



solutions and action

Interstate Power and Light Company

Sutherland 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 the inactive CCR surface impoundment. Primarily, the annual inspection report is focused on the structural stability of the CCR surface impoundment and to ensure that the operation and maintenance of the CCR surface impoundment is in accordance with recognized and generally accepted good engineering standards.

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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), Sutherland Generating Station (SGS) in Marshalltown, Iowa has one inactive CCR surface impoundment that meets the requirements of Section 1.1, identified as the SGS Main Pond. The CCR surface impoundment has been assigned a state identification number by the Iowa Department of Natural Resources (IDNR), which is 64-UDP-02-15.

The annual inspection of the inactive CCR surface impoundment at SGS was completed by a qualified PE on May 24th, 2018. The annual inspection was completed to ensure that the design, construction, operation, and maintenance of the inactive CCR surface impoundment at SGS is consistent with recognized and generally accepted good engineering standards.

The annual inspection of the inactive CCR surface impoundment at SGS included a review of available information regarding the status and condition of the inactive 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 SGS (ccr.alliantenergy.com). These files for the inactive CCR surface impoundment at SGS 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 by a qualified person, and results of the previous annual inspection.

The annual inspection also included a visual inspection of the inactive CCR surface impoundment to identify signs of distress or malfunction of the inactive CCR surface impoundment and appurtenant structures. Additionally, the visual inspection included hydraulic structures underlying the base of the inactive CCR surface impoundment or passing through the dikes of the inactive 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) and §257.100(a) of the CCR Rule for the inactive CCR surface impoundment located at SGS.

2.1 SGS Main Pond (Inactive CCR Surface Impoundment)

2.1.1 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 SGS pertaining to the status and condition of the inactive CCR surface impoundment, and discussions with SGS facility personnel who oversee and maintain the operation, maintenance, and inspection activities of the inactive CCR surface impoundment, there have been no identified changes in the geometry since the previous annual inspection.

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

The SGS Main Pond does not have instrumentation that supports the operation of the inactive CCR surface impoundment.

2.1.3 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 SGS Main Pond since the previous annual inspection were not able to be determined as no instrumentation data was provided from IPL since the previous annual inspection, apart from the 7-day inspection forms. It should be noted that at the time of the annual inspection there was little to no water present within the CCR surface impoundment. Additionally, review of the 7-day inspection forms provided by IPL confirmed

little to no water present within the CCR surface impoundment since the previous annual inspection in 2017.

Due to the SGS Main Pond being an inactive CCR surface impoundment it was determined that physical measurements of the SGS Main Pond would not be required on an annual basis due to minimal changes since the prior annual inspection. Without the collection of physical measurements at the time of the annual inspection, as well as having no historical information available since the previous annual inspection, the approximate minimum, maximum, and present depths and elevations of the impounded CCR and water in the SGS Main Pond were determined using information that was collected during the initial annual inspection in 2017, as well as from historical information that was previously provided from IPL.

The annual inspection that was previously completed in 2017 included the collection of field data such as surveying of the water surface elevation, as well as on-water GPS depth measurements from the water surface to the top of CCR/sediment to determine depths/elevations. The historical information previously provided from IPL included a topographic/bathymetric survey of the SGS Main Pond prepared by Hard Hat Services (2005), design drawings of the reconfiguration of the SGS Main Pond prepared by Hard Hat Services (2006), as well as the most recent topographic/bathymetric survey of the SGS Main Pond completed by DLZ Industrial, LLC (2016). Reviewing the information provided within the above-mentioned documents, as well as the data collected at the time of the initial annual inspection in 2017, the following minimum, maximum, and present depths and elevations were approximated for the impounded CCR and water:

- At the time of the initial annual inspection in 2017, the water surface elevation of the SGS Main Pond was surveyed. Due to the low water elevation within the CCR surface impoundment the water surface was divided into four separate pool areas. The elevations of each of the four pool areas were as follows:
 - Pool Area #1 surface water elevation was surveyed to be approximately 856.73 feet.
 - Pool Area #2 surface water elevation was surveyed to be approximately 856.66 feet.
 - Pool Area #3 surface water elevation was surveyed to be approximately 856.79 feet.
 - Pool Area #4 surface water elevation was surveyed to be approximately 856.68 feet.
- The average surface water elevation of the four pool areas at the time of the initial annual inspection in 2017 was approximately 856.72 feet, approximately 8.58 feet below the crest of the south and east embankments of the CCR surface impoundment, which have an elevation of approximately 865.3 feet at the lowest point of the embankments.
- At the time of the initial annual inspection in 2017, the water depths that were measured within the four pool areas of the CCR surface impoundment, as well as the average elevations of the top of CCR/sediment within the four pool areas of the CCR surface impoundment, were as follows:
 - Pool Area #1 water depths varied between 0.2 feet and 0.6 feet, with an average water depth measurement of 0.4 feet. The elevation of the top of CCR/sediment that was measured averaged approximately 856.33 feet.
 - Pool Area #2 water depth was approximately 0.5 feet. The elevation of the top of CCR/sediment that was measured was approximately 856.16 feet.
 - Pool Area #3 water depths varied between 0.2 feet and 1.8 feet, with an average water depth measurement of 0.9 feet. The elevation of the top of CCR/sediment that was measured averaged approximately 855.89 feet.

