



REPORT

GRAND HAVEN BOARD OF LIGHT AND POWER J.B. SIMS GENERATING STATION

CLOSURE PLAN PURSUANT TO 40 CFR 257.102

Units 1 and 2 Inactive Ash Impoundments and Unit 3 Active East and West Ash Impoundments

Submitted to:

Grand Haven Board of Light and Power

J.B. Sims Generating Station
1231 North 3rd Street
Grand Haven, Michigan 49417

Submitted by:

Golder Associates Inc.

15851 South US 27, Suite 50 Lansing, Michigan, USA 48906

PN: 18113500

Original Revision April 2017

Updated December 2017

Updated October 2019

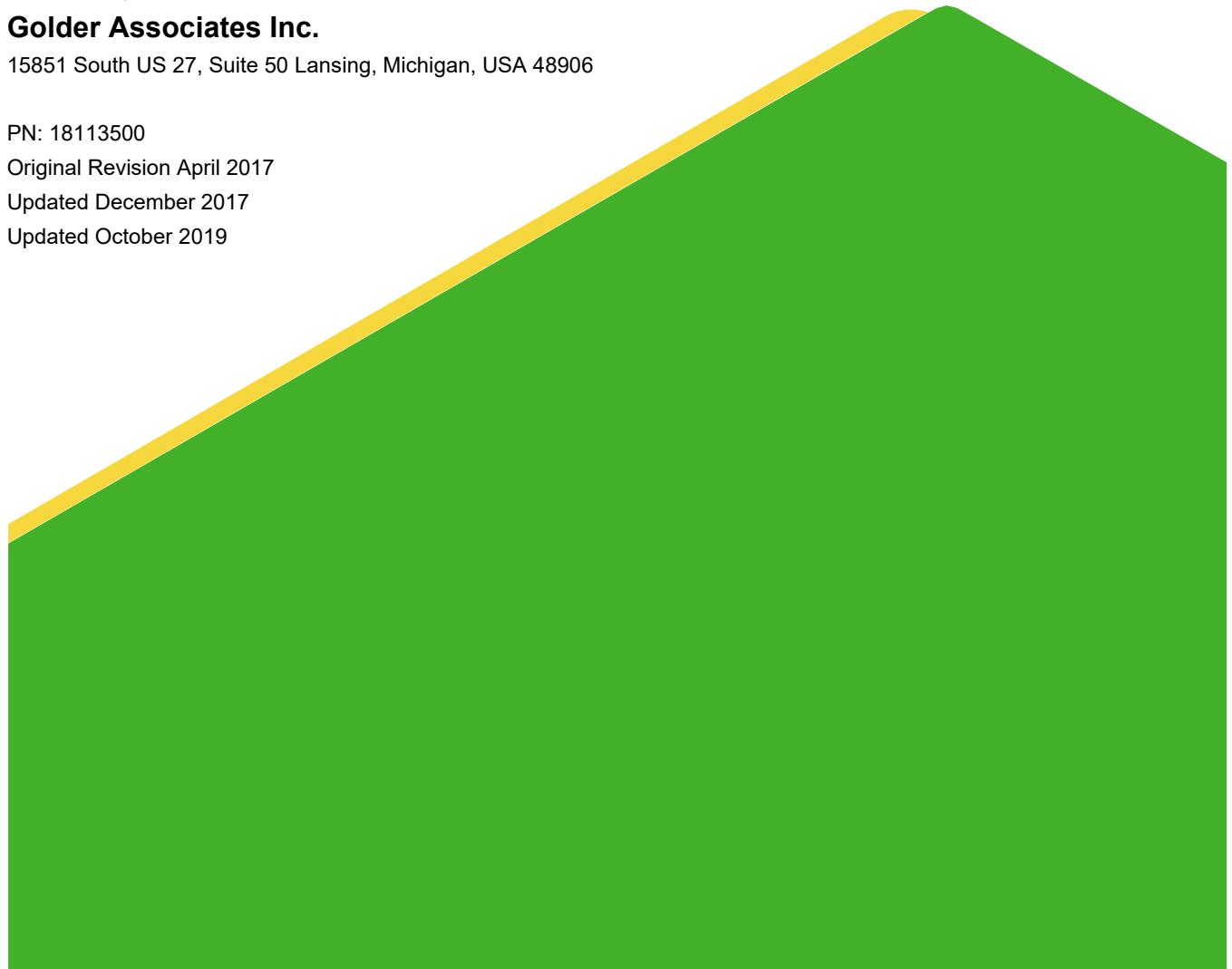


Table of Contents

1.0	INTRODUCTION	3
2.0	NARRATIVE DESCRIPTION (40 CFR 257.102(B)(1)(I-III-V)).....	3
2.1	Unit 1 and 2 Ash Impoundments CCR Quantity [40 CFR 257.102(b)(1)(iv-v)].....	4
2.2	Unit 3 Ash Impoundments CCR Quantity [40 CFR 257.102(b)(1)(iv-v)]	4
2.3	Closure Construction Sequence [40 CFR 257.102(b)(1)(ii)].....	5
2.3.1	Dewatering	5
2.3.2	Unit 1 and 2 Impoundments – Closure by Removal of CCR [40 CFR 257.102(c)]	5
2.3.3	Unit 3 East and West Impoundments – Closure by Removal of CCR [40 CFR 257.102(c)]	6
2.3.4	Post Closure Groundwater Monitoring.....	6
3.0	SCHEDULE [40 CFR 257.102(B)(1)(VI)].....	6
3.1	Introduction.....	6
3.2	Impoundment Closure Commencement	6
3.3	Closure Deadline Extension [40 CFR 257.102(f)(2)] and No Alternative Disposal Capacity Information.	7
4.0	AMENDMENTS.....	8
5.0	REFERENCES.....	9

TABLES

Table 1 – Ash Impoundment and Size

Table 2 - Ash Impoundment Conceptual CCR Removal Schedule Milestones

FIGURES

Figure 1 – Units 1 and 2 Inactive Impoundment Ash Delineation Map

Figure 2 – Approximate Units 1 and 2 Impoundment Material Volume

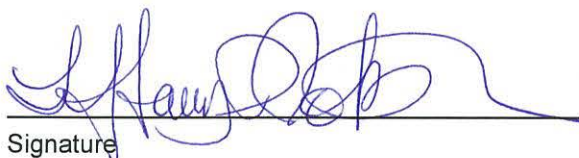
Figure 3 – Approximate Unit 3 East and West Impoundment Material Volume

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

