



GRETCHEN WHITMER  
GOVERNOR

STATE OF MICHIGAN  
DEPARTMENT OF  
ENVIRONMENT, GREAT LAKES, AND ENERGY  
GRAND RAPIDS DISTRICT OFFICE



LIESL EICHLER CLARK  
DIRECTOR

August 26, 2021

**VIA EMAIL AND U.S. MAIL**

Mr. Erik Booth  
Grand Haven Board of Light and Power  
1700 Eaton Drive  
Grand Haven, MI 49417

Dear Mr. Booth:

SUBJECT: Unit 3 Clay Liner Additional Information

The Department of Environment, Great Lakes and Energy (EGLE) has reviewed the report submitted on June 30, 2021, titled "ADDENDUM TO THE UNIT 3 CLOSURE DOCUMENTATION REPORT". On August 16, 2021, The Environmental Protection Agency (EPA) hosted a meeting with EGLE and Grand Haven Board of Light and Power (GHBLP) to discuss the content of this report. This letter formally submits to GHBLP the questions, comments, and concerns EGLE had with the submitted report.

**Unit 3 Clay Liner Source Material**

After review of the information provided and a field visit to the alleged clay source location, EGLE has questions and comments on if the Unit 3 clay was sourced from the Bass River State Recreation Area (BRSRA) as GHBLP has indicated.

First, the Unit 3 clay observed at the JB Sims site and during installation in 1983 is observed to be predominantly brown in color (Figure 1). The clay observed in the report and from the EGLE site visit at the Bass River Recreation area noted the clay was predominantly gray in color.

Second, EGLE reviewed historical aerial imagery of the site before and after construction of the Unit 3 impoundments (Figure 2). The 1974 aerial photo (pre-Unit 3 construction) and 1993 aerial photo (post-Unit 3 construction) do not appear drastically different. The clay borrow area does not appear to have been excavated any further than its current day boundaries since 1974. EGLE questions if the clay material may have been mined from a different depth or someplace different on the site. EGLE requests if GHBLP could provide more information to where on the site the clay may have been sourced.

**EGLE comments on the report.**

1. Updated Boron Results

Did the lab retain samples from the original sample collection? If so, were the original samples tested within their hold time?

2. Table 1

GHBLP has developed site specific background concentrations for the Unit 3 clay liner. To determine if the clay liner has been impacted, GHBLP should compare concentrations of the Unit 3 Clay liner to the source clay. Statewide background concentrations are used in the

absence of site-specific data. Table 1 indicates Barium, Chromium, Cobalt and Nickle are compared to statewide background concentrations. These constituents should be compared to the site-specific values calculated, if available.

### 3. Naturally Occurring Constituents.

- a. GHBLP states that all samples from the Unit 3 Clay liner for each of the constituents of focus (Arsenic, Iron and Selenium) are less than the mean plus three standard deviation of the source clay. In the report, GHBLP indicates that the mean plus three standard deviation for Arsenic is 6,219 ug/kg. When compared to the results of the Unit 3 clay liner, 15 out of 21 samples are higher in concentration in the Unit 3 clay liner than the BRSRA source clay. For Iron the mean plus three standard deviations is listed as 26,943,608 ug/kg and 15 out of 21 samples are higher in concentration in the Unit 3 clay liner when compared to the BRSRA clay. The report indicates Selenium has a mean plus three standard deviation of 2,786 ug/kg and 16 out of 21 samples were reported higher than this number when compared to the BRSRA Clay. This information indicates that approximately 70 percent of samples from the Unit 3 Clay Liner are statistically elevated in concentration above the BRSRA clay.
- b. EGLE agrees that Boron is a highly mobile CCR tracer in a water matrix. However, various metals can adsorb/desorb differently when migrating through media such as clay. Furthermore, EGLE has previously indicated desiccation cracking observed in the Unit 3 clay liner. The S3TM sampling guidance states, "Clays also have a much greater secondary porosity than primary (primary porosity is the space between the soil particles; secondary porosity is the space between fractures, bedding planes, and soil structures). As a result, spills in clay soils tend to follow preferred pathways. Clays will often show signs of shrinkage cracks or fractures that will allow contaminants to migrate in what would otherwise be considered a "tight" soil in a lab analysis of permeability". It is possible that higher concentrations of Boron were not detected in the clays because they preferentially migrated through fractures, incompletely bonded lift interfaces and any potential flaws from construction.
- c. EGLE has previously indicated that coal ash wastes have been documented outside of the wetted boundary of Unit 3; therefore, the soils outside of the wetted boundary would also be subject to CCR impacts.
- d. EGLE does not agree with GHBLPs assessment of soil samples above the mean plus 3 standard deviation for Iron and Arsenic. EGLE's review indicates Arsenic, Selenium and Iron all have about 70 percent of the Unit 3 sample locations above the screening level.

