



solutions and action

**Interstate Power and Light Company**

Lansing Generating Station  
CCR Surface Impoundment Annual Inspection Report  
154.018.025.002  
Report issued: December 14, 2022

**Hard Hat Services**

ph: 877-630-7428  
hardhatinc.com  
932 N. Wright St., Suite 160  
Naperville, IL 60563

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

After conducting the annual inspection, reviewing available information provided by the Interstate Power and Light Company pertaining to the status and condition of the existing CCR surface impoundment, and having discussions with facility personnel who oversee and perform the operation, maintenance, and inspection activities of the existing CCR surface impoundment, we conclude that there are no operating deficiencies.

Since the previous annual inspection, the plant has begun pre-closure activities in the LAN Upper Ash Pond, including hydraulic dredging of CCR from the northern (lowest) part of the upper ash pond and placement of the dredged material into geo-tubes at the southern (highest) end of the impoundment. SCS Engineers conducted a Geotechnical Slope Stability Analysis dated December 8, 2022 on the Upper Ash Pond Closure activities. This stability

analysis concludes that the planned closure activities meet the stability requirements of the 40 CFR 257.73(e).

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## 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 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), Lansing Generating Station (LAN) in Lansing, Iowa has one existing CCR surface impoundment that meets the requirements of Section 1.1, identified as the LAN Upper Ash Pond. Until 2022, the LAN Upper Ash Pond consisted of five interconnected settling areas separated by intermediate dikes. Settling area #1 was located furthest south, while settling area #5 was located furthest north. Figure 1 identifies the location of each of the five interconnected settling areas of the LAN Upper Ash Pond. In 2022, LAN initiated pre-closure activities including hydraulic dredging of the northern portion of the impoundment. The interconnected settling areas in the southern portion of the impoundment were reconfigured to make space for geo-tubes that receive the dredged material.

The CCR surface impoundment has been assigned a state identification number by the Iowa Department of Natural Resources (IDNR), which is 03-UDP-01-15.

The annual inspection of the CCR surface impoundment at LAN was completed by a qualified PE on September 21<sup>st</sup>, 2022. The annual inspection was completed to ensure that the design, construction, operation, and maintenance of the CCR surface impoundment at LAN is consistent with recognized and generally accepted good engineering standards.

The annual inspection of the CCR surface impoundment at LAN included a review of available information regarding the status and condition of the 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 the Alliant Energy CCR Rule Compliance Data and Information website entries for LAN ([ccr.alliantenergy.com](http://ccr.alliantenergy.com)). These files for the CCR surface impoundments at LAN 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 instrumentation monitoring by a qualified person, and results of the previous annual inspection.

The annual inspection also included a visual inspection of the CCR surface impoundment 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 impoundment or passing through the dikes of the CCR surface impoundment 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) of the CCR Rule for the existing CCR surface impoundment located at LAN.

### 2.1 LAN Upper Ash Pond

#### 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 LAN pertaining to the status and condition of the existing CCR surface impoundment, and discussions with LAN facility personnel who oversee and perform the operation, maintenance, and inspection activities of the existing CCR surface impoundment, there has been one change in the geometry since the previous annual inspection.

In the spring of 2022, pre-closure activities of the LAN Upper Ash Pond were initiated. The closure activities included a soil solidification wall installed in between settling area #4 and settling area #5. A hydraulic dredge was used to remove CCR from settling area #5 and pump the slurry to geo-tubes placed on the southern end of the impoundment (the former locations of settling area #1, settling area #2, and settling area #3). No change in total footprint of the LAN Upper Ash Pond has occurred. However, there has been an increase in height of the impounded material in areas where the geo-tubes have been placed. SCS Engineers conducted a Geotechnical Slope Stability Analysis dated December 8, 2022 on the Upper Ash Pond Closure activities. This stability analysis concludes that the planned closure activities meet the stability requirements of the 40 CFR 257.73(e).

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

Instrumentation that supports the operation of the LAN Upper Ash Pond includes flow monitoring equipment on water discharged from the northeast corner of the #5 settling are water. The instrumentation is located in a Weir Box (installed in 2021) and is associated with the NPDES Outfall 010 at LAN. Instrumentation at Weir Box #1, Outfall 002, continues to monitor flow, if any, through the emergency overflow structure. The last day of regular operations for Outfall 002 was September 21, 2021.

The flow data associated with the NPDES Outfall 002 and Outfall 010 discharge (e.g. maximum flow rate) was provided by IPL for the dates September 1, 2021 through August 31, 2022. Reviewing the provided flow data, the maximum flow reading recorded through NPDES Outfall 010 was 9.49 million gallons per day (March 9 through 14, 2022). This peak discharge is likely not an accurate representation of peak flow, because it was measured after all the stoplogs were removed from the Weir Box as part of the pre-closure work. When the stoplogs are removed, the flow monitor reports an erroneously high flow rate.

