



Initial Annual CCR Landfill Inspection
Phase 3, Module 1
Phase 3, Module 2
Phase 4, Module 1

Edgewater I-43 Ash Disposal Facility

Prepared for:

Wisconsin Power and Light Company

Edgewater Generating Station
3739 Lakeshore Drive
Sheboygan, Wisconsin 53081

Prepared by:

SCS ENGINEERS

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Madison, Wisconsin 53718-6751
(608) 224-2830

January 2016
File No. 25215159.00

Offices Nationwide
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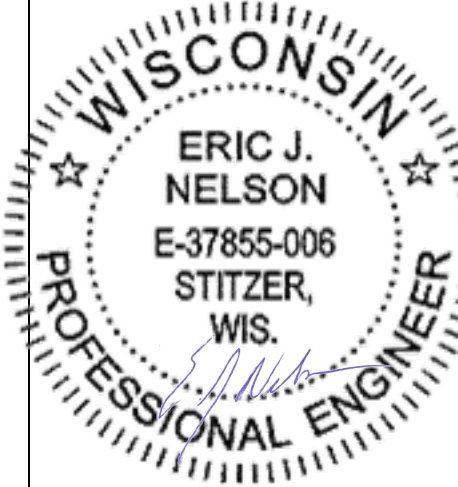
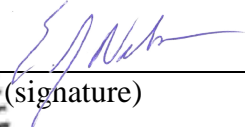
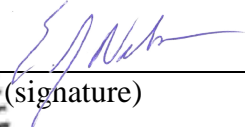
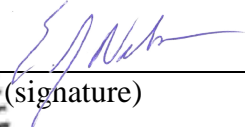
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1	Operating Record Summary

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PE CERTIFICATION

	<p>I, Eric J. Nelson, hereby certify that this Initial Annual CCR Landfill Inspection Report meets the requirements of 40 CFR 257.84(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 Wisconsin.</p>		
	<table style="width: 100%; border: none;"> <tr> <td style="width: 60%; border: none; vertical-align: bottom;">  (signature) </td> <td style="width: 40%; border: none; vertical-align: bottom; text-align: right;"> <u>01/18/2016</u> (date) </td> </tr> </table>	 (signature)	<u>01/18/2016</u> (date)
	 (signature)	<u>01/18/2016</u> (date)	
	<p><u>Eric J. Nelson</u> (printed or typed name)</p>		
	<p>License number <u>E37855-6</u></p>		
<p>My license renewal date is <u>07/31/2016</u>.</p>			
<p>Pages or sheets covered by this seal: <u>Initial Annual CCR Landfill Inspection Report text and Table 1</u> <u>dated January 2016, and delivered January 18, 2016.</u></p>			

1.0 INTRODUCTION

1.1 PURPOSE

SCS Engineers (SCS) completed an annual inspection of the Wisconsin Power and Light Company (WPL) Edgewater I-43 Ash Disposal Facility (I-43) in Sheboygan, Wisconsin. The annual 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 257.84(b)(1). According to 40 CFR 257.84(b)(1) an annual inspection by a qualified professional engineer is required for all existing and new CCR landfills and any lateral expansion of a CCR landfill. 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. 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., the results of inspections by a qualified person, and results of previous annual inspections); and
- A visual inspection of the CCR unit to identify signs of distress or malfunction of the CCR unit.

This report has been prepared in accordance with 40 CFR 257.84(b)(2) to document the annual inspection.

1.2 BACKGROUND

The I-43 facility includes a closed CCR landfill, which consists of disposal Phase 1 and Phase 2, and an active CCR landfill, which currently consists of three CCR units in disposal Phase 3 and Phase 4. The two landfills are located on the same property, but are not contiguous. The USEPA CCR rule does not apply to Phase 1 and Phase 2, because they were closed before the effective date of the CCR rule.

The active CCR landfill at I-43 is comprised of three existing CCR Units:

- Phase 3, Module 1
- Phase 3, Module 2
- Phase 4, Module 1

The inspection requirements in 40 CFR 257.84(b)(1) apply to the three existing (active) CCR units listed above.

At the time of the inspection, the active CCR landfill modules were in various stages of development and use as described in the table below.

