

February 12, 2020

Project No. 20141048

TECHNICAL MEMORANDUM

Mr. Kent A. Walters, Geologist

Materials Management Division
Grand Rapids District Office
Department of Environment, Great Lakes, and Energy
State Office Building
350 Ottawa Avenue, NW, Unit 10
Grand Rapids, Michigan 49503

**UNIT 3 IMPOUNDMENTS ALTERNATE SOURCE DEMONSTRATION RESPONSE
GRAND HAVEN BOARD OF LIGHT AND POWER - JB SIMS POWER GENERATING STATION**

Dear Mr. Walters,

Golder Associates Inc. (Golder) has prepared this memorandum (memo) in response to the Department of Environment, Great Lakes, and Energy (EGLE) letter dated January 28, 2021 to the Grand Haven Board of Light and Power (GHBLP) regarding the Alternate Source Demonstration prepared by Golder dated December 28, 2020. Comments received from EGLE are included below in bold with Golder's responses directly following the comment.

EGLE: Grand Haven Board of Light and Power (GHBLP) submitted a Unit 3 impoundment ASD on December 28, 2020, stating that the groundwater impact immediately adjacent to Unit 3A/3B is from another source. Michigan Admin Code, R 299.4440(9) governs requests for ASD and states:

The owner and operator may demonstrate to the director that a source other than a landfill unit caused the contamination or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation or from natural variation in groundwater quality. A report that documents the demonstration shall be certified by a qualified groundwater scientist, be submitted to the director within 30 days of the determination specified in subrule (8) of this rule, and be placed in the operating record. If the director determines that the alternate source demonstration prepared pursuant to this subrule has not been successfully provided, the deficiencies shall be specified to the petitioner in writing and the petitioner granted 15 days to address those deficiencies identified by the director.

Rule 299.4440(8), referenced by Rule 299.4440(9), in turn relates to when an owner or operator determines "that there is a statistically significant increase over background for one or more of the constituents at any monitoring well at the solid waste boundary or at other monitoring locations required by the

director.” GHBLP indicated statistical exceedances above groundwater protection standards in its 2018 annual groundwater monitoring report submitted January 2019. A timely ASD would have been submitted no later than March of 2019, and thus this ASD submittal is well beyond the 30-day deadline as required by R 299.4440.

Golder Response: For ease of reference, Golder has included the Part 115 references as well as the Federal CCR Rule. Following the PA 640 Section, 11511a(3)(c), Rule 440(9), similarly 40 CFR 257.94(2) follows detection monitoring and indicates that while in detection monitoring if an SSI is identified the owner/operator has 30 days to submit an ASD or Assessment Monitoring will be triggered. On April 2, 2018 GHBLP initiated assessment monitoring following the 40 CFR 257.95 and has conducted an assessment monitoring program to include the additional constituents identified in PA 640 Section 11511a(3)(c) and 11519b(2). GHBLP had initiated assessment monitoring prior to enactment of PA 640. Following Rule 4441(8) and similarly 40 CFR 257.95(g)(3)(ii) while in assessment monitoring, the owner/operator may demonstrate that a source other than the CCR unit caused the contamination. Specifically,

An owner and operator may demonstrate that a source other than a type II landfill unit or other source at the facility caused the contamination or that the statistically significant increase resulted from error in sampling, analysis, or statistical evaluation or from natural variation in groundwater quality. A report that documents the demonstration shall be certified by a qualified groundwater scientist, approved by the director, and placed in the operating record. Until a successful demonstration is made, the owner and operator shall comply with subrules (6) and (7) of this rule....

Contrary to Rule 4440(9), the rule does not specify a timeline for which an ASD must be submitted while in assessment monitoring. As more data becomes available during the investigation, an alternate source may present itself as is the case for the former 3A/B Impoundments at JB Sims.

EGLE: Although the ASD was submitted almost two years past its required submittal date, EGLE will comment on the information provided in the ASD.