### 4. Other Discussion Points

EGLE collected confirmatory samples at the BRSRA at GHBLP sample locations six, eight and nine within three feet of the original sample location at the same sampling depth to confirm or dispute the results submitted by GHBLP. The results were similar in concentrations for most constituents. Some variability is observed between GHBLP and EGLE's results when comparing Arsenic and Barium; however, the most significant differences in sample results was observed for Selenium. EGLE's results for Selenium were

Mr. Erik Booth  
Page 3  
August 26, 2021

less than half the concentration of GHBLP samples for two of three samples, and just over half the concentration for the third sample. EGLE's background sampling results for Selenium fall within the "typical range" as indicated by the Michigan State Soil Survey which accounts for 95 percent of the data. All GHBLP samples report above the typical range for Selenium. Further discussion will be needed and potentially another round of sampling at the BRSRA.

If GHBLP would like to discuss any of the above information, please contact Kent Walters by email at [waltersk7@michigan.gov](mailto:waltersk7@michigan.gov) or by telephone at 616-278-4350.

Sincerely,



Kent A. Walters, Geologist  
Grand Rapids District Office  
Materials Management Division

cc: Ms. Tiffany Johnson, Golder  
Ms. Margie Ring, EGLE  
Ms. Alexandra Clark, EGLE  
Mr. David Willard, EGLE  
Mr. Fred L. Sellers, EGLE  
Mr. Timothy Unseld, EGLE

