015 - 03/25/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
G52D	UA	257	Chloride, total	mg/L	12/03/2015 - 03/25/2021	CB around linear reg	9.0	200	29	200	Standard
G52D	UA	257	Chromium, total	mg/L	12/03/2015 - 03/25/2021	All ND - Last	0.0015	0.10	0.0093	0.1	Standard
G52D	UA	257	Cobalt, total	mg/L	12/03/2015 - 03/25/2021	CI around mean	0.00276	0.037	0.037	0.006	Background
G52D	UA	257	Fluoride, total	mg/L	12/03/2015 - 03/25/2021	CI around mean	0.25	4.0	0.29	4	Standard
G52D	UA	257	Lead, total	mg/L	12/03/2015 - 03/25/2021	All ND - Last	0.001	0.0075	0.0018	0.0075	Standard
G52D	UA	257	Lithium, total	mg/L	12/03/2015 - 03/25/2021	CI around mean	0.00269	0.040	0.0024	0.04	Standard
G52D	UA	257	Mercury, total	mg/L	12/03/2015 - 03/25/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
G52D	UA	257	Molybdenum, total	mg/L	12/03/2015 - 03/25/2021	CI around mean	0.00108	0.10	0.0018	0.1	Standard
G52D	UA	257	pH (field)	SU	12/03/2015 - 03/25/2021	CI around mean	6.2	6.2/9.0	6.2/6.9	6.5/9	Background/Standard
G52D	UA	257	Radium-226 + Radium 228, tot	pCi/L	12/03/2015 - 03/25/2021	CI around mean	0.78	5.0	1.5	5	Standard
G52D	UA	257	Selenium, total	mg/L	12/03/2015 - 03/25/2021	All ND - Last	0.001	0.050	0.0039	0.05	Standard
G52D	UA	257	Sulfate, total	mg/L	12/03/2015 - 03/25/2021	CI around mean	82	400	203	400	Standard
G52D	UA	257	Thallium, total	mg/L	12/03/2015 - 03/25/2021	All ND - Last	0.002	0.002	0.001	0.002	Standard
G52D	UA	257	Total Dissolved Solids	mg/L	12/03/2015 - 03/25/2021	CI around mean	348	1200	541	1200	Standard
G53D	UA	257	Antimony, total	mg/L	12/03/2015 - 03/25/2021	All ND - Last	0.001	0.006	0.001	0.006	Standard
G53D	UA	257	Arsenic, total	mg/L	12/03/2015 - 03/25/2021	All ND - Last	0.001	0.010	0.0026	0.01	Standard
G53D	UA	257	Barium, total	mg/L	12/03/2015 - 03/25/2021	CB around linear reg	-0.00254	2.0	0.30	2	Standard
G53D	UA	257	Beryllium, total	mg/L	12/03/2015 - 03/25/2021	All ND - Last	0.001	0.004	0.001	0.004	Standard