October 14, 2019

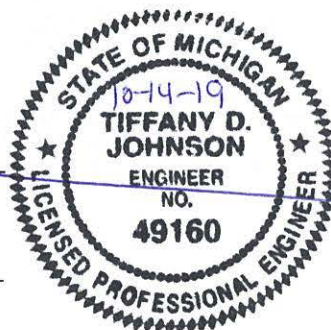
Date of Report Certification

Tiffany D. Johnson, P.E.

Name

6201049160

Professional Engineer Certification Number



1.0 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. Those units that were considered “inactive” prior to October 2015 were subject to the CCR Direct Final Rule which was published in August 2016, and those extended the deadline for closure work on inactive impoundments to April 17, 2018. The Grand Haven Board of Light and Power (GHBLP) identified four existing CCR surface impoundments at the J.B. Sims Generating Station (JBSGS):

- Units 1 and 2 Inactive Ash Impoundments (last received CCR material in June 2012, so is therefore ‘Inactive’ and follows the Direct Final Rule timeline).
- Unit 3 Active East Bottom Ash Impoundment
- Unit 3 Active West Bottom Ash Impoundment

On December 28, 2018, the State of Michigan enacted Public Act No. 640 of 2018 (PA 640) to amend the Natural Resources and Environmental Protection Act, also known as Part 115 of PA 451 of 1994, as amended (i.e. Michigan Part 115 Solid Waste Rules)(Part 115 Statute Amendment). The December 2018 amendments to Part 115 allowed for the regulation of CCR impoundments, and impoundments to be closed as landfills in the State of Michigan.

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

This closure plan is written pursuant of 40 CFR 257.102(b) and Part 115 Statute Amendment, Section 11519b, and describes the steps necessary to close the JBSGS Ash Impoundments in a manner consistent with recognized and generally accepted good engineering practices. The Part 115 Statute Amendment names 40 CFR 257.102 for closure requirements, so for brevity, only the CCR RCRA Rule will be cited throughout this report.

