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March 15, 2023

Georgia Environmental Protection Division
Land Protection Branch
4244 International Parkway
Atlanta Tradeport, Suite 104
Atlanta, Georgia 30354

RE: Mining Land Use Plan Permit submitted by Twin Pines Minerals, LLC for Saunders Demonstration Mine in Charlton County, application number **SAS-2018-00554-SP-HAR**

Dear Georgia Environmental Protection Division Surface Mining Unit,

Thank you for the opportunity to comment on the Mining Land Use Permit (MLUP) put forward by Twin Pines Minerals, LLC (TPM) for its 773-acre (582 acres mining area)¹ Saunders Demonstration Mine located in St. George, Georgia. St. Marys Riverkeeper submits the following comments on behalf of the St. Marys River, and Riverkeeper Members and Supporters.

St. Marys Riverkeeper (Riverkeeper)² is a 501(c)3 private environmental advocacy organization charged with protecting the St. Marys River and its tributaries in the four counties it serves – Camden and Charlton County in Georgia, and Baker and Nassau County in Florida. The St. Marys River is the focus of our work to improve water quality in areas that are designated as swimmable and/or fishable, ensure the river thrives for future generations with our work on resiliency projects and community partnerships, promote low impact development in a fast-growing area, find solutions for water related issues, and advocate against industrial threats.

Riverkeeper is concerned that the proposed mine as presented to Georgia Environmental Protection Division (EPD) will negatively impact the St. Marys River watershed ecosystem. Riverkeeper's comments focus on the significant risk of failure and the use of several experimental and untested techniques for sand mining due to the catastrophic events that could happen should something go wrong. The St. Marys River and its headwaters, the Okefenokee Swamp, are pristine waterways and loved by locals and all who come to experience its scenic wilderness. The St. Marys River and Okefenokee Swamp are too important to risk with untested mining methods from a company that does not have experience in greenfield mining and has a negative track record of environmental stewardship.

¹ TPM Groundwater Withdrawal Permit. May 19, 2022. Page 1

² St. Marys Riverkeeper, Inc. <https://www.stmarysriverkeeper.org/>

I. St. Marys River Watershed

St. Marys River

The St. Marys River forms the border between Southeast Georgia and Northeast Florida. Arising from the Okefenokee Swamp, the river flows 130 miles to the Atlantic Ocean emptying at Cumberland Island National Seashore. The St. Marys River watershed is nearly 1,600 square miles; is home to roughly 160,000 residents who depend on the health of the river for tourism, recreation, commercial fishing, and safe drinking water; is comprised of 40% wetlands; and home to many endangered and threatened species such as the Atlantic and Shortnose Sturgeon.

The shape of the St. Marys River is defined by the natural break in Trail Ridge (Image 1), a former sand beachfront.³ When sea levels receded roughly 6,500 years ago, Trail Ridge prevented swamp water from flowing directly to the Atlantic Ocean. Instead, water in the southeast corner collected and found its way through the only gap in Trail Ridge, forming the St. Marys River. This one (1) mile-wide and 100-mile-long topographic ridge separates the Okefenokee Basin and Swamp from the coastal plain of Georgia.⁴ The North Prong of the St. Marys River flows south out of the southeastern corner of the Okefenokee Swamp along the western edge of Trail Ridge. The river then turns eastward as it makes its way through the only gap in Trail Ridge. Then the river heads north running along the eastern side of Trail Ridge before turning east at Folkston, GA/Hilliard, FL to make its way to the Atlantic Ocean.⁵



Image 1 Trail Ridge is an ancient barrier island that formed the Okefenokee Swamp and subsequently the St. Marys River 5,000 to 7,000 years ago.

³ US Fish and Wildlife Service letter to US Army Corp of Engineers. May 28, 2020

⁴ TPM MLUP App L-a. Impact of the Proposed Twin Pines Mine on the Trail Ridge Hydrologic System. Page 1

⁵ US Geological Survey Open File Report 87-557. Humic Substances in the Suwannee River, Georgia: Interactions, Properties, and Proposed Structures.

Roughly twenty percent of the Okefenokee Swamp feeds the St. Marys which results in the upper section of the river having zero flow at times and flooding at others. The land along the St. Marys is almost entirely privately owned by private working forests and private residents. In 2022, Georgia Department of Natural Resources (DNR) declared 2 segments of the St. Marys River safe for recreational use (Image 2). This upgrade means that EPD is committed to protecting these segments for recreation with higher levels of acceptable water quality.⁶



Image 2 Two stretches of the St. Marys River designated as recreational during the 2019 Triennial Review. The southernmost stretch is Deep Creek to Boone Creek and the northernmost stretch is Prospect Landing to Little St. Marys.

Okefenokee Swamp

The Okefenokee Swamp is a 438,000-acre precipitation-fed headwater wetland, the largest blackwater swamp in North America, and is designated a Wetland of International Importance. In 1937, 407,000-acres were designated as the Okefenokee National Wildlife Refuge (Refuge) and is the largest refuge in the eastern United States.⁷ The Refuge protects most of the Okefenokee Swamp and portions of Trail Ridge, supporting the federally designated Okefenokee National Wilderness Area and nationally designated water trail—the Okefenokee Wilderness Canoe Trail. The Refuge sees over 600,000 visits annually with 10% of the visitations represented by international guests from 46 countries.⁸

⁶ GA DNR Designated Uses and Water Quality Standards. Chapter 391-3-6

⁷ US Fish and Wildlife Service letter to US Army Corp of Engineers. May 28, 2020

⁸ US Fish and Wildlife Service. Okefenokee National Wildlife Refuge. [Okefenokee Swamp's Peatlands: A Hidden Resource](#).

The Refuge is a mecca for wildlife viewing and fishing, and home to endangered and threatened species, including the red-cockaded woodpecker, flatwoods salamander, wood stork, and eastern indigo snake. The shallow-water swamp, with an average water depth of 1 to 3 feet, contains peat deposits up to 15 feet deep⁹ and is the headwater source for the free-flowing St. Marys and Suwannee Rivers¹⁰, two of the most pristine rivers in the southeastern United States.

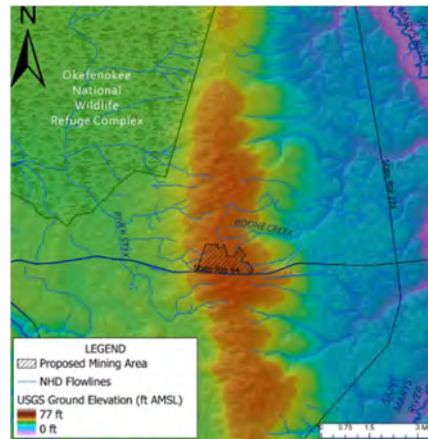
Our St. Marys River is pristine from Swamp to Sea, but a river is only as healthy as its headwaters and tributaries.

Mine Location and Future Plans

The proposed mine site (Image 3a) sits on the crest of Trail Ridge, a natural hydrologic divide, that results in water on the west side of the ridge crest to flow to the swamp and water on the east side to flow to the St. Marys River. Ironically, both sides of the ridge flow to the St. Marys. To the west, water flows to River Styx, a stream headwater system to the Okefenokee Swamp which then flows to the North Prong of the St. Marys River (North Prong). Water on the east side of the ridge flows to Boone Creek, a tributary of the St. Marys River. The LiDAR (Light Detection and Ranging) Map (Image 3b) is zoomed in to show ground elevation change on the east and west side of Trail Ridge at the mine site.



3(a)



3(b)

Image 3(a) and (b) shows the location of the proposed mine site on Trail Ridge west of St. George, GA. 3(a) is the proposed mine site within the St. Marys River watershed and its proximity to the Okefenokee Swamp and St. Marys River 3(a) source: TPM MLUP. Image 3(b) is a LiDAR map showing the mine site's elevation changes east and west at the crest of Trail Ridge and the tributaries that would be directly impacted. 3(b) source: Dr. Rhett Jackson.

⁹ US Fish and Wildlife Service. Okefenokee National Wildlife Refuge. [Okefenokee Swamp's Peatlands: A Hidden Resource](#).

¹⁰ US Geological Survey Open File Report 87-557. Humic Substances in the Suwannee River, Georgia: Interactions, Properties, and Proposed Structures.