### **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 LAN Upper 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 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 to determine present CCR depths/elevations. As a result of pre-



closure activities, settling area #1, settling area #2, and settling area #3, have been converted to laydown areas for the geo-tubes. Water depths were not collected from these areas as the pre-closure activities have filled in these areas.

The historical information provided from IPL included flow monitoring equipment data since the previous annual inspection, original design drawing contours of the LAN Upper Ash Pond prepared by Sargent & Lundy (1974), the most recent topographic survey of the LAN Upper Ash Pond (2015), and the most recent hydrographic survey of the LAN Upper Ash Pond (2015). 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:

- LAN Upper Ash Pond - Settling Area #1
  - At the time of the annual inspection, settling area #1 was filled with geo-tubes, therefore there were no water depths collected. The CCR within the geo-tubes extended approximately 2 feet above the crest of the west embankment of the CCR surface impoundment, which had an elevation of approximately 657 feet at the lowest point of the embankment adjacent to settling area #1.
  - From the 1974 original design drawing contours of the LAN Upper Ash Pond, the original design bottom contour elevation of the existing CCR surface impoundment was approximately 624 feet. Comparing the results from the water surface measurement at the time of the annual inspection to the 1974 original design drawing contours, the deposition thickness was estimated at 35 feet.

- LAN Upper Ash Pond - Settling Area #2
  - At the time of the annual inspection, settling area #2 was filled with geo-tubes, therefore there were no water depths collected. The CCR within the geo-tubes extended approximately 2 feet above the crest of the west embankment, which had an elevation of approximately 656 feet at the lowest point of the embankment adjacent to settling area #2.
  - From the 1974 original design drawing contours of the LAN Upper Ash Pond, the original design bottom contour elevation of the existing CCR surface impoundment was approximately 624 feet. Comparing the results from the water depth measurements at the time of the annual inspection to the 1974 original design drawing contours, the deposition thickness was estimated at 34 feet.
- LAN Upper Ash Pond - Settling Area #3
  - At the time of the annual inspection, settling area #3 was filled with geo-tubes, therefore there were no water depths collected. The CCR within the geo-tubes extended approximately 2 feet above the crest of the west embankment, which had an elevation of approximately 655 feet at the lowest point of the embankment adjacent to settling area #3.
  - From the 1974 original design drawing contours of the LAN Upper Ash Pond, the original design bottom contour elevation of the existing CCR surface impoundment was approximately 624 feet. Comparing the results from the water depth measurements at the

time of the annual inspection to the 1974 original design drawing contours, the deposition thickness was estimated at 33 feet.

- LAN Upper Ash Pond - Settling Area #4
  - At the time of the annual inspection, the water surface elevation was 649.00 feet, 5.0 feet below the crest of the west embankment of the CCR surface impoundment, which had an elevation of approximately 654 feet at the lowest point of the embankment adjacent to settling area #4.
  - At the time of the annual inspection, the water depths that were measured within settling area #4 of the CCR surface impoundment varied between 7.2 feet and 8.1 feet.
  - From the water depth measurements at the time of the annual inspection, the elevation of the top of CCR/sediment that was measured varied between an elevation of 641.8 feet and 640.9 feet.
  - From the 1974 original design drawing contours of the LAN Upper Ash Pond, the original design bottom contour elevation of the existing CCR surface impoundment was approximately 624 feet. Comparing the results from the water depth measurements at the time of the annual inspection to the 1974 original design drawing contours, the deposition thickness varied between 17.8 feet and 16.9 feet.
- LAN Upper Ash Pond - Settling Area #5
  - At the time of the annual inspection, the water surface elevation was 641.67 feet, 11.3 feet below the crest of the west embankment of the CCR surface impoundment, which had an elevation of

approximately 653 feet at the lowest point of the embankment adjacent to settling area #5.

- At the time of the annual inspection, the water depths that were measured within settling area #5 of the CCR surface impoundment varied between 3.47 feet and 20.0 feet.
- From the water depth measurements at the time of the annual inspection, the elevation of the top of CCR/sediment that was measured varied between an elevation of 638.2 feet and 621.7 feet.
- From the 1974 original design drawing contours of the LAN Upper Ash Pond, the original design bottom contour elevation of the existing CCR surface impoundment was approximately 624 feet. Comparing the results from the water depth measurements at the time of the annual inspection to the 1974 original design drawing contours, the deposition thickness varied between 14.2 feet and 0 feet. The hydraulic dredge was removing CCR from this settling area, therefore there are areas where no deposition was observed.
- Because of the pre-closure activities, stoplogs have been removed and replaced several times. As a result, the exact maximum water elevation is unknown. Based on the flow data and design elevations of the new weir box structure, the estimated maximum water elevation was 647.35.