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HISTORY OF POTENTIAL EXCEEDANCES
JOPPA POWER PLANT
EAST ASH POND
JOPPA, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G53D	UA	257	Boron, total	mg/L	12/03/2015 - 03/25/2021	CI around median	0.33	2.0	0.055	2	Standard
G53D	UA	257	Cadmium, total	mg/L	12/03/2015 - 03/25/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
G53D	UA	257	Chloride, total	mg/L	12/03/2015 - 03/25/2021	CI around median	17	200	29	200	Standard
G53D	UA	257	Chromium, total	mg/L	12/03/2015 - 03/25/2021	CI around median	0.001	0.10	0.0093	0.1	Standard
G53D	UA	257	Cobalt, total	mg/L	12/03/2015 - 03/25/2021	CI around geomean	0.00133	0.037	0.037	0.006	Background
G53D	UA	257	Fluoride, total	mg/L	12/03/2015 - 03/25/2021	CI around mean	0.62	4.0	0.29	4	Standard
G53D	UA	257	Lead, total	mg/L	12/03/2015 - 03/25/2021	All ND - Last	0.001	0.0075	0.0018	0.0075	Standard
G53D	UA	257	Lithium, total	mg/L	12/03/2015 - 03/25/2021	CI around geomean	0.0017	0.040	0.0024	0.04	Standard
G53D	UA	257	Mercury, total	mg/L	12/03/2015 - 03/25/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
G53D	UA	257	Molybdenum, total	mg/L	12/03/2015 - 03/25/2021	CI around median	0.001	0.10	0.0018	0.1	Standard
G53D	UA	257	pH (field)	SU	12/03/2015 - 03/25/2021	CI around mean	6.5	6.2/9.0	6.2/6.9	6.5/9	Background/Standard
G53D	UA	257	Radium-226 + Radium 228, tot	pCi/L	12/03/2015 - 03/25/2021	CI around mean	0.26	5.0	1.5	5	Standard
G53D	UA	257	Selenium, total	mg/L	12/03/2015 - 03/25/2021	All ND - Last	0.001	0.050	0.0039	0.05	Standard
G53D	UA	257	Sulfate, total	mg/L	12/03/2015 - 03/25/2021	CB around T-S line	38	400	203	400	Standard
G53D	UA	257	Thallium, total	mg/L	12/03/2015 - 03/25/2021	All ND - Last	0.002	0.002	0.001	0.002	Standard
G53D	UA	257	Total Dissolved Solids	mg/L	12/03/2015 - 03/25/2021	CI around mean	318	1200	541	1200	Standard
G54S	UCU	845	Antimony, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.001	0.006	0.001	0.006	Standard
G54S	UCU	845	Arsenic, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.001	0.010	0.0017	0.01	Standard
G54S	UCU	845	Barium, total	mg/L	03/03/2021 - 07/20/2021	CI around mean	0.037	2.0	0.25	2	Standard
G54S	UCU	845	Beryllium, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.001	0.004	0.0011	0.004	Standard
G54S	UCU	845	Boron, total	mg/L	03/03/2021 - 07/20/2021	CI around mean	0.015	2.0	0.053	2	Standard
G54S	UCU	845	Cadmium, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
G54S	UCU	845	Chloride, total	mg/L	03/03/2021 - 07/20/2021	CI around mean	28	200	32	200	Standard
G54S	UCU	845	Chromium, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.0015	0.10	0.0039	0.1	Standard

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
JOPPA POWER PLANT
EAST ASH POND
JOPPA, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G54S	UCU	845	Cobalt, total	mg/L	03/03/2021 - 07/20/2021	Most recent sample	0.001	0.006	0.0015	0.006	Standard
G54S	UCU	845	Fluoride, total	mg/L	03/03/2021 - 07/20/2021	CI around mean	0.25	4.0	0.25	4	Standard
G54S	UCU	845	Lead, total	mg/L	03/03/2021 - 07/20/2021	CI around median	0	0.0075	0.0015	0.0075	Standard
G54S	UCU	845	Lithium, total	mg/L	03/03/2021 - 07/20/2021	CI around median	0	0.040	0.003	0.04	Standard
G54S	UCU	845	Mercury, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
G54S	UCU	845	Molybdenum, total	mg/L	03/03/2021 - 07/20/2021	CI around mean	0.00242	0.10	0.0015	0.1	Standard
G54S	UCU	845	pH (field)	SU	03/03/2021 - 07/20/2021	CI around mean	6.2	6.0/9.0	6.0/6.8	6.5/9	Background/Standard
G54S	UCU	845	Radium-226 + Radium 228, tot	pCi/L	03/03/2021 - 07/20/2021	CI around mean	-0.211	5.0	1.7	5	Standard
G54S	UCU	845	Selenium, total	mg/L	03/03/2021 - 07/20/2021	CI around mean	0.018	0.050	0.0042	0.05	Standard
G54S	UCU	845	Sulfate, total	mg/L	03/03/2021 - 07/20/2021	CI around mean	-10.2	400	39	400	Standard
G54S	UCU	845	Thallium, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.002	0.002	0.002	0.002	Standard
G54S	UCU	845	Total Dissolved Solids	mg/L	03/03/2021 - 07/20/2021	CI around mean	263	1200	334	1200	Standard
G54D	UA	257	Antimony, total	mg/L	12/03/2015 - 03/24/2021	All ND - Last	0.001	0.006	0.001	0.006	Standard
G54D	UA	257	Arsenic, total	mg/L	12/03/2015 - 03/24/2021	CB around linear reg	-0.000224	0.010	0.0026	0.01	Standard
G54D	UA	257	Barium, total	mg/L	12/03/2015 - 03/24/2021	CI around mean	0.11	2.0	0.30	2	Standard
G54D	UA	257	Beryllium, total	mg/L	12/03/2015 - 03/24/2021	All ND - Last	0.001	0.004	0.001	0.004	Standard
G54D	UA	257	Boron, total	mg/L	12/03/2015 - 03/24/2021	CI around mean	0.54	2.0	0.055	2	Standard
G54D	UA	257	Cadmium, total	mg/L	12/03/2015 - 03/24/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
G54D	UA	257	Chloride, total	mg/L	12/03/2015 - 03/24/2021	CB around linear reg	14	200	29	200	Standard
G54D	UA	257	Chromium, total	mg/L	12/03/2015 - 03/24/2021	CI around mean	0.00122	0.10	0.0093	0.1	Standard
G54D	UA	257	Cobalt, total	mg/L	12/03/2015 - 03/24/2021	CB around linear reg	0.00344	0.037	0.037	0.006	Background
G54D	UA	257	Fluoride, total	mg/L	12/03/2015 - 03/24/2021	CI around mean	0.32	4.0	0.29	4	Standard
G54D	UA	257	Lead, total	mg/L	12/03/2015 - 03/24/2021	All ND - Last	0.001	0.0075	0.0018	0.0075	Standard
G54D	UA	257	Lithium, total	mg/L	12/03/2015 - 03/24/2021	CB around linear reg	0.00187	0.040	0.0024	0.04	Standard

