SCS ENGINEERS

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

December 2016
File No. 25216069.00

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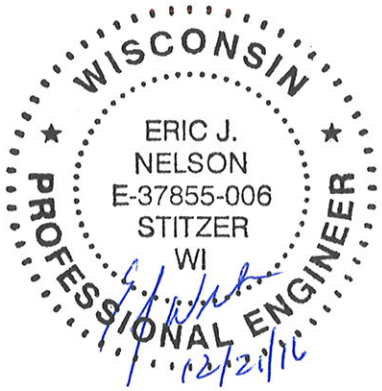
PE CERTIFICATION



I, Eric J. Nelson, hereby certify that this 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.

(signature) 12/21/2016 (date)

ERIC J. NELSON
(printed or typed name)

License number E-37855-6

My license renewal date is 7/31/2018.

Pages or sheets covered by this seal:
ANNUAL CCR LANDFILL INSPECTION – DECEMBER 2016
WPL I-43 ASH DISPOSAL FACILITY

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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 again as overlay fill is placed as filling progresses in Phase 3, Module 2.	Final or interim grades have been reached. Final cover present 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, Accepting CCR	Module construction began before the effective date of the CCR Rule and was completed in December 2015. The unit began receiving CCR after state approval of the construction, which was issued in March 2016.
Phase 4	Module 1	Existing, Not currently accepting CCR. Will accept CCR following construction of Phase 4, Module 2.	Final or interim grades have been reached. Existing final cover on portions of the CCR unit. Final closure per 257.102 will not be completed until final grades are reached throughout the CCR unit.

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 2, 2016. Mr. Nelson is a licensed professional engineer in Wisconsin and holds a Bachelor's of Science degree in Geological Engineering. He has over 18 years of experience in the design, construction, and operation of solid waste disposal facilities. This was the second annual inspection of Phase 3, Modules 1 and 2 and Phase 4, Module 1 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. The 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.

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 second 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). No apparent changes in geometry were noted that would indicate distress or malfunction of the CCR units at the facility. All changes in geometry observed during the annual inspection were the result of planned CCR filling or cover construction activities.

At the time of the visual inspection, no active CCR placement was ongoing in Phase 3, Module 1. Final grades where no future CCR placement is anticipated in Phase 3, Module 1 have been reached. Interim grades where future CCR placement is planned when adjacent CCR unit construction will allow for the overlay of additional CCR in Module 1 have also been reached. Construction of the final cover on portions of the north, east, and top slopes is complete. Intermediate cover soils are in place on all remaining areas of the module.

As noted in **Section 1.2**, Phase 3, Module 2 construction has been completed and CCR is being accepted in this unit. An initial lift of CCR is in place across approximately two-thirds of the unit area.

At the time of the visual inspection, no active CCR placement was ongoing in Phase 4, Module 1. Final grades where no future CCR placement is anticipated in Phase 4, Module 1 have been reached. Interim grades where future CCR placement is planned when adjacent CCR unit construction will allow for the overlay of additional CCR in Module 1 have also been reached. Construction of the final cover on portions of the north, east, south, and top slopes is complete. Intermediate cover soils are in place on the remaining west slope of the module.

3.2 CCR VOLUMES

The approximate volume of CCR contained in each of the CCR units 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	Estimated volume based on interim capacity permitted with state Department of Natural Resources.
	Module 2	16,600 cubic yards	Estimated volume based on tons disposed between 6/01/2016 and 10/31/2016. Tonnage converted to cubic yards assuming an average unit weight for CCR of 0.9 tons per cubic yard. Disposal records for 6/01/2016 to 10/31/2016 provided by WPL.
Phase 4	Module 1	73,300 cubic yards	Estimated volume based on interim capacity permitted with state Department of Natural Resources.

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

No 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.

Areas where inadequate compaction of CCR was noted during the previous annual inspection have been addressed with the interim closure of Phase 4, Module 1. Final and intermediate cover material has been installed on all areas of 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 of the intermediate cover on the west slope of Phase 3, Module 1; the final cover on the east slope of Phase 3, Module 1; and the leachate drainage layer on the east slope of Phase 3, Module 2 was noted in the 7-day inspections completed by WPL. At the time of the annual inspection, the erosion of the intermediate cover had been repaired, and the repair areas were covered with erosion mat.

