Provisions Check List for Protection of the Environment and Resources of the State

Project: **Twin Pines Minerals, LLC Saunders Demonstration Mine**
Charlton County, Georgia

Date: **September 17, 2021**

GEORGIA AREA/CATEGORY	IS AREA AFFECTED?			IF AFFECTED, HOW SEVERELY?			
	NO	YES	UNKNOWN	MINOR	MEDIAN	MAJOR	UNKNOWN
1. Wetlands		X		X			
2. Flood Plain/River Corridor	X						
3. Water Supply	X						
4. Water Resources	X						
5. Groundwater Recharge	X						
6. Storm Water		X		X			
7. Waste Water	X						
8. Air Quality		X		X			
9. Solid Wastes	X						
10. Soil Stability/ Erodibility	X						
11. Protected Mountains	X						
12. Protected Species		X		X			
13. Critical Habitats	X						
14. Historical	X						
15. Archeological	X						
16. Parks/Recreation	X						
17. Energy Supplies	X						
18. Beaches	X						
19. Dunes	X						
20. Shoreline	X						
21. Coastal Marshland	X						
22. Forest Land		X		X			
23. Barrier Island	X						
24. Aquatic Life/Trout Streams		X		X			

TWIN PINES MINERALS, LLC
SAUNDERS DEMONSTRATION MINE
CHARLTON COUNTY, GEORGIA

As requested by Georgia EPD, Twin Pines Minerals, LLC (TPM) has completed the Provisions Checklist for Protection of the Environment and Resources of the State.

The following provides an explanation for the answers provided to each item in the checklist.

1. Wetlands - Will the action occur in a "wetlands" area?

The definition of wetlands is included in the Federal Regulation, 33 CFR 32.93. The DNR Rules for Environmental Planning, Chapter 391-3-16-03, incorporate the federal definition as well as both acceptable and unacceptable uses of wetlands. Under current federal law and state policy, alterations or degradations of wetlands should be avoided unless it can be demonstrated that there will be no long-term impacts or net loss of wetlands. A Federal Permit is required for most wetland activities.

No federal jurisdictional wetlands will be affected by this project as determined by the U.S. Army Corps of Engineers (USACE). Non-jurisdictional wetlands will be temporarily affected. They will be reclaimed as detailed in the Reclamation Plan incorporated in the Surface Mining Land Use Plan. Topsoil will be removed in the area to be mined and stockpiled adjacent to the pit to preserve “seed banks” for native vegetation and for use as a planting medium during reclamation. The area will be mined, with tailings returned to the pit. Top soil will then be replaced to its approximate original thickness. The mining site will be returned to approximate pre-mining topography, allowing low areas to return naturally to wetland conditions. TPM will begin observing hydrologic regimes, soil characteristics and plant community development after the mining pit is backfilled. TPM expects plant communities to develop from the seedbank in the topsoil. Trees will be planted one to two years after the start of mining.

2. Flood Plain/River Corridor - Will the action occur in a floodplain or a river corridor?

Floodplains are designated areas of land that become flooded with water during periods of rainfall that increase the primary stream flow. Many floodplain areas are shown on Federal Floodplain Maps which have been prepared in support of the National Flood Insurance Program. Additional maps and information on floodplains are available from the DNR's Environmental Protection Division (EPD). Most proposed government actions that occur directly in a floodplain area or which may alter the size or character of the floodplain area are considered significant. Under H.B. 643, passed by the 1991 Session of the General Assembly, lands adjacent to major rivers are protected from certain types of development. DNR is charged with developing rules for the River Corridor protection program.

Two small depressional areas designated as Zone A on the Flood Insurance Rate Map (Panels 12003C0075C, 13049C0450C, and 10349C0475D) are located within the project site. These areas will be returned to their approximate pre-mining topographic elevations. No permanent structures will be located within these areas. TPM will obtain the necessary permit from Charlton County to mine within these areas. The project site is also not in a river corridor, as defined by Georgia Rule 391-3-16-.04(2)(m) (Criteria for River Corridor Protection), being over 5 miles from the St. Marys River.

3. **Water Supply - Does the proposed action have the potential for decreasing either the quality or quantity of water available for water supply?**

   Water supply means a source of water that is used for drinking water in addition to other consumptive purposes. The DNR Rules, Chapter 391-3-16, contain criteria for water supply watersheds. These criteria establish a basis to allow development in a water supply watershed without contaminating the water source to a point where it cannot be treated to meet drinking water standards. EPD can provide information to state agencies as to whether their proposed projects lie within water supply watersheds.

The quality and quantity of drinking water sources will not be affected. Based on a well inventory prepared for the project, there are no public water supply wells in the area. The nearest known public water supply well completed in the Upper Floridan Aquifer is located in Folkston, Georgia, approximately 22 miles northeast of the proposed Saunders Demonstration Mine Site. To the best of our knowledge, the nearest known private water supply well completed in the Upper Floridan Aquifer is located at the Martin Marietta Materials – St Marys Sand Company, approximately 11 miles southeast of the proposed Saunders Demonstration Mine Site. Based on our review of readily available published information, there are four permitted water supply wells installed within the Upper Floridan Aquifer in Charlton County, Georgia.

