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Interstate Power and Light Company

Ottumwa Generation Station

CCR Surface Impoundment Annual Inspection Report

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Executive Summary

This annual inspection report has been prepared in accordance with the requirements of the United States Environmental Protection Agency published Final Rule for Hazardous and Solid Waste Management System - Disposal of Coal Combustion Residual (CCR) from Electric Utilities (40 CFR Parts 257 and 261, also known as CCR Rule) and Extension of Compliance Deadlines for Certain Inactive Surface Impoundments.

This annual inspection report has been prepared to assess the condition of existing and inactive CCR surface impoundments. Primarily, the annual inspection report is focused on the structural stability of the CCR surface impoundments and to ensure that the operation and maintenance of the CCR surface impoundments is in accordance with recognized and generally accepted good engineering standards.

After conducting the annual inspection, as well as review of available information pertaining to the status and condition of the existing CCR surface impoundments, discussions with facility personnel who oversee and maintain the operation, maintenance, and inspection activities of the existing CCR surface impoundments, there are no operating deficiencies and there have been no changes that have affected the stability or operation of the CCR surface impoundments since the previous annual inspection other than the activities associated with removing all CCR from the OGS Zero Liquid Discharge Pond and ceasing all placement of non-CCR wastes in the OGS Ash Pond.

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1. INTRODUCTION

This annual inspection report has been prepared in accordance with the requirements of §257.83(b) and §257.100(a) of the United States Environmental Protection Agency (USEPA) published Final Rule for Hazardous and Solid Waste Management System – Disposal of Coal Combustion Residual (CCR), herein referenced as the CCR Rule.

1.1 CCR Rule Applicability

The CCR Rule requires annual inspections by a qualified professional engineer (PE) for both existing and inactive CCR surface impoundments with a height of 5 feet or more and a storage volume of 20 acre-feet or more or the CCR surface impoundment has a height of 20 feet or more (40 CFR §§ 257.73(b), 257.73(d), 257.83(b) and 257.100(a)).

1.2 Annual Inspection Applicability

The Interstate Power and Light Company (IPL), Ottumwa Generating Station (OGS) in Ottumwa, Iowa has two CCR surface impoundments, one existing and one inactive, that meet the requirements of Section 1.1. The existing CCR surface impoundment is identified as the OGS Ash Pond, and the inactive CCR surface impoundment is identified as the OGS Zero Liquid Discharge (ZLD) Pond. The CCR surface impoundments have been assigned a state identification number by the Iowa Department of Natural Resources (IDNR), which is 90-UDP-01-15.

As of September 2020, the OGS Ash Pond no longer received CCR or sluice water from the facility. As of May 2022, the OGS Ash Pond no longer received any process water from on or off site. Currently, the impoundment only receives

stormwater. OGS Ash Pond dewatering started in April 2022 and is scheduled to close by the end of 2022.

In 2021, the OGS Low Volume Wastewater Treatment (LVWT) Pond was constructed within the footprint of the former OGS ZLD Pond. This closure work included the removal of all CCR materials from the impoundment and the rerouting of the Solids Contact Unit blowdown, stormwater runoff and facility floor drains into the impoundment. The interior slopes of the impoundment were enhanced with rip-rap materials, while the external slopes remained unchanged. The overall height of the embankment has not changed. The new discharge weir box directs effluent water through Outfall 007 where it combines with other facility process water and is discharged into the Des Moines River through Outfall 008. Because the OGS ZLD Pond is not officially closed, this Report assesses the embankment and continues to discuss the impoundment as the OGS ZLD Pond.

The annual inspection of the CCR surface impoundments at OGS was completed by a qualified PE on May 17, 2022. The annual inspection was completed to ensure that the design, construction, operation, and maintenance of the CCR surface impoundments at OGS are consistent with recognized and generally accepted good engineering standards.