The erosion of the final cover on the east slope of Phase 3, Module 1 was noted during the annual inspection, but the erosion appears to have been stemmed by the establishment of vegetation on this slope. No erosion damage to the final cover appears to warrant repair at this time, but the area should be monitored for changes.

The erosion of the final cover noted during the 7-day and annual inspections is not currently considered an operating deficiency since WPL will continue to monitor these areas for changes.

A majority of the leachate drainage layer erosion noted in the inspections appear to be repaired; however, limited areas of erosion remained in the leachate drainage layer at the north end of the east slope in Phase 3, Module 2. These remaining areas of erosion were discussed with landfill staff. Landfill staff indicated that this erosion damage would be repaired as the active disposal operation approached these areas and was more accessible to equipment. Landfill staff indicated the erosion of the leachate drainage layer would be repaired before CCR was placed in these areas.

The erosion of the leachate drainage layer is not currently considered an operating deficiency since WPL has repaired, and plans to continue repairing, erosion damage prior to CCR placement.

Erosion damage to exposed CCR surfaces that was noted during the previous inspection of Phase 4, Module 1 has been addressed with the interim closure of this CCR unit. Final and intermediate cover material has been installed on all areas of Phase 4, Module 1. Vegetation on the final and intermediate cover has been established on a majority of the Phase 4, Module 1 cover areas and no erosion damage was noted during the visual inspection.

No other erosion damage was noted during the inspection of Phase 3, Module 1; Phase 3, Module 2; 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 CONDITIONS

3.4.1 Existing Disruptive Conditions

3.4.1.1 Current Inspection

No existing conditions that were disrupting the operation and safety of the CCR units were noted during the annual inspection.

3.4.1.2 Previous Inspection

No existing conditions that were disrupting the operation and safety of the CCR units were noted during the previous inspection.

3.4.2 Potentially Disruptive Conditions

3.4.2.1 Current Inspection

The tracking of CCR onto landfill haul roads was noted as a potentially disruptive condition during the annual inspection. The tracking and accumulation of CCR on the landfill haul roads has the potential to produce fugitive dust if not addressed through maintenance of the roads as described in the September 2015 fugitive dust control plan.

Wet site conditions due to recent rain have likely contributed to the conditions observed during the inspection. The conditions were discussed with landfill staff who indicated that CCR is removed from the roads as indicated in the fugitive dust control plan on an as needed basis.

The tracking and accumulation of CCR on the landfill haul roads is not currently considered an operating deficiency since WPL has maintained, and plans to continue maintaining, the haul

roads as described in the fugitive dust control plan. The observed tracking and accumulation of CCR on the landfill haul roads can be addressed through regular housekeeping practices described in the fugitive dust control plan.

No other potentially disruptive conditions were noted during the inspection of Phase 3, Module 1; Phase 3, Module 2; and Phase 4, Module 1.

3.4.2.2 Previous Inspection

The erosion damage observed during the previous inspection in Phase 4, Module 1 that 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, has been addressed with the interim closure of Phase 4, Module 1. Final cover material has been installed on the areas of Phase 4, Module 1 where the erosion was noted, which has eliminated the issue noted in the previous inspection. Runoff from the final cover is collected by the perimeter drainage swales and is discharged to the on-site detention/sedimentation basin.

3.5 OTHER CHANGES SINCE PREVIOUS ANNUAL INSPECTION

The most significant change to the facility since the previous annual inspection is the completion of CCR filling in Phase 4, Module 1 and the initiation of CCR placement activities in Phase 3, Module 2. As noted in **Section 1.2**, CCR was not being placed in Phase 3, Module 1 or Phase 4, Module 1 at the time of the annual inspection because final or interim grades had been achieved in these CCR units. Construction of the liner for Phase 3, Module 2 was completed in December 2015 and subsequently approved for use in disposal operations by the Wisconsin Department of Natural Resources.

WPL has also modified the leachate and contact water storage basin monitoring and pumping system since the previous inspection. A staff gauge and high level marker buoy have been installed in the storage basin. WPL is also installing upgrades to the contact water pumping system that is used for CCR conditioning and landfill dust mitigation. These pump system upgrades include the following:

- A new floating pump in the contact water pond with a tether system to shore.
- Booster pump at the contact pond to feed the existing conditioning pump.
- Control upgrades.
- Piping modification and additional power for the new equipment.

