CCR Surface Impoundment 3B 2018 Annual Inspection Report

Neal North Energy Center

Sergeant Bluff, Iowa
January 11, 2019

hgm ASSOCIATES INC.

MIDAMERICAN ENERGY COMPANY

MidAmerican Energy Company
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2018 CCR Surface Impoundment 3B Annual Inspection Report

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Professional Engineer Certification

"I hereby certify that the CCR Surface Impoundment 3B at the Neal North Energy Center, owned and operated by the MidAmerican Energy Company, has been inspected and this report prepared in accordance with the Coal Combustion Residual Rule 40 CFR 257.83(b). I am a duly licensed Professional Engineer under the laws of the State of Iowa"

Print Name: Zachary M. Wheat

Signature: 

Date: January 11, 2019

License No.: 22574

My license renewal date is December 31, 2020

1 Introduction

On April 17, 2015, the U.S. Environmental Protection Agency (EPA) published the final rule for the regulation and management of coal combustion residuals (CCR) under Subtitle D of the Resource Conservation and Recovery Act [RCRA, 42 United States Code (U.S.C.) §6901 et seq.]. The CCR Rule defines a set of requirements for the disposal and handling of CCR within CCR units (defined as either landfills or surface impoundments). MidAmerican Energy Company (MEC) is subject to the CCR Rule and therefore must have a qualified Professional Engineer conduct an annual inspection of its CCR surface impoundments in accordance with 40 CFR Section 257.83(b). HGM Associates Inc. conducted the 2018 annual inspection of the Neal North Energy Center (NNEC) CCR Surface Impoundment 3B (NNEC Impoundment 3B) on September 26, 2018, on behalf of MEC. This report contains the results and observations of the inspection.

1.1 Purpose

The CCR Rule requires inspections of CCR units and reports to be completed and filed on an annual basis. The completion date of the last inspection report (i.e. placed in the facility operating record) establishes the deadline to complete the next inspection and report. The requirements of the annual inspection include:

- A review of available information regarding the status and condition of the CCR unit - 257.83 (b)(1)(i)
- A visual inspection of the CCR unit to identify signs of distress or malfunction - 257.83 (b)(1)(ii)
- A visual inspection of any hydraulic structures underlying the base or passing through the dike of the CCR unit for structural integrity and continued safe and reliable operation - 257.83 (b)(1)(iii)
- An inspection report that includes the following:
  - Changes in geometry since the last inspection - 257.83 (b)(2)(i)
  - Location and type of existing instrumentation and maximum recorded readings - 257.83 (b)(2)(ii)
  - Approximate minimum, maximum and present depth and elevation of impounded water and CCR - 257.83 (b)(2)(iii)
  - Storage capacity of the impounding structure at time of inspection - 257.83 (b)(2)(iv)
  - Approximate volume of impounded water and CCR in unit at time of inspection - 257.83 (b)(2)(v)

- Appearance of actual or potential structural weakness of the CCR unit - 257.83 (b)(2)(vi)
- Any other changes which may have affected the stability or operation of the CCR unit since the last inspection - 257.83 (b)(2)(vii)

MEC, as owner and operator of the NNEC CCR Impoundment 3B, must notify the Iowa Department of Natural Resources (IDNR) Director within 30 days of placing the CCR Surface Impoundment Annual Inspection Report in the operating record and date of posting to the CCR web site (40 CFR §257.106 and §257.107).

1.2 Background

The Neal North Energy Center is a coal-fired generating plant located approximately four miles south of Sergeant Bluff, Iowa, along the east shore of the Missouri River. NNEC includes an existing CCR landfill and an existing CCR surface impoundment. Inactive portions of the onsite CCR Surface Impoundments were closed in December 2017; the existing surface impoundment, NNEC Impoundment 3B, initiated closure July 27, 2018. This annual inspection report covers the NNEC Impoundment 3B.

