Annual CCR Landfill Inspection, Modules 1-3, Modules 4-6, and Modules 10-11

Columbia Dry Ash Disposal Facility

Prepared for:

Wisconsin Power and Light Company
W8375 Murray Road
Pardeeville, Wisconsin 53954

SCS ENGINEERS

25224067.00 | December 19, 2024

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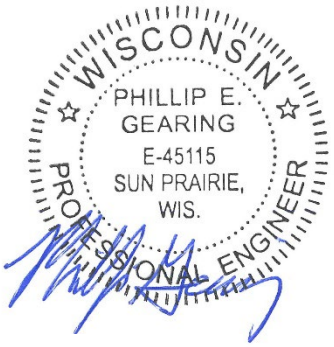
PE CERTIFICATION



12/19/2024

I, Phillip E. Gearing, 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.

12/19/2024

(signature) (date)

Phillip Gearing

(printed or typed name)

License number E-45115

My license renewal date is July 31, 2026.

Pages or sheets covered by this seal:

All – Annual CCR Landfill Inspection – Columbia Dry Ash Disposal Facility

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1.0 INTRODUCTION

1.1 PURPOSE

On July 30, 2024, 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 (U.S. EPA) coal combustion residuals (CCR) rule, 40 Code of Federal Regulations (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 the following CCR units:

- Module 1 through Module 3 (existing CCR landfill per 40 CFR 257.53).
- Module 4 through Module 6, Module 10, and Module 11 (new CCR landfill per 40 CFR 257.53).

Modules 1 through 3 were previously described as separate existing CCR landfills, although they are contiguous and are managed as a single landfill by the facility and by the Wisconsin Department of Natural Resources. WPL previously clarified that Modules 1 through 3 are one existing CCR landfill under the federal CCR Rule, and this report reflects WPL's clarification. Modules 4, 5, 6, 10, and 11 are a new CCR landfill that initiated construction after October 19, 2015, and is therefore managed as a separate CCR unit under the CCR Rule, even though it is contiguous to Modules 1 through 3. Modules 10 and 11 were constructed in 2022 and 2023 and became operational in June 2023. Modules 7, 8, 9, 12, and 13 are permitted by the State of Wisconsin, but have not yet been developed. Modules 12 and 13 were under construction at the time of the inspection.

The inspection requirements in 40 CFR 257.84(b)(1) apply to all of the CCR units listed above.

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

Disposal Phase	Unit	CCR Rule Status	Basis for Status
Phase 1	Modules 1 - 3	Existing CCR Landfill. Currently accepting CCR.	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. CCR overlay from Module 10 was occurring onto Module 3. Final cover construction was occurring on a western portion of Modules 2 and 3 during the inspection.
Phase 1/ Phase 2	Modules 4 - 6, Module 10, and Module 11	New CCR Landfill. Currently accepting CCR.	CCR placement began on November 5, 2018, in the unit. CCR placement began in Modules 10 and 11 on June 1, 2023. Intermediate cover has been placed over most of Modules 4 through 6. Final cover construction was occurring on a western portion of Module 4 during the inspection. CCR overlay from Module 11 was occurring onto Module 4.

2.0 SUMMARY OF RESULTS AND RECOMMENDATIONS

SCS identified no deficiencies or releases during the annual inspection of the CCR units at COL. Deficiencies and releases must be remedied by the owner or operator as soon as feasible and the remedy documented.

SCS did identify additional conditions during the annual inspection that are not considered deficiencies but have the potential to become a deficiency if left unaddressed. Each condition and the recommendations provided by SCS to address them are summarized in the table below. These conditions and recommendations are described in further detail in Section 4.0.