Golder Response: As stated above, GHBLP has conducted both detection and assessment monitoring over the past two years. Also, under Rule 4441(8), there is no required submittal date for an ASD. While performing assessment monitoring, GHBLP has conducted additional site evaluations in determining the nature and extent of groundwater impacts. GHBLP has collected additional site data and completed studies to determine imminent risk to human health and the environment and has diligently communicated with and responded to EGLE concerns over the boundary of the inactive 1/2 Impoundment and the monitoring well network. EGLE's statement above is incorrect in suggesting that an ASD must have been submitted prior to March 2019 in order to be considered as an ASD is specifically allowable under Rule 4441(8) at any time during assessment monitoring. This should provide adequate clarification and documentation that the timing of the ASD submittal is appropriate.

EGLE Comment:

- 1) EGLE previously notified GHBLP that their groundwater monitoring network around Unit 3A/3B is inadequate to properly monitor groundwater downgradient of the unit. Since the addition of new groundwater monitoring points, a more consistent flow pattern appears to be emerging. Michigan coal ash rules require the number, spacing and depths of monitoring wells shall be based upon site**

specific information including seasonal and temporal fluctuations in groundwater flow (R299.4906(7)).

GHBLP does not meet this requirement as the ASD groundwater flow maps show there are no downgradient monitoring wells of Unit 3A/3B. GHBLP is therefore unable to assess if groundwater has been impacted from the units and has not properly assessed downgradient groundwater conditions to be able to submit an ASD.

Golder Response: Golder is currently evaluating expansion of the groundwater monitoring well network. However additional wells at the boundary of the former 3A/B Impoundments does not impact the demonstration. Golder disagrees that a more consistent flow pattern appears to be emerging. With the additional monitoring data, refinement of the groundwater flow pattern is presented. The flow pattern is understood. JB Sims is on an island in the Grand River. Groundwater within the island rises and falls in response to the elevation of the Grand River. Additionally, the potentiometric surface of unit being monitored is within 15 feet of ground surface. This uppermost aquifer consists of varying types of fill material and therefore, is NOT homogenous and NON isotropic (e.g., flow rate and flow direction are not consistent across the site). So, to state a more consistent flow pattern is emerging based on the depth and materials is inaccurate. For EGLE to state that there are no downgradient monitoring wells is also inaccurate.

Regionally, groundwater flow is toward the west and Lake Michigan. Locally, surrounding the former 3A/B Impoundments and around the inactive 1/2 impoundment, we observe radially outward flow patterns at different times throughout the year. Golder assumes EGLE is referring to a well north and south of the former 3A/B Impoundments being necessary as the deficiency comment is incomplete. Under this assumption, Golder ascertains that the three (3) detection monitoring wells MW-2, MW-3, and MW-4 as well as assessment monitoring well MW-9 are sufficient to monitoring the downgradient edge of the unit as regional flow direction is toward the west. Further, based on knowledge of the site, any well installed at the former waste boundary of the former 3A/B Impoundments either north or south would be installed in historical ash used as beneficial fill prior to the construction of Unit 3 and/or municipal solid waste and therefore would not provide for detection of a release from the former 3A/B Impoundments.

EGLE Comment:

- 2) **GHBLP utilizes trend charts as a line of evidence to determine if the units have caused groundwater impact. EGLE recognizes that Units 3A/3B have been actively accepting wastes since the early 80s and provides the following comments:**
 - a) **GHBLP states that if Unit 3 was the source of groundwater impact, then closure of the units should produce decreasing trends in the groundwater. EGLE does not disagree with this statement, however GHBLP ceased accepting waste into Unit 3A/3B on July 30, 2020 and has had only one sampling event on September 25, 2020 after the units ceased waste acceptance. Furthermore, GHBLP photologs show coal ash wastes being removed well into October 2020. Using trend charts as an ASD is inappropriate in this circumstance because there has not been enough time, post waste removal, to monitor potential groundwater quality improvement.**
 - b) **Unit 3A/3B's National Pollutant Discharge Elimination System (NPDES) Discharge Monitoring Report (DMR) indicates a daily fluctuating discharge and likely fluctuating hydraulic loading within the impoundments. The inconsistent hydraulic loading of the ponds can produce inconsistent**

analytical trends in the groundwater, therefore rendering analytical trends unreliable when used to track groundwater quality.