Disposal Phase	Module	CCR Rule Status	Basis for Status
Phase 3	Module 1	Existing, Not currently accepting CCR. Will accept CCR following construction of Phase 3, Module 2.	Final or interim grades have been reached. Final cover under construction on portions of the CCR unit. Final closure per 257.102 will not be completed until final grades are reached throughout the CCR unit.
	Module 2	Existing, Not accepting CCR	Liner is under construction. Consistent construction presence was initiated in September 2015, prior to effective date of CCR Rule.
Phase 4	Module 1	Existing, Accepting CCR	

2.0 ANNUAL INSPECTION

Mr. Eric Nelson of SCS completed an annual inspection of active CCR landfill areas at I-43, including Phase 3, Module 1; Phase 3, Module 2; and Phase 4, Module 1 on November 19, 2015. A follow up to the November 19 inspection was completed by Mr. Nelson on January 8, 2016, to review some maintenance that was completed on some erosion control best management practices (BMPs) installed in Phase 4, Module 1. Mr. Nelson is a licensed professional engineer in Wisconsin and holds a Bachelor's of Science degree in Geological Engineering. He has over 17 years of experience in the design, construction, and operation of solid waste disposal facilities. This was the initial annual inspection of Phase 3, Modules 1 and 2 and Phase 4, Module 2 at I-43. The scope of the annual inspection is described in **Sections 2.1** and **2.2**. The results of the annual inspection are discussed in **Section 3.0**.

2.1 OPERATING RECORD REVIEW

SCS reviewed the available information in the operating record for I-43 prior to the visual inspection discussed in **Section 2.2**. Information reviewed by SCS included operating record materials provided by WPL and the information posted on Alliant Energy's CCR Rule Compliance Data and Information website for the I-43 facility. These materials reviewed are summarized in **Table 1**.

2.2 VISUAL INSPECTION

SCS completed a visual inspection of Phase 3, Module 1; Phase 3, Module 2; and Phase 4, Module 1 to identify signs of distress or malfunction of the CCR unit. SCS is also currently providing oversight of construction activities in Phase 3, Module 2.

The visual inspection included observations of the following:

- CCR placement areas including active filling areas, intermediate cover areas, final cover areas, and exterior non-CCR berms or slopes.
- Leachate collection and removal system components including visible leachate drainage layer materials.
- Leachate and contact water run-off management features including swales, the storage basin, and the storage basin pumping system.
- Non-contact storm water run-on and run-off control features, including swales located adjacent to active fill areas but outside the landfill limits and the on-site storm water management basin.

3.0 INSPECTION RESULTS

The results of the annual inspection along with a description of any deficiencies or releases identified during the visual inspection are summarized in the following sections.

3.1 CHANGES IN GEOMETRY

This is the initial annual inspection of Phase 3, Module 1; Phase 3, Module 2; and Phase 4, Module 1 at the I-43 facility completed under 40 CFR 257.84(b)(1). There are no previous annual inspections to which SCS could compare the current geometry of the landfill structure.

At the time of the visual inspection, placement of CCR in Phase 3, Module 1 had temporarily ceased. Construction of the final cover on portions of the north, east, and top slopes was ongoing. Intermediate cover soils had been placed on all remaining areas of the module.

At the time of the visual inspection, active CCR placement was evident in Phase 4, Module 1, although no placement activities were happening during the site visit.

As noted in **Section 1.2** and in the facility operating records reviewed for this inspection, Phase 3, Module 2 is currently under construction. No CCR had been received in Phase 3, Module 2 as of the date of the visual inspection.

Changes to geometry of the landfill structure will be assessed at the time of the next annual inspection.

3.2 CCR VOLUMES

The approximate volume of CCR contained in each of the active modules at the time of the inspection is summarized below. A description of how the estimate was developed and the sources used are also summarized below.

Disposal Phase	Module	Estimated Volume of CCR in Place	Basis for Estimate and Source
Phase 3	Module 1	127,400 cubic yards	CCR placement in module is on hold pending construction of Phase 3, Module 2. Estimated volume based on interim capacity permitted with state Department of Natural Resources.
	Module 2	0 cubic yards	Liner is under construction and no CCR has been placed in this module.
Phase 4	Module 1	62,295 cubic yards	Airspace consumed as of 8/21/15 plus tons disposed between 8/22-11/19/15 converted to cubic yards, assuming an average unit weight for CCR of 0.9 tons per cubic yard. Airspace consumed based on topographic survey of module on 8/21/15. Disposal records for 8/22-11/19/15 provided by WPL.