TPM owns nearly 8,000 acres (including the proposed demonstration mine) from Highway 94 northward (Image 4).¹¹ If this mine is permitted, TPM will likely seek future permits to mine the remaining acres they currently own. The northwestern corner of their property comes within 400 feet of the Okefenokee Swamp, half a mile from the Refuge property, and north and west of the St. Marys River.¹²

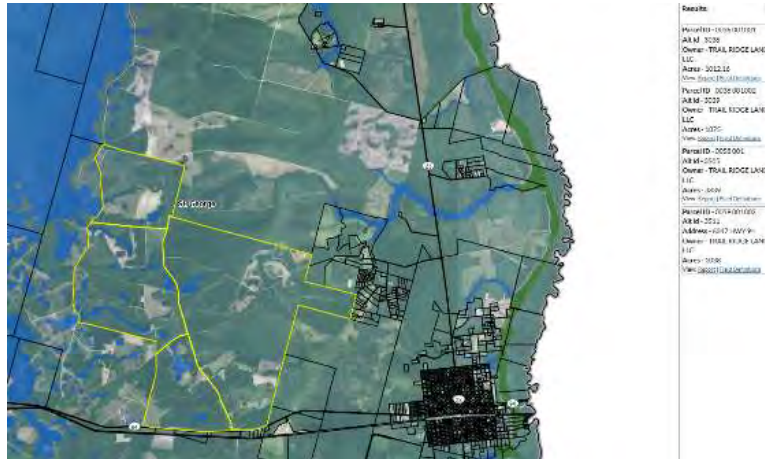


Image 4 Trail Ridge Land, LLC property (in yellow) in Charlton County with flooding filter enabled. Source: Charlton County Tax Assessors website.

Has the additional site south of Highway 94 been taken into consideration in regards to plans to be reviewed and wastewater storage capacity? Sheet 5 of the MLUP 2a, Note 1 of Mining Sand Process Flow Diagram, states that “All material shall be hauled, utilizing trucks, between the permitted mine, wet processing areas, and Mineral Separation Plant (MSP) south of Highway 94.¹³” The Mineral Separation Plant that is located outside of the permit boundary¹³ is currently owned by Sharon Bell and Eli L. Padgett¹¹. **Is the use of this Mineral Separation Plant to be approved as part of this permit?** Additionally, Note 2 of Sheet 5 states “Process water shall be piped to the MSP from Management Pond 3 (M3). Any wastewater from the MSP shall be hauled by tanked trucks, to the processing ponds for re-use¹³” (Image 5). **Are there plans showing the pipes that connect M3 to MSP? How much wastewater is expected to be produced from the MSP and has that been included in the water budget of the process ponds?**

¹¹ Charlton County Board of Assessors. [Charlton County Tax Assessor's Office \(qpublic.net\)](http://qpublic.net)

¹² US Fish and Wildlife Service letter to US Army Corp of Engineers. October 8, 2019.

¹³ TPM MLUP 2a. Sheets Revd 11-28-22.

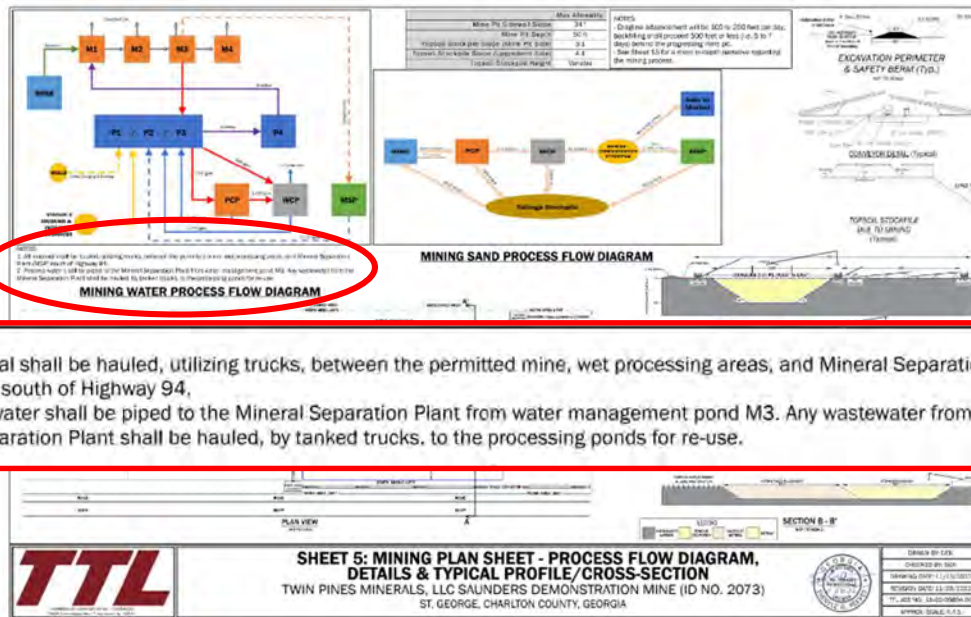


Image 5 Sheet 5 of MLUP 2a stating that all material will be hauled off property to a Mineral Separation Plant and wastewater from MSP will be hauled onsite to the processing ponds to be disposed of.

II. Riverkeeper Comments

Water Monitoring and Process Water

USGS Water Level Gauges - St. Marys River

The St. Marys River water levels are heavily dependent on precipitation from both the Okefenokee Swamp and the surficial aquifer in the upper section of the river and is tidally influenced where the river turns eastward at Folkston, GA/Hilliard, FL to head out to the Atlantic Ocean. There are five USGS water level gauges (gauges) in the St. Marys River¹⁴: US 94 bridge over North Prong at Moniac, Macclenny upriver of St. Marys Cove boat ramp, Traders Hill Boat Ramp, I95 Bridge, and Front Street in Fernandina Beach. Tidal influence impacts the gauges at Traders Hill Boat Ramp, I95 Bridge, and Front Street in Fernandina where you can see oscillation in the gauge graph. However, the Moniac and Macclenny gauges do not have tidal influence but rather surficial aquifer, tributary, and swamp water influence.

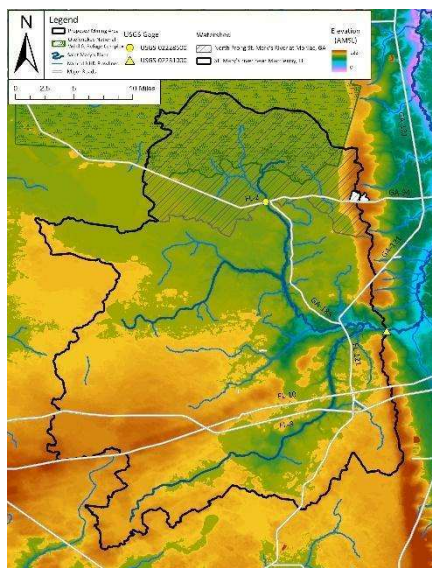
The Moniac gauge (Latitude: 30.517500° N, Longitude: 82.230556° W) is located on the Highway 94 bridge over the St. Marys River and the Macclenny gauge (Latitude: 30.358611° N, Longitude: 82.081667° W) is located just upriver of St. Marys Cove (old boy scout camp) in Macclenny, FL.

¹⁴ St. Marys Riverkeeper website. Water Level gauge links. [Explore Your Watershed - St. Marys Riverkeeper \(stmarysriverkeeper.org\)](http://stmarysriverkeeper.org)

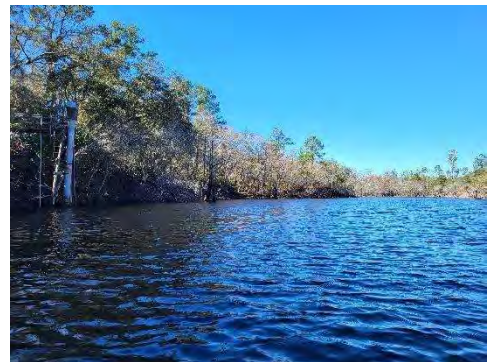
The Moniac gauge is located in the channel of the North Prong and the river itself is narrow (Image 6a) while the Macclenny gauge is located along the shore and the river is roughly 150 feet wide (Image 6c). The tributaries that flow into the St. Marys River between the two gauges change the volume of water which changes the width of the river. The 160 square mile drainage area of the North Prong is fed entirely by the Okefenokee Swamp and surficial aquifer. In contrast, the drainage area of the Macclenny gauge is 4.4 times larger (700 square miles) and includes a larger area of influence from the surficial aquifer and a dozen tributaries, three of which are over 20 miles long with their own headwaters.¹⁵ With a substantially larger drainage area into the St Marys River in the downstream portion around Macclenny, there is the potential for increased variability in measured streamflow at this gage compared to the Moniac gage, where river inputs are fewer. As the Okefenokee swamp is drought sensitive, minor alterations to water inputs in the area may have a disproportionate impact, and monitoring only based on the Macclenny gage may obscure or minimize negative effects to the Okefenokee and headwaters of the St. Marys River.



