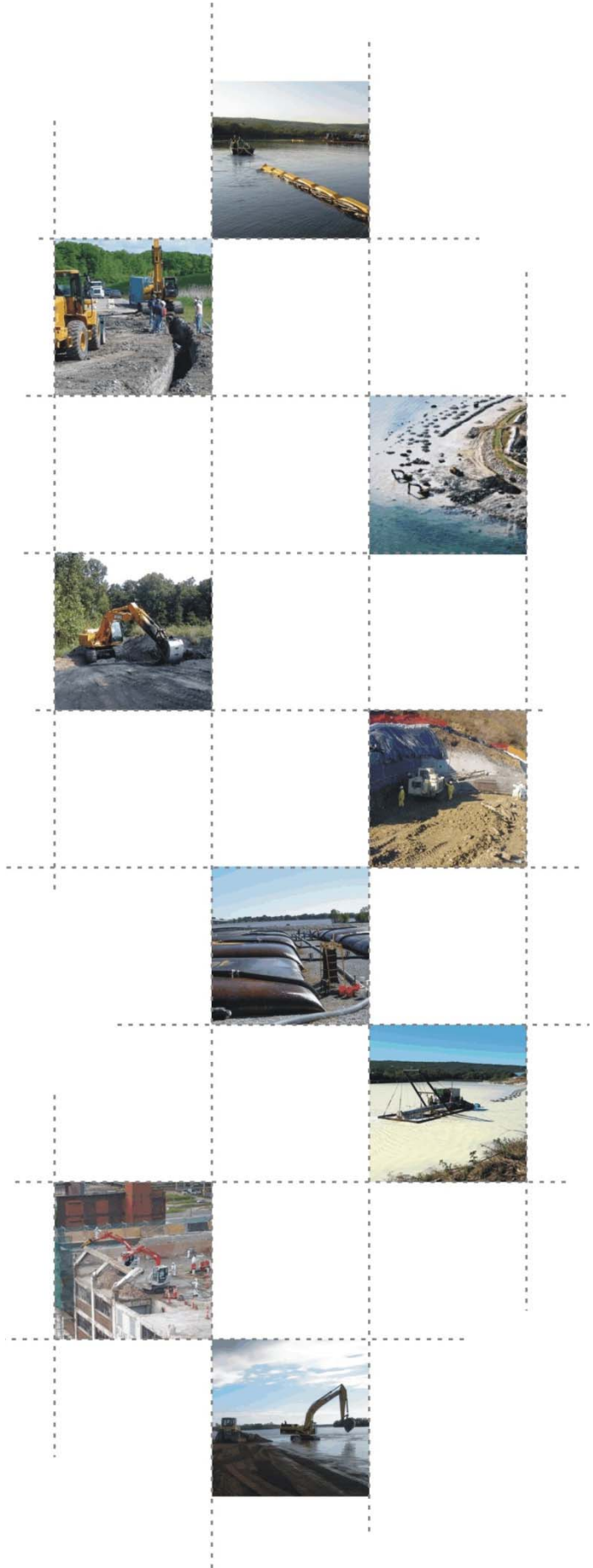


**ALLIANT ENERGY
WISCONSIN POWER AND LIGHT
NELSON DEWEY GENERATING STATION**

CCR SURFACE IMPOUNDMENT

ANNUAL INSPECTION REPORT

January 15, 2016



EXECUTIVE SUMMARY

This annual inspection report has been prepared in accordance with the requirements of the United States Environmental Protection Agency (USEPA) published Final Rule for Hazardous and Solid Waste Management System - Disposal of Coal Combustion Residual (CCR) from Electric Utilities (40 CFR Parts 257 and 261, also known as the CCR Rule) published on April 17, 2015 and effective October 19, 2015.

This annual inspection report has been prepared to assess the condition of existing CCR surface impoundments. Primarily, the annual inspection report is focused on the structural stability of the existing CCR surface impoundments and to ensure that the operation and maintenance of the existing CCR surface impoundments is in accordance with recognized and generally accepted good engineering standards.



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1.0 INTRODUCTION

This annual inspection report has been prepared in accordance with the requirements of §257.83(b) of the CCR Rule.

1.1 CCR Rule Applicability

The CCR Rule requires annual inspections by a qualified professional engineer (PE) for existing CCR surface impoundments with a height of 5 feet or more and a storage volume of 20 acre-feet or more or the existing CCR surface impoundment has a height of 20 feet or more (40 CFR §§ 257.73(b), 257.73(d) and 257.83(b)).