The annual inspection of the CCR surface impoundments at OGS included a review of available information regarding the status and condition of the CCR surface impoundments. The information reviewed included all relevant files available in the operating record at the time of the annual inspection, as well as the Alliant Energy CCR Rule Compliance Data and Information website entries for OGS (ccr.alliantenergy.com). These files for the CCR surface impoundments

at OGS included, but is not limited to, CCR surface impoundment design and construction information (history of construction), hazard potential classification, structural stability assessment, safety factor assessment, hydrologic and hydraulic capacities (inflow flood control plan), results of 7-day inspections and instrumentation monitoring by a qualified person, and results of previous annual inspections.

This annual inspection also included a visual inspection of the CCR surface impoundments to identify signs of distress or malfunction of the CCR surface impoundments and appurtenant structures. Additionally, the visual inspection included hydraulic structures underlying the base of the CCR surface impoundments or passing through the dikes of the CCR surface impoundments for structural integrity and continued safe and reliable operation.

2. ANNUAL INSPECTION REPORTING CRITERIA

The following sub-sections address the annual inspection reporting criteria per §257.83(b)(2) and §257.100(a) of the CCR Rule for the CCR surface impoundments located at OGS.

2.1 OGS Ash Pond (Existing CCR Surface Impoundment)

2.1.1 Changes in Geometry (§257.83(b)(2)(i))

After conducting the annual inspection, as well as review of available information provided by OGS pertaining to the status and condition of the existing CCR surface impoundment, and discussions with OGS facility personnel who oversee and maintain the operation, maintenance, and inspection activities of the existing CCR surface impoundment, there have been no identified changes in the geometry since the previous annual inspection, other than the addition of CCR from the closure process of the OGS ZLD Pond. CCR was placed in the out-of-water portions of the impoundment. Within the softer areas of the impoundment geotextile and geogrid was placed to provide stability of the placement of CCR. Based on visual observations the additional material thickness was approximately 6 to 8 feet.

2.1.2 Existing Instrumentation (§257.83(b)(2)(ii))

Instrumentation that supports the operation of the OGS Ash Pond includes the following:

- *Parshall flume discharge structure and equipment to measure the flow of the discharged water through the NPDES Outfall 001. The instrumentation is in the northeast corner of the OGS Ash Pond within the Polishing Pond area of the CCR surface impoundment.*

The flow data associated with the NPDES Outfall 001 discharge (i.e. maximum daily flow), since the previous annual inspection, was provided by IPL from May 1, 2021 through April 30, 2022. Reviewing the provided flow data, the maximum daily flow recorded through NPDES Outfall 001 was 7.9 million gallons (October 16, 2021).

- *Staff gauge to monitor the water elevation of the CCR surface impoundment.* The staff gauge is located on the northwest corner of the OGS Ash Pond. The staff gauge measurements were collected by IPL staff at the same time as the 7-day inspections. The water elevation data included measurements collected between May 5, 2021 through April 27, 2022. After review of the provided staff gauge water elevation data, the maximum water elevation recorded within the OGS Ash Pond was 676.98 feet (February 23, 2022) (Note: Elevations in feet above mean sea level).

2.1.3 Depth and Elevation of Impounded CCR and Water (§257.83(b)(2)(iii))

The approximate minimum, maximum, and present depths and elevations of the impounded CCR and water in the OGS Ash Pond since the previous annual inspection were determined using information that was collected during the annual inspection, as well as from historical information provided from IPL.

At the time of the annual inspection, a survey was completed to determine the present surface water elevation of the CCR surface impoundment. Depth measurements from the water surface to the top of CCR/sediment were obtained to determine present depths/elevations.

The historical information provided from IPL included staff gauge water elevation data since the previous annual inspection, a drawing of the original

site grading plan contours prepared by Black & Veatch (1976) which show the original contours prior to the construction of the OGS Ash Pond, as well as the most recent topographic/bathymetric survey of the OGS Ash Pond completed by French-Reneker-Associates (2016). Reviewing the information provided within the above-mentioned documents, as well as the data collected during the annual inspection, the following minimum, maximum, and present depths and elevations were approximated for the impounded CCR and water:

- OGS Ash Pond – Large Open Area of Impounded Water
 - At the time of the annual inspection, the water surface elevation of the large open area of impounded water within the CCR surface impoundment was observed to have an elevation of 670.6 feet. The water surface at the time of the annual inspection was approximately 11.4 feet below the crest of the east embankment of the CCR surface impoundment, which had an elevation of approximately 682 feet at the lowest point of the embankment. Dewatering activities of the OGS Main Ash Pond were initiated in early April 2022.
 - At the time of the annual inspection, the water depths that were measured within the large open area of impounded water varied between 0.0 feet in the southwest portion of the CCR surface impoundment to 2.8 feet in the eastern portion of the CCR surface impoundment adjacent to the Polishing Pond area. Many of the previous monitoring points which were below water are now above the water level because of the dewatering activities.

- From the water depth measurements at the time of the annual inspection, the elevation of the top of CCR/sediment that was measured within the large open area of impounded water within the CCR surface impoundment varied between an elevation of 669.9 feet in the southwest portion of the CCR surface impoundment to an elevation of 668.6 feet in the eastern portion of the CCR surface impoundment.
- From staff gauge water elevation data provided by IPL since the previous annual inspection, the minimum water elevation within the OGS Ash Pond was recorded to be 675.3 feet (September 22, 2021). The maximum water elevation within the large open area of the OGS Ash Pond was recorded to be 677.0 feet (February 23, 2022).
- From the 1976 drawing of the original site grading plan contours, the original bottom contour elevations varied from west to east within the existing area of impounded water within the CCR surface impoundment. The depth of the OGS Ash Pond varied between an elevation of 675 feet near the western portion of the CCR surface impoundment to an elevation of 665 feet in the eastern portion of the CCR surface impoundment adjacent to the Polishing Pond area. Comparing the results from the water depth measurements at the time of the annual inspection to the 1976 original site grading plan bottom contour elevations, the deposition thickness ranged from 0.1 feet in the western portion of the CCR surface impoundment to 9.0 feet in the eastern portion of the CCR surface impoundment.

- OGS Ash Pond – Polishing Pond Area
 - At the time of the annual inspection, the water surface elevation of the Polishing Pond area of the CCR surface impoundment was surveyed to be 672.17 feet, approximately 8.8 feet below the crest of the east embankment of the CCR surface impoundment (681 feet).
 - At the time of the annual inspection, the water depth that was measured within the Polishing Pond area of the CCR surface impoundment varied between 2.6 feet and 3.3 feet.
 - From the water depth measurements at the time of the annual inspection, the elevation of the top of CCR/sediment that was measured within the Polishing Pond area of the CCR surface impoundment varied between an elevation of 668.9 feet to an elevation of 669.6 feet.
 - From the 1976 drawing of the original site grading plan contours, the bottom contour elevation within the Polishing Pond area was approximately 658 feet. Comparing the results from the water depth measurements at the time of the annual inspection to the 1976 original site grading plan bottom contour elevations, the deposition thickness in the Polishing Pond area was approximately 11.2 feet.
- OGS Ash Pond – Out of Water Area
 - Of the approximately 39 acres that makes up the surface area of the OGS Ash Pond, approximately 30.1 acres consists of CCR/sediment above the normal impounded water elevation. The out of water area is generally located in the southwestern,

western, and northwestern portions of the CCR surface impoundment. At the time of the annual inspection an increase of 5.8 acres of CCR/sediment was located outside the footprint of impounded water due to the dewatering activities, which increased the out of water area to approximately 35.9 acres. From the 1976 drawing of the original site grading plan contours, the average bottom contour elevation within the western portion of the CCR surface impoundment was approximately 673 feet.

- o From both the 2016 topographic/bathymetric survey of the OGS Ash Pond and the survey of the water surface elevation at the time of the annual inspection, the elevation of the top of CCR/sediment varied between 677 feet near the large open area of impounded water and 705 feet in the northwest portion of the OGS Ash Pond in the CCR operational area. Comparing the 2016 topographic/bathymetric survey top of CCR/sediment elevations, as well as the survey of the water surface elevation at the time of the annual inspection, to the 1976 drawing of the original site grading plan contour elevations, the deposition thickness of the OGS Ash Pond in the areas that did not consist of impounded water at the time of the annual inspection varied between 2 feet and 30 feet.

