



CLOSURE PLAN

GRAND HAVEN BOARD OF LIGHT AND POWER

J.B. SIMS GENERATING STATION

Closure Plan

Pursuant to 40 CFR 257.102

Unit 3 East and West Ash Pond Surface
Impoundments



Submitted To: Grand Haven Board of Light and Power
17000 Eaton Drive
Grand Haven, Michigan 49417

Submitted By: Golder Associates Inc.
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April 2017

Project No. 1775416

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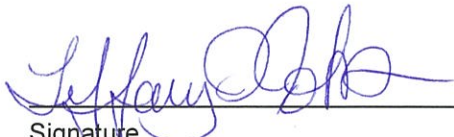
J. B. Sims Closure Plan
1775416

CERTIFICATION

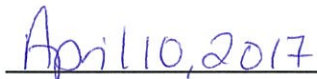
Professional Engineer Certification Statement [40 CFR 257.102(b)(4)]

I hereby certify that, having reviewed the attached documentation and being familiar with the provisions of Title 40 of the Code of Federal Regulations Section 257.102 (40 CFR Part 257.102), I attest that this Closure Plan is accurate and has been prepared in accordance with good engineering practices, including the consideration of applicable industry standards, and with the requirements of 40 CFR Part 257.102.

Golder Associates Inc.



Signature



Date of Report Certification

Tiffany D. Johnson, P.E.

Name

6201049160

Professional Engineer Certification Number

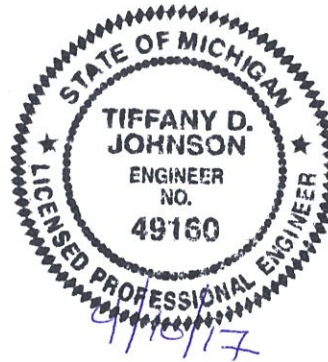




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1. INTRODUCTION

On April 17, 2015, the United States Environmental Protection Agency (EPA) issued the Coal Combustion Residual (CCR) Resource Conservation and Recovery Act (RCRA) Rule (40 CFR 257 Subpart D) (“CCR RCRA Rule”) to regulate the beneficial use and disposal of CCR materials generated at coal-fired electrical power generating complexes. In accordance with the CCR RCRA Rule, any CCR surface impoundment or CCR landfill that was actively receiving CCRs on the effective date of the CCR RCRA Rule (October 19, 2015) was deemed to be an “Existing CCR Unit” on that date and subject to self-implementing compliance standards and schedules. The Grand Haven Board of Light and Power (GHBLP) identified two existing CCR surface impoundments at the J.B. Sims Generating Station (JBSGS):

- Unit 3 East Bottom Ash Pond
- Unit 3 West Bottom Ash Pond

JBSGS is located on Harbor Island, Grand Haven, Michigan as presented on Figure 1 – Site Location Map. The locations of the Unit 3 East and West Bottom Ash Ponds are presented on Figure 2 – General Site Plan.

This closure plan is written pursuant of 40 CFR 257.102(b), and describes the steps necessary to close the JBSGS Ash Ponds in a manner consistent with recognized and generally accepted good engineering practices.



2. NARRATIVE DESCRIPTION [40 CFR 257.102(b)(1)(i-ii,iv-v)]

The GHBLP has elected to close the CCR surface impoundments at the JBSGS facility per 40 CFR 257.102(c) for closure by removal of CCR. As per 40 CFR 257(b)(ii), a description of the removal and decontamination procedures are presented in the sections to follow.

2.1 Unit 3 Ash Ponds CCR Quantity [40 CFR 257.102(b)(1)(iv-v)]

The Unit 3 East and West Bottom Ash Ponds are expected to have a maximum CCR volume of 68,000 cubic feet and 77,000 cubic feet, respectively, see Table 1, below. The Unit 3 East and West Bottom Ash Ponds were constructed with compacted clay berms and liner system, so the CCR contained within the ponds will be the only CCR materials to remove.

Table 1: Unit 3 East and West Bottom Ash Pond Dimensions and Size

Dimension	Units	West Pond	East Pond
Year of Construction	year	1983	1983
Surface Area	acre	0.3	0.2
Total CCR Storage Capacity (with 2 feet of freeboard)	cubic feet	77,000	68,000
Current Crest Elevation	ft-amsl	591.2 to 592.7	591.2 to 592.7
Normal Pond Elevation	ft-amsl	588 to 590	588 to 590
Inflow	MGD	0.5	0.5
Recent Liner Modifications	year ^(see note 3)	2013	2013
Clay Liner Thickness	feet	3	3
Clay Liner Permeability	centimeters per second	3x10 ⁻⁷	3x10 ⁻⁷

Notes:

1) Information from USEPA (2012), Black and Veatch (1983), and Soils & Structures (2016).