1.2 Annual Inspection Applicability to the Nelson Dewey Generating Station

The Wisconsin Power and Light Company (WPL), Nelson Dewey Generating Station (NED) in Cassville, Wisconsin is no longer generating electricity as of December 31, 2015 and therefore CCR is no longer generated by the facility. However, NED has one existing CCR surface impoundment, identified as the NED Slag Pond. The NED Slag Pond meets the requirements of §257.73(b)(1) of the CCR Rule, as the existing CCR surface impoundment has a storage height of 5 feet or more and a storage volume greater than 20 acre-feet, and thus is subject to the periodic structural stability assessment requirements of §257.73(d) of the CCR Rule. Therefore, the existing CCR surface impoundment at NED is required to be inspected by a qualified PE on a periodic basis per §257.83(b) of the CCR Rule.

The initial annual inspection of the NED Slag Pond was completed by a qualified PE on October 19, 2015. The annual inspection was completed by a qualified PE to ensure that the design, construction, operation, and maintenance of the existing CCR surface impoundment at NED is consistent with recognized and generally accepted good engineering standards.

The initial annual inspection of the NED Slag Pond included a review of available information regarding the status and condition of the existing CCR surface impoundment. The information reviewed included all relevant files available in the operating record at the time of the initial annual inspection. These files for the NED Slag Pond included the 7-day inspection forms and 30-day instrumentation monitoring forms.



The initial annual inspection also included a visual inspection of the existing CCR surface impoundment in order to identify signs of distress or malfunction of the existing CCR surface impoundment and appurtenant structures. Additionally, the visual inspection included any hydraulic structures underlying the base of the existing CCR surface impoundment or passing through the dikes of the existing CCR surface impoundment for structural integrity and continued safe and reliable operation.



2.0 DESCRIPTION OF EXISTING CCR SURFACE IMPOUNDMENT AT NED

The following sub-section provides a summary description of the existing CCR surface impoundment located at NED.

2.1 NED Slag Pond

The NED Slag Pond is located northwest of the generating plant and south of the on-site closed ash landfill. The NED Slag Pond receives storm water runoff from the on-site closed ash landfill, as well as slag handling areas. The NED Slag Pond was the primary receiver of process flows from the generating plant prior to December 31, 2015 when the facility ceased operations. Wastewater was also periodically pumped from the WPDES Pond to the Slag Pond. Process flows, prior to the facility ceasing operations, included sluiced CCR (slag) from the slag tanks located inside the generating plant, as well as flows associated with the seal well sump pumps. Flows from the seal well sump pumps included soot blowers, air compressors, boiler blowdown, Unit 1 and Unit 2 floor sumps, oil and hydrogen coolers and demineralization/reverse osmosis multi-media units.

Prior to the facility ceasing operations the sluiced CCR was discharged into the east end of the NED Slag Pond where the majority of CCR was recovered. A dozer was then utilized to push the CCR towards an excavator for dredging. Prior to October 19, 2015, the dredged CCR was stockpiled adjacent to the NED Slag Pond for dewatering. Once dewatered, the CCR was transported off-site for beneficial use. Since October 19, 2015 CCR was no longer stockpiled adjacent to the NED Slag Pond.

The water used to sluice the CCR from the generating plant to the NED Slag Pond flowed from the east end to the west end of the NED Slag Pond. The southwest corner of the NED Slag Pond consists of the facility's Wisconsin Pollution Discharge Elimination System (WPDES) Outfall 002. The concrete outfall structure consists of a notched weir that discharges into a 30-inch diameter reinforced concrete pipe. The water flows through the WPDES Outfall 002, under the adjacent access road along the west side of the NED Slag Pond, and discharges into a riprap lined swale that flows to the southwest into the Mississippi River.

Instrumentation associated with the NED Slag Pond includes a flow meter for monitoring the discharge through WPDES Outfall 002.



3.0 ANNUAL INSPECTION REPORTING CRITERIA

The following sub-sections address the annual inspection reporting criteria per §257.83(b)(2) of the CCR Rule for the existing CCR surface impoundment located at NED.

3.1 NED Slag Pond

3.1.1 Changes in Geometry (§257.83(b)(2)(i))

After review of available information provided by NED pertaining to the status and condition of the existing CCR surface impoundment, as well as discussions with NED facility personnel who oversee and maintain the operation, maintenance, and inspection activities of the existing CCR surface impoundment, there have been no identified changes in the geometry of the impounding structure that would warrant additional investigation or remedial activities.