2.0 NARRATIVE DESCRIPTION (40 CFR 257.102(B)(1)(I-III-V))

The GHBLP has elected to close the Units 1 and 2 Inactive Ash Impoundments by removing CCR. Prior to construction of the closure by CCR removal, Units 1 and 2 Inactive Ash Impoundments will be required to be dewatered by actively pumping the impoundment contents in a manner that maintains permitted effluent limits. Historical piping is currently capped in place. Once pumping is complete, any additional piping will either be removed or be permanently capped to prevent subsequent filling of the impoundment. Once dewatered, the CCR material in Units 1 and 2 Inactive Ash Impoundments will be removed, dried, and sent to a licensed landfill. General fill will be used to fill to final grades designed with a minimum two percent slope to meet performance standard requirements per 40 CFR 257.102(d)(3)(ii). Details of the closure by removal construction are provided in the following sections.

The GHBLP has elected to close the Unit 3 Active East and West Bottom Ash 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 also presented in the sections to follow.

2.1 Unit 1 and 2 Ash Impoundments CCR Quantity [40 CFR 257.102(b)(1)(iv-v)]

The Unit 1 and 2 Ash Impoundments are expected to have a maximum CCR (and other residuals) volume of approximately 17,400 cubic yards, see Figure 2, attached. The volume was conservatively determined by using the area of each impoundment and assuming a depths based on ash thicknesses (ERM, 2016). The area covered by the Unit 2 impoundment includes the small projection to the northeast. The Unit 1 and 2 Ash Impoundments are incised impoundments that have no evidence of an engineered liner. These impoundments will be closed by removal.

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

The Unit 3 East and West Bottom Ash Impoundments are expected to have a maximum CCR (and other residuals) volume of approximately 18,950 cubic yards, see Figure 3, attached. The Unit 3 East and West Bottom Ash Impoundments were constructed with compacted clay berms and liner system, so the CCR contained within the impoundments will be the only CCR materials to remove.

Table 1: Ash Impoundment Dimensions and Size

Dimension	Units	Unit 1 ¹ Impoundment	Unit 2 ¹ Impoundment	Unit 3 West Impoundment ²	Unit 3 East Impoundment ²
Year of Construction	year	1978-1981	1968-1973	1983	1983
Surface Area	acre	0.3	0.9	0.3	0.2
Current CCR Storage Capacity (with 2 feet of freeboard)	cubic feet	81,000 ³	230,000 ³	77,000	68,000
Current Crest Elevation	ft-amsl ⁴	580	580	591.2 to 592.7	591.2 to 592.7
Normal Pond Elevation	ft-amsl ⁴	580	580	588 to 590	588 to 590
Inflow	Million gallons per day (MGD)	Inactive ⁵	Inactive ⁵	0.5 ⁶	0.5 ⁶
Recent Liner Modifications	Year	Not Applicable	Not Applicable	2013 ⁷	2013 ⁷

Dimension	Units	Unit 1 ¹ Impoundment	Unit 2 ¹ Impoundment	Unit 3 West Impoundment ²	Unit 3 East Impoundment ²
Clay Liner Thickness	feet	0	0	>3	>3
Clay Liner Permeability	centimeters per second	Not Applicable	Not Applicable	2.4x10 ⁻⁸	3x10 ⁻⁷

Notes:

- 1) Construction documents unavailable. Information gathered from aerial photograph and USGS topographic maps.
- 2) Information from USEPA (2012), Black and Veatch (1983), and Soils & Structures (2016).
- 3) Assumes an average depth of 6 to 8 feet (ERM, 2016).
- 4) ft-amsl = feet above mean sea level.
- 5) No further inflow. Impoundments are no longer actively in use.
- 6) Per GHBLP personnel, GHBLP circulates approximately 0.5 MGD and blows down approximately 0.030 MGD. MGD = million gallons per day.
- 7) During the process of removing bottom ash from each impoundment, 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.
- 8) Updated clay liner permeability from Documentation of Liner Report (Golder, 2018).