(6a)



(6b)



(6c)

Image 6(a)(b)(c) shows the locations and river view at low water of USGS water level gauges Moniac (6a) and Macclenny (6c). The map (6b) shows the watershed of the upper St. Marys River with all the tributaries that feed into the main stem from Georgia and Florida. The three major segments are the North Prong (exiting the Swamp), Middle Prong, and South Prong. The two gauges are represented on the map by a yellow hexagon due west of the mine site (white polygon) and a yellow triangle due south of the mine site. The crest of Trail Ridge is colored in red. (6a) was taken on January 30 at low water levels - 5.8 ft, discharge 4.3 cubic ft per second. (6c) was taken January 26 at low water levels - 3.14 ft, discharge 117 cubic ft per second.¹⁶

¹⁵ EPD memorandum (12/7/2022) from Water Supply Program department to the Land Protection Branch. Additional hydrologic analysis in response to Dr. Rhett Jackson's 11/22/2022 comment.

¹⁶ St. Marys Riverkeeper website. Water Level gauge links. [Explore Your Watershed - St. Marys Riverkeeper \(stmarysriverkeeper.org\)](https://stmarysriverkeeper.org)

Riverkeeper does not agree with EPD’s decision to solely use the Macclenny gauge. Based on a letter signed by more than ten research hydrologists of southeastern universities “the appropriate USGS gauge for assessing hydrologic effects on the Okefenokee Swamp of consumptive groundwater withdrawals...is North Prong of the St. Marys River at Moniac, GA.¹⁷” Furthermore, USGS has stated that “EPD is using USGS’s quality rating system incorrectly to make its gage-decision.¹⁸”

To accurately determine how water withdrawals from the surficial aquifer will impact the St. Marys River at its source, the Moniac gauge must be monitored. In addition to this, water levels and water flow in the main stem St. Marys River must also be monitored. Therefore, it is the recommendation of Riverkeeper that three gauges be monitored and recorded to fully understand the impacts of water withdrawal from the Floridan and surficial aquifer on water flow to the Swamp and/or St. Marys River: Moniac, Macclenny, and Traders Hill Boat Ramp. In addition, a water level gauge and water quality monitoring device should be installed on the St. Marys River downstream of the mouth of Boone Creek.

Process Water

a. Management Ponds – Water Use Management Plan (WUMP)

A series of four Management Ponds (M1-M4) are proposed cascading down the northeast quadrant of the property in question (Image 7). These ponds will “capture precipitation, drainage from the stockpile staging area, and any seepage water evacuated from the mine pit¹⁹” and is presented as the solution for managing their closed loop system.

¹⁷ *Memo from research hydrologists of southeastern universities. Appropriate streamflow data for assessing how the proposed TPM LLC mine groundwater withdrawals will affect Okefenokee Swamp Hydrology. Feb 23, 2023*

¹⁸ *Savannah Morning News. March 4, 2023. Hydrologists say Georgia EPD choosing to use wrong data in Okefenokee evaluation. [Georgia EPD using wrong USGS stream gage data at Okefenokee Swamp \(savannahnow.com\)](https://www.savannahnow.com).*

¹⁹ *TPM MLUP App P Water Use Management Plan 1-10-2023. Page 5*

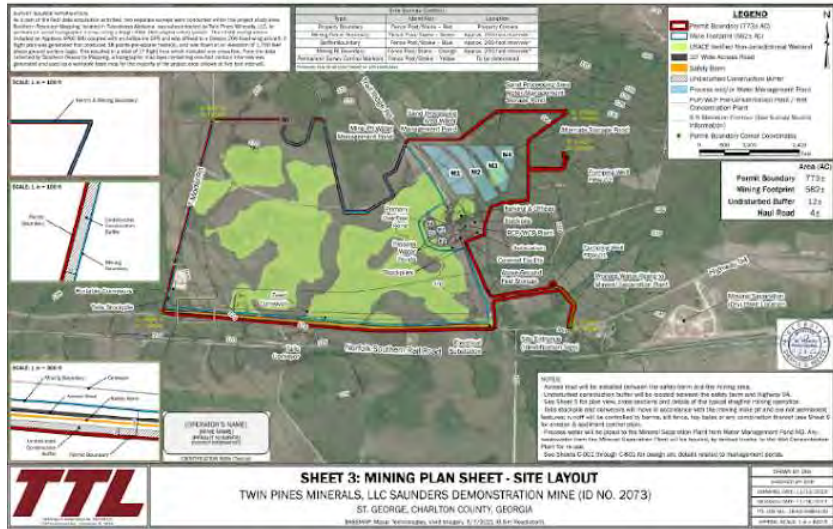


Image 7 Site layout including the locations of the eight water ponds on the property (permitted boundary is indicated in red). The Four Management Ponds (M1-M4) are indicated in blue in the upper right quadrant and the four processing ponds are south of the Management Ponds.

Each pond is diked around the perimeter as well as in between each pond, ponds M1-M3 have an overflow section 2 feet below the top of each berm, and there is a large quantity of floating evaporators to expedite the evaporation process.

i. Berms and Silt Fence

The berms along the edge of the ponds and in between each pond will be made of soil from the surrounding soils (presumably from the dugout ponds) which will be returned to the excavated hole once the ponds are decommissioned.²⁰ Each pond will be lined with a double sided textured high density polyethylene geomembrane on bedding layer²¹ to prevent stored water from seeping back into the soil compromising the structural integrity of the berms. Each berm will be inspected daily using Georgia Safe Dams inspection checklist.²² If a berm needs repairing, TPM states “the pond associated with the berm can be dewatered and repaired.”²⁰ **Can the other berms withstand the additional volume of water added by an out-of-commission pond? What is the backup plan if the remaining ponds do not have the capacity or are in fact compromised themselves and cannot take in additional water? How is the liner going to be inspected and repaired?**

²⁰ TPM MLUP App P Water Use Management Plan 1-10-2023.

²¹ TPM MLUP 2b - Pond Sheets Revd 01-12-2023. Page 55

²² TPM MLUP App V Safe Dams Inspection List.

Sediment Control is unclear and concerning and could affect the pristine quality of the upper St. Marys River. A silt fence is proposed along the perimeter of the pond area, 2 feet before the permitted boundary.²³ The locations of sediment control are either Sd1-BB – Brush Barrier or Sd1-S – Silt Fence. Sd1- BB is the only designated silt fence around the M1 – M4 ponds, below Ponds 1-4 and the Plant area where there are major natural contour changes and some near off site natural wetlands. The sediment barrier Sd-1 is to ‘prevent sediment from leaving the construction site, it may be sandbags, bales of straw or hay, brush, logs and poles, gravel, or a sediment fence. The barriers are usually temporary’ (Image 8).²³ Also, M1 - 4 is a pond area constructed by a huge amount of dirt relocation and diking. MLUP Sheet 7 details Silt Fence Type C with “height” to be shown on erosion, sedimentation, and pollution control plan.” There is no height designation for silt fencing found on the plan as referenced. Also on Sheet 7 is the detail for Brush Barrier “with minimum base width of 5’ and no wider than 10’ and “filter fabric may be placed on the side...”²⁴ However, details for a fabric silt fence placed 2 feet from the limits of disturbance are mentioned in the Legend. **Why only place a Brush Barrier around Ponds M1 – M4, P1- P4 and the Plant? Or is it to be a fabric silt fence, and at what height? If a Brush Barrier, how does the base width fit into the permit area? What is the height of the silt fence around the mining area?**

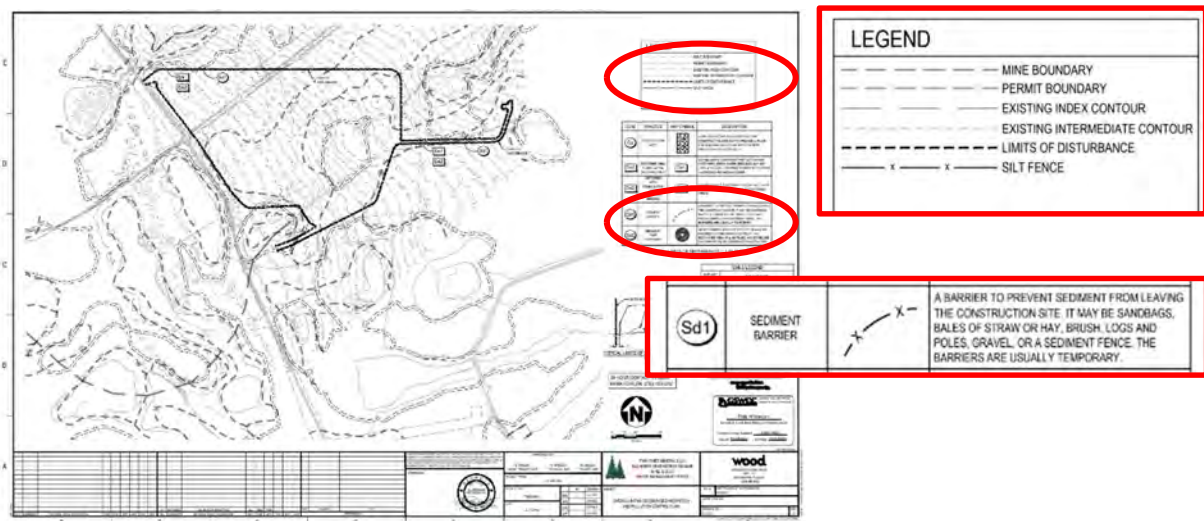


Image 8 Description of sediment barrier along perimeter of permitted boundary.