Additionally, review of historical annual inspections completed in 2011 through 2014, prior to this initial CCR Rule annual inspection, has shown there have been no previously identified changes in the geometry of the NED Slag Pond.

3.1.2 Existing Instrumentation (§257.83(b)(2)(ii))

Instrumentation that supports the operation of the NED Slag Pond includes a flow meter that monitors the discharge through WPDES Outfall 002. The instrumentation is located in the southwest corner of the NED Slag Pond.

As this is the initial CCR Rule annual inspection, there is no historical record of available information regarding the maximum recorded readings of each instrument from a previous annual inspection that was available for review. However, flow data associated with the WPDES Outfall 002 discharge (e.g. maximum daily flow) was provided by WPL staff for 2015 (January 01, 2015 through September 30, 2015). Reviewing the provided flow data, the maximum daily flow recorded through WPDES Outfall 002 was approximately 3.15 million gallons (August 2015).

3.1.3 Depth and Elevation of Impounded CCR and Water (§257.83(b)(2)(iii))

As this is the initial CCR Rule annual inspection, there were no historical record of available information regarding the approximate minimum, maximum, and present depths and elevations of the impounded CCR and water in the NED Slag Pond from a previous annual inspection that were available for review.



However, historical information was previously provided from WPL staff, including the most recent bathymetric survey of the NED Slag Pond completed by BT² (2006), as well as an ash pond slope stability and hydraulic analysis report prepared by Aether DBS (2011) which included information regarding soil boring data and depth of CCR below ground surface adjacent to the NED Slag Pond. Reviewing the information provided within the above mentioned documents, the following depths and elevations were approximated for the impounded CCR and water:

- From the 2011 ash pond slope stability and hydraulic analysis report, soil borings installed adjacent to the NED Slag Pond encountered CCR from the ground surface (elevation of 625) to approximately 18 feet below ground surface (elevation of 607). Therefore, the original design bottom elevation of the existing CCR surface impoundment was estimated to be approximately 607.
- From the 2006 bathymetric survey, the lowest contour elevation identified in the NED Slag Pond was approximately 607, located in the western half of the existing CCR surface impoundment. As the NED Slag Pond extends from west to east the bathymetric elevation rises from 607 to an approximate elevation of 615. Comparing the 2006 bathymetric survey to the estimated original design bottom elevation of 607, the thickness of deposition ranges from 0 feet in the western half of the existing CCR surface impoundment to approximately 8 feet in the eastern half.
- From the 2006 bathymetric survey, the water elevation of the NED Slag Pond was approximately 616.61 and the elevation of the weir outlet structure of WPDES Outfall 002 was approximately 615.31. From 2015 flow data provided by WPL, the measured staff height of the NED Slag Pond at the time of the highest flow discharge through WPDES Outfall 002 was recorded to be 1.5 feet, which equaled a water elevation of 616.81 in the NED Slag Pond. Comparing the water elevation at the time of the highest flow discharge through WPDES Outfall 002 in 2015 (616.81) and the 2006 bathymetric survey, the water depth ranges from approximately 9.81 feet in the western half of the existing CCR surface impoundment to approximately 1.81 feet in the eastern half.

3.1.4 Storage Capacity of Impounding Structure (§257.83(b)(2)(iv))

The storage capacity (water volume) of the NED Slag Pond at the time of the initial annual inspection was not readily available.

However, historical information was previously provided from WPL staff, including the most recent bathymetric survey of the NED Slag Pond completed by BT² (2006), as well as a hydraulic evaluation report of the NED Slag Pond prepared by BT² (2006) which included information regarding the water volume of the existing CCR surface



impoundment. Reviewing the information provided within the above mentioned documents, the approximate storage capacity of the NED Slag Pond was calculated.

From the 2006 bathymetric survey, the surveyed elevation of the weir outlet structure of WPDES Outfall 002 was approximately 615.31. From 2015 flow data provided by WPL, the measured staff height of the NED Slag Pond at the time of the highest flow discharge through WPDES Outfall 002 was recorded to be 1.5 feet, which equaled a water elevation of 616.81. The deepest contour identified in the NED Slag Pond from the 2006 bathymetric survey was at an elevation of approximately 607, however, the average bottom elevation of the NED Slag Pond was closer to 611 as the bathymetry of the existing CCR surface impoundment rose in elevation from west to east. Comparing the water elevation at the time of the highest flow discharge through WPDES Outfall 002 in 2015 (616.81) and the estimated average bottom contour elevation (611), the total interior storage height was approximately 5.81 feet.