#### **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 acreage of the CCR surface impoundment in the areas where water was present, and the

approximate depth of water within those areas of the CCR surface impoundment.

From the most recent topographic and hydrographic surveys of the LAN Upper Ash Pond (2015), as well as the water depth data that was collected within each of the settling areas at the time of the annual inspection, the water surface areas and average water depths of each settling area of the CCR surface impoundment were determined to be as follows:

<b>LAN Upper Ash Pond - Settling Area ID</b>	<b>Water Surface Area (Acres)</b>	<b>Average Water Depth (Feet)</b>
Settling Area #1	0.0	0.0
Settling Area #2	0.0	0.0
Settling Area #3	0.0	0.0
Settling Area #4	0.78	7.7
Settling Area #5	4.77	15.2

Pre-closure activities have displaced water from settling areas #1, #2, and #3. Thus, from the water surface areas and average water depth data provided above, the total water volume within the LAN Upper Ash Pond at the time of the annual inspection was approximately 126,300 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, not including freeboard) within the LAN Upper 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 original design drawing contours of the LAN Upper Ash Pond prepared by Sargent & Lundy (1974), the most recent topographic survey of the LAN Upper Ash Pond (2015), and the most recent hydrographic survey of the LAN Upper Ash Pond (2015).

The surveyed elevations of the water surfaces within the LAN Upper Ash Pond at the time of the annual inspection were collected in settling area #4 and settling area #5. The pre-closure activities have placed CCR within geo-tubes in former settling area #1, settling area #2, and settling area #3. At the time of the annual inspection, the geo-tubes containing CCR had been stacked to a height of approximately 2 feet above the western exterior embankment. Therefore, the volume of impounded CCR and water, where water was present, was determined individually for each settling area and for the intermediate dikes between the settling areas. In addition to the volume of CCR and water in the areas where water was present, the volume of impounded CCR located outside the footprint of the water surface of the settling areas was determined. These additional areas included the intermediate dikes located between the five settling areas.

At the time of the annual inspection, the total volume of impounded CCR and water, not including freeboard, within the LAN Upper Ash Pond was approximately 525,100 cubic yards.

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

After review of available information provided by LAN pertaining to the status and condition of the existing CCR surface impoundment, discussions with LAN 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 structure (NPDES Outfall 002 or Outfall 010) associated with the LAN Upper Ash Pond.


Regarding the existing conditions of the LAN Upper 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.

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

After review of available information provided by LAN pertaining to the status and condition of the existing CCR surface impoundment, as well as discussions with LAN facility personnel who oversee and maintain the operation, maintenance, and inspection activities of the existing CCR surface impoundment, there has been one identified change since the previous annual inspection. The change includes CCR held within geo-tubes that are stacked at the southern half of the impoundment (former settling area #1, settling area #2, and settling area #3). At the time of the inspection, the CCR was approximately 2 feet higher than the western embankment height, while the total footprint of the impoundment has not changed. SCS Engineers conducted a Geotechnical Slope Stability Analysis dated December 8, 2022 on the Upper Ash Pond Closure activities. This stability analysis concludes that the planned closure activities meet the stability requirements of the 40 CFR 257.73(e).

### 3. 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: DECEMBER 19, 2022





## Figures

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*Figure 1: LAN Upper Ash Pond Settling Areas*

CCR Surface Impoundment  
Annual Inspection Report

LOWER POND  
CLOSED SEPTEMBER 2015



SETTLING AREA #5

SETTLING AREA #4

SETTLING AREA #3

SETTLING AREA #2

SETTLING AREA #1

LAN UPPER ASH POND  
AERIAL PHOTOGRAPH  
NOT TO SCALE

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REV	DATE	BY	DESCRIPTION



SCALE:	AS SHOWN
DATE:	11-19-18
DRAWN BY:	JFD
CHKD BY:	CTS
APRVD BY:	MWL

CLIENT / LOCATION	ALLIANT ENERGY-INTERSTATE POWER AND LIGHT COMPANY LANSING GENERATING STATION LANSING, IOWA
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DRAWING DESCRIPTION	SETTLING AREAS CCR SURFACE IMPOUNDMENT (EXISTING) - LAN UPPER ASH POND
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JOB	154.018.017.002
SHT.	FIGURE 1
DWG.	154.018.017.002-D1