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

2.3.1 Dewatering

The inactive CCR units will be dewatered by actively pumping the water into the active CCR units in a manner that maintains permitted effluent limits to the eventual NPDES outfall located south of the plant. Upon reaching an equilibrium groundwater elevation, active pumping will cease. The influent and effluent pipes in each CCR unit will be permanently capped and abandoned to prevent subsequent filling of the impoundments.

2.3.2 Unit 1 and 2 Impoundments – Closure by Removal of CCR [40 CFR 257.102(c)]

Once a Joint Permit Application (JPA) has been obtained, since the Units 1 and 2 Inactive Ash Impoundments have wetlands and floodplain impacts, and sufficient water has been decanted, the CCR will be removed and dried in preparation of transport to a license landfill. Once existing CCR in the Units 1 and 2 Inactive Ash Impoundments is removed excess on-site and clean fill material from the JBSGS site and/or other offsite sources may need to be imported as fill to meet the surrounding grades. 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 non CCR layer as determined at the time of construction. The final grading will be designed with a proposed minimum 2.0 percent slope to prevent future impoundment of water, limit the effects of settlement, and minimize erosion.

The areas will then be restored with topsoil, seed, fertilizer, and mulch in accordance with Michigan Department of Transportation (MDOT) Standard Specification 816 – Turf Establishment.

2.3.3 Unit 3 East and West Impoundments – 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 storm water 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.

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.

The areas will then be restored with topsoil, seed, fertilizer, and mulch in accordance with MDOT Standard Specification 816 – Turf Establishment.

2.3.4 Post Closure Groundwater Monitoring

After closure, groundwater monitoring concentrations will be analyzed in accordance with 40 CFR 257.95(h) as well as the Part 115 Statute Amendment, for the Units 1 and 2 Ash Impoundments and Unit 3 Active East and West Bottom Ash Impoundments. Details regarding the groundwater monitoring program is described in the approved Hydrogeologic Monitoring Plan (HMP), which is provided in a separate document.

3.0 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 to 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 for the active impoundments. In accordance with 40 CFR 257.102(f)(1)(ii), closure activities are expected to be completed within five years (or less) of the notification of intent to initiate closure.

3.2 Impoundment Closure Commencement

It is anticipated that closure construction will begin with the inactive ponds on or before May 1, 2020 in order to comply with the site's closure schedule. As per 40 CFR 257.102(e)(3), closure of the Units 1 and 2 inactive Ash Impoundments and the Unit 3 Active East and West Bottom Ash 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 2 – 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 2: Ash Impoundment Conceptual CCR Removal Schedule Milestones

Closure Component	Start Date	Estimated End Date
Monitor groundwater	January 1, 2017	December 2025
Notification of closure	Prior to May 1, 2020	December 2020
Removal of CCR and areas affected by releases of the CCR unit	Starting on or about May 2020	December 2020
Document constituent concentrations do not exceed groundwater protection standards	December 2020	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)] and No Alternative Disposal Capacity Information.

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). However, GHBLP has demonstrated that the JBSGS has documented “No Alternative Disposal Capacity” and therefore may follow an alternate timeline (Golder, 2019).

As stated in the Preamble of the Title 40 of the Code of Federal Regulations Section 257 (40 CFR §257), Section (C)(V)(M)(4)(b)(iii)(c) (page 21423 of the rule):

“c. Alternative Closure Requirements: The Agency is finalizing alternative closure requirements in two narrow circumstances for a CCR landfill or CCR surface impoundment that would otherwise have to cease receiving CCR and close, consistent with the requirements of § 257.101(a), (b)(1), or (d). The first is where the owner or operator can certify that CCR must continue to be managed in that CCR unit due to the absence of both on-site and off-site alternative disposal capacity. § 257.103(a). The second is where the owner or operator of a facility certifies that

the facility will cease operation of the coal-fired boilers no later than the dates specified in the rule but lacks alternative disposal capacity in the interim. § 257.103(b). Under either of these alternatives, CCR units may continue to receive CCR under the specified conditions explained below. In addition, under either alternative, the owner or operator must continue to comply with all other requirements of the rule, including the requirement to conduct any necessary corrective action.

