



Annual CCR Landfill Inspection Modules 1 - 3

Columbia Dry Ash Disposal Facility

Prepared for:

Wisconsin Power and Light Company

Columbia Energy Center
W8375 Murray Road
Pardeeville, Wisconsin 53954

Prepared by:

SCS ENGINEERS
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(608) 224-2830

December 2016
File No. 25216067.00

Offices Nationwide
www.scsengineers.com

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1 Operating Record Summary

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PE CERTIFICATION

	<p>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.</p>	
	<p style="text-align: center;"><i>E J Nelson</i></p> <p>(signature)</p>	<p style="text-align: center;">12/21/2016</p> <p>(date)</p>
	<p style="text-align: center;">ERIC J. NELSON</p> <p>(printed or typed name)</p>	
	<p>License number <u>E-37855-6</u></p>	
	<p>My license renewal date is <u>7/31/2018</u>.</p>	
<p>Pages or sheets covered by this seal:</p> <p><u>Annual CCR Landfill Inspection - DECEMBER 2016</u></p> <p><u>WPL COLUMBIA Dry Ash Disposal Facility</u></p>		

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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) Columbia Dry Ash Disposal Facility (COL) in Pardeeville, 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 COL facility includes an active CCR landfill, which currently consists of three CCR units, all located in Phase 1 of the facility.

The active CCR landfill at COL is comprised of three existing CCR units:

- Module 1
- Module 2
- Module 3

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 1	Module 1	Existing. Not currently accepting CCR. Will accept CCR again following construction of Phase 2, Modules 7 and 8.	Final or interim grades have been reached. Final cover completed 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 currently accepting CCR. Will accept CCR again as overlay fill is placed as filling progresses in Phase 1, Module 3.	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 3	Existing, Accepting CCR	Consistent construction presence was initiated in September 2015, prior to effective date of CCR Rule. Module construction was completed in July 2016 and began receiving CCR after state approval of the construction.

2.0 ANNUAL INSPECTION

Mr. Eric Nelson of SCS completed an annual inspection of active CCR landfill areas at COL, including Module 1, Module 2, and Module 3 on November 1, 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 Module 1, Module 2, and Module 3 at COL. 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 COL 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 COL facility. These materials reviewed are summarized in **Table 1**.

2.2 VISUAL INSPECTION

SCS completed a visual inspection of Module 1, Module 2, and Module 3 to identify signs of distress or malfunction of the CCR units.

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 internal contact water drainage features, leachate collection system discharge pipe, and the leachate/surface water pond.
- 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 south sedimentation 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 Module 1, Module 2, and Module 3 at the COL 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 Module 1. Final grades where no future CCR placement is anticipated in Module 1 have been reached. Interim grades where future CCR placement is planned where adjacent CCR unit construction will allow for the overlay of additional CCR in Module 1 have also been reached. The final cover has been extended along the south and west slopes. No change in the final cover on the east slope has occurred. Intermediate cover soils have been placed on a portion of the south and east slopes. Erosion mat was being installed on the final and intermediate cover areas at the time of the inspection.

At the time of the visual inspection, no active CCR placement was ongoing in Module 2. Final grades where no future CCR placement is anticipated in Module 2 have been reached in a small area on a portion of the west slope. Interim grades where future CCR placement is planned where adjacent CCR unit construction will allow for the overlay of additional CCR in Module 2 have also been reached. Final cover has been constructed over a small portion of the west slope of Module 2. Intermediate cover soils have been placed on a portion of the west, north, and east slopes. Erosion mat was being installed on the final and intermediate cover areas at the time of the inspection.

As noted in **Section 1.2**, Module 3 construction has been completed and CCR is being accepted in this CCR unit. A temporary rain cover installed over the leachate drainage layer has been removed from the base of approximately one-half of the CCR unit. An initial lift of CCR is in place in areas where the rain cover has been removed.

3.2 CCR VOLUMES

The approximate volume of CCR contained in each of the active modules at the time of 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 1	Module 1	554,029 cubic yards	Estimated volume based on existing waste volumes as of 11/31/2015 plus tons disposed between 12/1/2015 and 9/23/2016. Tonnage converted to cubic yards assuming an average unit weight for CCR of 0.9 tons per cubic yard. Volume includes material placed during the 2016 cover construction project. Estimated disposal volume is split evenly between Module 1 and Module 2. Disposal records for 12/1/2015 to 9/23/2016 provided by WPL. Waste placement in Modules 1 and 2 stopped on 9/23/2016.
	Module 2	219,429 cubic yards	Same as above.
	Module 3	9,550 cubic yards	Waste placement in Module 3 began on 9/23/2016. Estimated volume based on tons disposed between 9/23/2016 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 9/23/2016 to 10/31/2016 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

The slopes in excess of 3H:1V and evidence of inadequate compaction of exposed CCR that were noted in one specific location during the initial annual inspection of Module 2, in December 2015, have been addressed. Since the previous inspection, this area has been regraded to flatten the steep slopes and repair eroded areas. This area was included in the recently constructed intermediate cover project.