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
JOPPA POWER PLANT
EAST ASH POND
JOPPA, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G54D	UA	257	Mercury, total	mg/L	12/03/2015 - 03/24/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
G54D	UA	257	Molybdenum, total	mg/L	12/03/2015 - 03/24/2021	CB around linear reg	0.00135	0.10	0.0018	0.1	Standard
G54D	UA	257	pH (field)	SU	12/03/2015 - 03/24/2021	CI around mean	6.6	6.2/9.0	6.2/6.9	6.5/9	Background/Standard
G54D	UA	257	Radium-226 + Radium 228, tot	pCi/L	12/03/2015 - 03/24/2021	CI around mean	0.51	5.0	1.5	5	Standard
G54D	UA	257	Selenium, total	mg/L	12/03/2015 - 03/24/2021	All ND - Last	0.001	0.050	0.0039	0.05	Standard
G54D	UA	257	Sulfate, total	mg/L	12/03/2015 - 03/24/2021	CI around mean	145	400	203	400	Standard
G54D	UA	257	Thallium, total	mg/L	12/03/2015 - 03/24/2021	All ND - Last	0.002	0.002	0.001	0.002	Standard
G54D	UA	257	Total Dissolved Solids	mg/L	12/03/2015 - 03/24/2021	CI around mean	483	1200	541	1200	Standard
G151	UCU	845	Antimony, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.001	0.006	0.001	0.006	Standard
G151	UCU	845	Arsenic, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.001	0.010	0.0017	0.01	Standard
G151	UCU	845	Barium, total	mg/L	03/03/2021 - 07/20/2021	CI around median	0	2.0	0.25	2	Standard
G151	UCU	845	Beryllium, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.001	0.004	0.0011	0.004	Standard
G151	UCU	845	Boron, total	mg/L	03/03/2021 - 07/20/2021	CI around mean	0.088	2.0	0.053	2	Standard
G151	UCU	845	Cadmium, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
G151	UCU	845	Chloride, total	mg/L	03/03/2021 - 07/20/2021	CI around median	0	200	32	200	Standard
G151	UCU	845	Chromium, total	mg/L	03/03/2021 - 07/20/2021	CI around mean	0.000532	0.10	0.0039	0.1	Standard
G151	UCU	845	Cobalt, total	mg/L	03/03/2021 - 07/20/2021	CI around median	0	0.006	0.0015	0.006	Standard
G151	UCU	845	Fluoride, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.10	4.0	0.25	4	Standard
G151	UCU	845	Lead, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.001	0.0075	0.0015	0.0075	Standard
G151	UCU	845	Lithium, total	mg/L	03/03/2021 - 07/20/2021	CI around mean	0.00476	0.040	0.003	0.04	Standard
G151	UCU	845	Mercury, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
G151	UCU	845	Molybdenum, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.0015	0.10	0.0015	0.1	Standard
G151	UCU	845	pH (field)	SU	03/03/2021 - 07/20/2021	CI around mean	5.4	6.0/9.0	6.0/6.8	6.5/9	Background/Standard
G151	UCU	845	Radium-226 + Radium 228, tot	pCi/L	03/03/2021 - 07/20/2021	CI around mean	-0.378	5.0	1.7	5	Standard