No other changes to site conditions that appear to have the potential to affect the stability or operation of the facility were noted during the inspection of Phase 3, Module 1; Phase 3, Module 2; and Phase 4, Module 1.

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 inspection report is the basis for establishing the deadline to complete the next 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 1 year of the placement of this inspection report in the operating record for the COL 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 #25216069.00

	Record Date	Source
Location Restrictions		
No materials in operating record as of 12/21/16		Website
Design Criteria		
No materials in operating record as of 12/21/16		Website
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
7-Day Inspection	11/21/2015	WPL
7-Day Inspection	11/27/2015	WPL
7-Day Inspection	12/5/2015	WPL
7-Day Inspection	12/12/2015	WPL
7-Day Inspection	12/19/2015	WPL
7-Day Inspection	12/26/2015	WPL
7-Day Inspection	1/2/2016	WPL
7-Day Inspection	1/9/2016	WPL
7-Day Inspection	1/16/2016	WPL
Initial Annual CCR Landfill Inspection	1/18/2016	Website
7-Day Inspection	1/23/2016	WPL
7-Day Inspection	1/30/2016	WPL
7-Day Inspection	2/6/2016	WPL
7-Day Inspection	2/13/2016	WPL
7-Day Inspection	2/19/2016	WPL
7-Day Inspection	2/27/2016	WPL
7-Day Inspection	3/5/2016	WPL
7-Day Inspection	3/11/2016	WPL
7-Day Inspection	3/18/2016	WPL
7-Day Inspection	3/22/2016	WPL
7-Day Inspection	3/26/2016	WPL
7-Day Inspection	4/2/2016	WPL
7-Day Inspection	4/9/2016	WPL
7-Day Inspection	4/16/2016	WPL
7-Day Inspection	4/23/2016	WPL
7-Day Inspection	4/30/2016	WPL
7-Day Inspection	5/7/2016	WPL
7-Day Inspection	5/14/2016	WPL
7-Day Inspection	5/16/2016	WPL
7-Day Inspection	5/21/2016	WPL
7-Day Inspection	5/28/2016	WPL
7-Day Inspection	6/4/2016	WPL
7-Day Inspection	6/11/2016	WPL

Table 1. Operating Record Summary
WPL Edgewater I-43 Ash Disposal Facility / Sheboygan, Wisconsin
SCS Engineers Project #25216069.00

	Record Date	Source
7-Day Inspection	6/15/2016	WPL
7-Day Inspection	6/18/2016	WPL
7-Day Inspection	6/23/2016	WPL
7-Day Inspection	6/25/2016	WPL
7-Day Inspection	6/29/2016	WPL
7-Day Inspection	7/2/2016	WPL
7-Day Inspection	7/8/2016	WPL
7-Day Inspection	7/13/2016	WPL
7-Day Inspection	7/16/2016	WPL
7-Day Inspection	7/22/2016	WPL
7-Day Inspection	7/29/2016	WPL
7-Day Inspection	8/5/2016	WPL
7-Day Inspection	8/6/2016	WPL
7-Day Inspection	8/13/2016	WPL
7-Day Inspection	8/20/2016	WPL
7-Day Inspection	8/27/2016	WPL
7-Day Inspection	9/3/2016	WPL
7-Day Inspection	9/10/2016	WPL
7-Day Inspection	9/17/2016	WPL
7-Day Inspection	9/24/2016	WPL
Run-On and Run-Off Control Plan	9/29/2016	Website
7-Day Inspection	10/1/2016	WPL
7-Day Inspection	10/8/2016	WPL
7-Day Inspection	10/15/2016	WPL
7-Day Inspection	10/22/2016	WPL
7-Day Inspection	10/29/2016	WPL
Annual CCR Fugitive Dust Control Report	11/30/2016	Website
Groundwater Monitoring		
No materials in operating record as of 12/21/16		Website
Closure/Post-Closure Care		
Post-Closure Care Plan	9/29/2016	Website
Initial Closure Plan	9/29/2016	Website

Notes:
1) Items sourced to the Website are from Alliant Energy's CCR Rule Compliance Data and Information website as of 12/21/16.
   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.

I:\25216069.00\Reports\2016 Federal Inspection\Operating Record Files\[Table 1 Operating Record Summary_I43.xlsx]Summary