NNEC Impoundment 3B is located on the southeast portion of the property, south of the coal pile and railroad tracks. NNEC Impoundment 3B is located between closed Impoundment 3A and New Lake, a former oxbow of the Missouri River. A facility site map is included in Appendix A. NNEC Impoundment 3B encompasses approximately 35 acres and is divided by berms constructed of CCR into four distinct pond areas. CCR transport water was piped to the northwestern pond area which ultimately draining through a culvert into the southern pond area and discharged through a permitted outfall (see Appendix A); however, the plant converted to dry ash handling in May 2018. Non-CCR wastewater was redirected to a new lined wastewater pond in July 2018; therefore, the Impoundment initiated closure in July 2018. The northern pond area was dry at the time of the inspection. The outlet structure is located at the southwest corner of the southern pond and discharges through a permitted outfall to a culvert under the existing road, conveying water to the west and eventually day-lighting approximately 1,400 feet west of NNEC Impoundment 3B. The impoundment consists of embankments on all sides, however the north side includes CCR placed higher than the surrounding embankment.

2 Review of Available Information

Section 257.83(b)(1)(i) of the CCR Rule requires that available information regarding the status and condition of the CCR surface impoundment such as the previous weekly and annual inspections are to be reviewed. Several documents pertaining to the operation and structural integrity of the NNEC Surface Impoundment were reviewed before, during and after the site inspection, including:

- Annual inspection report prepared by HDR and dated January 13, 2017, and the annual inspection report prepared by HGM and dated January 12, 2018.
- The NNEC Surface Impoundment weekly inspection records from September 27, 2017 through September 29, 2018.
- Records on instrumentation for the CCR surface impoundment, provided within the inspection reports by MEC.
- CCR disposal quantities provided by MEC.
- Topographic survey previously provided by MEC.

Review of the above documents did not uncover any unresolved issues that indicated operational, safety or structural concerns of the NNEC Impoundment 3B.

3 Visual Site Inspection

Section 257.83(b)(1)(ii) of the CCR Rule requires a visual inspection of the CCR surface impoundment be performed. A site inspection of the NNEC Surface Impoundment was performed on September 26, 2018 by Zachary Wheat of HGM Associates. Office reviews of available information were conducted by Zachary Wheat.

3.1 Extent of Inspection

The weather during the site visit was sunny and clear with temperatures ranging from 47 to 67 degrees Fahrenheit.

The visual inspection involved walking the entire perimeter of the impoundment along the upper working areas and along the toe and crest of the containment berms/embankments. The intent of the visual inspection was to identify signs of any distress or malfunction of the CCR surface impoundment and appurtenant structures including a check of the hydraulic structures for structural integrity and continued safe and reliable operation. As the CCR Rule

only requires the inspection of the active existing CCR surface impoundments an appurtenant structures, this report does not address the condition of the groundwater monitoring system, access roads beyond the surface impoundment perimeter, and structures, grades or drainage channels that are not an operational component of NNEC Surface Impoundment 3B.

The field visit included visual inspection of the following:

- Perimeter embankments/berms condition (surface cracking, erosion, slides/sloughs, inadequate slope protection, poor vegetation, animal burrows, settlement, seepage)
- Interior berms condition
- Hydraulic structures
  - Inlet condition
  - Culvert(s) between pond areas and Outfall structure condition
  - Lift station

The site was no longer receiving sluiced ash flow of CCR or non-CCR wastewater at the time of the inspection.

3.2 Inspection Findings

Based on the observations made at the time of the visual inspection, the following are the findings of the NNEC Impoundment 3B inspection:

- In general, vegetation was well established throughout the exterior containment berms.
- Minor erosion rills from storm water runoff were still present on interior slope along the east side of the south containment (pond) area.
- The corrugated metal pipe (CMP) at the northwest corner where sluice water previously entered the south subcell of the impoundment shows sign of corrosion where it was exposed. The area of erosion is internal to the surface impoundment and not currently a stability concern.

The hydraulic structure, or outfall structure, was visually inspected for signs of distress or malfunction and none was observed. No significant deficiencies were observed during the inspection.

4 Changes in Geometry

Section 257.83(b)(2)(i) of the CCR Rule requires that any changes in geometry be noted since the previous annual inspection.

Currently the geometry of the NNEC Impoundment 3B is generally similar to the previous annual inspection. Minor grading has been completed along the northwest interior to eliminate erosion caused by the sluiced ash previously being discharged into the impoundment. Both the western and eastern portions of the northern pond area have been cut off from inflow and appeared dry during the field inspection. The southern pond includes a larger ponded water area where water surface elevation is monitored and observed at the control structure.

5 Instrumentation

Section 257.83(b)(2)(ii) of the CCR rule requires location and type of existing instrumentation and maximum recorded readings of each instrument since the previous annual inspection.