The total surface area of the NED Slag Pond was approximately 3.7 acres. Thus, the total volume of water within the NED Slag Pond available for storage was approximately 34,000 cubic yards. Comparing the calculated storage capacity to the 2006 hydraulic evaluation report prepared by BT², the total volume calculated in 2006 was approximately 32,000 cubic yards.

3.1.5 Volume of Impounded CCR and Water (§257.83(b)(2)(v))

The volume of impounded CCR and water (total volume) within the NED Slag Pond at the time of the initial annual inspection was not readily available.

However, historical information was previously provided from WPL staff, including the most recent bathymetric survey of the NED Slag Pond completed by BT² (2006), as well as an ash pond slope stability and hydraulic analysis report prepared by Aether DBS (2011) which included information regarding soil boring data and depth of CCR below ground surface adjacent to the NED Slag Pond. Reviewing the information provided within the above mentioned documents, the approximate volume of the impounded CCR and water in the NED Slag Pond was calculated.

From the 2011 ash pond slope stability and hydraulic analysis report, soil borings installed adjacent to the NED Slag Pond encountered CCR from the ground surface (elevation of 625) to approximately 18 feet below ground surface (elevation of 607). From



the 2006 bathymetric survey, the surveyed elevation of the weir outlet structure of WPDES Outfall 002 was approximately 615.31. From 2015 flow data provided by WPL, the measured staff height of the NED Slag Pond at the time of the highest flow discharge through WPDES Outfall 002 was recorded to be 1.5 feet, which equaled a water elevation of 616.81. Comparing the water elevation at the time of the highest flow discharge through WPDES Outfall 002 in 2015 (616.81) and the elevation of the native soil immediately below the encountered CCR (607), the total height of the impounded CCR and water was approximately 9.81 feet.

The total surface area of the NED Slag Pond was approximately 3.7 acres. Thus, the total volume of impounded CCR and water within the NED Slag Pond was approximately 58,000 cubic yards.

3.1.6 Structural Weaknesses and Disruptive Conditions (§257.83(b)(2)(vi))

After review of available information provided by NED pertaining to the status and condition of the existing CCR surface impoundment, discussions with NED facility personnel who oversee and maintain the operation, maintenance, and inspection activities of the existing CCR surface impoundment, as well as conducting the on-site visual inspection of the existing CCR surface impoundment, there have been no identified appearances of an actual or potential structural weakness of the existing CCR surface impoundment that would warrant additional investigation or remedial activities. Additionally, there were no identified issues with the structural integrity of the hydraulic structures (WPDES Outfall 002) associated with the NED Slag Pond.

Regarding the existing conditions of the NED Slag Pond that are disrupting or have the potential to disrupt the operation and safety of the existing CCR surface impoundment and appurtenant structures, the following conditions were identified:

- Vegetation Overgrowth
 - The discharge end of the WPDES Outfall 002 hydraulic structure could not be properly inspected due to the presence of dense/tall brush and woody vegetation (e.g. shrubs, small/large diameter trees) protruding through the riprap in certain areas along the slope around the hydraulic structure. The vegetation restricted the ability to properly inspect the area around the hydraulic structure for structural integrity. Items such as erosion, seeps,



and animal activity (if present) were unable to be observed due to the vegetation overgrowth.

{Note: Embankments of existing CCR surface impoundments located in or adjacent to floodplains, sovereign lands, property boundaries, wetlands, and potential other restrictive areas may require various types of permits prior to conducting vegetation management activities.}

3.1.7 Other Changes Affecting Stability or Operation of Impounding Structure (§257.83(b)(2)(vii))

After review of available information provided by NED pertaining to the status and condition of the existing CCR surface impoundment, as well as discussions with NED facility personnel who oversee and maintain the operation, maintenance, and inspection activities of the existing CCR surface impoundment, there have been no other identified changes that have affected the stability or operation of the NED Slag Pond.

Additionally, review of historical annual inspections completed in 2011 through 2014, prior to this initial CCR Rule annual inspection, has shown there have been no previously identified changes that have affected the stability or operation of the NED Slag Pond.



4.0 CERTIFICATION

To meet the requirements of 40 CFR 257.83(b), I Mark W. Loerop hereby certify that I am a licensed professional engineer in the State of Wisconsin; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in 40 CFR 257.83(b).



By: 

Name: MARK W. LOEROP

Date: JAN 15, 2016

