

Annual CCR Surface Impoundment Inspection – Main Pond

Sutherland Generating Station
3001 E Main Street Road
Marshalltown, Iowa 50158

Prepared for:

Interstate Power and Light Company
Sutherland Generating Station
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Marshalltown, Iowa 50158

SCS ENGINEERS

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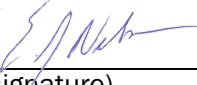
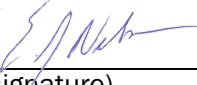
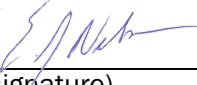
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PE CERTIFICATION

	<p>I, Eric J. Nelson, hereby certify that this Initial Annual CCR Surface Impoundment Inspection Report meets the requirements of 40 CFR 257.83(b)(2), was prepared by me or under my direct supervision, and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.</p>				
	<table style="width: 100%; border: none;"> <tr> <td style="width: 60%; text-align: center; border: none;">  </td> <td style="width: 40%; text-align: center; border: none;"> <p>6/21/2019</p> </td> </tr> <tr> <td style="border: none;">(signature)</td> <td style="border: none;">(date)</td> </tr> </table>		<p>6/21/2019</p>	(signature)	(date)
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	(signature)	(date)			
	<p>Eric J. Nelson (printed or typed name)</p>				
<p>License number <u>23136</u></p> <p>My license renewal date is December 31, 2020.</p>					
<p>Pages or sheets covered by this seal:</p> <p style="margin-left: 40px;">Annual Inspection - SGS Main Pond</p>					

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1.0 INTRODUCTION

On April 16, 2019, SCS Engineers (SCS) completed an annual inspection of the Main Pond at the Interstate Power and Light Company (IPL) Sutherland Generating Station (SGS) in Marshalltown, Iowa. The inspection was completed in accordance with the U.S. Environmental Protection Agency (USEPA) Coal Combustion Residuals (CCR) rule, 40 CFR 257 Subpart D, in particular 257.83(b)(1). The SGS Main Pond is an inactive CCR surface impoundment. IPL is currently in the process of closing the CCR surface impoundments, and has recently received a closure permit (Sanitary Disposal Project Closure Permit #64-SDP-11-19C) from the Iowa Department of Natural Resources.

1.1 PURPOSE

The purpose of the annual inspection is to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards. Per 40 CFR 257.83(b)(1), the inspection must, at a minimum, include:

- A review of available information regarding the status and condition of the CCR unit, including, but not limited to, files available in the operating record (e.g., CCR unit design and construction information required by 257.73(c)(1) and 257.74(c)(1), previous periodic structural stability assessments required under 257.73(d) and 257.74(d), the results of inspections by a qualified person, and results of previous annual inspections).
- A visual inspection of the CCR unit to identify signs of distress or malfunction of the CCR unit and appurtenant structures.
- A visual inspection of any hydraulic structures underlying the base of the CCR unit or passing through the dike of the CCR unit for structural integrity and continued safe and reliable operation.

This annual inspection report has been prepared in accordance with the requirements of 40 CFR 257.83(b)(2) to document the annual inspection.

1.2 BACKGROUND

SGS ceased burning coal in 2012 and was converted to burn natural gas. SGS was retired in 2017 (Hard Hat Services [HHS], History of Construction, 2018a). According to 40 CFR 257.83(b)(1), an annual inspection by a qualified professional engineer is required for existing and inactive CCR surface impoundments that are subject to the periodic structural assessment requirements in 40 CFR 257.73(d) or 257.74(d). Based on the July 2017 annual inspection report prepared by HHS for the Main Pond (HHS, 2017), the Main Pond has a height of 5 feet or more and a storage volume of 20-acre feet or more. Therefore, the Main Pond is subject to the requirements of 40 CFR 257.73(d). The Main Pond is the only ash pond at SGS that is subject to the annual inspection requirements.

The ash ponds at SGS are described in the following excerpt from HHS' July 2017 annual inspection report for this CCR unit (HHS, 2017a):

“SGS is located east of the City of Marshalltown and approximately one half mile west of the Iowa River in Marshall County, at 3001 East Main Street, Marshalltown, Iowa.

SGS is a fossil-fueled electric generating station consisting of three steam turbine electric generating units and three combustion turbine units. SGS initiated operations in 1954. From 1954 to 2012 sub-bituminous coal was the primary fuel for producing steam. As of the end of 2012, SGS ceased using coal and modified facility operations in order to use natural gas as the primary fuel source. As of June 20, 2017, SGS ceased generating operations as the plant is scheduled for retirement.

During the time when the burning of coal was the primary fuel for producing steam a by-product of CCR was produced. The CCR at SGS is categorized into two types, bottom ash and precipitator fly ash. The precipitator fly ash at SGS was collected by the electrostatic precipitators and conveyed dry to a temporary on-site storage area. The precipitator fly ash was then transported off-site for beneficial reuse. If the dry conveying system malfunctioned, an emergency by-pass system would utilize water to sluice the precipitator fly ash from the generating plant to one of two surface impoundments. The surface impoundments, identified as the SGS North Primary Pond and SGS South Primary Pond, are located east of the generating plant and are identified as inactive CCR surface impoundments at SGS.