Golder Response: Golder has presented trend charts and the lack of either an increasing or decreasing trend as one of many lines of evidence that the source of groundwater impacts is not the former 3A/B Impoundments. The lack of either an increasing or decreasing trend simply substantiates that the source of the impacts is stable and longstanding (i.e., ash fill and comingled waste). This is consistent with Golder's observation that the bottom and sidewalls of the impoundment were intact and when upper layers of clay were removed, the lower levels showed no indication of penetration such as discoloration or mottling. Additional monitoring data available from November 2020 following removal of ash from former 3A/B Impoundments confirms the lack of trends in groundwater monitoring data which further supports the demonstration that former 3A/B Impoundments are not the source of groundwater impacts.

Golder disagrees with EGLE's further argument that the fluctuating hydraulic loading within the impoundments rendering unreliable utilization of trend analyses. Since the former 3A/B Impoundments were clay lined, it is not accurate to directly connect the inconsistent hydraulic loading of the impoundment to the groundwater quality. Any fluctuation of the hydraulic loading within the impoundments would be of negligible or very minimal impact compared to the fluctuating groundwater elevations and resulting gradients observed.

Regardless, the lack of increasing or decreasing trends in groundwater quality as it relates to the source of groundwater impacts is simply one of multiple lines of evidence that substantiates that the source of groundwater impacts are not from the former 3A/B Impoundment.

EGLE Comment:

- 3) **GHBLP compared major cations and ions from the source area and the surrounding groundwater near the source. GHBLP states that Unit 3A/3B have not leaked because the concentrations of major cations and ions in the groundwater are not like the wastewater contained within the impoundments and that data does not plot on a mixing line. EGLE does not agree that this is an appropriate method for determining alternate sources at the site for the following reasons:**
 - a) **GHBLP uses groundwater, surface water and wastewater data spanning a 4-year period. Major cation and ion data should be compared from the same sample monitoring points collected during the same sampling events as source signatures can change over time.**
 - b) **GHBLP has only collected one data point from Unit 3A/3B in 2017. The units were actively used since the early 80s disposing of coal ash wastes along with other waste streams including but not limited to Grand River chlorinated water, scrubber sump discharge, demineralizer water and coal pile runoff stormwater. It is likely that major cations and ions have changed over time, dependent on which and how much of a given waste stream is added into the impoundments during a given day/month. Using one single data point to characterize the Unit 3A/3B wastewater is not sufficient.**
 - c) **The Unit 3A/3B wastewater may geochemically change due to differing pH levels and reactions occurring during migration through substrate. Based on site conditions at Unit 3A/3B, it is not appropriate to compare geochemical signatures from the source as the signature could change as the wastewater migrates into and reacts with the groundwater.**

Golder Response: The use of geochemical modeling tools (i.e., Stiff and Piper diagrams) has been used at multiple CCR and solid waste sites across the country. This modeling was presented to EGLE as early as November 2019. If EGLE disagrees with this evaluation tool and approach to assessing groundwater quality, why has EGLE not brought up the concerns prior to this letter. Golder disagrees with EGLE's comment regarding the utilization of geochemical modeling as an appropriate method to evaluate groundwater quality compared to the likely source of groundwater impacts.

