

November 10, 2022

Transmitted Via: Email ([Jamie.Lancaster1@dnr.ga.gov](mailto:Jamie.Lancaster1@dnr.ga.gov))

Ms. Jamie Lancaster  
Surface Mining Unit  
Georgia Department of Natural Resources  
Environmental Protection Division  
4244 International Parkway, Suite 104  
Atlanta, Georgia 30354

**Subject:**            *Response to EPD Permit Coordination Comments Dated October 21, 2022*  
                         *Twin Pines Minerals, LLC*  
                         *Saunders Demonstration Mine*  
                         *Charlton County, Georgia*  
                         *EPD Mine ID No. 2073*

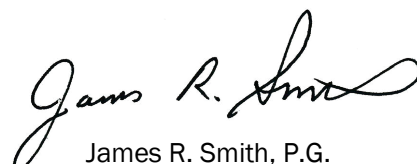
Dear Ms. Lancaster:

Attached please find our response to questions included in the Permit Coordination Comments dated October 21, 2022 and the follow-up memorandum from Wei Zeng dated November 9, 2022. In addition to a line-by-line response, we have also attached (1) an updated version of the Water Use and Management Plan, which has been revised to incorporate answers to these questions (voluminous appendices will be provided separately); and (2) a technical memorandum by Dr. Sorab Panday with GSI Environmental answering questions specifically related to seepage and the modelling GSI has conducted.

Please reach out if you have any additional questions or concerns. We appreciate your efforts to review our application and look forward to the public notice, which we trust is imminent.

Sincerely,  
TTL, Inc.

  
Sheryle G. Reeves, P.E.  
Principal Engineer

  
James R. Smith, P.G.  
Principal Geologist

## RESPONSES TO EPD PERMIT COORDINATION COMMENTS

***October 21 Bullet #1:*** *What is TP's understanding of seepage into the pit from the surficial aquifer or other sources?*

Response – Bullet #1: Water from the surficial aquifer will seep into the mine pit during normal mining operations.

***October 21 Bullet #2 / November 9 Question #2:*** *What is TP's estimate of the rate of such seepage?*

Response – Bullet #2: The weighted average seepage rate is conservatively estimated to be about 783 gpm. Dr. Sorab Panday with GSI Environmental Inc. used a numerical groundwater flow model to make this estimate. The results are provided in an addendum to GSI's 2021 report on the model that was used for this work. See Attachment 1, Memorandum from GSI Environmental to Jones Fortuna LP re: *Addendum to Modeling the Groundwater Flow at the Proposed Twin Pines Mine on the Trail Ridge Report* (Nov. 9, 2022). As documented in the addendum, the seepage rate will vary based on the hydraulic properties of the soils surrounding the pit as it moves, but the weighted average is the appropriate number for planning purposes, and GSI's addendum explains that the estimate of 783 gpm is "highly conservative."

***October 21 Bullet #3 / November 9 Question #3:*** *Does TP anticipate pumping seepage water out of the pit and store it using the water management ponds as well?*

Response – Bullet #3: Yes. As explained in the updated Water Use and Management Plan, seepage water will be pumped out of the mine pit as necessary to keep water depth in the pit below 8 feet. This water will be pumped to Water Management Ponds so that it can be conserved for use in the beneficiation process. This water will be evaporated, rather than being used, only to the extent necessary to maintain 5 feet of freeboard. Seepage water stored in the Water Management Ponds will be the primary source of process water for the Wet Separation Plant once the process water ponds are charged.

***October 21 Bullet #4:*** *TP indicated in its process diagram that the amount of water lost in the mineral production is roughly 17%.*

Response – Bullet #4: This is a misunderstanding based on confusing text in prior submissions. Approximately 10% of the water used in the beneficiation process will be consumed; 3,000 gpm will be used, but approximately 2,700 gpm will be returned. References in earlier submissions to a 17% water loss referred to the percentage of the water held in wet material that will be "lost" to drainage while the material is in the stockpile holding area. Because water draining from the stockpile will be captured and pumped to the Water Management Ponds for reuse, it will not be lost in the sense of being consumed.

***October 21 Bullet #5:*** *Is this 17% of the flow involved in production? For example, if 1000 gpm of water is used in production, does it mean that there is 170 gpm of water consumption?*

Response – Bullet #5: No. See response to Bullet #4.

***October 21 Bullet #6:*** *Why is this percentage different from the Water Use Management Plan submitted in August 2022 (Page 4), i.e., 3,000 gpm processing water with a 300 gpm (10%) consumption?*

Response – Bullet #6: See response to Bullet #4

***October 21 Bullet #7 / November 9 Question #3:*** *If the operation is halted because of equipment maintenance and mining pit dewatering, then there is no simultaneous loss of water from the production process. Is this understanding correct?*

Response – Bullet #7: Yes, it is. If the mining operation is shut down for any reason, the production process will continue only for a short time until any stockpiled material is depleted. Water will be withdrawn from the Process Water Ponds and the Water Management Ponds (not from the aquifer) as needed to process the stockpile. After the stockpile is depleted, processing will cease until mining resumes to make additional material available. No process water will be withdrawn from the ponds or pumped from the aquifer when processing is halted. Indeed, given the conservation of water in the Water Management Ponds, water will almost never be pumped from the aquifer, except during startup.