Condition	CCR Unit / Area	Recommendation(s) / [STATUS]	Report Section
Vegetation growth in down chute, which could eventually affect final cover	Southwest grouted Down Chute (Module 1 Final Cover)	Remove vegetation. **[COMPLETED]** Continue to observe and remove existing / future vegetation, as necessary. Monitor during 7-day inspections.	4.3.2
Vegetation growth at outlet, which could eventually compromise leachate drainage	Module 1 Leachate Pipe Outlet	Remove vegetation. **[COMPLETED]** Continue to observe and remove vegetation, as necessary to provide outlet operation.	4.3.2

Condition	CCR Unit / Area	Recommendation(s) / [STATUS]	Report Section
		Monitor during 7-day inspections.	
Woody vegetation growth off access road	West of Contact Water/ Leachate Pond and east of Module 2	Remove woody growth or other unwanted vegetation. **[COMPLETED]** Continue to observe and remove vegetation, as necessary. Monitor during 7-day inspections.	4.3.2
Bare areas observed. Future erosion may eventually expose CCR if left unvegetated	East slopes of Modules 2 and 3	Backfill and grade eroded areas. Add seed and erosion mat to bare areas to promote vegetation growth on intermediate cover. **[COMPLETED]** Monitor during 7-day inspections.	4.3.4
Sediment accumulation due to rain event	Storm water swale and culverts Module 2 contact water piping inlets and outlets Contact water / leachate pond east of Module 2 contact water piping outlets	Remove accumulated sediment. **[PARTIALLY COMPLETED, ONGOING MAINTENANCE]** Monitor during 7-day inspections.	4.3.4
Leachate pipe outlet sediment accumulation	Module 2 leachate pipe outlet	Sediment removed and marked during inspection. **[COMPLETED]** Remove future accumulated sediment and debris. Monitor during 7-day inspections.	4.4.2.1
Toe drain outlet sediment accumulation	Module 1 toe drain outlet	Remove additional sediment in the swale adjacent to toe drain. Protect the end of the toe drain with a protector sleeve and add additional aggregate material. **[COMPLETED]** Monitor during 7-day inspections.	4.4.2.1

Condition	CCR Unit / Area	Recommendation(s) / [STATUS]	Report Section
Limited contact water capacity	Module 10 (South CCR Limit)	Grade CCR material to create drainage path around perimeter of the module. Supplement drainage layer sand material at the CCR limit for additional buffer or add intermediate cover on the CCR slope to limit the production of contact water. **[COMPLETED]** Monitor during 7-day inspections.	4.4.2.1
Leachate headwells and pond level sensor communication failure	LH-2, LH-5, LH-6, and Pond level sensors	Replace damaged equipment. **[LH-2 AND POND LEVEL COMPLETED]** Observe leachate headwell and pond levels manually or under other electronic means until repair of the communication signal.	4.4.2.1

3.0 ANNUAL INSPECTION

Mr. Phillip Gearing of SCS completed an annual inspection of active CCR landfill areas at COL, including Modules 1 through 3, Modules 4 through 6, and Modules 10 and 11 on July 7, 2023. Mr. Gearing is a licensed professional engineer in Wisconsin and holds a Bachelor of Science degree in Geological Engineering. He has over 18 years of experience in the design, construction, and operation of solid waste disposal facilities. 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 COL. 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.

3.2 VISUAL INSPECTION

SCS completed a visual inspection of Modules 1 through 3, Modules 4 through 6, and Modules 10 and 11 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, on intermediate/final cover slopes, and outside the landfill limits and the south sedimentation basin.

4.0 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.

4.1 CHANGES IN GEOMETRY

No apparent changes in geometry were noted that would indicate distress or malfunction of the CCR units at the facility since the previous annual inspection at the COL facility completed under 40 CFR 257.84(b)(1). Changes in geometry observed during the annual inspection were the result of planned CCR filling in the current CCR units.

As noted in **Section 1.2**, CCR placement is occurring in Module 10 and Module 11, with overlay into Module 3 and Module 4. Final cover or intermediate cover is established along portions of Modules 1 through 3 and Modules 4 through 6. Final cover construction was occurring on a western portion of Modules 2, 3, and 4; and module construction was occurring in Modules 12 and 13 during the 2024 inspection. Vegetation is established or becoming established on all final and intermediate cover areas.