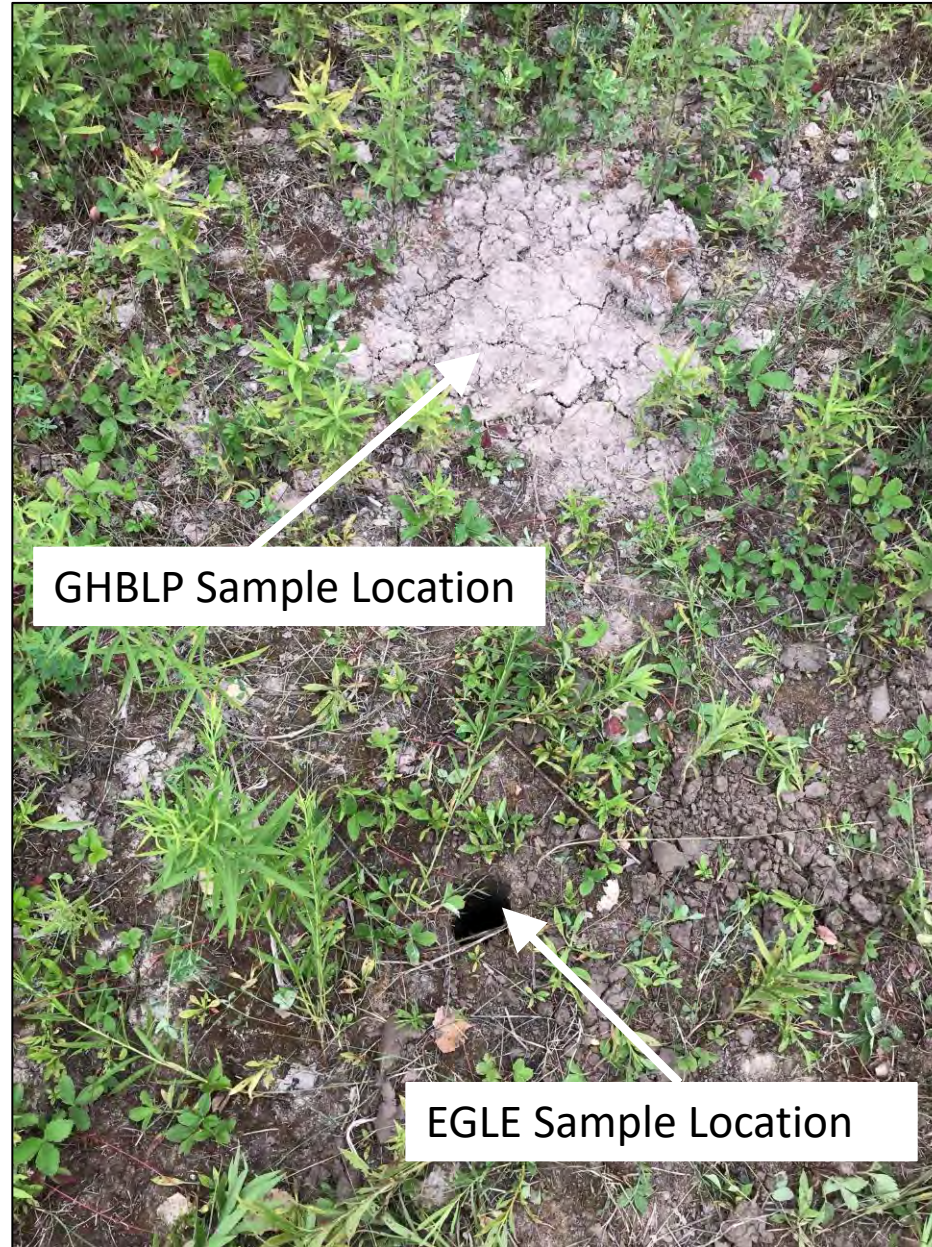
## SB-6 Confirmatory Sample Location



Sample Location SB-6:  
Clay with few silt, fine  
gravel and fine sand.  
Grey, some mottling  
present in soil, moist,  
some rooty material,  
firm.



## SB-6 Confirmatory Sample Location



Sample Location SB-6:  
Sample was collected  
within 3 feet of GHBLP  
location and collected  
6-12" below ground  
surface