If a berm collapses during a heavy rain event, is the expectation that this silt fence will prevent the turbid water from entering and contaminating neighboring properties and local waterways? Will the company be implementing silt fence Stormwater Best Management Practices based on EPA’s document EPA 833-F-11-008²⁵? How will the fencing be placed? How long is each fence run? Will there be an overlap between runs? How has the drainage area been evaluated to determine efficiency and quantity of the silt fences? What is the silt fence made of? The silt fence design and installation is unclear.

²³ TPM MLUP 2b - Pond Sheets Revd 01-12-2023. Sheet C400-C405

²⁴ TPM MLUP 2a. Sheets Revd 11-28-22. Sheet 6.

²⁵ EPA Stormwater Best Management Practice: Silt Fences

In the wetland delineation map (Image 9), there are two waterbodies in close proximity of the Management Ponds that are of concern.²⁶ The first water body originates under the perimeter berm of the M4 pond. Although this pond is the alternate storage, any leaks from the liner or berm collapse will directly impact this waterbody and downstream. The second waterbody that is of concern is the northwestern corner where the permitted boundary comes within 25 ft of the wetland. Within the wetland is another stream that could be directly impacted from a contamination discharge. **Are the wetlands that are outside of the permitted boundary northwest and east of the Management Ponds considered jurisdictional under the new rules?**

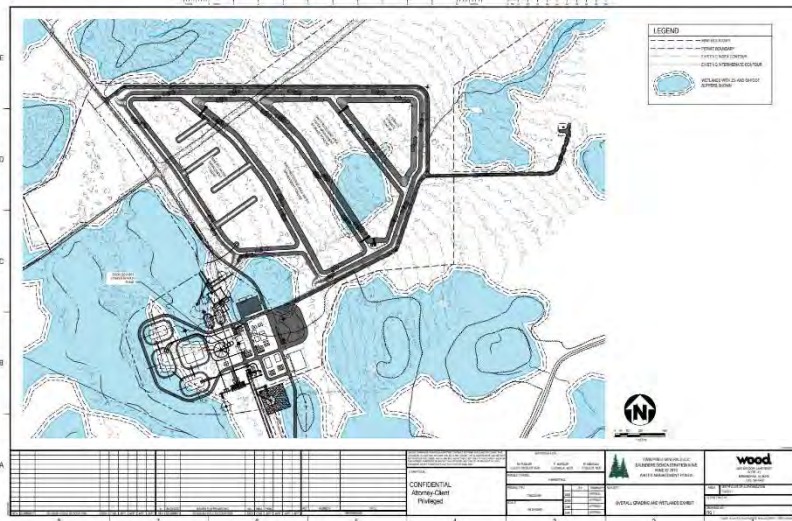


Image 9 Wetland delineation map in proximity to the Management and Processing Ponds in the northeast quadrant of the permitted property. Berms and silt fencing come within 25 feet of a wetland in the northwest corner of M1. A stream of concern flows under the berm in M4.

The silt fencing is on the outside of the perimeter roadway and berm meaning there is a long steep slope for sediment runoff. EPA’s silt fence BMP states that “When there is a long steep slope, install one fence near the head of the slope to reduce the volume and velocity of water flowing down the slope, and another fence 6–10 ft from the toe of the slope to create a sediment storage area near the bottom.²⁷” The size of the drainage area for the management pond is not provided indicating that the site has not been evaluated for this necessary and critical piece of equipment.

It is the recommendation of Riverkeeper that TPM consult EPA’s silt fence BMP document to determine the drainage area to properly install the appropriate material, quantity, and design of silt fencing. In addition, TPM should install two silt fences to prevent sediment from flowing outside of the permitted boundary, and a buffer of 25 feet should be required between the furthest out silt fence and the permitted boundary to provide an extra level of protection for the surrounding area.

²⁶ TPM MLUP 2b - Pond Sheets Revd 01-12-2023. Page 61

²⁷ EPA Stormwater Best Management Practice: Silt Fences

ii. Overflow

Flow between the ponds will be controlled by sluice gates and the overflow section will pass water to the lower adjacent pond once water elevation exceeds overflow elevation.²⁸ M4 does not have an overflow section to an adjacent pond as it is designed to be the alternate storage pond if the other 3 ponds reach high water levels. **What is the plan if M4 overflows? Where will overflow discharge occur?**

iii. Evaporators

A mechanical evaporation system has been proposed to evaporate water from the Management Ponds in order to avoid an effluent discharge permit. TPM has listed the Varimax 40 system from e3 Solutions in their permit application to show the efficiency for evaporating water using an evaporation system versus the natural process. However, the permit does state “or equivalent/equal” after the system name indicating that another system could be used after the permit is approved without state review or approval. Another system could be more cost efficient for the company and not meet the targeted goals of evaporating 1.44 mgd that TPM has stated in the permit to have a successful closed loop system.

The proposed evaporators will be installed and positioned to manage water in the four Management Ponds. According to e3 Solutions these units “allow for adjustable droplet size (70-125 microns on average), overspray control, and is capable of evaporating in the highest and lowest of pH and challenging levels of TSS and TDS for wastewater.”²⁹ With 40 gpm, each unit can evaporate up to 50,000 gpd and have up to 90% evaporation efficiency, with performance varying with climate and local weather. The test data provided by TPM is not for the system in question, it uses different chemistry than mineral sands water, and was conducted in a different climate condition.³⁰ South Georgia has high humidity much of the year, heavy rainfall events including hurricanes, and winds do not blow frequently. **Have these evaporators been tested for heavy minerals mining? Will the mining process stop when water levels in the pond reach the high-water line to allow for the evaporators to make more room in the ponds? What about during periods of heavy and long-term rain events or high humidity when evaporation rates are low? What is the redundancy plan for when there is too much water to manage or the evaporators malfunction?**

The MLUP 2b shows the locations of the evaporators in the 4 Management Ponds. There is a discrepancy of the number of evaporators that will be used. The Legend states that Pond M1 will have 55 Evaporators and their locations are depicted below but the additional evaporator locations in M2-M4 are called ‘Potential Alternative Evaporator Locations’.

²⁸ TPM MLUP App P Water Use Management Plan 1-10-2023. Page 12

²⁹ e3 Wastewater Solutions, Enhanced Evaporation Technologies. [Wastewater Solutions, Enhanced Evaporation Technologies | E3 Solutions \(evaporationworks.com\)](https://www.e3solutions.com/wastewater-solutions/enhanced-evaporation-technologies).

³⁰ Memo: Response to EPD Hydrology Unit Request for Evaporator Information. From TPM to EPD.

³¹ TPM MLUP 2b - Pond Sheets Revd 01-12-2023. Page 40

In the Key notes, it states that “ ...in the water use management Plan, a sufficient number of units will be installed to evaporate 1.44 mgd. Based on the manufacturer’s recommendations, 167 units will be installed initially with 26 additional units being installed if needed³²” (Image 10). **Why is TPM installing only 55 evaporators when the manufacturer recommends installing 167 to meet the goal of evaporating 1.44 mgd?**