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
JOPPA POWER PLANT
EAST ASH POND
JOPPA, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G151	UCU	845	Selenium, total	mg/L	03/03/2021 - 07/20/2021	CI around mean	0.00217	0.050	0.0042	0.05	Standard
G151	UCU	845	Sulfate, total	mg/L	03/03/2021 - 07/20/2021	CI around mean	97	400	39	400	Standard
G151	UCU	845	Thallium, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.002	0.002	0.002	0.002	Standard
G151	UCU	845	Total Dissolved Solids	mg/L	03/03/2021 - 07/20/2021	CI around mean	254	1200	334	1200	Standard
G152B	UCU	845	Antimony, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.001	0.006	0.001	0.006	Standard
G152B	UCU	845	Arsenic, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.001	0.010	0.0017	0.01	Standard
G152B	UCU	845	Barium, total	mg/L	03/03/2021 - 07/20/2021	CI around mean	0.54	2.0	0.25	2	Standard
G152B	UCU	845	Beryllium, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.001	0.004	0.0011	0.004	Standard
G152B	UCU	845	Boron, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.025	2.0	0.053	2	Standard
G152B	UCU	845	Cadmium, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
G152B	UCU	845	Chloride, total	mg/L	03/03/2021 - 07/20/2021	CI around mean	42	200	32	200	Standard
G152B	UCU	845	Chromium, total	mg/L	03/03/2021 - 07/20/2021	CI around mean	0.00213	0.10	0.0039	0.1	Standard
G152B	UCU	845	Cobalt, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.001	0.006	0.0015	0.006	Standard
G152B	UCU	845	Fluoride, total	mg/L	03/03/2021 - 07/20/2021	CI around mean	0.46	4.0	0.25	4	Standard
G152B	UCU	845	Lead, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.001	0.0075	0.0015	0.0075	Standard
G152B	UCU	845	Lithium, total	mg/L	03/03/2021 - 07/20/2021	CI around mean	0.00426	0.040	0.003	0.04	Standard
G152B	UCU	845	Mercury, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
G152B	UCU	845	Molybdenum, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.0015	0.10	0.0015	0.1	Standard
G152B	UCU	845	pH (field)	SU	03/03/2021 - 07/20/2021	CI around mean	6.4	6.0/9.0	6.0/6.8	6.5/9	Background/Standard
G152B	UCU	845	Radium-226 + Radium 228, tot	pCi/L	03/03/2021 - 07/20/2021	CI around mean	-0.0622	5.0	1.7	5	Standard
G152B	UCU	845	Selenium, total	mg/L	03/03/2021 - 07/20/2021	CI around mean	0.00424	0.050	0.0042	0.05	Standard
G152B	UCU	845	Sulfate, total	mg/L	03/03/2021 - 07/20/2021	CI around mean	12	400	39	400	Standard
G152B	UCU	845	Thallium, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.002	0.002	0.002	0.002	Standard
G152B	UCU	845	Total Dissolved Solids	mg/L	03/03/2021 - 07/20/2021	CI around mean	404	1200	334	1200	Standard