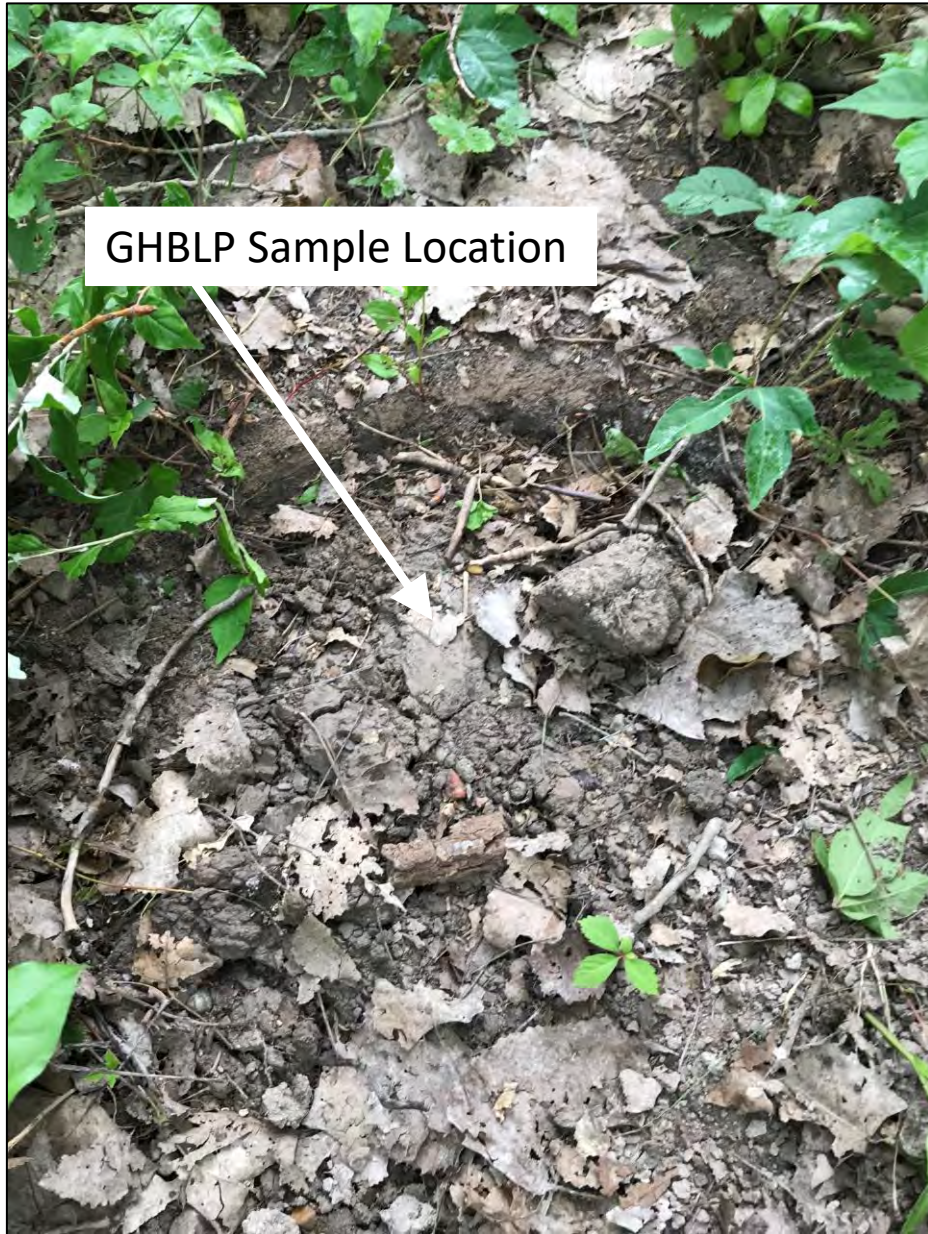
## SB-8 Confirmatory Sample Location



Sample Location SB-8:  
Clay with few silt, fine  
gravel and fine sand.  
Grey, somewhat friable,  
rooty material,  
Dense/hard



## SB-8 Confirmatory Sample Location



Sample Location SB-8: Sample was collected within 3 feet of GHBLP location and collected 6-12" below ground surface. Sample was located 3' closer to waters edge than GHBLP sample location.