Utilizing geochemical modeling techniques to determine whether or not a release has occurred from a CCR unit, or to delineate the extent of groundwater impacts if a release has occurred is recommended by the Electric Power Research Institute (EPRI) and has been well documented (Hem, 1985)¹. Dating back to 1944, Piper diagrams have been used to interpret water analyses.² Discussion of Piper diagrams can be found in most hydrogeology textbooks and Wikipedia³. Piper diagrams are used to assess groundwater mixing (i.e., mixing of background and source water) and are prescribed by USGS⁴.

The reasons provided by EGLE to discount the use of geochemical modeling to evaluate the groundwater quality and assess the source of groundwater impacts are not substantiated. Specifically, Golder has addressed each sub bullet separately.

- a) EGLE suggests that because source data and groundwater quality data is collected over a period of time, it should not be used for comparison. Ideally, data would have been collected from all points at the same time. Multiple samples were collected from groundwater monitoring wells and no trend toward or away from the "source" was observed, therefore a single representative data point was used to plot results. We are using conservative tracers to plot this data. Simply because the data is collected over a period of time should not be a reason to discount this line of evidence.

Further, a single source sample from the Unit 3 impoundments was used for the mixing analyses presented in the Piper diagrams. However, the data available has been substantiated by comparing published results to multiple published similar sources from other coal ash impoundments and documented by EPRI.

The opinion that "major cation and ion data must be compared from the same sample monitoring points collected during the same sampling events as source signatures can change over time" is not accurate. Major ion data can be evaluated by comparing data from multiple sample monitoring points collected during the same sampling events as well as multiple sample points collected over multiple sampling events. We agree that source signatures can change over time; only viewing one specific sampling event is not looking at the whole picture. Golder has included the available data which includes multiple dates over a period of time.

¹ Hem, J.D., 1985. *Study and interpretation of the chemical characteristics of natural water* (Vol. 2254). Department of the Interior, US Geological Survey.

² Piper, 1944. [A graphic procedure in the geochemical interpretation of water-analyses - Piper - 1944 - Eos, Transactions American Geophysical Union - Wiley Online Library](#)

³ [Piper diagram - Wikipedia](#)

⁴ USGS, June 26, 2020. [GW Chart: A Program for Creating Specialized Graphs Used in Groundwater Studies \(usgs.gov\)](#).

- b) Using more than one single data point to characterize the former 3A/B Impoundment wastewater would provide additional information. However, our data falls within the range of data for multiple sources across the country as demonstrated by EPRI. To exclude this evaluation tool based on not collecting more samples appears based on an assumption by EGLE that the former 3A/B Impoundments have experienced a release. To date, Golder does not have evidence that the former 3A/B Impoundments leaked and in fact has developed several lines of evidence to the contrary. The data developed in this ASD demonstrates that a source other than the Impoundment caused the groundwater impacts (i.e., beneficial ash and comingled waste).
- c) As mentioned above, Golder does not have evidence that the former 3A/B Impoundments created a release from the clay liner. The former 3A/B Impoundments were engineered clay lined impoundments. EGLE's statement "Based on site conditions at Unit 3A/3B, it is not appropriate to compare geochemical signatures from the source as the signature could change as the wastewater migrates into and reacts with the groundwater." is not accurate. The data presented in the Piper diagrams does not support the idea that wastewater from the former 3A/B Impoundments have migrated into and reacted with the groundwater. The geochemical analyses used conservative tracers which take into account variable pH and geochemical reactions within the waste stream because we know the geochemical makeup of the wastewater will change over time.

EGLE Comment:

- 4) **GHBLP appears to be selectively choosing data to include in the ASD. Boron, Calcium, Chloride, Chromium, Cobalt, Fluoride, Lead, Lithium, Total Dissolved Solids all are statistically significant according to the report. GHBLP selectively chooses Chromium, Cobalt, Fluoride, Lead and Lithium as not from Unit 3, but does not address Boron, Calcium, Chloride and TDS which are also statistically significant.**

Golder Response: Golder has not selectively chosen to ignore Boron, Calcium, Chloride and TDS from the ASD. Golder has statistically evaluated all constituents analyzed including detection monitoring constituents (Appendix III under the federal rule as well as the PA 640 Section 11511a(3) constituents) and assessment monitoring constituents (Appendix IV under the federal rule as well as the PA 640 Section 11519b(2) constituents).