2) ft-amsl = feet above mean sea level.

3) During the process of removing bottom ash from each pond, using an excavator, some of the clay liner can become disturbed or removed. GHBLP periodically hires an earthworks contractor to repair the clay liner. The most recent relining was completed in September 2013.

4) Per GHBLP personnel, GHBLP circulates approximately 0.5 MGD and blows down approximately 0.030 MGD. MGD = million gallons per day.

2.2 Closure Construction Sequence [40 CFR 257.102(b)(1)(ii)]

2.2.1 Dewatering

The Unit 3 East and West Bottom Ash Ponds will be dewatered by actively pumping the water downstream through the permitted National Pollutant Discharge Elimination System (NDPES) outfall in a manner that maintains permitted effluent limits. Upon reaching an equilibrium groundwater elevation, active plant



pumping will cease; and the influent and effluent pipes will be permanently capped and abandoned to prevent subsequent filling of the pond.

2.2.2 Closure By Removal of CCR [40 CFR 257.102(c)]

After final receipt of CCR and dewatering activities are complete, CCR will be removed from the units. The above grade portion of the compacted clay impoundment berms will then be graded inward to reduce interior slopes and to minimize additional stormwater run-on from outside of the impoundment boundary. Clean fill material from the JBSGS site and/or other offsite sources may need to be imported in order to attain the proposed post source removal grades. After removal of all CCR, groundwater monitoring concentrations will be analyzed to confirm no exceedance of the protection standard established by 40 CFR 257.95(h).

Soil sampling will be conducted in the field during closure activities to provide multiple lines of physical evidence documenting CCR removal. It is anticipated that the CCR removal will continue a nominal extent into the existing compacted clay liner.

Groundwater monitoring will be conducted to document that constituent concentrations throughout the CCR unit and any areas affected by releases from the CCR unit do not exceed the groundwater protection standards per 40 CFR 257.95(h) for constituents listed in Table 2, below. Closure will be documented as complete when two consecutive quarterly groundwater monitoring events demonstrate no exceedances.

Groundwater monitoring wells were installed around the Unit 3 East and West Bottom Ash Ponds to establish a groundwater monitoring system under 40 CFR 257.91(e)(1) during the fourth quarter of 2016. In conformance with 40 CFR 257.93, a groundwater sampling and analysis procedure plan was developed for the groundwater monitoring program. The plan was prepared by others and should include direction on how to perform or acquire the following:

- | | |
|---|---|
| ■ Groundwater elevations | ■ Quality assurance/Quality control (QA/QC) |
| ■ Sample collection and handling procedures | ■ Investigation derived waste (IDW) |
| ■ Equipment decontamination procedures | ■ Field documentation |
| ■ Chain of custody control | ■ Analytical suite and procedures |
| ■ Sample preservation and shipment | ■ Optional additional analyses |
| | ■ Data evaluation |

The minimum of two consecutive quarterly groundwater monitoring events to initiate the detection monitoring program are currently being collected to confirm that groundwater monitoring concentrations do



not exceed the groundwater protection standard established pursuant to 40 CFR 257.95(h) for constituents listed in Table 2. If a statistically significant increase over background levels for one or more of the constituents listed in Table 2 is detected after the self-implementing schedule milestone of October 17, 2016 to establish a detection monitoring program, then GHBLP will follow the self-implementing schedule outlined in 40 CFR 257.93(h) and 257.95(g). The initial collection and presentation of data will be certified in an annual groundwater monitoring and corrective action report no later than January 31, 2018 per 40 CFR 257.90(e) and annually, thereafter, until groundwater monitoring concentrations do not exceed the groundwater protection standard established pursuant to 40 CFR 257.95(h) for constituents listed in Table 2.

Table 2 – Groundwater Assessment Monitoring Constituents

Common Name		
Antimony	Chromium	Mercury
Arsenic	Cobalt	Molybdenum
Barium	Fluoride	Selenium
Beryllium	Lead	Thallium
Cadmium	Lithium	Radium 226 and 228 combined



3. SCHEDULE [40 CFR 257.102(B)(1)(VI)]

3.1 Introduction

GHBLP will initiate closure by providing notification pursuant to 40 CFR 257.102(e). Pursuant of 40 CFR 257.102(e)(i), notification shall take place no later than 30 days after the units receive the known final receipt of waste. In accordance with 40 CFR 257.102(f)(1)(ii), closure activities are expected to be completed within five years of the notification of intent to initiate closure.

3.2 Closure Commencement

As per 40 CFR 257.102(e)(3), closure of the impoundment has commenced when JBSGS has ceased sluicing CCR into the impoundments and performs any of the following actions or activities:

- Taken any steps necessary to implement this written closure plan;
- Submitted a completed application for any required state or agency permit or permit modification; or
- Taken steps necessary to comply with any state or other agency standards that are a prerequisite, or are otherwise applicable, to initiating or completing the closure of a CCR unit.