Three of the four water supply wells installed within the Upper Floridan Aquifer in Charlton County are within the St Marys River Basin and one well is within the Satilla River Basin. To compare the production capacity of the Upper Floridan Aquifer to the proposed withdrawal at the proposed Saunders Demonstration Mine Site, TPM evaluated the approved permitted withdrawal limits of the four permitted water supply wells to the proposed withdrawal rate at the mine site. The proposed withdrawal rate at the proposed mine site [1.44 million gallons per day (MGD)] is generally consistent with the permitted monthly withdrawal limit for the City of Folkston (1.50 MGD) and within the production capacity of the Upper Floridan Aquifer.

The Theis (1935) solution was used to predict well drawdowns caused by pumping in wells FPW-01 and FPW-02 over the 4-year life of the mine and determine the potential impact on nearby river basins. These results indicate that the basin north of the St. Marys River Basin will see drawdown of less than 1 foot due to TPM withdrawal, the basins south and west of the St. Marys River Basin will have drawdown between 1 and 2 feet, and the basin east of the St. Marys River Basin will show drawdown of slightly over 2 feet. Details of this analysis is in Attachment A of TPM's "Response to EPD Comments", dated June 25, 2021.

4. **Water Resources - Will the proposed action result in large demand for water from the available water resources? Will the proposed action result in a degradation of the quality of waters of the state?**

   The waters of the state include surface and groundwater that is not wholly confined to a single privately owned piece of property. Water resources management is one of the most important issues facing Georgia now and in the future. A growing population and the potential for water shortages focus on the importance of adequate amounts of good quality water. The DNR Rules for Surface Water Withdrawals, chapter 391-3-6, provide the regulatory framework for withdrawal, diversion or impoundment of surface waters of the State. DNR Rules for groundwater Use, Chapter 391-3-2, establish regulatory framework for withdrawal, diversion or impoundment of surface waters of the State. DNR Rules for Groundwater Use, Chapter 391-3-2, establish regulatory procedures for withdrawing, obtaining or utilization of groundwaters of the state.

No surface water withdrawal is proposed for the project. A maximum of 1.44 MGD of water will be withdrawn from the Upper Floridan Aquifer; the average daily withdrawal will be much less and will not have a material effect on the availability of water for other users or uses, on water levels in the Okefenokee National Wildlife Refuge, or on associated hydrologic systems. Nonetheless, the withdrawal will be subject to a permit to be issued by Georgia EPD, which will include any conditions necessary to protect these resources.

The proposed withdrawals from the Upper Floridan Aquifer are far distant from the areas of concern for salt water intrusion into the aquifer in the Brunswick and Savannah areas, as described in Georgia EPD's June 2006 "Coastal Georgia Water and Wastewater Permitting Plan for Managing Salt Water Intrusion." Therefore, the proposed withdrawals are of no concern for salt water intrusion. Furthermore, Georgia EPD's June 2017 "Suwannee-Satilla Regional Water Plan" anticipates an additional annual average daily need of 43 MGD for municipal, industrial, and agricultural growth in the Region from 2015 to 2050, with 82% of that need to be met by groundwater. The Water Plan also concludes that no groundwater resource shortfalls are expected to occur in the Suwannee-Satilla Region over the 2050 planning horizon. EPD's 2006 Permitting Plan and EPD's 2017 Regional Water Plan easily provide capacity for the modest new groundwater use proposed by TPM.

No impacts to water quality are anticipated as a result of the groundwater withdrawal from the Upper Floridan Aquifer. As discussed in parts 6 and 7 below, the project will operate pursuant to stormwater permits issued by Georgia EPD, which will ensure that waters of the state will meet Georgia water quality standards.

5. **Groundwater Recharge - Will the action result in the disturbance or altering of a groundwater recharge area?**

   Groundwater recharge areas are those portions of the earth's surface where water infiltrates into the ground to replenish an aquifer. The Significant Recharge Areas of the state are those areas mapped by the DNR in Hydrologic Atlas 18 (1989 Edition). The DNR Rules for Environmental Planning Criteria, Chapter 391-3-16, contain specific criteria for protection of groundwater recharge areas.

No significant groundwater recharge area, as mapped by the DNR, will be affected by this project. The proposed TPM Saunders Demonstration Mine site is not located within a Significant Recharge Area as mapped by the DNR in Hydrologic Atlas 18 (1989 Edition).

6. **Stormwater - Will the project result in increasing the amount of storm water runoff for downstream property owners?**

   The primary concern related to storm water is the creation of impervious surfaces that contribute to an increase of the amount of storm water runoff to the point where there is damage or a threat to downstream property owners. Another very important issue is the potential contamination of stormwater through increased contact with contaminants.

Stormwater discharges associated with the proposed TPM Saunders Demonstration Mine will be covered under an Industrial National Pollutant Discharge Elimination System (NPDES) General Permit (GAR050000). There will be less than five (5) acres of impervious surfaces constructed on the site. TPM will be required to maintain compliance with the requirements of the permit, including preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP).