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

3.3.2 Inappropriate Vegetation Growth

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

3.3.3 Animal Burrows

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

3.3.4 Erosion Damage

Minor erosion in the exposed leachate drainage layer material at downslope edge of the remaining temporary rain cover on the west slope of Module 3 was noted during the inspection. Erosion of exposed leachate drainage layer appears to be caused by concentrated flow of storm water at the edge of the rain cover.

The condition noted is not currently considered an operating deficiency since it is unlikely to have a significant impact on the function of the CCR unit. However, additional observation of these areas is recommended to ensure that the conditions observed during the visual inspection, or similar future conditions, are addressed as the rain cover is removed and before CCR filling in these areas occurs.

No erosion damage was noted during the inspection of Module 1, Module 2, and Module 3.

3.3.5 Unusual Surface Damage Caused by Vehicle Traffic

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

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

A potentially disruptive condition was noted during the inspection at the contact water management area located at the east end and within the limits of Module 2. The contact water management area is functioning as designed and has accumulated a significant amount of CCR. The accumulated CCR in this area should be removed and leachate drainage layer restored to as-built conditions before too much CCR accumulates in this area. If too much CCR is allowed to accumulate in this area, the accumulated CCR may impede the flow of contact water into the leachate/surface water pond or allow the release of CCR into the leachate/surface water pond.

The accumulated CCR and recommended maintenance in this area was discussed with plant staff at the time of the inspection. According to plant staff, the COL facility is currently making plans to obtain the equipment needed to perform the recommended maintenance.

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

3.4.2.2 Previous Inspection

No potentially disruptive conditions were noted during the previous inspection.

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 Module 1 and Module 2, and the initiation of CCR placement activities in Module 3. As noted in **Section 1.2**, CCR was not being placed in Module 1 and Module 2 at the time of the annual inspection because final or interim grades had been achieved in these CCR units. Construction of the liner for Module 3 was completed in July 2016 and subsequently approved for use in disposal operations by the Wisconsin Department of Natural Resources.

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 Module 1, Module 2, and Module 3.

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 Module 1, Module 2, and Module 3 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 COL 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).

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TABLE 1

Operating Record Summary

**Table 1. Operating Record Summary
WPL Columbia Dry Ash Disposal Facility / Pardeeville, Wisconsin
SCS Engineers Project #25216067.00**

	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		
7-Day Inspection	10/19/2015	WPL
7-Day Inspection	10/23/2015	WPL
7-Day Inspection	10/26/2015	WPL
7-Day Inspection	10/30/2015	WPL
7-Day Inspection	11/2/2015	WPL
7-Day Inspection	11/6/2015	WPL
7-Day Inspection	11/9/2015	WPL
7-Day Inspection	11/13/2015	WPL
7-Day Inspection	11/16/2015	WPL
7-Day Inspection	11/19/2015	WPL
CCR Fugitive Dust Control Plan	11/23/2015	Website
7-Day Inspection	11/23/2015	WPL
7-Day Inspection	11/28/2015	WPL
7-Day Inspection	12/4/2015	WPL
7-Day Inspection	12/7/2015	WPL
7-Day Inspection	12/9/2015	WPL
7-Day Inspection	12/11/2015	WPL
7-Day Inspection	12/14/2015	WPL
7-Day Inspection	12/18/2015	WPL
7-Day Inspection	12/21/2015	WPL
7-Day Inspection	12/23/2015	WPL
7-Day Inspection	12/28/2015	WPL
7-Day Inspection	1/1/2016	WPL
7-Day Inspection	1/4/2016	WPL
7-Day Inspection	1/8/2016	WPL
7-Day Inspection	1/11/2016	WPL
7-Day Inspection	1/18/2016	WPL
Initial Annual CCR Landfill Inspection Mod 1-3	1/18/2016	Website
7-Day Inspection	1/22/2016	WPL
7-Day Inspection	1/25/2016	WPL
7-Day Inspection	1/29/2016	WPL
7-Day Inspection	2/1/2016	WPL
7-Day Inspection	2/8/2016	WPL
7-Day Inspection	2/12/2016	WPL
7-Day Inspection	2/15/2016	WPL
7-Day Inspection	2/20/2016	WPL
7-Day Inspection	2/22/2016	WPL
7-Day Inspection	2/26/2016	WPL
7-Day Inspection	2/29/2016	WPL