Golder and GHBLP have not stated that Boron, Calcium, Chloride and TDS are not statistically significant. As stated in EGLE's comment, "Boron, Calcium, Chloride, Chromium, Cobalt, Fluoride, Lead, Lithium, Total Dissolved Solids all are statistically significant according to the report." Golder and GHBLP have not selectively prepared an ASD for certain constituents. GHBLP placed a notice of assessment monitoring in the operating record on April 9, 2018. Following the certified statistical plan (Golder, 2019)⁵, and Unified Guidance (USEPA, 2009)⁶, Golder and GHBLP have determined the statistically significant increases (SSIs) and subsequently initiated Assessment Monitoring. While in assessment monitoring, GHBLP and Golder have evaluated site data and statistically significant levels (SSLs) for the Unit 3 impoundment monitoring network.

⁵ Golder, 2019. Statistical Analysis Plan, JB Sims Generating Station, October 2019.

⁶ USEPA, 2009, *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance*. Office of Resource Conservation and Recovery – Program Implementation and Information Division, March 2009.

Specifically, the monitoring program identifies detection monitoring (Appendix III under the federal rule as well as the PA 640 Section 11511a(3) constituents) and assessment monitoring (Appendix IV under the federal rule as well as the PA 640 Section 11519b(2) constituents) constituents. The statistical approach states that the detection monitoring constituents (Appendix III under the federal rule as well as the PA 640 Section 11511a(3) constituents) would be evaluated using interwell prediction limits to establish if there were any SSLs. If SSLs are reported, assessment monitoring constituents (Appendix IV under the federal rule as well as the PA 640 Section 11519b(2) constituents) would be evaluated using confidence intervals with calculated site-specific groundwater protection standards (GWPS) to determine if there were any SSLs.

The ASD was prepared for SSLs of chromium, cobalt, fluoride, lead and lithium. The demonstration provided is applicable to the Appendix III constituents (boron, calcium, chloride and TDS) however not required following the site statistical program. GHBLP and Golder has submitted an alternate source demonstration for Appendix IV constituents under the federal rule as well as the PA 640 Section 11519b(2) where statistically significant levels above the site-specific groundwater protection standards have been identified. Golder and GHBLP have identified that groundwater impacts, based on available data and conservative tracers, are NOT the result of a release from the former 3A/B Impoundments but rather an alternate source. Should additional SSLs of Appendix IV constituents be identified, the ASD will be reevaluated to determine if the evidence supports an alternate source for those constituents. GHBLP will continue detection and assessment monitoring for the former 3A/B Impoundments.

EGLE Comment:

- 5) GHBLP does not provide any information on the alternate source. GHBLP states the source is historic island fill yet does not characterize that potential source to support that determination.**

Golder Response: Rule 4441(8) does not specifically state that the alternate source must be documented. The rule simply states that GHBLP may demonstrate that “a source other than” the former 3A/B Impoundments caused the contamination. The lines of evidence documented in the ASD demonstrate that the constituents detected in the groundwater near the former 3A/B Impoundments were from impacts by a source other than the former 3A/B Impoundments such as the historical ash fill and municipal solid waste located beneath the former 3A/B Impoundments.

Rule 4441(8): An owner and operator may demonstrate that a source other than a type II landfill unit or other source at the facility caused the contamination or that the statistically significant increase resulted from error in sampling, analysis, or statistical evaluation or from natural variation in groundwater quality. A report that documents the demonstration shall be certified by a qualified groundwater scientist, approved by the director, and placed in the operating record. Until a successful demonstration is made, the owner and operator shall comply with subrules (6) and (7) of this rule.