In addition to precipitator fly ash, the bottom ash at SGS was also sluiced from the generating plant to the SGS North Primary Pond and SGS South Primary Pond. Other influent flows that previously discharged into the two CCR surface impoundments consisted of cooling tower blow down water, air compressor cooling water, boiler blow down water, storm water runoff from the former coal pile storage area, and other low-volume waste water streams from the generating plant via a ground-floor sump pump.

The water within the SGS North Primary Pond and SGS South Primary Pond discharge to the east into another surface impoundment identified as the SGS Main Pond. The SGS Main Pond is located east of the generating plant and is also identified as an inactive CCR surface impoundment at SGS.

The water within the SGS Main Pond is designed to flow around a series of intermediate berms prior to discharging to the north through a precast concrete mixing channel into another surface impoundment identified as the SGS Polishing Pond. The SGS Polishing Pond is located to the east of the generating plant and is also identified as an inactive CCR surface impoundment at SGS.

The water within the SGS Polishing Pond is designed to discharge through the facilities National Pollutant Discharge Elimination System (NPDES) Outfall 001 which consists of a Parshall Flume and Flow metering equipment. The water within the SGS Polishing Pond is designed to discharge into an outfall pond. The water would then drain through a corrugated metal pipe into a grassy ditch located north of the outfall pond. The water in the grassy ditch would then flow west for several hundred yards between the rail road tracks located north of the generating plant. At the end of the grassy ditch, an underground culvert directed the

stream under the rail road tracks towards the north and into an unnamed drainage ditch parallel to the county road, eventually draining towards the east into the Iowa River.”

2.0 SUMMARY OF RESULTS AND RECOMMENDATIONS

SCS identified no deficiencies or releases during the annual inspection of the SGS Main Pond. If deficiencies and releases are identified, they must be remedied by the owner or operator as soon as feasible and the remedy documented.

In addition, SCS only identified one condition during the annual inspection that, in our opinion, has the potential to become a deficiency, if left unaddressed. Animal activity and mower scuffs were identified as described in **Sections 4.6.6** and **4.6.7** that could lead to erosion on the impoundment berm.

3.0 SURFACE IMPOUNDMENT INSPECTION

Mr. Eric Nelson of SCS completed an annual inspection of the Slag Pond on April 16, 2019, in accordance with 40 CFR 257.83(b)(1). Mr. Nelson is a licensed professional engineer in Iowa and holds a Bachelor’s of Science degree in Geological Engineering. He has over 20 years of experience in the design, construction, and operation of solid waste disposal facilities and impoundment closures.

The scope of the annual inspection is described in **Sections 3.1** and **3.2**. The results of the annual inspection are discussed in **Section 4.0**.

3.1 OPERATING RECORD REVIEW

SCS reviewed the available information in the operating record for the Main Pond in support of the visual inspection discussed in **Section 3.2**. SCS reviewed operating record materials provided by IPL and the information posted on Alliant Energy’s CCR Rule Compliance Data and Information website for the SGS facility.

3.2 VISUAL INSPECTIONS

SCS completed a visual inspection of the SGS Main Pond to identify signs of distress or malfunction of the CCR unit and appurtenant structures per 40 CFR 257.83(b)(1)(ii). No hydraulic structures underlying the base of the SGS Main Pond are described in the operating record, and none were visually inspected during our inspection. Three hydraulic structures passing through the embankment of the SGS Main Pond are described in the operating record and were visually inspected per 40 CFR 257.83(b)(1)(iii). These structures are inactive, but appeared to be in acceptable condition. One condition noted is that the exposed upstream end of the culvert between the SGS North Primary Pond and the SGS Main Pond is cracked. The crack is limited to only the exposed portion of the pipe, and does not appear to impact the function of the structure. The pipe is visibly open along its length between the two ponds with no other apparent damage. This pipe will be abandoned in the near future as part of the SGS Main Pond closure activities.

4.0 INSPECTION RESULTS

The results of the annual inspection, along with a description of any deficiencies identified during the visual inspection, are summarized in the following sections in accordance with 40 CFR Part 257.83(b)(2).

4.1 CHANGES IN GEOMETRY

Based on the description of the SGS Main Pond and the 7-day inspections completed since the previous annual inspection, the geometry of the SGS Main Pond has not changed since the previous annual inspection.

4.2 INSTRUMENTATION

The SGS Main Pond did not have any instrumentation at the time of the SCS inspection.

4.3 IMPOUNDED WATER AND CCR CONDITIONS

The approximate minimum, maximum, and present depth and elevation of the impounded water in the SGS Main Pond since the previous inspection are summarized in the table below.