1. No alternative CCR disposal capacity (§ 257.103(a)). The Agency recognizes that the circumstance may arise where a facility's only disposal capacity, both on-site and off-site, is in a CCR unit that has triggered the closure requirements in § 257.101(a), (b)(1), or (d). As a result, the facility may be faced with either violating the closure requirements in § 257.101 by continuing to place CCR in a unit that is required to close or having to cease generating power at that facility because there is no place in which to dispose of the resulting waste. For example, while it is possible to transport dry ash off-site to alternate disposal facility that simply is not feasible for wet-generated CCR. Nor can facilities immediately convert to dry handling systems. As noted previously, the law cannot compel actions that are physically impossible, and it is incumbent on EPA to develop a regulation that does not in essence establish such a standard."

The Preamble and 40 CFR §257.103(b)(1) outline specific conditions that must be met to qualify for continued operation of the Unit 3 East and West Bottom Ash Ponds at JBSGS. The report prepared by Golder (2019) provided documentation pursuant to 40 CFR §257.103(b)(1)(i) that demonstrates the lack of existing alternative disposal capacity on- or off-Site, without consideration of increase in costs or inconvenience to GHBLP.

Per 40 CFR §257.103(b)(2), "for a CCR surface impoundment that is 40 acres or smaller, the coal-fired boiler must cease operation and the CCR surface impoundment must have completed closure no later than October 17, 2023". The GHBLP JBSGS Board has certified and announced that the only remaining operating coal-fired boiler at JBSGS will cease operations no later than June 2020 as required by 40 CFR §257.103(b)(1) and (b)(2).

4.0 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
December 2017	Paul Cederquist, Environmental Compliance Specialist	Revision to include closure plan for Units 1 and 2 Inactive Ash Impoundments
October 2019	Paul Cederquist, Environmental Compliance Specialist	Revision to closure method for Units 1 and 2 and accelerated timeline.

5.0 REFERENCES

- Black & Veatch. 1983. City of Grand Haven, Michigan Board of Light and Power J.B. Sims Station, Unit 3 Ash Pond Construction Report.
- Environmental Resource Management Michigan Inc. 2016. Coal Ash Delineation Sampling Results, Grand Haven Board of Light and Power, Grand Haven, Michigan.
- Golder Associates Inc., July 2019. CCR Surface Impoundment – No Alternative Disposal Capacity Documentation, Pursuant to 40 CFR 103(b)(1), Grand Haven Board of Light and Power, JB Sims Generating Station.
- Golder Associates Inc., January 2018. Grand Haven Board Of Light And Power, J.B. Sims Generating Station, Documentation of Liner Construction, Pursuant to 40 CFR 257.71, Units 1 and 2 Inactive Ash Ponds, and Unit 3 Active East and West Ash Pond Surface Impoundments.
- “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.

Signature Page

Sincerely,

Golder Associates Inc.