- Pool Area #4 water depth was approximately 1.8 feet. The elevation of the top of CCR/sediment that was measured was approximately 854.88 feet.
- From the 2006 design of the SGS Main Pond reconfiguration, the original bottom contour elevation of the CCR surface impoundment varied between 851 feet and 856 feet, with an average bottom contour elevation of approximately 853.5 feet.

2.1.4 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 initial annual inspection in 2017 was 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. Due to the SGS Main Pond being an inactive CCR surface impoundment it was determined that physical measurements of the SGS Main Pond would not be required on an annual basis due to minimal changes since the prior annual inspection. Without the collection of physical measurements at the time of the annual inspection, as well as having no available instrumentation data of the water surface elevation at the time of the annual inspection, the approximate storage capacity of the CCR surface impoundment was determined using historical field data collected during the prior annual inspection in 2017. It should be noted that at the time of the annual inspection there was little to no water present within the CCR surface impoundment.

The annual inspection that was previously completed in 2017 included the collection of field data such as surveying of the water surface elevation, as well as on-water GPS depth measurements from the water surface to the top of CCR/sediment to determine depths/elevations. From both the 2016 topographic/bathymetric survey of the SGS Main Pond and the survey of the

water surface elevations at the time of the initial annual inspection in 2017, as well as the water depth data that was collected within each of the pool areas at the time of the initial annual inspection in 2017, the following water surface areas and average water depths of each pool area of the CCR surface impoundment were determined:

SGS Main Pond - Pool Area ID	Water Surface Area (Acres)	Average Water Depth (Feet)
Pool Area #1	0.44	0.4
Pool Area #2	0.23	0.5
Pool Area #3	2.76	0.9
Pool Area #4	0.34	1.8

Thus, from the water surface areas and average water depth data provided above, the total storage capacity within the SGS Main Pond at the time of the initial annual inspection in 2017 was approximately 5,500 cubic yards. Being that little to no water was present within the CCR surface impoundment at the time of the annual inspection the approximate storage capacity within the SGS Main Pond would be less than the 5,500 cubic yards that was calculated in 2017.

Note, from the 2006 design of the SGS Main Pond reconfiguration, the normal surface water elevation was identified to be approximately 862.6 feet, approximately 5.88 feet higher in elevation than at the time of the initial annual inspection in 2017. Comparing the 2006 designed normal surface water elevation to the average top of CCR/sediment elevation measured at the time of the initial annual inspection in 2017, the storage capacity of the SGS Main Pond would be approximately 42,000 cubic yards.

2.1.5 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 SGS Main Pond at the time of the initial annual inspection in 2017 was determined using information that was collected during the initial annual inspection, as well as from readily available historical information which included a topographic/bathymetric survey of the SGS Main Pond prepared by Hard Hat Services (2005), design drawings of the reconfiguration of the SGS Main Pond prepared by Hard Hat Services (2006), as well as the most recent topographic/bathymetric survey of the SGS Main Pond completed by DLZ Industrial, LLC (2016). Due to the SGS Main Pond being an inactive CCR surface impoundment it was determined that physical measurements of the SGS Main Pond would not be required on an annual basis due to minimal changes since the prior annual inspection. Without the collection of physical measurements at the time of the annual inspection, as well as having no available instrumentation data of the water surface elevation at the time of the annual inspection, the approximate volume of impounded CCR and water within the CCR surface impoundment was determined using historical field data collected during the prior annual inspection in 2017. It should be noted that at the time of the annual inspection there was little to no water present within the CCR surface impoundment.

The annual inspection that was previously completed in 2017 included the collection of field data such as surveying of the water surface elevation, as well as on-water GPS depth measurements from the water surface to the top of CCR/sediment to determine depths/elevations. The surveyed elevation of the water surface within the SGS Main Pond at the time of the initial annual inspection in 2017 varied between the four pool areas. Therefore, the volume

of impounded CCR and water, where water was present, was determined individually for each of the four pool areas. In addition to the volume of CCR and water in the areas where water was present, the volume of impounded CCR located within, as well as located outside, the footprint of the pool areas was determined. These additional areas included the CCR located within the footprint of the pool areas that rose above the water surface elevation at the time of the initial annual inspection in 2017, as well the CCR located outside the footprint of the pool areas within the original intermediate berm.

From the available information, the total volume of impounded CCR and water within the SGS Main Pond at the time of the initial annual inspection in 2017 was approximately 34,000 cubic yards. Being that little to no water was present within the CCR surface impoundment at the time of the annual inspection the approximate volume of impounded CCR and water within the SGS Main Pond would be less than the 34,000 cubic yards that was calculated in 2017.

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

After review of available information provided by SGS pertaining to the status and condition of the inactive CCR surface impoundment, discussions with SGS facility personnel who oversee and maintain the operation, maintenance, and inspection activities of the inactive CCR surface impoundment, as well as conducting the on-site visual inspection of the inactive CCR surface impoundment, there have been no identified appearances of an actual or potential structural weakness of the inactive CCR surface impoundment. Additionally, there were no identified issues with the structural integrity of the hydraulic structures (concrete mixing channel) associated with the SGS Main Pond.

Regarding the existing conditions of the SGS Main 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 CCR surface impoundment.

2.1.7 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 SGS pertaining to the status and condition of the inactive CCR surface impoundment, as well as discussions with SGS facility personnel who oversee and maintain the operation, maintenance, and inspection activities of the inactive CCR surface impoundment, there have been no other identified changes that have affected the stability or operation of the SGS Main Pond since the previous annual inspection.

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: 6/28/2018 _____