3.3 APPEARANCE OF STRUCTURAL WEAKNESS

The inspection included a review of the appearance of an actual or potential structural weakness of the CCR unit. The visual inspection included a review of CCR fill areas including the top slopes, internal side slopes, external side slopes, and internal ramps/haul roads for the presence of the following conditions:

- Signs of surface movement or instability:
 - Sloughing, slumping, or sliding
 - Surface cracking
 - Slopes in excess of 3 horizontal to 1 vertical (3H:1V)
 - Toe of slope bench movement
 - Evidence of inadequate compaction of exposed CCR
- Inappropriate vegetation growth
- Animal burrows
- Erosion damage
- Unusual surface damage caused by vehicle traffic

3.3.1 Signs of Surface Movement or Instability

Evidence of inadequate compaction of CCR was noted during the inspection of Phase 4, Module 1. Mild areas of wet, loose CCR in areas internal to the active fill area in Phase 4, Module 1 were observed. The site received approximately 0.12 inches of precipitation the day

before the inspection¹ and 1.36 inches of precipitation over the seven days prior to the inspection² on November 19, 2015. The areas were localized, and, if allowed to dry before additional CCR is placed, are unlikely to have a significant impact on the overall stability of the CCR fill in this module.

The conditions noted are not currently considered an operating deficiency. However, additional observation of these areas is recommended to ensure that the conditions observed during the visual inspection, or similar future conditions, do not have an impact on the overall stability of the CCR unit.

No other signs of surface movement or instability were noted during the inspection of Phase 3, Module 1; Phase 3, Module 2; and Phase 4, Module 1.

3.3.2 Inappropriate Vegetation Growth

No inappropriate vegetation growth was noted during the inspection of Phase 3, Module 1; Phase 3, Module 2; and Phase 4, Module 1.

3.3.3 Animal Burrows

No animal burrows were noted during the inspection of Phase 3, Module 1; Phase 3, Module 2; and Phase 4, Module 1.

3.3.4 Erosion Damage

Erosion damage to exposed CCR surfaces was noted during the inspection of Phase 4, Module 1. Mild rill and gully erosion of exposed CCR in Phase 4, Module 1 was observed in areas where CCR appeared to have been placed recently (within the week prior to November 19, 2015). The erosion observed, which included rills and small (approximately 12 or fewer inches wide and 3 or fewer inches deep) gully erosion, does not appear to impact the overall stability of the CCR fill.

SCS discussed the erosion with the landfill operator present at the site. The operator indicated the erosion was likely due to variations in the incoming CCR properties. According to the landfill operator, incoming CCR generally sets up shortly after placement in the landfill. The operator indicated that on occasions the incoming CCR does not set up as rapidly and requires increased effort to moisture condition and compact the ash before it sets up. If significant precipitation occurs before the CCR sets up, erosion can occur.

The minor erosion is not currently considered an operating deficiency since it is unlikely to have significant impact on the overall stability of the CCR unit. However, the buildup of eroded material in contact water run-off management features has the potential to allow contact water or CCR to leave the limits of the module if not addressed with regular maintenance as discussed further in **Section 3.4**.

1 Source is Weather Underground (<http://www.wunderground.com/>) for Sheboygan, Wisconsin on 11/18/15.

2 Source is Weather Underground (<http://www.wunderground.com/>) for Sheboygan, Wisconsin from 11/12-11/19/15.

No other erosion damage was noted during the inspection of Phase 3, Module 1 and Phase 4, Module 1.

3.3.5 Unusual Surface Damage Caused by Vehicle Traffic

No unusual surface damage caused by vehicle traffic was noted during the inspection of Phase 3, Module 1; Phase 3, Module 2; and Phase 4, Module 1.

3.4 DISRUPTIVE EXISTING CONDITIONS

The erosion damage observed during the inspection in Phase 4, Module 1 has resulted in the accumulation of eroded CCR material within the contact water swale located along the exterior toe of the CCR fill slopes in this module. A 3-foot-high perimeter berm is constructed at the limits of CCR fill along the outside perimeter of Phase 4, Module 1 (north, east, and south sides). The berm creates a v-shaped swale along the exterior toe of the CCR fill. Rock check dams are installed within the contact water swale at intervals of approximately 100 to 250 feet. The eroded CCR is accumulated on the upstream side of the rock check dams. Silt fence is also installed along the exterior slope of the perimeter berm on the north side of Phase 4, Module 1.

