



solutions and action

Interstate Power and Light Company

Ottumwa Generation Station
CCR Surface Impoundment Annual Inspection Report
154.018.012.003
Report issued: December 21, 2016

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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 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 existing CCR surface impoundments is in accordance with recognized and generally accepted good engineering standards.

Table of Contents

1. INTRODUCTION	1
1.1 CCR Rule Applicability	1
1.2 Annual Inspection Applicability	1
2. FACILITY DESCRIPTION	3
2.1 OGS Ash Pond	4
3. ANNUAL INSPECTION REPORTING CRITERIA	5
3.1 OGS Ash Pond	5
3.1.1 Changes in Geometry (§257.83(b)(2)(i))	5
3.1.2 Existing Instrumentation (§257.83(b)(2)(ii))	6
3.1.3 Depth and Elevation of Impounded CCR and Water (§257.83(b)(2)(iii))	6
3.1.4 Storage Capacity of Impounding Structure (§257.83(b)(2)(iv))	10
3.1.5 Volume of Impounded CCR and Water (§257.83(b)(2)(v))	11
3.1.6 Structural Weaknesses and Disruptive Conditions (§257.83(b)(2)(vi))	12
3.1.7 Other Changes Affecting Stability or Operation of Impounding Structure (§257.83(b)(2)(vii))	13
4. CERTIFICATION	14

1. INTRODUCTION

This annual inspection report has been prepared in accordance with the requirements of §257.83(b) 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 existing CCR surface impoundments with a height of 5 feet or more and a storage volume of 20 acre-feet or more or the existing CCR surface impoundment has a height of 20 feet or more (40 CFR §§ 257.73(b), 257.73(d) and 257.83(b)).

1.2 Annual Inspection Applicability

The Interstate Power and Light Company (IPL), Ottumwa Generating Station (OGS) in Ottumwa, Iowa has one existing CCR surface impoundment that meets the requirements of Section 1.1, identified as the OGS Ash Pond.

OGS also has one inactive CCR surface impoundment, identified as the OGS Zero Liquid Discharge (ZLD) Pond. An annual inspection of the OGS ZLD Pond is not covered within this Report. An annual inspection of the OGS ZLD Pond will be completed in accordance with the Direct Final Rule that became effective on October 04, 2016, which extended the compliance dates for inactive CCR surface impoundments.

The annual inspection of the existing CCR surface impoundment at OGS was completed by a qualified PE on November 7th and 8th, 2016. The annual inspection was completed to ensure that the design, construction, operation, and maintenance of the existing CCR surface impoundment at OGS is

consistent with recognized and generally accepted good engineering standards.

The annual inspection of the existing CCR surface impoundment at OGS included a review of available information regarding the status and condition of the existing CCR surface impoundment. The information reviewed included all relevant files available in the operating record at the time of the annual inspection, as well as all relevant publicly accessible internet site entries. These files for the existing CCR surface impoundment at OGS include, 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 30-day instrumentation monitoring by a qualified person, and results of the previous annual inspection.

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

2. FACILITY DESCRIPTION

The following sub-section provides a summary description of the facility, as well as a description of the existing CCR surface impoundment located at OGS.

OGS is located approximately ten miles northwest of Ottumwa, Iowa on the western shore of the Des Moines River in Wapello County, at 20775 Power Plant Road, Ottumwa, Iowa. The McNeese Wildlife Area is located to the southeast of OGS. Middle Avery Creek, which flows to the northeast into the Des Moines River, is located to the south and east of OGS.

OGS is a fossil-fueled electric generating station consisting of one steam electric generating unit. Sub-bituminous coal is the primary fuel for producing steam. The burning of coal produces a by-product of CCR. The CCR at OGS is categorized into three types; bottom ash, fly ash, and flue gas desulfurization (scrubber) byproducts. The fly ash also can be subdivided into two types, economizer fly ash and precipitator fly ash.

General Facility Information:

Date of Initial Facility Operations:	1981
IDNR CCR Units State ID No.	90-UDP-01-15
NPDES Permit Number:	IA90-001-01
Latitude / Longitude:	41°5'53"N 92°33'17"W
Site Coordinates:	Section 26, Township 73 North, Range 15 West
Unit Nameplate Ratings:	Unit 1 (1981) 674 MW

2.1 OGS Ash Pond

The OGS Ash Pond is located east of the generating plant on the eastern portion of the site. The OGS Ash Pond receives influent flows from the generating plant floor drains, oil/water separator, boiler blow down water, solid contact unit sludge, sluiced CCR (bottom ash and economizer fly ash), recirculating media sanitary treatment plant, and surface water runoff from the generating site proper.

The sluiced CCR is discharged into the west end of the OGS Ash Pond. The sluiced CCR is discharged into a collection pad area where the majority of CCR is recovered. A dozer is used to scrape the collection pad and push the CCR into a stockpile for dewatering. Once dewatered, the CCR may be loaded into over-the-road haul trucks for transporting off-site. The sluiced water from the CCR drains into a narrow channel that flows into the southwest portion of the OGS Ash Pond. Routine maintenance dredging of the narrow channel occurs as the CCR settles out in the channel.

The water in the OGS Ash Pond from other sources flows to the east and discharges through the facility's National Pollution Discharge Elimination System (NPDES) Outfall 001, located in the northeast corner of the OGS Ash Pond. NPDES Outfall 001 consists of a concrete discharge structure with a six foot wide overflow weir and includes a Parshall flume and instrumentation to measure the flow of the discharged water. The water flows through the NPDES Outfall 001 and discharges into an unnamed creek. The unnamed creek flows into the Des Moines River downstream of the water intake structure and before the confluence of Middle Avery Creek.