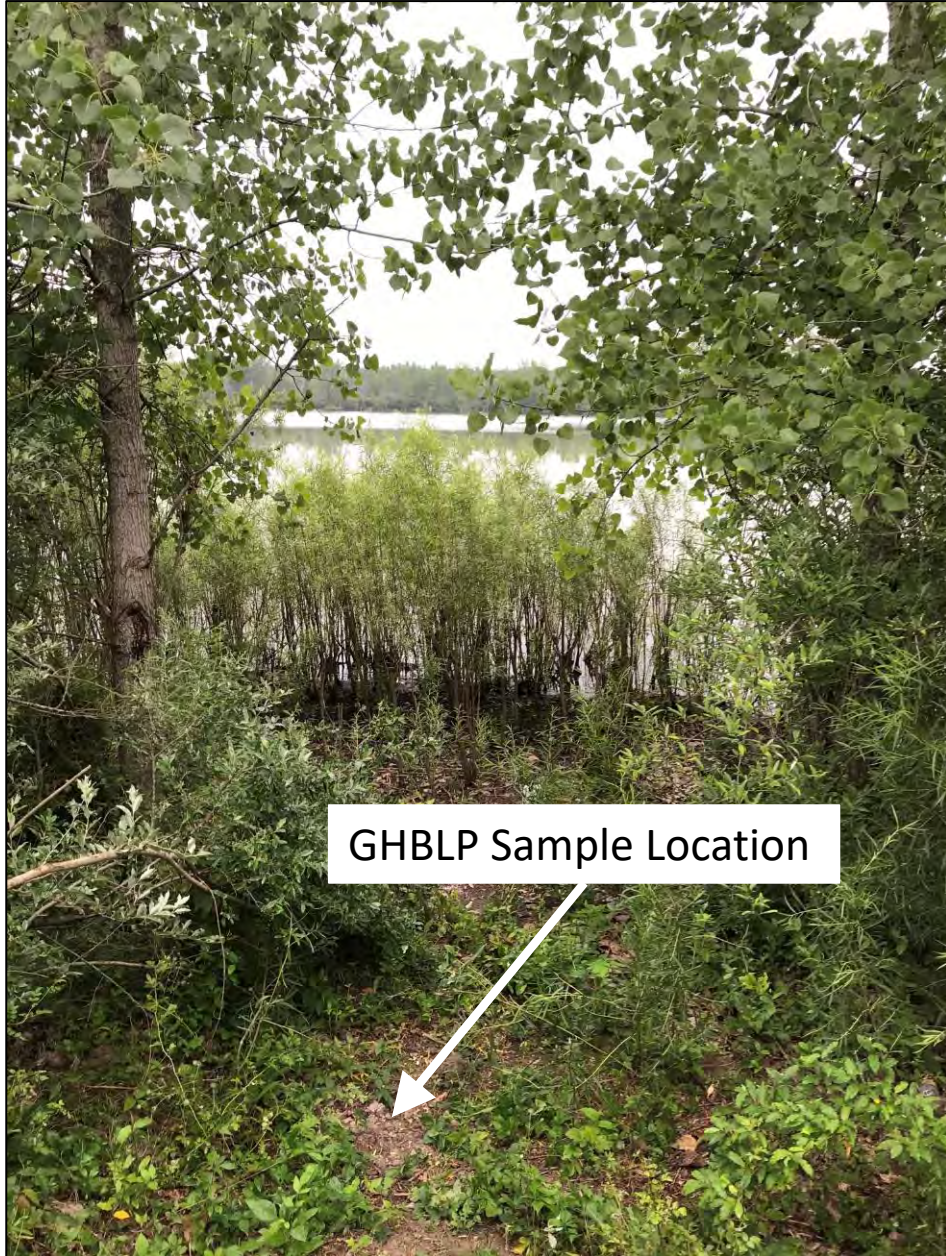
## SB-9 Confirmatory Sample Location



Sample Location SB-9:  
Clay with few silt, fine  
gravel and fine sand.  
Grey, somewhat friable,  
rooty material,  
Dense/hard



## SB-9 Confirmatory Sample Location



Sample Location SB-9:  
Sample was collected  
within 3 feet of GHBLP  
location and collected 6-  
12" below ground  
surface.



# Unit 3 Clay at the JB Sims Generating Station



7. Spreading the initial lift of clay onto the southwest quadrant of the ash ponds.

Brown clay when Unit 3 construction just started in early 80s

67. East pond construction progress. Late June



Brown clay at Unit 3, exposed during ash removal current day.



68. West pond construction progress. Late June

Brown clay when construction at Unit 3 was close to completion in early 80s



**Legend**

● Clay Sample Locations

**Bass River State Recreation Area 1974**



1

5

9

2

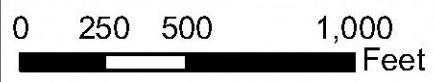
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7

3

6

4





**Legend**

● Clay Sample Locations

**Bass River State Recreation Area 1993**