The accumulation of CCR in the contact water swale has reduced the effective depth of the swale. The reduced swale depth has the potential to allow contact water or CCR to leave the limits of Phase 4, Module 1 if not addressed with regular maintenance until intermediate cover material or the final cover system is installed over the exposed CCR. The rock check dams should be inspected weekly, and accumulated CCR should be removed from behind the rock check dams when the CCR reaches one half the height of a check dam. Some of the rock may need to be removed and replaced when accumulated CCR is removed.

In follow up to our November 19, 2015, inspection, WPL completed maintenance on the rock check dams in Phase 4, Module 1 on January 7 and 8, 2016. The maintenance completed included replacement or installation of new rock check dam materials and removal of accumulated CCR in the contact water swale immediately adjacent to each check dam. SCS completed a follow up visit to the site to inspect the rock check dam maintenance on January 8, 2016. WPL plans to complete additional maintenance of the contact water swale between the rock check dams in Phase 4, Module 1 once snow covered and frozen slopes have thawed to allow the work to be completed safely.

The accumulated CCR behind the rock check dams in the contact water swale in Phase 4, Module 1 is not considered an operating deficiency. The maintenance completed by WPL in follow up to the November 19, 2015 inspection and the activities planned for Spring 2016 will prevent the conditions from having a significant impact on the overall function of the CCR unit.

3.5 OTHER CHANGES SINCE PREVIOUS ANNUAL INSPECTION

This is the initial annual inspection of Phase 3, Module 1; Phase 3, Module 2; and Phase 4, Module 1 at the I-43 facility completed under 40 CFR 257.84(b)(1). There are no previous

annual inspections to which SCS could compare the current site conditions of the landfill to fulfill the requirement in 40 CFR 257.84(b)(2)(iv).

Changes to site conditions that may have affected the stability or operation of Phase 3, Module 1; Phase 3, Module 2; and Phase 4, Module 1 will be assessed at the time of the next annual inspection.

4.0 FUTURE INSPECTIONS

4.1 EXISTING CCR LANDFILL

As stated in 40 CFR 257.84(b)(4), the owner or operator of the CCR unit must conduct the inspection required by paragraphs (b)(1) and (2) of this section on an annual basis. The date of completing the initial inspection report is the basis for establishing the deadline to complete the first subsequent inspection. Any required inspection may be conducted prior to the required deadline provided the owner or operator places the completed inspection report into the facility's operating record within a reasonable amount of time. In all cases, the deadline for completing subsequent inspection reports is based on the date of completing the previous inspection report. The owner or operator has completed an inspection when the inspection report has been placed in the facility's operating record.

The next annual inspection of Phase 3, Module 1; Phase 3, Module 2; and Phase 4, Module 1 must be completed within one year of the placement of this inspection report in the operating record for the I-43 facility.

4.2 NEW CCR LANDFILLS AND LATERAL EXPANSIONS

As discussed above, all of the CCR units at the I-43 facility are considered existing CCR units. The initial annual inspection for modules constructed in the future must be completed within 14 months of the initial receipt of CCR in the module per 40 CFR 257.84(b)(4).

TABLE

- 1 Operating Record Summary

Table 1. Operating Record Summary
WPL Edgewater I-43 Ash Disposal Facility / Sheboygan, Wisconsin
SCS Engineers Project #25215159.00

	Record Date	Source
Operating Criteria		
CCR Fugitive Dust Control Plan	9/23/2015	Website
7-Day Inspection	10/19/2015	WPL
7-Day Inspection	10/26/2015	WPL
7-Day Inspection	10/31/2015	WPL
7-Day Inspection	11/7/2015	WPL
7-Day Inspection	11/14/2015	WPL

Notes:

1) Items sourced to the Website are from Alliant Energy's CCR Rule Compliance Data and Information website as of 12/4/15.

See <http://ccr.alliantenergy.com/Edgewater/Landfill/index.htm>

2) Items sourced to WPL are from the facility Operating Record as of the date of inspection.

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