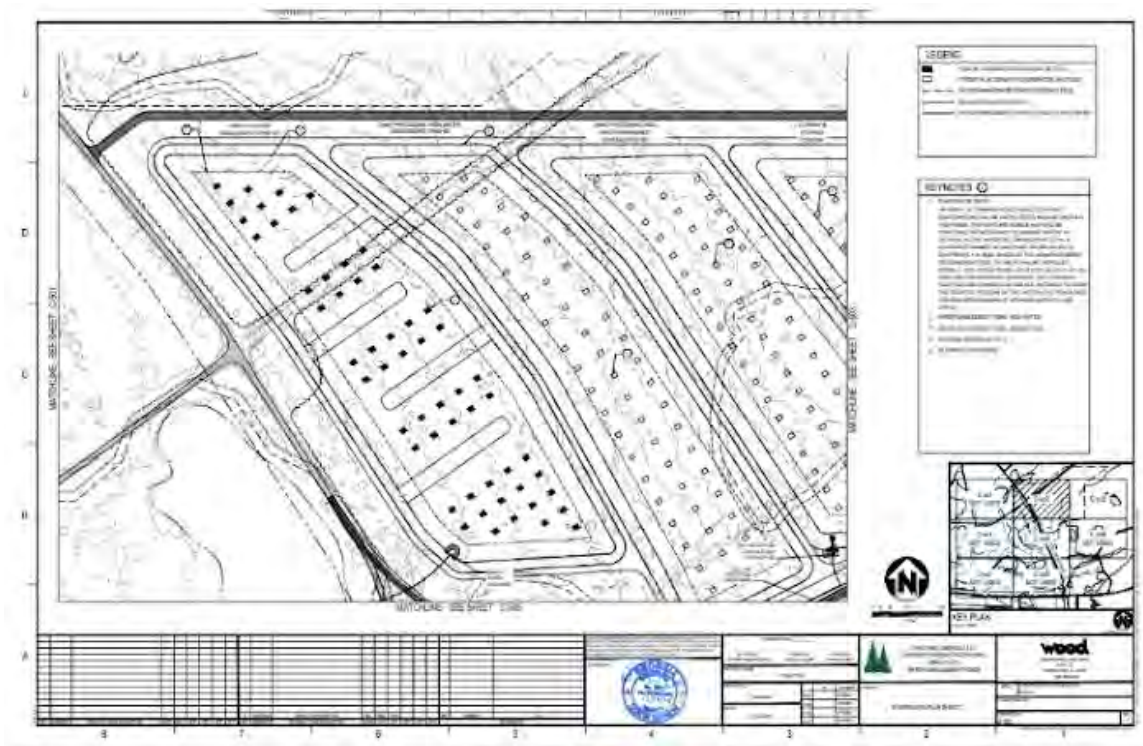


Image 10 Potential location of evaporators in ponds M1-M4. M1 pond will have 55 spaced evenly throughout. M2-M4 evaporator locations are called ‘Alternative Evaporator Locations’ indicating that these will not be placed unless needed. In order to evaporate the 1.44 mgd TPM needed to evaporate, the manufacturing company recommends 167 evaporators.

There is an additional concern of the mining and processing water clogging the evaporation system due to high concentrations of humates, TDS, and fine sediment particles (silts and clays). This deposition is likely to impair evaporator performance and should be evaluated in more detail before this experimental process is approved. Conventional dispersion technologies have resulted in visible contamination such as white salt buildup on surrounding trees and soil up to 200 feet away from the perimeter of the wastewater pond. In contrast, an embodiment according to the present invention, was tested on an approximate 2.5-acre waste water pond operated by North Bill Disposal in Douglas, Wyoming and showed a substantial improvement as compared to conventional technologies, with maximum drift limited to about 40 feet in winds as high as about 45 mph, with no contamination exceeding the perimeter of the pond.³³

³² TPM MLUP 2b - Pond Sheets Revd 01-12-2023. Page 40

³³ Noel et al. US Patent Application US 2014/0262055 A1, September 18, 2014. “Wastewater Evaporator”

TPM states that the total dissolved solids (TDS) concentration of groundwater and surface water is 50 mg/L. With a proposed evaporation rate of 800 gpm, this results in a salt load of 480 lb/day or 88 tons/year potentially being aerosolized.³⁴ **Does this mean that salts and humates will be dispersed back into the ponds once water goes through the evaporator? Are the evaporators connected to an Anemometer to measure wind speed and direction for auto adjustment?** However, TPM does not have data about potential TDS in the process water. **What are the expected TDS in the process water and how will TPM keep their experimental evaporators from impacting the land and water bodies surrounding their proposed mine site?** The St. Marys River, the Okefenokee Swamp, and nearby forests are not adapted to a saline environment and given that winds in the area are often from the east, salt deposition is inevitable. The salt load will reduce long-term soil productivity in the downwind areas.³⁴ **How does EPD plan to address this saline cloud and its impacts on the surrounding freshwater ecosystems?**

There is no assurance that this evaporator system will work with a proposed heavy mineral mining project. There is no plan for controlling, monitoring, or addressing discharge of process water to the tributaries of the St. Marys River if it were to occur. There is no back up plan for water management failure.

Water Withdrawals

a. Groundwater on Trail Ridge

Groundwater is the water that exists beneath the land surface and is layered in different aquifers which are separated by aquitards or confining layers (Image 11). In its usable form, aquifers are storehouses of water and the movement of the water through the sediment varies based on the porosity and permeability.³⁵ The surficial aquifer along the coastal plain of Georgia including Trail Ridge, is composed of layered sand, clay, and in some places limestone, and is unconfined allowing for water to feed surface river systems.³⁶ Recharge for a surficial aquifer occurs anytime it rains. Below the surficial aquifer is a 350 ft thick calcium based clay known as the Hawthorn Group.³⁷ This confining layer effectively isolates the surficial aquifer from the deeper Floridan Aquifer.³⁸ The Floridan Aquifer system (Floridan) encompasses all of Florida and parts of Georgia, Alabama, and South Carolina and varies in depth and thickness. Recharge for the Floridan occurs where no confining layer is present and these areas are few and far between. Groundwater is recharged by precipitation but can be diminished by pumping water from a well.

³⁴ Dr. Rhett Jackson, University of Georgia, comments on TPM LLC Draft Mining Land Use Plan (and supporting documents). February 26, 2023

³⁵ USGS, Water Science School. *Aquifers and Groundwater*. October 16, 2019. [Aquifers and Groundwater | U.S. Geological Survey \(usgs.gov\)](https://www.usgs.gov/edu/aquifers-and-groundwater)

³⁶ USGS, *Groundwater Conditions in Georgia*. [Groundwater Conditions of Georgia \(usgs.gov\)](https://www.usgs.gov/edu/groundwater-conditions-in-georgia)

³⁷ Fish, Johnnie E. 1988. USGS, *Water Resources Investigations Report 87-4034. Hydrogeology, Aquifer Characteristics, and Ground-water Flow of the Surficial Aquifer System, Broward County, Florida*.

³⁸ TPM MLUP App L-a Impact on the Trail Ridge Hydrologic System 1-14-2020. Page 3

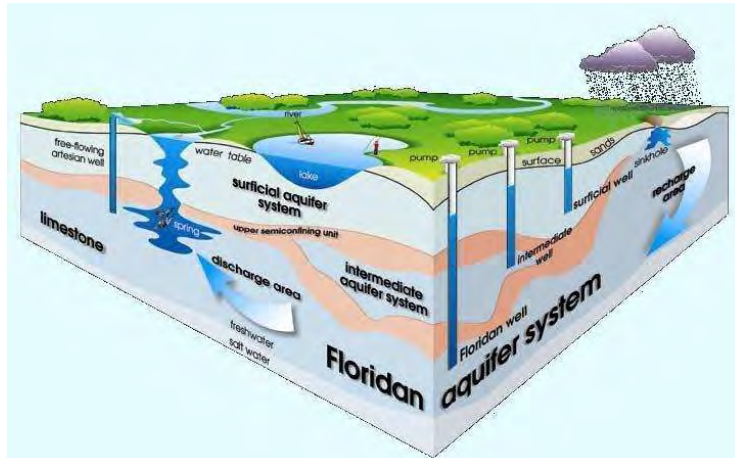


Image 11 Aquifers can be thought of as vast underground, porous rocks that hold water and allow water to move through the holes within the rock. They are recharged through precipitation, discharge into springs, and can be pumped out to provide water to residents.

i. Surficial Aquifer

The Surficial Aquifer ‘Zone of Saturation’ is the water filled area underground with the top of this section called the water table. In the southeastern United States, the surficial aquifer underlies an area of about 63,600 square miles and in 2015 about 14 million people living in the area withdrew 270 mgd for public supply. When USGS evaluated the surficial aquifer in the region, it was determined to be one of the most important aquifer systems they evaluated.³⁹

Along Trail Ridge, the water table is shallow and mimics the topography of the ground surface (Image 12). Precipitation that is not evaporated or transpired to the atmosphere infiltrates to recharge the surficial aquifer. Trail Ridge acts as a hydrologic divide where along the western margin of the ridge, groundwater flow provides water to the Okefenokee Swamp and related wetlands. On the eastern side, groundwater provides base flow to streams⁴⁰ and ultimately the St. Marys River.

³⁹ USGS Groundwater Quality in the Surficial Aquifer System, Southeastern United States. Fact Sheet 2022-3035. July 2022.