EGLE Comment:

EGLE also notes the following information that suggests the unit may have leaked during operation:

- 1) GHBLP observed that during closure, the unit appeared to be visually intact and therefore GHBLP has claimed the unit has not leaked during its lifetime. GHBLP appears to discount natural migration of liquid through an engineered clay barrier. EGLE used available information to calculate an**

estimated time of breakthrough. EGLE considered the site conditions and assumed the liner was a monolithic intact liner as a best-case scenario. Even with a best-case scenario, EGLE calculated that natural breakthrough of the clay liner could be as soon as 15-25 years. The units have been active since the early 80s. EGLE therefore believes it is not appropriate to assume that the unit has not leaked during its lifetime based on visual inspection alone.

Golder Response: Golder provided supporting evidence that the clay liner remained intact and no visual evidence of a release from the unit was observed after all ash was removed from the impoundment and confirmation soils testing was conducted. We stress that confirmation testing was conducted in accordance with EGLE guidance for soil cleanup (EGLE, 2002 and 2018)^{7 8}. Soil removal was completed using EGLE guidance as a minimum acceptable standard and in fact a smaller minimum spacing for analytical testing was used to be conservative.

GHBLP does not discount natural migration of liquid through and engineered clay barrier. Golder and GHBLP are well aware that water particles and thus ash porewater has the potential to infiltrate a clay liner. This fact that a clay liner is not 100 percent impermeable is not disputed. Which is why GHBLP has provided multiple lines of evidence indicating that Unit 3 is not the source of groundwater impacts observed downgradient of the Unit 3 impoundments.

Golder has provided multiple lines of evidence that the clay liner for the former Unit 3 impoundment remained intact. EGLE provided a time of travel assuming a breakthrough of the clay liner at 15-25 years. EGLE's assumptions do not take several factors into consideration including:

- The clay liner was properly engineered and constructed to a minimum of 3-feet thick using compaction methods that promote the clay particles to align perpendicular to the flow path, decreasing the liner's permeability further. See below for a Figure from Lambe, 1985 that shows the relation between compaction effort and relative density and moisture content.

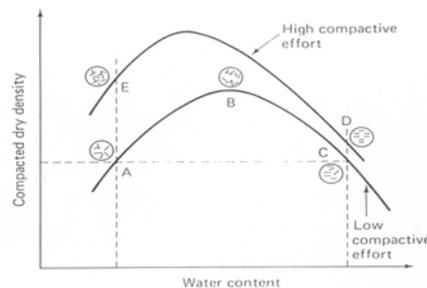


Fig. 5.5 Effect of compaction on soil structure (after Lambe, 1958a).

Reference: Holtz and Kovacs, 1981.

Figure 1: Effect of Compaction on Soil Structure

⁷ Sampling Strategies and Statistics Training for Part 201 Cleanup Criteria, Michigan Department of Environmental Quality, Remediation and Redevelopment Division, 2002

⁸ Incremental Sampling Methodology and Applications, Remediation and Redevelopment Division Resource Materials, Michigan Department of Environmental Quality, Remediation and Redevelopment Division, January 2018.

- The breakthrough time provided by EGLE assumes that breakthrough occurred the instant the Unit 3 impoundments started operating. Given that the clay liner was properly constructed, this is not a reasonable assumption.

EGLE “further believes that it is not appropriate to assume that the unit has not leaked during its lifetime based on visual inspection alone”. Golder agrees with that statement which is why we provided multiple lines of evidence to show that the clay liner left in place was not impacted by any release from the impoundment, including visual, photographic, colorimetric analysis, microscopy, and analytical testing. The testing program alone followed EGLE’s own guidance for soil cleanup. Based on the characteristics of the coal ash and resulting porewater that was stored in the ash impoundment. If a release were to have occurred, soil staining would have been observed as the ash and clay liner was removed. Soil staining was not observed after the ash and top several inches of the clay liner was removed. So, while there may have been shallow, surficial permeation of the clay liner, there is no evidence to assume that the ash porewater permeated through the entire liner and, in fact, there is evidence that it has not. EGLE’s assumed rate of permeability is just that, an assumption without support. It is not evidence.

