Annual CCR Landfill Inspection

Ottumwa-Midland Landfill
15300 130th Street
Ottumwa, Iowa 52501

Prepared for:

Interstate Power and Light Company
15300 130th Street
Ottumwa, Iowa 52501

SCS ENGINEERS

25219073.00 | December 20, 2019

2830 Dairy Drive
Madison, WI 53718-6751
608-224-2830

Table of Contents

Section Page

I:\25219073.00\Deliverables\2019 Federal Inspection\191220_OML Annual CCR Landfill Inspection.docx

[This page left blank intentionally]

PE CERTIFICATION

12/20/19

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 Iowa.

12/20/2019

(signature) (date)

Eric J. Nelson

(printed or typed name)

License number 23136

My license renewal date is December 31, 2020.

Pages or sheets covered by this seal:

Annual CCR Landfill Inspection, Ottumwa-Midland Landfill,

December 20, 2019

[This page left blank intentionally]

1.0 INTRODUCTION

1.1 PURPOSE

SCS Engineers (SCS) completed an annual inspection of the Interstate Power and Light Company (IPL) Ottumwa-Midland Landfill (OML) in Ottumwa, Iowa. 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 OML facility includes an active CCR landfill, which currently consists of two CCR units:

- OML Existing Landfill
- OML Expansion Phase 1

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

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

CCR Unit	CCR Rule Status	Basis for Status
OML Existing Landfill	Existing, Accepting CCR	Module received CCR before and after the effective date of the CCR Rule.
OML Expansion Phase 1	Existing, Accepting CCR	Module construction was completed in September 2015 and began receiving CCR in October 2016 after state approval of the construction.

2.0 SUMMARY OF RESULTS AND RECOMMENDATIONS

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

SCS did identify 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, remedial recommendations, and activities completed or planned to remedy each item, as available from IPL, are described in further detail in Section 4.0.

Condition	CCR Unit	Recommendation(s)	Report Section
Rill and minor gully erosion of intermediate soil cover	Existing Landfill	Monitor intermediate cover during 7-day inspections and repair/restore if CCR is exposed.	4.3.4
Erosion of bottom ash ramp	Expansion Phase 1	Monitor during 7-day inspections and repair if ponding of leachate/ contact water occurs, signaling obstruction of contact water flow or leachate collection.	4.3.4
OML staff identified low influent flows from the south storm water basin to the storm water/ groundwater underdrain lift station. Staff suspect pipe between the storm water basin and lift station may be damaged.	Existing Landfill	Verify storm water intake in pond is clean/clear providing unobstructed flow. Repair leachate flow meter in lift station to allow measurement of leachate collected from Existing Landfill. Camera inspect leachate and groundwater underdrain piping via the cleanouts located at the lift station.	4.4.2.1
Surface cracking in temporary contact water and northern-most sedimentation basin berms	Expansion Phase 1	Fill the cracks with sand/bentonite mixture and monitor during 7-day inspections.	4.4.2.1
Leachate headwell level sensor (transducer) is reading negative value	Expansion Phase 1	Verify ongoing negative reading. If negative reading is verified, remove pressure transducer from headwell and contact manufacturer for assistance troubleshooting.	4.4.2.1

3.0 ANNUAL INSPECTION

Mr. Eric Nelson of SCS completed an annual inspection of the active CCR units at OML, including the Existing Landfill and Expansion Phase 1 on July 12, 2019. 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. 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 OML in addition to the visual inspection discussed in Section 3.2. Information reviewed by SCS included operating record materials provided by IPL and the information posted on Alliant Energy's CCR Rule Compliance Data and Information website for the OML facility.

3.2 VISUAL INSPECTION

SCS completed a visual inspection of the Existing Landfill and Expansion Phase 1 at OML 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, and exterior non-CCR berms or slopes.
- Leachate collection and removal system components including visible leachate drainage layer materials, leachate vaults, cleanouts, and the leachate storage lagoon.
- Contact water run-off management features including internal contact water drainage features and Temporary Contact Water Basin 1/2.
- Non-contact storm water run-on and run-off control features including swales and sedimentation basins located adjacent to active fill areas but outside the landfill limits.
- Groundwater underdrain system components including the visible underdrain discharge pipes.