3. ANNUAL INSPECTION REPORTING CRITERIA

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

3.1 OGS Ash Pond

3.1.1 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, the following changes to the geometry of the CCR surface impoundment were identified since the previous annual inspection:

- Re-grading of a portion of the downstream slope of the east embankment south of the railroad tracks. Re-grading of the downstream slope of the CCR surface impoundment included placement of fill material over an area that previously consisted of riprap along the bottom portion of the downstream slope in order to lessen the slope and facilitate management of vegetation;
- Re-grading of a portion of the downstream slope of the east embankment north of the railroad tracks, adjacent to the NPDES Outfall 001. Re-grading of the downstream slope of the CCR surface impoundment included placement of fill material in order to lessen the slope and facilitate management of vegetation.

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

Instrumentation that supports the operation of the OGS Ash Pond includes a Parshall flume discharge structure and equipment to measure the flow of the discharged water through the NPDES Outfall 001, as well as a staff gauge in order to monitor the water elevation of the CCR surface impoundment. The instrumentation is located 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 for 2016 (October 01, 2015 through October 31, 2016). Reviewing the provided flow data, the maximum daily flow recorded through NPDES Outfall 001 was 3.25 million gallons (April 2016).

The staff gauge water elevation data, since the previous annual inspection, was provided by IPL and included eight measurement dates (September 13, 2016 through November 02, 2016). After review of the provided staff gauge water elevation data, the maximum water elevation recorded within the Polishing Pond area of the OGS Ash Pond was 675.21 feet.

3.1.3 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 that was previously provided from IPL.

At the time of the annual inspection, a survey was completed in order to determine the present surface water elevation of the CCR surface impoundment. Additionally, depth measurements from the water surface to

the top of CCR/sediment were obtained in order 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 surveyed to be 676.21 feet, 5.79 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.
 - At the time of the annual inspection, the water depth that was measured within the large open area of impounded water within the CCR surface impoundment varied between 0.10 feet in the southwest portion of the CCR surface impoundment and 12.20 feet in the eastern portion of the CCR surface impoundment adjacent to the polishing pond portion of the CCR impoundment.
 - 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 676.11 feet in the southwest portion of the CCR surface impoundment to an elevation of 664.01 feet in the eastern portion of the CCR surface impoundment.

- From the 1976 drawing of the original site grading plan contours, the original bottom contour elevations varied from east to west within the existing area of impounded water within the CCR surface impoundment. The depth of the OGS Ash Pond varied between an elevation of 674 feet near the western portion of the CCR surface impoundment to an elevation of 656 feet in the eastern portion of the CCR surface impoundment adjacent to the polishing pond. 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 increased from 2.11 feet in the western portion of the CCR surface impoundment to 8.01 feet in the eastern portion of the CCR surface impoundment.
- OGS Ash Pond - Polishing Pond Portion of the CCR Surface Impoundment
 - At the time of the annual inspection, the water surface elevation of the polishing pond portion of the CCR surface impoundment was surveyed to be 675.43 feet, 6.57 feet below the crest of the east embankment of the CCR surface impoundment and 0.78 feet below the water surface elevation of the large open area of impounded water within the CCR surface impoundment.

- At the time of the annual inspection, the water depth that was measured within the polishing pond portion of the CCR surface impoundment varied between 8.55 feet and 8.75 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 portion of the CCR surface impoundment varied between an elevation of 666.88 feet to an elevation of 666.68 feet.
- From staff gauge water elevation data provided by IPL since the previous annual inspection, the minimum water elevation within the polishing pond portion of the OGS Ash Pond was recorded to be 675.21 feet. The maximum water elevation within the polishing pond portion of the OGS Ash Pond was recorded to be 675.71 feet.
- From the 1976 drawing of the original site grading plan contours, the bottom contour elevation within the area of the existing polishing pond 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 portion was 8.78 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 22 acres consists of CCR/sediment and does not normally consist of impounded water. This area is generally located in the southwestern, western, and northwestern portions of the CCR surface impoundment. 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 675 feet.

- From the 2016 topographic/bathymetric survey of the OGS Ash Pond, 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 survey top of CCR/sediment elevations to the 1976 drawing of the original site grading plan contour elevations, the deposition thickness of the OGS Ash Pond in the areas that do not normally consist of impounded water varied between 2 feet and 30 feet.

3.1.4 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 acreage of the CCR surface impoundment in the large 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 the 2016 topographic/bathymetric survey data, the area of the water surface of the CCR surface impoundment was approximately 17 acres. From the water depth data that was collected during the annual inspection, the average water depth within the CCR surface impoundment was 5.06 feet. Thus, the storage capacity within the OGS Ash Pond at the time of the annual inspection was approximately 139,000 cubic yards.

3.1.5 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 large open area of impounded water within the CCR surface impoundment that was surveyed at the time of the annual inspection was 676.21 feet. From the 2016 topographic 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 664 feet in the large open area of impounded water and 675 feet in the area outside the footprint of the water surface. Thus, the interior storage height of the OGS Ash Pond (water portion) was 12.21 feet and the interior storage height of the CCR/sediment located outside the footprint of the water surface was approximately 6 feet.

The surface area of the OGS Ash Pond, in the area where water was present, was approximately 17 acres. Thus, the volume of impounded CCR and water within the OGS Ash Pond, within the area where water was present, was approximately 335,000 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 22 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 213,000 cubic yards. The total volume of impounded CCR and water within the OGS Ash Pond at the time of the annual inspection was approximately 548,000 cubic yards.

3.1.6 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.

3.1.7 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.

4. CERTIFICATION

To meet the requirements of 40 CFR 257.83(b), 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).

By:  _____

Name: MARK LOEROP

Date: DEC 21, 2016