Table 1. Estimated Impounded Water Conditions

Condition	Depth/ Elevation (feet)	Notes
Minimum Water Depth	0	From 7-day inspections
Minimum Water Elevation	851 – 856 amsl	Based on the 2006 design of the SGS Main Pond reconfiguration bottom elevations (HHS, 2017), assuming minimum water depth = 0'
Maximum Water Depth	1	Not measured. Maximum depth reported during 7-day inspections.
Maximum Water Elevation	857 amsl	Not measured. Based on maximum elevation reported in initial annual inspection plus 1 foot maximum water depth recorded during 7-day inspections (HHS, 2017)
Present Water Depth	0 – 1	Not measured. Estimated visually.
Present Water Elevation	852 – 857 amsl	Based on the 2006 design of the SGS Main Pond reconfiguration bottom elevations (HHS, 2017), assuming minimum water depth = 1'

amsl – feet above mean sea level

The SGS Main Pond is inactive and has received no additional CCR since the previous annual inspection. Thus, no changes in the minimum, maximum, or present CCR depth and elevation are expected and remain as reported in the previous annual inspection (HHS 2018b).

4.4 CURRENT STORAGE CAPACITY

The current conditions in the SGS Main Pond are consistent with those described in the previous annual inspection and the 7-day inspections completed since. No additional CCR has been placed in the SGS Main Pond in the previous year according to IPL. The current storage capacity of the SGS Main Pond is estimated to be 42,000 cubic yards (cy) based at the capacity reported in the previous annual inspections (HHS, 2017 and HHS, 2018b).

4.5 CURRENT IMPOUNDED WATER AND CCR CONDITIONS

The current volumes of impounded water and CCR in the SGS Main Pond are estimated to be 34,000 cy based at the volumes reported in the previous annual inspections (HHS, 2017 and HHS, 2018b).

4.6 APPEARANCE OF STRUCTURAL WEAKNESS

The inspection included a review of the appearance of an actual or potential structural weakness of the SGS Main Pond. The visual inspection included a review of the areas described in **Section 3.2** for the presence of the following conditions:

- Seepage
- Sloughing, slumping, or sliding
- Excessive settlement
- Surface cracking
- Inappropriate vegetation growth
- Animal impacts
- Erosion damage
- Failing riprap
- Failing outlet or outfall structures

4.6.1 Seepage

No active seeps or signs of seepage such as open pathways in slopes, boils, or sinkholes were noted during the inspection.

4.6.2 Sloughing, Slumping, or Sliding

No sloughing, slumping, or sliding of the impoundment embankments were noted during the inspection.

4.6.3 Excessive Settlement

No excessive settlement of the impoundment embankments was noted during the inspection.

4.6.4 Surface Cracking

No surface cracking of the impoundment embankments was noted during the inspection.

4.6.5 Inappropriate Vegetation Growth

No inappropriate vegetation growth was noted during the inspection.

4.6.6 Animal Impacts

No animal activity affecting the stability of the Main Pond was noted during the inspection; however, animal activity (e.g., apparent deer tracks and a beaver run) was observed on the east berm that has worn the vegetation in limited areas. This animal activity has the potential to cause erosion in the pond berm, or become areas where erosion could start. The potential erosion concern will be addressed during the SGS Main Pond closure activities.

4.6.7 Erosion Damage

No erosion was noted during the inspection; however, there are a few apparent mower scuffs along exterior of the south berm where grassy vegetation appears to have been removed during maintenance activities. Although small (less than approximately 20 square feet each), these have potential to cause erosion in the pond berm, or become areas where erosion could start. The potential erosion concern will be addressed during the SGS Main Pond closure activities.

4.6.8 Failing Riprap

No failing riprap was noted during the inspection.

4.6.9 Failing Outlet or Outfall Structures

No issues were noted with the outlet from the SGS Main Pond. A crack in the exposed portion of the pipe connecting the SGS North Primary Pond and SGS Main Pond was noted as described in **Section 3.2**. The crack does not appear to be affecting the function of the structure.

4.7 DISRUPTIVE EXISTING CONDITIONS

No disruptive existing conditions were noted during the inspection.

4.8 OTHER CHANGES SINCE PREVIOUS ANNUAL INSPECTION

No other changes in the SGS Main Pond were noted in the annual inspection.

5.0 REFERENCES

Hard Hat Services (HHS), 2017, Interstate Power and Light Company, Sutherland Generating Station, CCR Surface Impoundment Annual Inspection Report, Naperville, IL, July 2017.

Hard Hat Services (HHS), 2018a, Interstate Power and Light Company, Sutherland Generating Station, History of Construction, Naperville, IL, March 2018.

Hard Hat Services (HHS), 2018b, Interstate Power and Light Company, Sutherland Generating Station, CCR Surface Impoundment Annual Inspection Report, Naperville, IL, June 2018.

SCS, 2019, Interstate Power and Light Company, Sutherland Generating Station, Closure Plan, Madison, WI, March 2019.