Once the removal of CCR has been completed, at least two consecutive quarterly groundwater monitoring events will be necessary to complete the clean closure certification. Table 3 – Conceptual CCR Removal Schedule Milestones contains a list of milestone dates that were developed as part of the closure construction schedule to demonstrate that closure will be completed within the self-implementing closure schedule per 40 CFR 257.102(f)(1)(ii).

Table 3 – Conceptual CCR Removal Schedule Milestones

Closure Component	Start Date	Estimated End Date
Monitor groundwater	January 1, 2017	December 2025
Notification of closure	NA	January 2025
Removal of CCR and areas affected by releases of the CCR unit	May 2025	August 2025
Document constituent concentrations do not exceed groundwater protection standards	September 2025	December 2025
Closure activities complete	NA	January 2026
Certified closure report	NA	March 2026



3.3 Closure Deadline Extension [40 CFR 257.102(f)(2)]

As previously indicated in Section 3.1, closure of existing CCR surface impoundments must be completed within five years of initiating closure in accordance with 40 CFR 257.102(f)(1)(ii). A deadline extension can be obtained as outlined in 40 CFR 257.102(f)(2) if completion of closure is not feasible within five years (e.g., shortened construction season, significant weather delays during construction, time required for dewatering CCR, delays due to state or local permitting or approval, etc.). An extension must include a narrative description that demonstrates closure is not feasible in the required timeframe in accordance with 40 CFR 257.102(f)(2)(i, iii). The closure deadline for the Unit 3 East and West Bottom Ash Ponds may be extended up to two years per 40 CFR 257.102(f)(2)(ii)(A).



4. AMENDMENTS

GHBLP may amend the closure plan in the future as provided for in 40 CFR 257.102(b)(3). A record of all amendments to the plan will be tracked in the log below.

Closure Plan Amendments Log

Date	Name and Title of Reviewer(s)	Amendment(s) Made
April 2017	Paul Cederquist, Environmental Compliance Specialist	Initial Closure Plan Issued



5. REFERENCES

Black & Veatch. 1983. City of Grand Haven, Michigan Board of Light and Power J.B. Sims Station, Unit 3 Ash Pond Construction Report.

“Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments,” Title 40 – Protection of the Environment Part 257 – Criteria for Classification of Solid Waste Disposal Facilities and Practices Subpart D – Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments.

Soils & Structures. 2014. Final Report of Evaluation for Grand Haven Power Plant Ash Impoundment Grand Haven, Michigan.

Soils & Structures. 2016. Annual Ash Impoundment Inspection Report.

USEPA. 2012. DRAFT - Coal Combustion Residue Impoundment, Round 12 - Dam Assessment Report, JB Sims Power Plant (Site 04), East and West Bottom Ash Ponds, Grand Haven Board of Power and Light, Grand Haven, Michigan, Prepared for: United States Environmental Protection Agency Office of Resource Conservation and Recovery, Prepared by: Dewberry & Davis, LLC Fairfax, Virginia, Dated October 2012.

USEPA (Environmental Protection Agency). 2015. Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule. 40 CFR Part 257. Effective Date October 19, 2015.

FIGURES



CLIENT
GRAND HAVEN BOARD OF LIGHT AND POWER
HARBOR ISLAND DRIVE
GRAND HAVEN, MI

PROJECT
CCR RULE COMPLIANCE

TITLE
SITE LOCATION MAP

CONSULTANT



YYYY-MM-DD	2017-03-20
PREPARED	JJS
DESIGN	JJS
REVIEW	DML
APPROVED	TDJ

PROJECT No.
1775461

CONTROL
1775461A000-GIS.mxd

Rev.
0

FIGURE
1



REFERENCE(S)

Service Layer Credits: Source: ESRI, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community.

CLIENT

GRAND HAVEN BOARD OF LIGHT AND POWER
HARBOR ISLAND DRIVE
GRAND HAVEN, MI

CONSULTANT



YYYY-MM-DD 2017-03-20

DESIGNED JJS

PREPARED JJS

REVIEWED DML

APPROVED TDJ

PROJECT

CCR RULE COMPLIANCE

TITLE

OVERALL SITE PLAN

PROJECT NO.
1775461

CONTROL

REV.

FIGURE
2

Established in 1960, Golder Associates is a global, employee-owned organization that helps clients find sustainable solutions to the challenges of finite resources, energy and water supply and management, waste management, urbanization, and climate change. We provide a wide range of independent consulting, design, and construction services in our specialist areas of earth, environment, and energy. By building strong relationships and meeting the needs of clients, our people have created one of the most trusted professional services organizations in the world.

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