2.1.4 Storage Capacity of Impounding Structure (§257.83(b)(2)(iv))

The storage capacity (i.e. water volume) of the CCR surface impoundment at the time of the annual inspection was calculated based on the estimated acreage of the CCR surface impoundment in the open area where water was

present, and the approximate depth of water within that area of the CCR surface impoundment. The water depth measurements of the CCR surface impoundment were collected at the time of the annual inspection.

From both the 2016 topographic/bathymetric survey of the OGS Ash Pond and the survey of the water surface elevation at the time of the annual inspection, the area of the water surface of the CCR surface impoundment was approximately 3.0 acres. From the water depth data that was collected during the annual inspection, the average water depth within the CCR surface impoundment was approximately 2.3 feet. Thus, the storage capacity within the OGS Ash Pond at the time of the annual inspection was approximately 11,200 cubic yards.

2.1.5 Volume of Impounded CCR and Water (§257.83(b)(2)(v))

The volume of impounded CCR and water (i.e. total volume) within the OGS Ash Pond at the time of the annual inspection was determined using information that was collected during the annual inspection, as well as from historical information that was previously provided from IPL. Historical information provided from IPL included a drawing of the original site grading plan contours prepared by Black & Veatch (1976), as well as the most recent topographic/bathymetric survey of the OGS Ash Pond completed by French-Reneker-Associates (2016).

The water surface elevation of the open area of impounded water within the CCR surface impoundment that was surveyed at the time of the annual inspection was 670.6 feet. From the 2016 topographic/bathymetric survey of the OGS Ash Pond, the average elevation of the top of CCR/sediment outside the footprint of the water surface, which includes the bottom ash pile, was

estimated to be approximately 681 feet. From the 1976 drawing of the original site grading plan contours, the bottom contour elevation that was present prior to the construction of the OGS Ash Pond was approximately 662 feet in the large open area of impounded water and 673 feet in the area outside the footprint of the water surface.

The surface area of the OGS Ash Pond, in the area where water was present, was approximately 3.0 acres. Thus, the volume of impounded CCR and water within the OGS Ash Pond, within the area where water was present, was approximately 54,900 cubic yards. The surface area of the OGS Ash Pond, in the area located outside of the footprint of the water portion, which includes the bottom ash pile, was approximately 35.9 acres. Thus, the volume of impounded CCR within the OGS Ash Pond, in the area located outside of the footprint of the water portion, was approximately 463,900 cubic yards. Approximately 194,700 cubic yards of CCR from the OGS ZLD Pond was transported to the OGS Main Ash Pond during closure of the ZLD Pond. The total volume of impounded CCR and water within the OGS Ash Pond at the time of the annual inspection was approximately 713,500 cubic yards.

2.1.6 Structural Weaknesses and Disruptive Conditions (§257.83(b)(2)(vi))

After review of available information provided by OGS pertaining to the status and condition of the existing CCR surface impoundment, discussions with OGS facility personnel who oversee and maintain the operation, maintenance, and inspection activities of the existing CCR surface impoundment, as well as conducting the on-site visual inspection of the existing CCR surface impoundment, there have been no identified appearances of an actual or potential structural weakness of the existing CCR surface impoundment.

Additionally, there were no identified issues with the structural integrity of the hydraulic structures (NPDES Outfall 001) associated with the OGS Ash Pond.

Regarding the existing conditions of the OGS Ash Pond, there were no existing conditions identified along the upstream and downstream slopes of the embankments that were disrupting or have the potential to disrupt the operation and safety of the existing CCR surface impoundment. At the time of the annual inspection, the upstream and downstream slopes of the embankments of the CCR surface impoundment were well maintained.