A gauge is located at the outlet structure at the southwest corner of NNEC Impoundment 3B. The gauge reference is measured down from the top of the control structure, a datum of 1083.5 feet mean sea level (MSL). The maximum recorded reading since the previous inspection was 7.2 feet (or 1076.3 feet MSL), as recorded by MEC during weekly inspections. Gauge reading at the time of inspection indicated a water surface measurement of 7.3 feet which coincides with a water surface elevation of 1076.2 feet MSL.

6 Approximate Depth - Impounded Water and CCR

Section 257.83(b)(2)(iii) requires the approximate minimum, maximum and present depth and elevation of the impounded water and CCR to be identified since the previous annual inspection. This information was obtained from the survey completed by HGM Associates, Inc. in November 2016 and visual observation during the inspection.

At the time of inspection, there was no water in the north portion of the Impoundment. Water surface elevation in the southern portion was observed at 1076.2 feet MSL with an average depth of 2.9 feet.

Maximum heights of CCR material in the NNEC Impoundment 3B was unchanged from when it had been surveyed which ranged in elevation from 1075.9 to 1076.7 feet MSL with a depth ranging from 7.6 to 7.0 feet on the control structure gauge.

7 Storage Capacity

Section 257.83(b)(2)(iv) requires the storage capacity of the impounding structure at the time of inspection to be identified. Storage capacity of the active impoundment was assessed by conducting AutoCAD modeling of the HGM Associates, Inc. survey information provided by MEC dated November 2016. The lowest elevation of the embankment surrounding the active portions of the impoundment is 1084.17 ft MSL and occurs approximately midway on the western slope of the southern pond area.

The total volume of the impoundment between the estimated bottom elevation of 1068.43 feet and the two feet of freeboard estimated elevation of 1082.17 feet is approximately 488 acre-feet or 787,250 cubic yards. CCR material which is stockpiled above the freeboard elevation is dry and fully contained within the limits of the impoundment's perimeter berm. This material is considered stable as documented within the stability assessment performed by Burns and McDonnell and the visual observations of HGM. The total amount of CCR within the impoundment is estimated at 671,330 cubic yards of which 200,600 cubic yards is above the freeboard elevation. The stockpiled CCR has minimal impact on the overall water and CCR storage capability of the impoundment.

8 Approximate Volume - Impounded Water and CCR

Section 257.83(b)(2)(v) requires the approximate volume of CCR and water in the CCR surface impoundment to be estimated as part of the annual report. Based on site survey and MEC records, the 2017 annual inspection estimated a total volume of CCR in the NNEC 3B Impoundment to be 651,599 cubic yards (per MEC this volume included material placed through September 2017).

Records currently available through September 2018 indicate 17,758 tons (approximately 19,731 cubic yards) of sluiced ash have been discharged into the pond since the previous inspection through September 2018 which totals 671,330 cubic yards of CCR material contained within Impoundment 3B. As previously noted, the impoundment ceased receiving CCR and non-CCR wastewater in July 2018, and MEC has initiated closure of the impoundment.

At the time of inspection, the water surface in the south portion of the impoundment was nearly unchanged from last year's inspection. Impounded water volume is estimated to be 26.1 acre-feet based on water surface elevation ranging from 1075.9 to 1076.7 feet MSL. A copy of the survey for reference is included in Appendix B.