⁴⁰ TPM MLUP App L-a. Impact of the Proposed Twin Pines Mine on the Trail Ridge Hydrologic System. Page 1

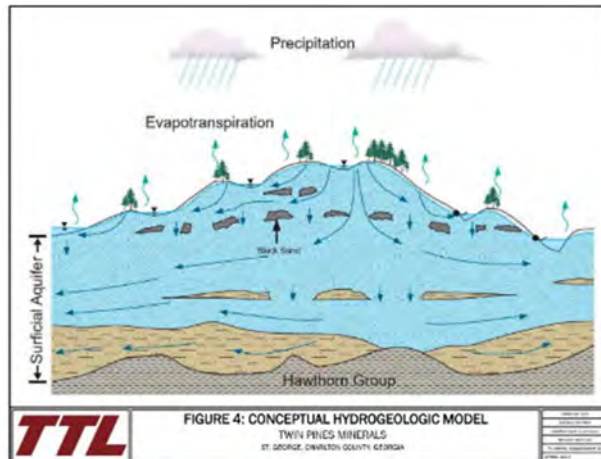


Image 12 Cross section of a hydrologic model showing how water moves through a ridge system. Water is recharged by precipitation and surface water is lost to evaporation. Water in the surficial aquifer moves downward either east or west depending on the hydrologic divide. The Hawthorn Group is a confining layer preventing water from traveling between the surficial and Floridan Aquifer.

The St. Marys River is considered a ‘gaining stream’ meaning that the waterbody receives water from the surficial aquifer in addition to precipitation and from the Okefenokee Swamp (Image 13).⁴¹ During heavy rainfall events, water levels in the upper St. Marys River can reach flood stage (12+ ft) and during drought periods water flow can be zero (Image 14). Between March 4, 2022 and March 14, 2022, the water levels at the Moniac gauge rose from 5.88 ft to 12.68 ft. The Macclenny water levels during this same timeframe went from 3.59 ft to 14.52 ft.⁴² This water is received from the Swamp, tributaries, and surficial aquifer. However, a drought situation (Image 14a) has the opposite effect resulting in the St. Marys River has zero flow and can move from a ‘gaining stream’ to a ‘losing stream’ if the water table is lowered enough.

⁴¹ California Farm Bureau Federation. *California’s Sustainable Groundwater Management Act: Surface Water Depletions.*

⁴² St. Marys Riverkeeper website. Water Level gauge links. [Explore Your Watershed - St. Marys Riverkeeper \(stmarysriverkeeper.org\)](https://stmarysriverkeeper.org)

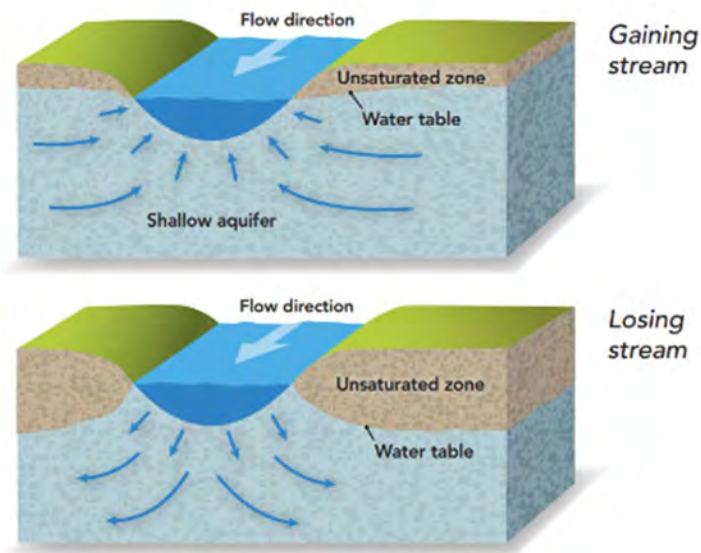
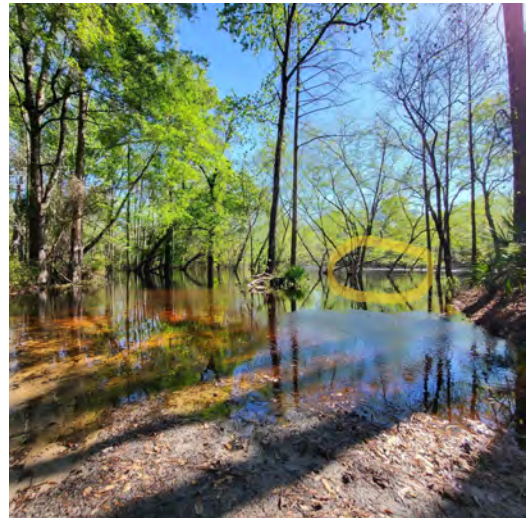


Image 13 Groundwater plays an important role in surface water ecosystems such as streams, springs, seeps and wetlands. Image 13 depicts how flowing surface waters are defined as either gaining or losing streams.



14(a)



14(b)

Images 14(a)(b) are pictures taken from the same location on the St. Marys. Image 14(a) was February 7, 2022 during a typical period of low water. Image 14(b) was taken five weeks later on March 21, 2022 after three weeks of rain. The yellow circle is highlighting the same trees in both images. Source: St. Marys Riverkeeper

When you dig a hole in southeast Georgia, it almost immediately fills with water. To be able to run their experimental technique of draglining, TPM will need to dewater the 50 feet pit continuously. They estimate removing 1.1 mgd of seepage water to maintain 8 feet of water or less in the excavated pit. The source of the seepage water is the surficial aquifer (Image 15). EPD in their December 2022 Memo, stated that “dewatering from the mining pit may have a higher level of connection with the surficial aquifer for the swamp than the Floridan Aquifer withdrawal.”⁴³

However, this dewatering will have an impact on the St. Marys River both from the west and from the east.

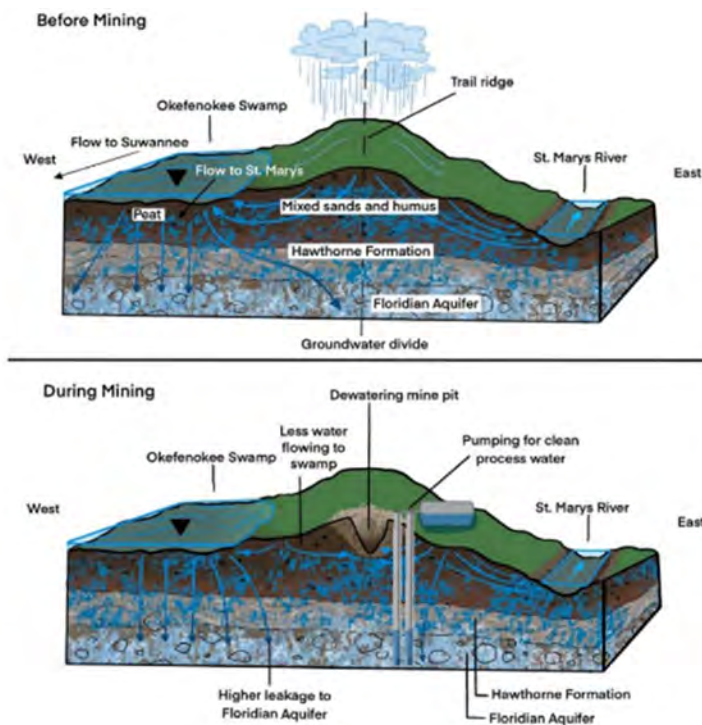


Image 15 Groundwater pumping during the mining process can exacerbate water depletion and impact wetland ecosystems. The top image depicts how groundwater flow on Trail Ridge prior to mining. The bottom image depicts how pumping affects surface water levels and flowing streams. Source: Dr. Rhett Jackson.

According to Dr. Rhett Jackson from University of Georgia, the North Prong water flow is zero approximately 3% of the Moniac gauge record, reflecting the drought sensitivity of the swamp and lack of groundwater input of this upper section of the St. Marys River. Consumptive use of the mining pit seepage water is 1.745 cfs with half (0.87cfs) of that coming from the west side of Trail Ridge and the other half coming from the east.⁴⁴ Removing this amount of water from the water budget of the swamp will result in the North Prong experiencing triple the cumulative duration of zero flow periods, increase the drought condition and potential for fire in the region, and expose peat layers (carbon release). In addition, 0.87 cfs of withdrawal from the surficial aquifer will reduce water to the main stem St. Marys River to the east of Trail Ridge. Riverkeeper is concerned of lateral encroachment from coastal waters (saltwater intrusion) further upstream negatively impacting the delicate freshwater ecosystems; exposing peat during drought periods and impacting the wetlands in the surrounding area of the mine site that rely on the surficial aquifer for their survival.

⁴³ EPD memorandum (12/7/2022) from Water Supply Program department to the Land Protection Branch. Additional hydrologic analysis in response to Dr. Rhett Jackson's 11/22/2022 comment.