2.1.7 Other Changes Affecting Stability or Operation of Impounding Structure (§257.83(b)(2)(vii))

After review of available information provided by OGS pertaining to the status and condition of the existing CCR surface impoundment, as well as discussions with OGS facility personnel who oversee and maintain the operation, maintenance, and inspection activities of the existing CCR surface impoundment, there have been no other identified changes that have affected the stability or operation of the OGS Ash Pond since the previous annual inspection, other than the addition of the CCR from the ZLD Pond and initiating the dewatering of the OGS Ash Pond.

2.2 OGS Zero Liquid Discharge Pond (Inactive surface impoundment)

2.2.1 Changes in Geometry (§257.83(b)(2)(i) and §257.100(a))

After conducting the annual inspection, as well as review of available information provided by OGS pertaining to the status and condition of the inactive surface impoundment, and discussions with OGS facility personnel who oversee and maintain the operation, maintenance, and inspection activities of the inactive surface impoundment, the OGS ZLD Pond has been excavated and

replaced with a new lined pond. The embankment height, internal and external slopes and overall area have not significantly changed.

2.2.2 Existing Instrumentation (§257.83(b)(2)(ii) and §257.100(a))

Instrumentation that supports the operation of the OGS ZLD Pond has been removed during the closure process. After review of the provided staff gauge water elevation data, the maximum water elevation recorded within the OGS ZLD Pond was 673.31 feet (May 12, 2021) (Note: Elevations in feet above mean sea level). In the middle of May 2021 dewatering was initiated for the closure of the OGS ZLD Pond. After the end of May 2021 there were no recordable water level measurements due to the dewatering and closure activities.

2.2.3 Depth and Elevation of Impounded CCR and Water (§257.83(b)(2)(iii) and §257.100(a))

The approximate minimum, maximum, and present depths and elevations of the impounded CCR and water in the former OGS ZLD Pond since the previous annual inspection were not determined as the impoundment has been excavated and replaced with a new lined low-volume waste water treatment pond (LVWTP).

2.2.4 Storage Capacity of Impounding Structure (§257.83(b)(2)(iv) and §257.100(a))

The storage capacity (i.e. water volume) of the CCR surface impoundment at the time of the annual inspection was not determined as the impoundment has been excavated and replaced with a new lined LVWTP.

2.2.5 Volume of Impounded CCR and Water (§257.83(b)(2)(v) and §257.100(a))

The volume of impounded CCR and water (i.e. total volume) within the OGS ZLD Pond at the time of the annual inspection was not determined as the impoundment has been excavated and replaced with a new lined LVWTP.

2.2.6 Structural Weaknesses and Disruptive Conditions (§257.83(b)(2)(vi) and §257.100(a))

After review of available information provided by OGS pertaining to the status and condition of the inactive surface impoundment, discussions with OGS facility personnel who oversee and maintain the operation, maintenance, and inspection activities of the inactive, surface impoundment, as well as conducting the on-site visual inspection of the inactive surface impoundment, there have been no identified appearances of an actual or potential structural weakness of the inactive surface impoundment.

Regarding the existing conditions of the OGS ZLD Pond, there were no existing conditions identified along the upstream and downstream slopes of the embankments that were disrupting or have the potential to disrupt the operation and safety of the inactive surface impoundment. At the time of the annual inspection, the upstream and downstream slopes of the embankments of the CCR surface impoundment were well maintained.


2.2.7 Other Changes Affecting Stability or Operation of Impounding Structure (§257.83(b)(2)(vii) and §257.100(a))

After review of available information provided by OGS pertaining to the status and condition of the inactive surface impoundment, as well as discussions with OGS facility personnel who oversee and maintain the operation, maintenance, and inspection activities of the inactive surface impoundment, there have been

no other identified changes that have affected the stability or operation of the OGS ZLD Pond since the previous annual inspection other than the excavation activities and construction of the new lined LVWTP.

3. CERTIFICATION

To meet the requirements of 40 CFR §§ 257.83(b) and 257.100(a), I Mark W. Loerop hereby certify that I am a licensed professional engineer in the State of Iowa; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in 40 CFR §§ 257.83(b) and 257.100(a).

By: 
Name: MARK LOEROP
Date: JUNE 27, 2022