9 Appearance of Structural Weakness

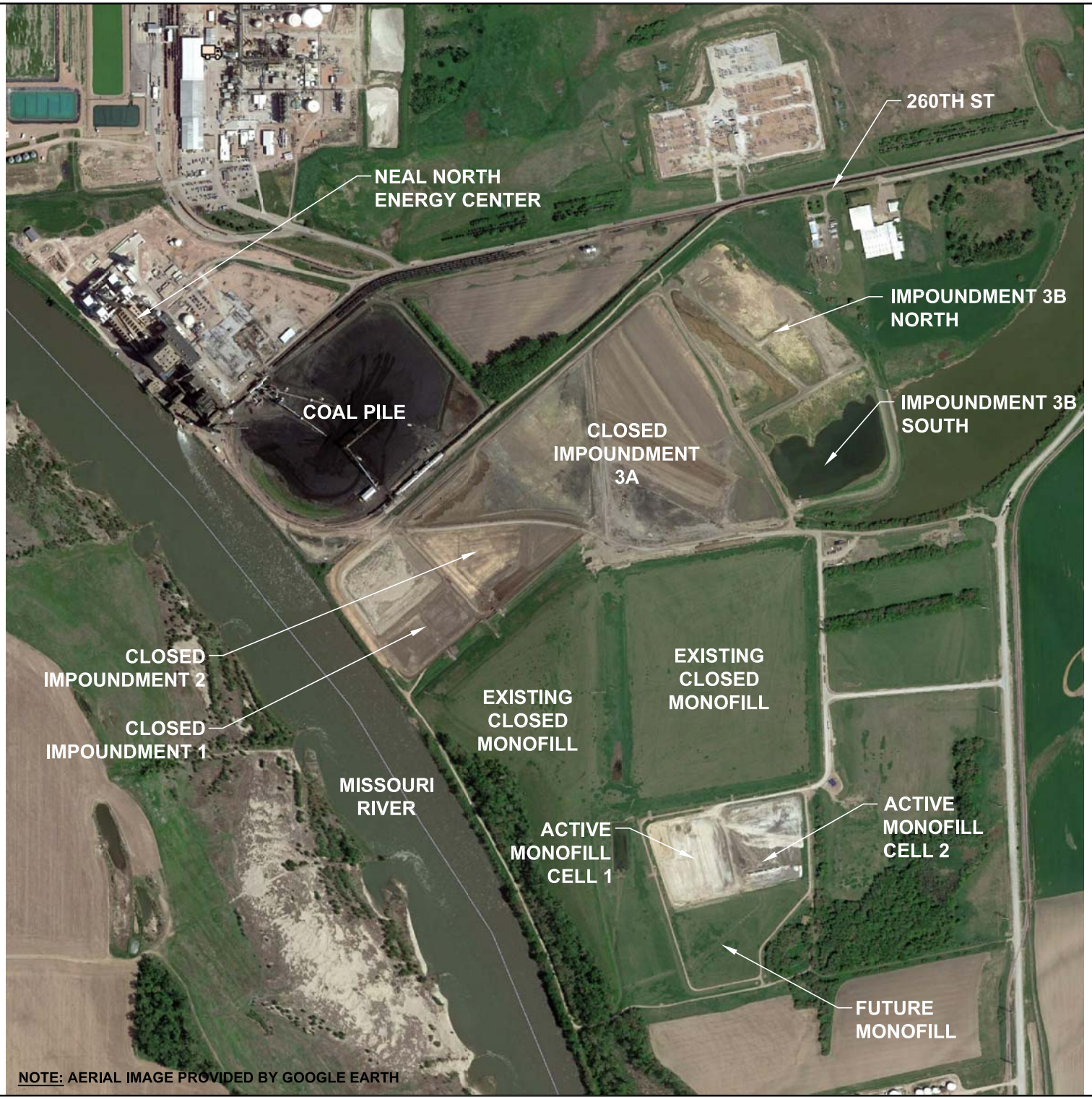
Section 257.83(b)(2)(vi) of the CCR Rule requires any appearances of actual or potential structural weakness or conditions that could disrupt or potentially disrupt operation and safety of the CCR surface impoundment and appurtenant structures be noted in the inspection report.

Based on the visual inspection findings reported above in Section 3, no apparent or potential structural weaknesses were observed.

10 Changes Affecting Stability or Operation

Section 257.83(b)(2)(vii) of the CCR Rule requires that changes that affect stability or operation of the impounding structure be identified since the last annual inspection. Based on review of weekly inspections, there were no reported, observed, or suspected changes that have weakened the site stability or negatively impacted the operation.

Appendix A
Facility Site Map



NOTE: AERIAL IMAGE PROVIDED BY GOOGLE EARTH

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640 FIFTH AVENUE COUNCIL BLUFFS, IA
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TBJ drawn
ZMW designed
ZMW approved

project NEAL NORTH ENERGY CENTER
client MIDAMERICAN ENERGY COMPANY
sheet FACILITY SITE MAP

project no. 111618
date DEC.'18
sheet 1 OF 1

Appendix B
Site Survey

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project no. 109716

sheet 1 OF 1

project SURFACE IMPOUNDMENT 3B

client MIDAMERICAN ENERGY COMPANY
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sheet **ASBUILT SURVAY**

DEF	drawn	
DEF	designed	
MGS	approved	
NOV.'16	date	revision date

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