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
JOPPA POWER PLANT
EAST ASH POND
JOPPA, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G153	UCU	845	Antimony, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.001	0.006	0.001	0.006	Standard
G153	UCU	845	Arsenic, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.001	0.010	0.0017	0.01	Standard
G153	UCU	845	Barium, total	mg/L	03/03/2021 - 07/20/2021	CI around mean	0.16	2.0	0.25	2	Standard
G153	UCU	845	Beryllium, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.001	0.004	0.0011	0.004	Standard
G153	UCU	845	Boron, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.025	2.0	0.053	2	Standard
G153	UCU	845	Cadmium, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.001	0.005	0.001	0.005	Standard
G153	UCU	845	Chloride, total	mg/L	03/03/2021 - 07/20/2021	CI around mean	22	200	32	200	Standard
G153	UCU	845	Chromium, total	mg/L	03/03/2021 - 07/20/2021	CI around median	0	0.10	0.0039	0.1	Standard
G153	UCU	845	Cobalt, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.001	0.006	0.0015	0.006	Standard
G153	UCU	845	Fluoride, total	mg/L	03/03/2021 - 07/20/2021	CI around mean	0.85	4.0	0.25	4	Standard
G153	UCU	845	Lead, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.001	0.0075	0.0015	0.0075	Standard
G153	UCU	845	Lithium, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.003	0.040	0.003	0.04	Standard
G153	UCU	845	Mercury, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.0002	0.002	0.0002	0.002	Standard
G153	UCU	845	Molybdenum, total	mg/L	03/03/2021 - 07/20/2021	CI around mean	0.00186	0.10	0.0015	0.1	Standard
G153	UCU	845	pH (field)	SU	03/03/2021 - 07/20/2021	CI around mean	6.5	6.0/9.0	6.0/6.8	6.5/9	Background/Standard
G153	UCU	845	Radium-226 + Radium 228, tot	pCi/L	03/03/2021 - 07/20/2021	CI around mean	-0.315	5.0	1.7	5	Standard
G153	UCU	845	Selenium, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.001	0.050	0.0042	0.05	Standard
G153	UCU	845	Sulfate, total	mg/L	03/03/2021 - 07/20/2021	CI around mean	66	400	39	400	Standard
G153	UCU	845	Thallium, total	mg/L	03/03/2021 - 07/20/2021	All ND - Last	0.002	0.002	0.002	0.002	Standard
G153	UCU	845	Total Dissolved Solids	mg/L	03/03/2021 - 07/20/2021	CI around mean	315	1200	334	1200	Standard

TABLE 1. DETERMINATION OF POTENTIAL EXCEEDANCES
HISTORY OF POTENTIAL EXCEEDANCES
JOPPA POWER PLANT
EAST ASH POND
JOPPA, ILLINOIS

Notes:
Potential exceedance of GWPS
HSU = hydrostratigraphic unit:
  LAU = Lower Aquifer Unit
  UA = Uppermost Aquifer
  UCU = Upper Confining Unit
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
  CB around T-S line = Confidence band around Thiel-Sen line
  CI around geomean = Confidence interval around the geometric mean
  CI around mean = Confidence interval around the mean
  CI around median = Confidence interval around the median
  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
JOPPA POWER PLANT
EAST ASH POND
JOPPA, ILLINOIS

Sample Location	HSU	Program	Constituent	Result Unit	Sample Date Range	Statistical Calculation	Statistical Result	GWPS	Background	Part 845 Standard	GWPS Source
G06	UA	845	Boron, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	3.0	2.0	0.053	2	Standard
G06S	UA	845	pH (field)	SU	03/04/2021 - 07/20/2021	CI around mean	5.5	6.0/9.0	6.0/6.8	6.5/9	Background/Standard
G07	UA	845	Boron, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	4.2	2.0	0.053	2	Standard
G07	UA	845	pH (field)	SU	03/04/2021 - 07/20/2021	CB around linear reg	5.9	6.0/9.0	6.0/6.8	6.5/9	Background/Standard
G08	UA	845	Boron, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	3.9	2.0	0.053	2	Standard
G10	UA	845	Boron, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	3.9	2.0	0.053	2	Standard
G11	UA	845	pH (field)	SU	03/04/2021 - 07/20/2021	CI around mean	5.8	6.0/9.0	6.0/6.8	6.5/9	Background/Standard
G11	UA	845	Sulfate, total	mg/L	03/04/2021 - 07/20/2021	CI around mean	443	400	39	400	Standard
G51D	UA	257	pH (field)	SU	12/03/2015 - 03/24/2021	CI around mean	5.6	6.2/9.0	6.2/6.9	6.5/9	Background/Standard
G151	UCU	845	pH (field)	SU	03/03/2021 - 07/20/2021	CI around mean	5.4	6.0/9.0	6.0/6.8	6.5/9	Background/Standard

Notes:
HSU = hydrostratigraphic unit:
  UA = Uppermost Aquifer
  UCU = Upper Confining Unit
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:
  CB around linear reg = Confidence band around linear regression
  CI around mean = Confidence interval around the mean
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)