Brian Brown
Staff Engineer

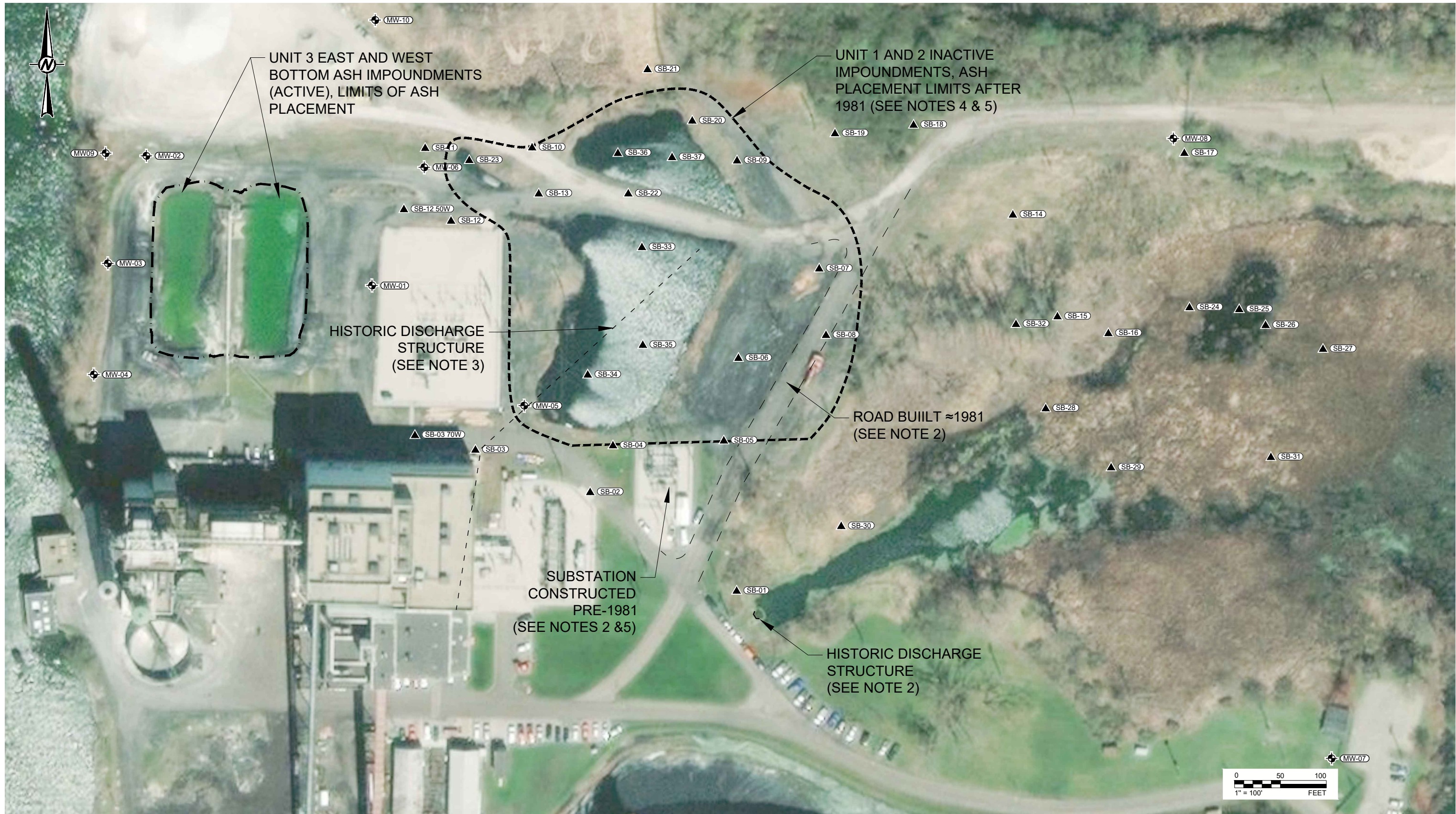


Tiffany D. Johnson, P.E.
Principal

Golder and the G logo are trademarks of Golder Associates Corporation

https://golderassociates.sharepoint.com/sites/106416/18113350_ghblp_jb_sims/5 technical work/updated closure plan/jbsgs-closure plan - final updated 10-14-19.docx

Path: \\nasgpc\proj\18113500_GHBLP\PRODUCTION\A-Ash Delineation | File Name: 18113500A001.dwg | Last Edited By: jschmuckler Date: 2019-10-14 Time: 11:30:59 AM | Printed By: jschmuckler Date: 2019-10-14 Time: 11:32:22 AM



REFERENCE(S)

1. Image reference: Service Layer Credits: Source: ESRI, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community. Date of imagery, 7/14/2016.
2. Approximate locations of Soil Borings taken from "Soil Boring Location Map," a pdf document by GHBLP, dated 12/18/15.
3. Approximate locations of:
 - Monitoring Wells MW-01 through MW-04 from ERM Report titled Sampling and Analysis Plan, dated 3/10/2017.
 - Monitoring Wells MW-05 through MW-08 from Golder Report titled GHBLP JB Sims Generating Facility Monitoring Well Installation Report, dated 7/16/2018.
 - Monitoring Wells MW-09 and MW-10 from Golder Report titled JB Sims Generating Plant 2019 Work Plan, dated 4/25/2019.