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 of the Existing Landfill and Expansion Phase 1 at the OML facility, completed under 40 CFR 257.84(b)(1). All changes in geometry observed during the annual inspection were the result of planned CCR filling or intermediate soil cover placement activities.

At the time of the visual inspection, active CCR placement was evident in the Existing Landfill. CCR placement is limited to an area of approximately 700 feet (east to west) by 160 feet (north to south) at the peak of the CCR unit. Intermediate cover is in place along a portion of the north, west, and east slopes; the majority of the south slope; and all but the active CCR placement area and access road on the top slope.

At the time of the visual inspection, active CCR placement was evident in Expansion Phase 1. CCR placement in this area has expanded since the previous annual inspection. The temporary rain cover has been partially removed and the CCR placement area expanded to include additional areas of the east and south slope and approximately 60 to 70 percent (%) of the bottom area of the CCR unit. The western third of the bottom area of the CCR unit and portion of the interior slopes (east, west, and south slopes) of the lined area are still covered with a temporary rain cover, and no CCR has been placed in these areas.

4.2 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.

CCR Unit	Estimated Volume of CCR in Place	Basis for Estimate and Source
OML Existing Landfill	973,467 cubic yards	Estimated volume based on existing in-place waste volume as of 5/23/2017 (848,611 cubic yards) plus estimated waste disposed between 5/24/2017 and 7/12/2019. In place volume as of 5/23/2017 is based on topographic survey and includes daily and intermediate cover soil. Waste disposed from 5/24/2017 to 7/12/2019 (112,370 tons) was estimated using actual disposal data provided by IPL and average daily disposal rates estimated using the data provided. This tonnage was converted to cubic yards (124,856 cubic yards), assuming an average unit weight for CCR of 0.9 tons per cubic yard. It was assumed all waste from this period, with the exception of fly ash from the Prairie Creek generating facility, was disposed of in the Existing Landfill. Disposal records through 8/30/2019 were provided by IPL.
OML Expansion Phase 1	28,087 cubic yards	Estimated volume based on existing in-place waste volume as of 5/23/2017 (11,157 cubic yards) plus estimated waste disposed between 5/24/2017 and 7/12/2019. In place volume as of 5/23/2017 is based on topographic survey. Waste disposed from 5/24/2017 to 7/12/2019 (15,237 tons) was estimated using actual disposal data provided by IPL and average daily disposal rates estimated using the data provided. This tonnage was converted to cubic yards (16,930 cubic yards), assuming an average unit weight for CCR of 0.9 tons per cubic yard. However, only fly ash generated by the Prairie Creek generating station was assumed to be disposed of in Expansion Phase 1 for this time period. Disposal records through 8/30/2019 were provided by IPL.

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 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

4.3.1 Signs of Surface Movement or Instability

No signs of surface movement or instability were noted in the inspection of the two CCR units.

4.3.2 Inappropriate Vegetation Growth

No inappropriate vegetation growth that was causing apparent distress or malfunction of the CCR units was noted during the inspection.

4.3.3 Animal Burrows

No animal burrows that were causing apparent distress or malfunction of the CCR units were noted during the inspection.

4.3.4 Erosion Damage

The following erosion damage was observed during the annual inspection.

- Mild gully erosion of the Existing Landfill intermediate cover materials was noted at various locations during the inspection. Similar erosion was also noted in the previous inspection and has been repaired between the annual inspections based on the presence of sparse vegetation and residual mulch and erosion mat materials. The erosion appears to be caused by areas of concentrated runoff from the intermediate cover. The runoff causing the erosion is controlled and directed to the storm water basin located to the south of the landfill. The erosion is not currently considered an operating deficiency since it is unlikely to have a significant impact on the function of the CCR unit. The eroded areas should be monitored. If CCR becomes visible, the eroded areas should be filled with soil.

  Based on discussions with IPL staff, erosion maintenance in un-vegetated areas of the intermediate cover is managed on an as-needed basis. Erosion maintenance and vegetation restoration in vegetated areas of the intermediate cover are completed on a

regular schedule with events in the spring and fall of each year. Per IPL, the erosion noted will be addressed during the next regularly scheduled maintenance event.