4.2 CCR VOLUMES

The approximate volume of CCR contained in each of the active units near the time of the inspection is summarized below. Note that the inspection was performed on July 30, 2024, and a survey of CCR was performed on August 7, 2024. A description of how the estimate was developed is summarized below.

Disposal Phase	Unit	Estimated Volume of CCR in Place	Basis for Estimate and Source
Phase 1	Modules 1-3	1,060,400 cubic yards	There was CCR overlay onto Module 3 at the time of the inspection. Estimated volume based on a survey performed on 8/7/2024 compared to documented base grades. Estimated volume excludes final cover or intermediate cover material installed at time of survey. Estimated volume considers a vertical boundary at the Module 3 limit to Module 4 and Module 10.
Phase1/ Phase 2	Modules 4 - 6, Module 10, and Module 11	925,100 cubic yards	CCR continued to be placed in Modules 4 - 6 until intermediate cover placement. CCR placement began in Modules 10 and 11 in June 2023 and has been overlayed onto Modules 3 and 4. CCR volume placed in Modules 4 - 6, 10, and 11 was estimated based on a survey performed on 8/7/2024 compared to documented top of leachate drainage layer grades. Estimated volume considers a vertical boundary at the Module 4 limit to Module 3 and Module 10 limit to Module 3.

4.3 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 greater than three horizontal to one 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

4.3.1 Signs of Surface Movement or Instability

No signs of surface movement or instability were noted during the inspection.

4.3.2 Inappropriate Vegetation Growth

No inappropriate vegetation growth impacting the CCR unit was noted during the inspection. The following items have the potential to become a deficiency if left unaddressed:

- Vegetation was observed in the southwest grouted riprap down chutes located on the Module 1 Final Cover. WPL should remove existing vegetation before it becomes established and impacts the final cover. Continued removal of future vegetation as necessary and monitoring during 7-day inspections is recommended.

- Woody vegetation was observed to the west of the contact water/leachate pond, off the edge of the access road. WPL should remove woody vegetation growth before it becomes established. The vegetative growth was not impacting the stability of the CCR landfill at the time of the inspection. Continued vegetation removal and monitoring during 7-day inspections is recommended.

- Vegetation made it difficult to observe the leachate outlet from Module 1. The location was staked so it could be located. Vegetation directly adjacent to the Module 1 outlet was cleared away during the annual inspection. No issues with the current operation of the outlet were observed. WPL should monitor vegetation during 7-day inspections and keep the area maintained to allow for the effective observation of flow from the pipe outlet.

Vegetation growth was discussed with plant staff. Maintenance and removal of vegetation has occurred post the inspection based on observations performed by SCS during ongoing Modules 12 and 13 construction activities.

4.3.3 Animal Burrows

No animal burrows were noted during the inspection.

4.3.4 Erosion Damage

The following erosion damage was noted during the inspection:

- Areas of bare soil were observed on the intermediate cover on the east slopes of Modules 2 and 3. Bare soil may erode, eventually exposing CCR if not addressed. Bare soil areas should have seed and erosion mat or hydromulch added to promote vegetation growth on the intermediate cover. WPL should continue to monitor this during 7-day inspections.

- Sediment accumulation was observed in the following areas due to erosion of intermediate cover materials: storm water swale and culverts; Module 2 contact water piping inlets and outlets; and the contact water/leachate pond east of Module 2 contact water piping outlets. WPL should remove the accumulated sediment and continue to monitor it during 7-day inspections.

The bare soil and sediment accumulation areas were discussed with plant staff after the inspection was performed. Erosion and sediment accumulation areas were actively being addressed with restoration and sediment removal post the inspection based on observations performed by SCS during ongoing Module 12 and 13 construction activities.