NOTE(S)

1. HORIZONTAL COORDINATE SYSTEM BASED ON MICHIGAN STATE PLANE SOUTH, INTERNATIONAL FEET. VERTICAL DATUM IS NAVD 1988.
2. HISTORICAL INFORMATION FROM BID DRAWINGS PREPARED BY BLACK & VEATCH, JANUARY 1981.
3. HISTORICAL INFORMATION FROM DRAWING PREPARED BY UNITED CONVEYOR CORP., DRAWING No. 4R-5136-C, DATED APRIL 1960.
4. AERIAL PHOTOGRAPHS PROVIDED BY GHBLP FOR 1984, 1989, 1994, 2009 SHOW ASH PLACEMENT IN THIS AREA AFTER THE ROAD WAS CONSTRUCTED IN 1981 (SEE NOTE 2).
5. SITE PHOTOGRAPH PROVIDED BY BLACK & VEATCH AND GHBLP FOR 1983 ALSO SHOWS ASH PLACEMENT LIMITED TO THIS AREA.

LEGEND

- MONITOR WELL (REFERENCE 3)
- SOIL BORING (REFERENCE 2)
- LIMIT OF UNITS 1/2 ASH PLACEMENT AFTER 1981
- UNIT 3 LIMITS OF ASH PLACEMENT