***October 21 Bullet #8:*** *EPD: Section 2B of the Water Management Plan references a question on the contingency plan for heavy rainfall events (not perking) 25 year – 24 hour events. How often do you anticipate the heavy rainfall events to occur? TP response: Refer to the NOAA historical rainfall data, <https://hdsc.nws.noaa.gov/hdsc/pfds/pfds> map, GA. Please provide a more detailed response.*

Response – Bullet #8: A 25-year, 24-hour storm event is the 24-hour accumulation that is expected to be exceeded once every 25 years. The probability that the 25-year, 24-hour storm event will be exceeded in any given year is 4% or 4-in-one-hundred. The probability that a 25-year, 24-hour event will occur during the 5-year life of the project is 20%. The Water Management Ponds have sufficient capacity to store a 1000-year, 60-day event without any discharge and with substantial room to spare.

As explained in the Water Use and Management Plan, an updated copy of which is attached, the Water Management Ponds will be 10-feet deep, providing a total storage capacity of more than 111 million gallons. The bottom 5 feet will be used to manage and conserve seepage water pumped from the active mining pit, so that it can be used in the beneficiation process. The top 5 feet will be managed as “rain storage” with capacity to capture precipitation accumulating during the entirety of the most extreme weather season – the 1,000-year, 60-day event – with substantial room to spare. The ponds will not be used to manage stormwater

runoff, so precipitation falling directly on the ponds is all the “rain storage” that will need to be provided.

According to the National Oceanic and Atmospheric Administration (NOAA)’s Point Precipitation Frequency Estimate for the Folkston 9 SW (09-3465) station, the 1,000-year, 60-day event is 38.2 inches or 3.18 feet. NOAA’s upper-bound 90% confidence interval for the 1,000-year, 60-day event estimate is 49.6 inches. With five feet of freeboard, sufficient capacity will be available at all times to store a 1,000-year, 60-day event with 1.81 feet of freeboard — enough to store an additional 50% of the millennial 60-day accumulation — to provide an enormous margin of safety.

Evaporators capable of removing up to 1,000 gpm will be used to manage levels in the Water Management Ponds to keep the working depth below 5 feet. Additional units could be added to provide additional capacity if this ever proved to be necessary.

***November 9 Question #3:*** *How does TP show that there would not be the need to discharge from the water management pond system even during heavy precipitation events? A detailed modeling is probably needed.*

Using the 1,000-year, 60-day precipitation event as a design standard addresses this concern without the need for sequential modeling. The Water Management Ponds provide storage capacity sufficient to manage seepage water from the mining pit with sufficient freeboard to capture precipitation from the millennial 60-day event with a 50% margin of safety. The use of evaporators capable of removing up to 1,000 gpm provides an additional margin of safety, as they can be used to make additional rain storage available during any such 60-day period.

***November 9 Question — #4:*** *What is the proper sequence of rain events to test the capability of the water management pond system under heavy precipitation circumstances? TP did provide a NOAA website, but this can not constitute an adequate answer or a detailed technical analysis.*

See answer to October 21 Bullet #8 and November 9 Question #3.

***November 9 Question #5:*** *EPD’s modeling team identified a USGS gage to the west of TP’s groundwater model domain. This gage recorded a wide range of gage heights. EPD would like to see that a sensitivity analysis be conducted by TP’s modeling expert (Dr. Panday) on boundary conditions reflecting the gage height changes.*

See GSI Addendum.

***November 9 Question #6:*** *A substantial number of the core samples used in determining hydraulic conductivities seemed to have been contaminated with drilling mud. Did the contamination undermine the hydraulic properties determined by these samples?*

No, the samples are trimmed on the top and bottom, and oriented vertically, so any sidewall contamination that may have been present would not have materially affected the outcome of the test.

**November 9 Question #7:** *TP seemed to have drilled a total of 385 boreholes in YEAR(S). There is insufficient information indicating the entity (entities) or person(s) who conducted that drilling or whether it was supervised by a Georgia-licensed Professional Engineer or Professional Geologist. TP does not have a bond posted with Georgia or a license issued by Georgia for drilling, thus EPD presumes that the drilling was conducted without proper licensing or bonding from the relevant State of Georgia regulatory authority. EPD notes this as a compliance issue to be resolved, and requests further information from TP regarding this drilling as further described below.*

We are in the process of gathering the requested information and will provide it to the Agency.

**November 9 Question #8:** *Dr. Panday's modeling report reflects the extent of change between pre-project and post-project groundwater conditions. However, it does not address the transition or the mining process. For example, the assumption of bentonite treated layer being placed at the vertical location of the black sand layer and at the thickness of the original black sand layer is only appropriate if there is successful implementation of the intended configuration. EPD asks for a backfill plan that ensures the proper emplacement of the bentonite treated layer.*

This issue is addressed in the Soil Amendment Plan Section 1.1. See Sheet 9 of the MLUP.