**Table 1. Operating Record Summary
WPL Columbia Dry Ash Disposal Facility / Pardeeville, Wisconsin
SCS Engineers Project #25216067.00**

	Record Date	Source
7-Day Inspection	3/4/2016	WPL
7-Day Inspection	3/7/2016	WPL
7-Day Inspection	3/11/2016	WPL
7-Day Inspection	3/14/2016	WPL
7-Day Inspection	3/18/2016	WPL
7-Day Inspection	3/21/2016	WPL
7-Day Inspection	3/25/2016	WPL
7-Day Inspection	3/28/2016	WPL
7-Day Inspection	4/1/2016	WPL
7-Day Inspection	4/4/2016	WPL
7-Day Inspection	4/8/2016	WPL
7-Day Inspection	4/11/2016	WPL
7-Day Inspection	4/15/2016	WPL
7-Day Inspection	4/18/2016	WPL
7-Day Inspection	4/24/2016	WPL
7-Day Inspection	4/29/2016	WPL
7-Day Inspection	5/2/2016	WPL
7-Day Inspection	5/9/2016	WPL
7-Day Inspection	5/10/2016	WPL
7-Day Inspection	5/16/2016	WPL
7-Day Inspection	5/20/2016	WPL
7-Day Inspection	5/23/2016	WPL
7-Day Inspection	5/27/2016	WPL
7-Day Inspection	5/30/2016	WPL
7-Day Inspection	6/3/2016	WPL
7-Day Inspection	6/6/2016	WPL
7-Day Inspection	6/10/2016	WPL
7-Day Inspection	6/13/2016	WPL
7-Day Inspection	6/17/2016	WPL
7-Day Inspection	6/20/2016	WPL
7-Day Inspection	6/24/2016	WPL
7-Day Inspection	6/27/2016	WPL
7-Day Inspection	7/1/2016	WPL
7-Day Inspection	7/4/2016	WPL
7-Day Inspection	7/8/2016	WPL
7-Day Inspection	7/11/2016	WPL
7-Day Inspection	7/18/2016	WPL
7-Day Inspection	7/22/2016	WPL
7-Day Inspection	7/25/2016	WPL
7-Day Inspection	7/29/2016	WPL
7-Day Inspection	8/1/2016	WPL
7-Day Inspection	8/5/2016	WPL
7-Day Inspection	8/8/2016	WPL
7-Day Inspection	8/12/2016	WPL
7-Day Inspection	8/15/2016	WPL
7-Day Inspection	8/22/2016	WPL

**Table 1. Operating Record Summary
WPL Columbia Dry Ash Disposal Facility / Pardeeville, Wisconsin
SCS Engineers Project #25216067.00**

	Record Date	Source
7-Day Inspection	8/29/2016	WPL
7-Day Inspection	9/2/2016	WPL
7-Day Inspection	9/5/2016	WPL
7-Day Inspection	9/10/2016	WPL
7-Day Inspection	9/12/2016	WPL
7-Day Inspection	9/16/2016	WPL
7-Day Inspection	9/19/2016	WPL
7-Day Inspection	9/26/2016	WPL
7-Day Inspection	9/30/2016	WPL
7-Day Inspection	10/3/2016	WPL
Run-On and Run-Off Control Plan: Ph1, Mod 1-3	10/6/2016	Website
7-Day Inspection	10/7/2016	WPL
7-Day Inspection	10/10/2016	WPL
7-Day Inspection	10/14/2016	WPL
7-Day Inspection	10/17/2016	WPL
7-Day Inspection	10/24/2016	WPL
7-Day Inspection	10/28/2016	WPL
7-Day Inspection	10/31/2016	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		
Initial Closure Plan: Ph1, Mod 1-3	10/6/2016	Website
Post-Closure Care Plan	10/6/2016	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/Columbia/index.htm>
- 2) Items sourced to WPL are from the facility Operating Record as of the date of inspection.

I:\25216067.00\Reports\2016 Federal Inspection\Operating Record Files\[Table 1 Operating Record Summary_COL.xlsx]Summary