⁴⁴ Dr. Rhett Jackson, University of Georgia, comments on TPM LLC Draft Mining Land Use Plan (and supporting documents). February 26, 2023

Has water withdrawals from the surficial aquifer been investigated on its potential impacts to the St. Marys River to the east of Trail Ridge? How is saltwater intrusion into the St. Marys River being evaluated in regard to this project and is this of concern to EPD? What additional measures is TPM taking to ensure fires do not get out of control? Although the wetlands on property are not jurisdictional, there may be ones in the surrounding area that may be impacted by water drawdown. **How are these wetlands being protected from activity occurring at the mine site?**

ii. Floridan Aquifer

The mining company is asking to remove 1.44 mgd from the Floridan Aquifer from two wells that penetrate through the Hawthorne Layer into the Floridan Aquifer. EPD has modeled the “impact of the Floridan Aquifer pumping loss on the swamp and concluded that “the water level in the swamp will have an impact of roughly 5 mm at the worst time.” Riverkeeper is concerned of water levels in the swamp dropping and how that impacts the North Prong; contamination between the Floridan and Surficial Aquifer during the drilling process as well as general maintenance and monitoring of the wells during the years of mining. **What is to become of the wells after this four year mining project – will they be capped or used in future mining operations?** TPM has stated and their land purchase supports that they will look to mine more sections of Trail Ridge over a 12-year period. **Once TPM has mined all they are permitted to mine, does the company have a plan for maintaining those wells to ensure no cracks or general wear and tear over time?**

b. Pumping

TPM is proposing to pump water out of a 50 ft deep pit continuously to keep the water level in the pit at 8 ft or less to ensure their mining equipment runs efficiently.⁴⁵ Pumping is a manual process consisting of personnel placing submersible pumps inside the mine pit and connecting them to above ground hoses that transmit the water to the pond M1. Planned shutdown/start-up of the mining operation requiring dewatering will only occur when adequate storage is available and when significant rainfall events are not forecast.⁴⁶ **How many and what kind of pumps? What is the volume per pump? What happens when they malfunction?** No redundancy plan for such a critical piece of equipment.

c. Bentonite Clay Layer Construction

Several hydrologists and scientists have questioned whether this application of bentonite horizontally can work due to several concerns including no historical use of bentonite applied horizontally, the care and continuous placement by large equipment with the proposed timing of mining movement.

There is no data indicating whether this will affect the water level of the swamp, however the proposed fix is to place a layer of bentonite at a height in the pits to simulate the hydraulic properties of the dense black mineral sands removed for mineral processing. A layer of 10.9% bentonite three feet thick will be placed to mimic the hydrologic conductivity of consolidated

⁴⁵ EPD memorandum (12/7/2022) from Water Supply Program department to the Land Protection Branch. Additional hydrologic analysis in response to Dr. Rhett Jackson’s 11/22/2022 comment.

⁴⁶ EPD MLUP Summary. January 19, 2023. Page 2

back sand, and the placement and recording will be by a registered Georgia engineer.⁴⁷ **Has this mixture of sand and bentonite been used before and proven to be effective for this use? What type of engineering documentation every quarter is required for potential sporadic placement?** It is important to follow proper installation procedures to ensure the effectiveness of the bentonite clay layer as a sealant. Testing should also be conducted to confirm that the clay layer is achieving the required level of hydraulic conductivity.

Endangered and Threatened Species

The St. Marys River watershed is home to many federally protected species including the Atlantic and Shortnose Sturgeon, red-cockaded woodpecker, gopher tortoise, indigo snake, manatee, and wood stork (recently proposed to be delisted by the Fish and Wildlife Service). The mouth of the river is critical calving habitat for the endangered North Atlantic Right Whale, in which there are fewer 350 left in the wild and fewer than 70 breeding females.⁴⁸

TPM hired an environmental consulting group to survey their original project area for protected amphibians/reptiles. Field studies were specifically targeting 2 reptile species (eastern indigo snake, gopher tortoise) and 3 amphibians (frosted flatwood salamander, striped newt, and gopher frog) which are all federally listed and/or state listed. Fifteen Gopher Tortoise burrows were found to be ACTIVE on the Keystone Property where the mine site is now proposed.⁴⁹ These tortoises dig extensive burrows which regulate temperature and provide a commensal habitat for 350 other species including the threatened eastern indigo snake, eastern cottontails, gopher frogs, burrowing owls, and more.⁵⁰ Habitat loss, degradation, and fragmentation caused by a variety of sources across the species' range continue to negatively affect gopher tortoise viability.⁴⁹ Although there are no critical habitats identified within the project area, the St. Marys River is considered critical habitat for both the Atlantic and Shortnose Sturgeon.

The fish assemblages in the St. Marys River are sensitive to changes in pH, salinity, and turbidity and could be negatively impacted by surface water runoff and increased pollutant load from the mining operation. Our river is home to two species of federally endangered fish, the shortnose sturgeon (*Acipenser brevirostrum*) and the Atlantic sturgeon (*Acipenser oxyrinchus*). Sturgeon species are living fossils as they date back to the time of the dinosaurs. They are anadromous and considered 'homestream-spawners' because they live in salt water but return to the fresh river system that they were born.⁵¹ However, due to overfishing and habitat loss, the populations have declined and were listed as an endangered species in 2012.⁵²

⁴⁷ TPM MLUP 2a. Sheets Revd 11-28-22. Sheet 9.

⁴⁸ NOAA Fisheries: North Atlantic Right Whale. [North Atlantic Right Whale | NOAA Fisheries](#)

⁴⁹ TPM MLUP App C Species Surveys and Habitat Assessments 2018-2020.

⁵⁰ The Conservation Fund: Protecting the Gopher Tortoise along Georgia's Coastline. [Protecting the Gopher Tortoise along Georgia's Coastline | The Conservation Fund](#)

⁵¹ Florida FWC: Atlantic Sturgeon. [Atlantic Sturgeon | FWC \(myfwc.com\)](#)

⁵² Fox, Adam G. Isaac Wirgin, Douglas Peterson. Occurrence of Atlantic Sturgeon in the St. Marys River, Georgia. December 21, 2018. American Fisheries Society. <https://doi.org/10.1002/mcf2.10056>

The St. Marys River is designated critical habitat⁵³ for both, meaning the river has “physical or biological features essential to the conservation of the species.⁵⁴” In the designation, it helps to protect areas—occupied and unoccupied—necessary to conserve a species.⁵⁵ Doug Peterson from UGA Warnell School documented in 2014 confirmed sturgeon reproduction in the St. Marys River when his research team captured more than 10 young juveniles⁵⁶ indicating that the St. Marys River is a spawning ground.⁵² However, after 7 years of population assessment from UGA and USFWS, the location of the spawning grounds have not been identified.

Conservation objectives for the South Atlantic species is to ‘increase survival of all life stages and facilitate adult reproduction and juvenile and subadult recruitment into adult population’. The features essential to for protection of sturgeon in the St. Marys River are ‘hard bottom substrates such as gravel or limestone in low salinity waters (0.0-0.5ppt) for settlement of fertilized eggs and refuge from predators during early life stages.⁵⁷ ‘Any activity that affects those features directly (like dredging) or indirectly (sedimentation or saltwater intrusion) would affect Atlantic Sturgeon habitat’⁵⁸ also ‘groundwater pumping and industrial and development has impacted water quality through introduction of nutrients and other contaminants.⁵⁹

Because we do not know where this endangered and small population within our watershed spawns, we must assume that the mining operation could negatively impact the local population of Atlantic Sturgeon by reduction in water flow resulting in saltwater intrusion and the potential for water quality issues. Under the Endangered Species Act, the Army Corps of Engineers must ensure that this project is not likely to destroy or adversely modify habitat needed by these species.

Reclamation Plans

Decommissioning of the ponds, Item 7 reads “TPM, LLC reserves the right to request that ponds remain in place for potential reuse.⁶⁰” On sheet 10 of the same set, the site plan shows no reclamation pinelands (no color) for the ponds, plant, or pile areas as if they intend to get additional permits to mine their adjacent lands and keep these areas functioning. **Does not EPD**

⁵³ NOAA Fisheries: Atlantic Sturgeon Critical Habitat Map and GIS Data. [Atlantic Sturgeon Critical Habitat Map and GIS Data | NOAA Fisheries](#)

⁵⁴ NOAA Fisheries: Critical Habitat [Critical Habitat | NOAA Fisheries](#)

⁵⁵ US Fish and Wildlife Service. Critical Habitat: What is it? Fact Sheet. [Critical Habitat fact sheet \(fws.gov\)](#)

⁵⁶ Sandi Martin, *GA Today*. October 8, 2014. UGA to study endangered Atlantic Sturgeon in three Georgia rivers. [UGA to study endangered Atlantic sturgeon in three Georgia rivers - UGA Today](#)

⁵⁷ National Archives: Federal Register. August 17, 2017. Endangered and Threatened Species; Designation of critical habitat for the Endangered New York Bight, Chesapeake Bay, Carolina and South Atlantic Distinct Population Segments of Atlantic Sturgeon... [Federal Register :: Endangered and Threatened Species; Designation of Critical Habitat for the Endangered New York Bight, Chesapeake Bay, Carolina and South Atlantic Distinct Population Segments of Atlantic Sturgeon and the Threatened Gulf of Maine Distinct Population Segment of Atlantic Sturgeon](#)

⁵⁸ NOAA Fisheries: Atlantic Sturgeon. [Atlantic Sturgeon | NOAA Fisheries](#)

⁵⁹ NOAA Fisheries: Shortnose Sturgeon. [Shortnose Sturgeon | NOAA Fisheries](#)

⁶⁰ TPM MLUP 2a. Sheets Revd 11-28-22. Sheet 9 and 10.

under this permit require some effort in the opposite direction, as if TPM were to stop mining after the Demonstration Mine and then later ask for permission to reuse existing pond, plant and pile areas?