CLIENT
GRAND HAVEN BOARD OF LIGHT AND POWER
GRAND HAVEN, MICHIGAN

CONSULTANT



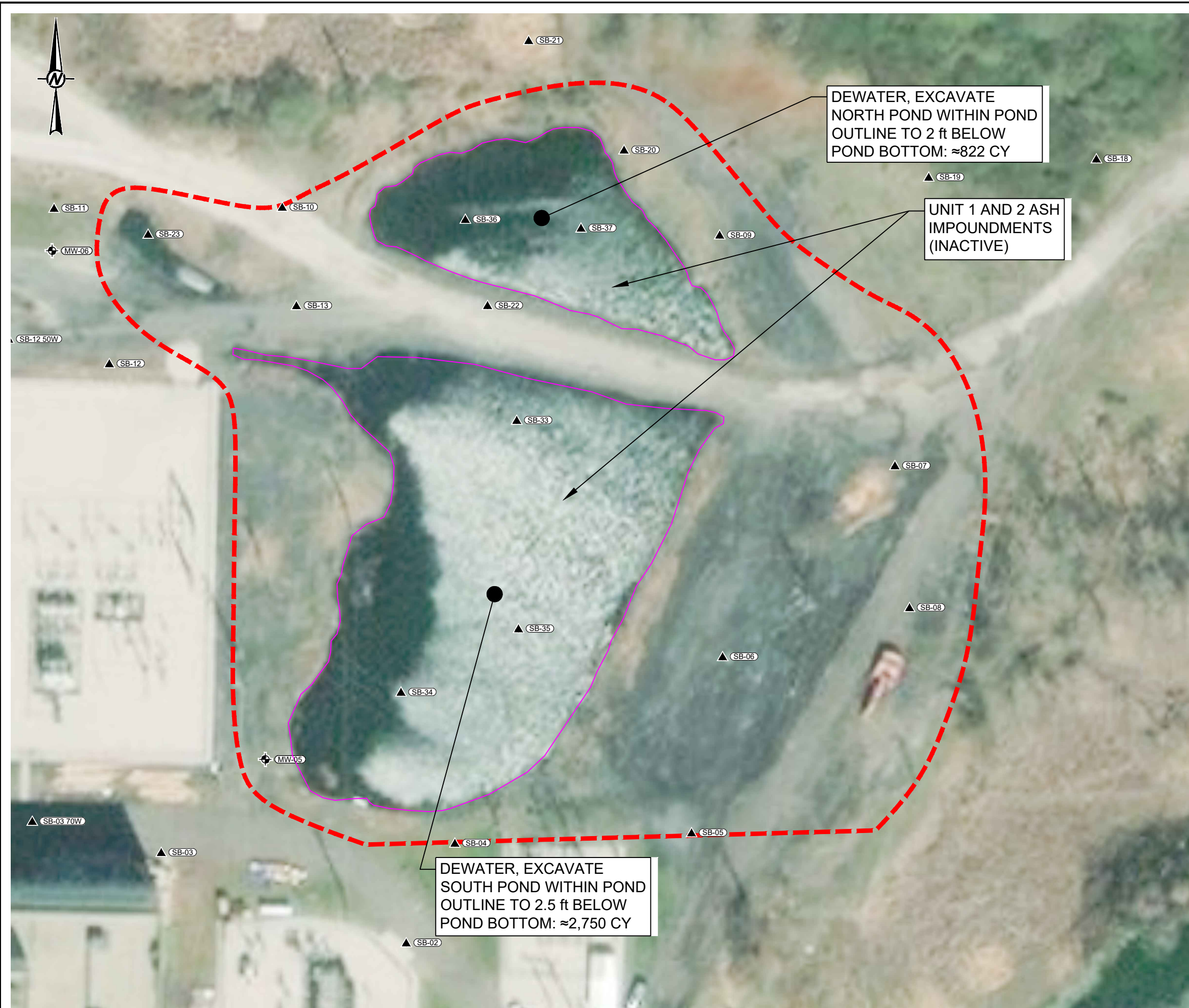
YYYY-MM-DD	2019-08-21
DESIGNED	JJS
PREPARED	JJS
REVIEWED	BAB
APPROVED	TDJ

PROJECT
JB SIMS GENERATING STATION
CLOSURE PLAN

TITLE
ASH DELINEATION MAP

PROJECT NO.	CONTROL	REV.	FIGURE
18113500		0	1

1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B



LEGEND



MONITOR WELL (REFERENCE 2)



SOIL BORING (REFERENCE 2)

LIMIT OF UNITS 1/2 ASH PLACEMENT AFTER 1981

NOTE(S)

1. APPROXIMATE VOLUME OF MATERIAL TO BE REMOVED FROM UNITS 1 & 2 PONDS: 17,400 CY

REFERENCE(S)

1. Image reference: Service Layer Credits: Source: ESRI, DigitalGlobe, GeoEye, I-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community. Date of imagery, 7/14/2016.
2. Approximate locations of Soil Borings taken from "Soil Boring Location Map," a pdf document by GHBLP, dated 12/18/15.
3. Approximate locations of:
 - Monitoring Wells MW-01 through MW-04 from ERM Report titled Sampling and Analysis Plan, dated 3/10/2017.
 - Monitoring Wells MW-05 through MW-08 from Golder Report titled GHBLP JB Sims Generating Facility Monitoring Well Installation Report, dated 7/16/2018.
 - Monitoring Wells MW-09 and MW-10 from Golder Report titled JB Sims Generating Plant 2019 Work Plan, dated 4/25/2019.
4. As constructed bottom of pond elevation obtained from the City of Grand Haven, Michigan Board of Light and Power, J.B. Sims Station, Unit 3 Ash Pond Construction Report (Black & Veatch, 1983).
5. Parcel boundaries are approximate based on information collected from Ottawa County Geospatial Insights & Solutions; Ottawa County GIS, DigitalGlobe, Microsoft, CNES/Airbus DS I Esri, HERE, Garmin, INCREMENT P, NGA, USGS.

Boring #:	Ground Surface Elevation (Plant Datum)	Top of Ash (feet below ground surface)	Bottom of Ash (feet below ground surface)	Excavation Elevation (Plant Datum)
SB-05	97.2	0	4.5	92.7
SB-06	96.9	0	5.5	91.4
SB-07	98.3	0	3	95.3
SB-09	97.1	0	5	92.1
SB-10	99.6	3.75	5	94.6
SB-13	99.2	1	7	92.2
SB-20	97.8	0	7.5	90.3
SB-22	99.4	4	6.75	92.6



CLIENT
GRAND HAVEN BOARD OF LIGHT AND POWER
GRAND HAVEN, MICHIGAN

PROJECT
JB SIMS GENERATING STATION
CLOSURE PLAN

TITLE
**APPROXIMATE UNITS 1 and 2 IMPOUNDMENT
MATERIAL VOLUME TO EXCAVATE**

CONSULTANT	YYYY-MM-DD	2019-10-04
 GOLDER	DESIGNED	JJS
	PREPARED	JJS
	REVIEWED	BAB
	APPROVED	TDJ

PROJECT NO.	CONTROL	REV.	FIGURE
18113500	18113500A003.dwg	0	2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



golder.com