EGLE Comment:

- 2) Many photographs taken by GHBLP show cracking and discontinuity in the engineered clay liner indicating that it is not a monolithic engineered barrier. Cracking and discontinuities in the clay provides preferential pathways for liquid to penetrate through the liner allowing coal ash contaminants into groundwater.**

Golder Response: As presented in a previous response, Golder has provided several lines of evidence that the portion of the clay liner that was left in place was decontaminated and was intact. Golder and GHBLP provided EGLE with information that the former 3A/B Impoundments were built on a field of ash. In addition, municipal solid waste was historically placed on the site. As to not exacerbate existing contamination per MCL 324.20107a, Golder and GHBLP determined that not exposing historically placed ash and municipal solid waste beneath the former 3A/B Impoundments by leaving uncontaminated portions of clay liner was an appropriate step. There is currently no evidence that the remaining clay liner was impacted by the Unit 3 bottom ash. Visual observation of the remaining clay liner was not used as a sole confirmation of ash removal but rather another line of evidence that the former 3A/B Impoundments are not the cause of the groundwater impacts. Desiccation cracks observed in clay soils is the result of drying of the clay liner after ash removal and confirmation samples was complete.

Specifically, the desiccation cracks identified in photographs provided by Golder, which were shallow and surficial, were taken after the former 3A/B Impoundments’ CCR materials were removed as well as portions of the clay liner documenting that the remaining clay liner showed no evidence of contamination. Since the liquid material from the impoundment had been removed and the surficial clay liner which was in direct contact with the liquid material had been removed, the soil mechanics of clay being exposed to the environment would experience desiccation cracks.

For EGLE to cite desiccation cracks as a reason to believe the liner leaked is incorrect and the lines of evidence provided must all be taken into account.

EGLE closing:

This letter details the state law requirements under Part 115 with which GHBLP must comply for Unit 3A/3B. Compliance with state law does not obviate the obligation that GHBLP comply with federal law,

including the United States Environmental Protection Agency's coal combustion residuals program and its closure requirements.

Golder Response: Golder and GHBLP ascertain that we have complied with state law requirements under Part 115 and with Federal requirements under US EPA 40 CFR 257.95.

Golder appreciates EGLE's review of the submitted ASD and respectfully requests EGLE review the demonstration without bias. Golder and GHBLP have not presented the ASD to avoid response action for the site. The ASD is presented specifically for the former 3A/B Impoundments. We understand that groundwater impacts as a result of historically placed ash fill and comingled waste, prior to the construction of the engineered clay lined Unit 3 Impoundments, require further investigation and subsequent corrective action following the requirements of Part 201 as well as the Federal CCR Rule for the applicable portions of the site such as the inactive 1/2 Impoundment. Golder trusts that the additional information provided in this letter addresses EGLE's comments provided on January 28, 2021.

Sincerely,

Golder Associates Inc.


Carolyn E. Powrozek, C.P.G.
Senior Geologist


Dawn L. Prell, C.P.G.
Senior Consultant

CEP/DLP

CC: Erik Booth – GHBLP
Paul Cederquist – GHBLP
David Walters – GHBLP
Arthur Siegal – Jaffe, Raitt Heuer & Weiss, P.C.

[https://golderassociates.sharepoint.com/sites/27317g/deliverables/200 reports/asd - unit 3/response to egle comment 2.2021/unit_3_asd_-_response_to_egle_comment_final_2_12_2021.docx](https://golderassociates.sharepoint.com/sites/27317g/deliverables/200%20reports/asd%20-%20unit%203/response%20to%20egle%20comment%202.2021/unit_3_asd_-_response_to_egle_comment_final_2_12_2021.docx)