The bare soil and sediment accumulation conditions noted are not currently considered an operating deficiency since it is unlikely to have a significant impact on the function of the CCR unit; however, WPL should continue to observe these areas during 7-day inspections to confirm that the conditions observed during the visual inspection, or similar future conditions, are addressed. No additional erosion damage was noted during the inspection.

4.3.5 Unusual Surface Damage Caused by Vehicle Traffic

No unusual surface damage caused by vehicle traffic was noted during the inspection.

4.4 DISRUPTIVE CONDITIONS

4.4.1 Existing Disruptive Conditions

4.4.1.1 Current Inspection

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

4.4.1.2 Previous Inspection

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

4.4.2 Potentially Disruptive Conditions

4.4.2.1 Current Inspection

Module 2 Leachate Pipe Outlet. The Module 2 leachate pipe outlet could not be immediately located during the inspection due to accumulated sediment and debris from a rain event. Once the pipe outlet was found, it was observed that the pipe was flowing and not impeded. Sediment and debris was removed from the outlet during the inspection and the pipe location was marked. Although the pipe outlet was not blocked at the time of the inspection, a blocked pipe could cause storage of leachate into Module 2. Monitoring of the leachate pipe outlet and the removal of future accumulated sediment and debris during 7-day inspections is recommended.

Module 1 Toe Drain Outlet. The Module 1 toe drain outlet was covered with sediment from a rain event. A blocked toe drain could cause issues with final cover drainage and potential slope instability. The sediment over the toe drain was removed, and the toe drain was marked during the inspection. Toe drain maintenance was discussed with WPL. The observed sediment accumulation at the outlet was addressed by removing sediment in the swale adjacent to the toe drain. A protector sleeve and additional aggregate material was added at the toe drain outlet. WPL should continue to monitor the toe drain outlets during 7-day inspections.

Module 10 (South CCR Limit) Limited Contact Water Capacity. Limited capacity for contact water was observed along the southern limit of Module 10. No CCR was observed to have migrated outside the liner limits; however, if the contact water pathway becomes severely blocked, CCR may migrate beyond the limits of the liner. It was discussed with WPL that CCR material should be graded to create a defined drainage path around the perimeter of the module when close to the CCR limit. For an additional buffer, drainage layer sand material should be supplemented at the CCR limit.

Alternatively, it was discussed that intermediate cover placement would limit the amount of contact water generated. Post inspection, additional drainage layer sand material was added to the perimeter of Modules 10 and 11. Intermediate cover material was also added to the south slope of Module 10 to limit contact water generation. The drainage in Modules 10 and 11 should continue to be monitored during 7-day inspections.

Leachate Headwell and Pond Level Sensor Communications. The LH-2, LH-5, LH-6, and contact water/leachate pond level sensor communications were not operational due to a damaged solar panel affecting the signal repeater. A discussion about replacing the damaged equipment was had with WPL. The damaged solar panel was fixed post inspection and the pond level sensor and LH-2 are operational based on observation of measurement readouts at the control panel. LH-5 and LH-6 have been monitored manually due to tie-in construction between Modules 12 and 13 and Modules 5 and 6, which included removal of the transducers and readout equipment.

No other potentially disruptive conditions were noted during the inspection.

4.4.2.2 Previous Inspection

The tracking of CCR onto the landfill haul road was noted as a potentially disruptive condition during the previous inspection. Tracking of CCR onto the landfill entrance and access roads was not observed during the current inspection.

4.5 OTHER CHANGES SINCE PREVIOUS ANNUAL INSPECTION

No changes to site conditions that appear to have the potential to affect the stability or operation of the facility were noted during the inspection.

5.0 FUTURE INSPECTIONS

5.1 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 CCR units Modules 1 through 3, Modules 4 through 6, and Modules 10 and 11 must be completed within 1 year of the placement of this inspection report in the operating record for the COL facility.

5.2 NEW CCR LANDFILLS AND LATERAL EXPANSIONS

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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