Riverkeeper requests TPM provide site-specific reclamation procedures for (1) topsoil replacement, soil stabilization, erosion control, and vegetation establishment; (2) a plan for monitoring the success of the reclamation activities and ensuring that the desired objectives are achieved over the long term. This may include monitoring of soil properties, vegetation growth, and wildlife populations, as well as ongoing maintenance activities such as weed control and erosion prevention; and (3) contingency plans for responding to unforeseen events that may affect the success of the reclamation activities, such as droughts, floods, or pest outbreaks.

Mining Experience

Regulators in North Carolina, Georgia, and Florida have taken legal action against TPM in the past six years. While processing tailings at two of the four Chemours titanium mines on Trail Ridge in north Florida, TPM spilled wastewater during Hurricane Irma. Because of that and other infractions, TPM is still under a Florida Consent Order. In Georgia and North Carolina, a Clean Water Act civil suit brought against Twin Pines-affiliated companies of Georgia Renewable Power, LLC and Greenfuels Energy LLC in 2019, resulted in a \$625,000 settlement for the plaintiffs. Toxins were being illegally discharged into the air and streams resulting in fish kills and compromising wetlands.⁶¹ As a result of their prior experience, there is an expectation for a Land Use Plan that provides an outline of handling environmental catastrophes such as spills, berm breaches, and other adverse effects.

This proposed mining operation is called a Demonstration Mine so that the company can demonstrate that they will minimize impacts on the surrounding ecosystem and protect the Okefenokee Swamp. TPM proposes to use multiple experimental techniques, such as draglines, evaporators, and a layer of bentonite placed horizontally in an attempt to minimize those impacts. However, TPM's track record of poor environmental stewardship does not give confidence that this project can proceed without harming the St. Marys River watershed.

III. Conclusion

TPM, for all above-mentioned concerns, has failed to present compelling evidence that its operation will not irrevocably harm the region's delicate ecosystem. The St. Marys River watershed is too important to risk for experimental mining methods and untested water management plans.

Since TPM first proposed mining on its Trail Ridge property, federal agencies have expressed their strong opposition to the proposal. In comments submitted to the U.S. Army Corps of Engineers regarding TPM original 404 permit application, the U.S. Environmental Protection

⁶¹ *Consent Order: State of Florida Department of Environmental Protections v. Chemours Company FC, LLC, Feb. 7, 2019; Georgia Department of Natural Resources Environmental Protection Division Notice of Violation to GRP Franklin Renewable Energy Facility, Dec. 9, 2019; North Carolina Environmental Quality Notice of Violation to North Carolina Renewable Power Lumberton, LLC, June 29, 2016*

Agency said that the proposed project would have “a substantial and unacceptable impact” on the Okefenokee Swamp.⁶² The U.S. Fish & Wildlife Service warned that damage to the Okefenokee National Wildlife Refuge “may be permanent.”⁶³

In a Nov. 22, 2022 letter to Gov. Brian Kemp, Department of Interior Secretary Deb Haaland urged the state to deny this permit: “I strongly recommend that the State of Georgia not move ahead with approval of this proposed mine in order to ensure that the swamp and refuge are appropriately protected, consistent with all appropriate legal processes...The proposed mining activity in this area poses an unacceptable risk to the long-term hydrology and the future of the swamp ecosystem.”⁶⁴

On Feb. 8, 2022, Gov. Kemp recognized the importance of the Okefenokee National Wildlife Refuge and Stephen Foster State Park’s designated International Dark Sky in his proclamation declaring Okefenokee Swamp Day. During the 2022 legislative session, the House of Representatives unanimously passed a resolution to encourage efforts to protect the Okefenokee Swamp and promote it as an international tourist destination.

Much of the focus in the mining permit is about minimizing impacts on the Okefenokee Swamp, but very little if any has been about negative impacts on the St. Marys River. St. Marys Riverkeeper appreciates the opportunity to provide input on this issue as it relates to the protection of the St. Marys River. The St. Marys River possesses excellent water quality, outstanding natural habitats, diverse wildlife, and an incredible, but untapped, recreational value.

Riverkeeper requests answers to the following questions that were all outlines in the above public comment:

- **Has the additional site south of Highway 94 been taken into consideration in regard to plans to be reviewed and wastewater storage capacity?**
- **Is the use of this Mineral Separation Plant to be approved as part of this permit?**
- **Are there plans showing the pipes that connect M3 to MSP?**
- **How much wastewater is expected to be produced from the MSP and has that been included in the water budget of the process ponds?**
- **Can the other berms withstand the additional volume of water added by an out-of-commission pond?**
- **What is the backup plan if the remaining ponds do not have the capacity or are in fact compromised themselves and cannot take in additional water?**
- **How is the liner going to be inspected and repaired?**
- **Why only place a Brush Barrier around Ponds M1 – M4, P1- P4 and the Plant? Or is it to be a fabric silt fence, and at what height?**

⁶² U.S. EPA to Army Corps Savannah, October 3, 2019, “the proposed project will have a substantial and unacceptable impact on aquatic resources of national importance.” <https://wwals.net/?p=50931>
TPM MLUP 2a. Sheets Revd 11-28-22. Sheet 9 and 10.

⁶³ U.S. Fish and Wildlife Service to Georgia U.S. Senator David Perdue, *op. cit.*

⁶⁴ Russ Bynam, Associated Press, 7 December 2022, Interior secretary: ‘Unacceptable’ to mine near famed swamp, [Interior secretary: ‘Unacceptable’ to mine near famed swamp | AP News](#)

- If a Brush Barrier, how does the base width fit into the permit area?
- What is the height of the silt fence around the mining area?
- If a berm collapses during a heavy rain event, is the expectation that this silt fence will prevent the turbid water from entering and contaminating neighboring properties and local waterways?
- Will the company be implementing silt fence Stormwater Best Management Practices based on EPA's document EPA 833-F-11-008?
- How will the fencing be placed?
- How long is each fence run?
- Will there be an overlap between runs?
- How has the drainage area been evaluated to determine efficiency and quantity of the silt fences?
- What is the silt fence made of?
- Are the wetlands that are outside of the permitted boundary northwest and east of the Management Ponds considered jurisdictional under the new rules?
- What is the plan if M4 overflows?
- Where will overflow discharge occur?
- Have these evaporators been tested for heavy minerals mining?
- Will the mining process stop when water levels in the pond reach the high-water line to allow for the evaporators to make more room in the ponds?
- What about during periods of heavy and long-term rain events or high humidity when evaporation rates are low?
- What is the redundancy plan for when there is too much water to manage or the evaporators malfunction?
- Why is TPM installing only 55 evaporators when the manufacturer recommends installing 167 to meet the goal of evaporating 1.44 mgd?
- Does this mean that salts and humates will be dispersed back into the ponds once water goes through the evaporator?
- Are the evaporators connected to an Anemometer to measure wind speed and direction for auto adjustment?
- What are the expected TDS in the process water and how will TPM keep their experimental evaporators from impacting the land and waterbodies surrounding their proposed mine site?
- How does EPD plan to address this saline cloud and its impacts on the surrounding freshwater ecosystems?
- Has water withdrawals from the surficial aquifer been investigated on its potential impacts to the St. Marys River to the east of Trail Ridge?
- How is saltwater intrusion into the St. Marys River being evaluated in regards to this project and is this of concern to EPD?
- What additional measures is TPM taking to ensure fires do not get out of control?
- How are these wetlands being protected from activity occurring at the mine site?
- What is to become of the wells after this four year mining project – will they be capped or used in future mining operations?
- Once TPM has mined all they are permitted to mine, does the company have a plan for maintaining those wells to ensure no cracks or general wear and tear over time?
- How many and what kind of pumps?

- **What is the volume per pump?**
- **What happens when they malfunction?**
- **Has this mixture of sand and bentonite been used before and proven to be effective for this use?**
- **What type of engineering documentation every quarter is required for potential sporadic placement?**

Sincerely,

A handwritten signature in dark ink, appearing to read "Emily Floore". The signature is written in a cursive style with a large initial "E" and "F".

Emily Floore, Executive Director & St. Marys Riverkeeper
on behalf of St. Marys Riverkeeper Board of Trustees