- **Erosion of the bottom ash access ramp to the Expansion Phase 1 active filling area** that was noted during previous inspection remains; however, no significant changes to the conditions in this area were noted during the current inspection. Bottom ash from the ramp has eroded into the area along the north side of the ramp and into the culvert that allows the free flow of contact water under the ramp in Expansion Phase 1. The condition is not prohibiting the proper management of contact water because a temporary rain cover is installed over the south end of the culvert, so the culvert serves no current function. Non-contact water generated in the temporary rain cover area is properly managed by facility staff by pumping it to the adjacent sedimentation basin to the north. This area should be monitored and repaired if ponding water occurs.

Based on the current inspection, the conditions noted are not considered an operating deficiency since they are unlikely to have a significant impact on the function of the CCR unit. However, erosion and the resulting deposit of sediment in surface water and contact water management features have the potential to cause ponding of water that may result in a discharge of CCR or impact the overall stability of the CCR. Observation of these areas and ongoing regular maintenance is recommended to ensure that the conditions observed during the visual inspection, or similar future conditions, are addressed and do not lead to a discharge of CCR or have an impact on the overall stability of the CCR unit.

No other erosion damage was noted during the inspection.

4.3.5 Unusual Surface Damaged 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

The following potentially disruptive conditions were observed during the annual inspection.

- **Low influent flow from south storm water basin**. OML staff identified low influent flows from the Existing Landfill south storm water basin to the storm water/groundwater underdrain lift station. Staff suspect the pipe between the storm water basin and lift station may be damaged. Since this piping is located near leachate and groundwater underdrain piping from the existing landfill, there is concern that this piping is also impacted. At the time of inspection, OML staff were not able to assess leachate flows from the Existing Landfill due to an inoperable leachate flow meter. It is recommended that IPL staff complete the following remedial actions:

  – Verify storm water intake in pond is clean/clear, providing unobstructed flow.
  – Repair leachate flow meter in lift station to allow measurement of leachate collected from existing landfill.
  – Camera inspect leachate and groundwater underdrain piping via the cleanouts located at the lift station.

  Per IPL, the likely cause of the inoperable leachate flow meter has been identified and repairs are underway. Camera inspections will be completed after leachate flow measurement resumes and leachate flow is assessed.

- **Surface cracking in berms**. SCS observed surface cracking in the berms that border the Expansion Phase 1 temporary contact water basin and northern-most storm water sedimentation basin to the east. The cracks are visible in sparsely vegetated areas along the top of the berm, which is constructed of clay. The cracks may be desiccation cracks caused by the very dry conditions at the site over the last couple years. It is recommended that IPL staff fill the cracks with a sand/bentonite mixture as they are identified and monitor the cracks for changes during their 7-day inspections.

- **Negative leachate head readings**. SCS also observed the level sensor (transducer) was reading negative values at the Expansion Phase 1 – leachate headwell. It is recommended OML staff verify ongoing negative readings and, if the reading is persisting, remove the transducer from the headwell and contact the manufacturer for trouble-shooting assistance.

4.4.2.2 Previous Inspection

The following potentially disruptive conditions were observed during the previous inspection.

- **Accumulation of CCR immediately upstream of three 36-inch-diameter contact water culverts** in the northwest corner of Expansion Phase 1 was noted in the previous inspection. Maintenance has occurred in this areas since the previous inspection. Continued monitoring of this location for recurring accumulation of CCR is recommended.

- **Surface cracking in the berms** that border the Expansion Phase 1 temporary contact water basin and northern-most storm water sedimentation basin were noted in the previous inspection. In addition to maintenance performed by OML staff, the cracking appears to vary based on site moisture conditions. Continued maintenance and monitoring are recommended to address these conditions.

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 of the Existing Landfill or Expansion Phase 1.

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 the Existing Landfill and Expansion Phase 1 must be completed within 1 year of the placement of this inspection report in the operating record for the OML facility.

5.2 NEW CCR LANDFILLS AND LATERAL EXPANSIONS

As discussed above, all of the CCR units at the OML facility are considered existing CCR units. The initial annual inspection for CCR units 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)(3)(ii).