The receiving waters for stormwater runoff will be un-named tributaries to Boone Creek and the North Prong of the St. Marys River. Typical erosion/sediment controls at the proposed TPM Saunders

Demonstration Mine will include brush or riprap check dams and silt fencing. In the event additional erosion/sediment control measures are needed, sediment traps will be constructed to detain stormwater flow and allow sediment to fall out.

7. Wastewater - Will the project produce wastewater that is discharged to a surface stream?

   Wastewater means contaminated water (sewage or other contaminants) that must be treated and disposed of either by direct discharge to a surface stream or indirect discharge to an existing municipal sewer system. Even if the wastewater from a state project is to be discharged to a municipal sewer system, the effect can be significant if that wastewater causes the municipality to expand its sewage treatment system.

Wastewater will not be discharged on the mining site. A sand processing area water management storage pond will be constructed to contain excess stormwater and/or process operations which produce more water than is typical. When there is excess stormwater or it is necessary to dewater the mine pit due to equipment malfunctions or other emergency repairs, the water will be temporarily stored in the mine pit water management storage pond. The water stored in these water management ponds will be used as process make-up water.

8. Air Quality - Will the action result in a release or discharge of contaminants into the ambient air?

   Any action that results in the release or discharge of contaminants into the air such that existing ambient air quality may be diminished is a significant action. All discharges or releases may be subject to regulation under the Georgia Air Quality Control Act and/or the U.S. Clean Air Act.

TPM has applied for an Air Quality Permit from GA EPD. An Air Quality Permit was drafted by EPD, Facility AIRS Number: 04-13-049-00011.

TPM will take precautions to prevent fugitive dust from becoming airborne from operations of the facility. Such precautions will include use of a water truck to spray water on haul roads, stockpiles, and other operational areas. Open-bodied trucks will not be used to transport finished product off-site.

Sand material moving back and forth between the mine and wet processing plant will have sufficient moisture content and should not present particulate/opacity issues. Performance standards will be in place per the Air Quality Permit for the Wet Mineral Concentration Plant (WCP).

The Mineral Separation Plant (MSP), on the south side of Hwy. 94, will use a combination of three dryers and two electric re-heaters. The indirect-fired dryers range in capacity from 1.02 to 5.32 MMBtu/hr and will burn propane. Combustion emissions from the dryers are vented outside (uncontrolled) via stack. Process emissions from the dryers and electric re-heaters (dust and particulates) are controlled by wet dynamic dust scrubbers. Emissions from other processes and equipment at the MSP, including bucket elevators, storage bins, screens, and product packaging stations are controlled by one of two baghouses or cartridge filters.

9. Solid Wastes - Will the project result in the generation of solid wastes for disposal, or will the proposed actions occur near or in an active or closed landfill?

   Solid waste is defined in the Georgia Comprehensive Solid Waste Management Act. It includes different categories of wastes which exist in a solid form (household garbage, demolition material, land clearing debris, commercial non-hazardous waste material, etc.). Whereas the amount of solid waste generated that requires disposal is of concern, another primary issue relates to a land disturbing activity in the vicinity of an active or closed landfill.

The TPM Saunders Demonstration Mine will not generate process solid waste that will require off-site disposal, other than office/maintenance-related waste. Process solid waste (solids from water/wastewater treatment) will be returned back to the mine pit with tailings from the mining process.

Office-related waste will be placed in a dumpster or other appropriate container and disposed off-site by a permitted and contracted waste disposal company. Oils, rags, batteries scrap metal, etc. will be picked up and recycled by companies permitted to do so. The proposed mining area is not within or adjacent to a former or existing landfill; therefore, no land disturbing activity will occur in the vicinity of an active or closed landfill.

Land clearing and grubbing activities will be performed ahead of excavation and construction. Merchantable timber will be harvested and taken off-site. Slash piles and other woody debris will be piled and burned on-site with the appropriate burn permit, when it is seasonably permissible to do so.

10. Soil Stability/Erodibility - Will the action displace soils that will be carried off site and pose a threat to surface waters or property?

Under the Georgia Soil, Erosion and Sedimentation Act, local governments which have authorized management programs under the Act establish control procedures and permit the project. If the action takes place in a county or municipality that does not have such authorization, EPD is the regulating agency. In either case, a technical guidance book is available from either the local government or EPD.

TPM has submitted a Surface Mining Land Use Plan for the proposed Saunders Demonstration Mine that details erosion control measures and reclamation activities that will be implemented to reduce the potential for sediment-laden soils to leave the site. The TPM Saunders Demonstration Mine site and the Mineral Separation Plant site will be covered under Industrial NPDES General Stormwater permits (GAR050000). These permits require the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP) to provide measures for control of stormwater discharge. Construction activities that are not covered by the Surface Mining Permit will be permitted under a Construction Stormwater Permit to be issued by the EPD. Detailed erosion control measures will be included in any such permit application.

Stormwater around the WCP will be captured and recirculated with process water. Stormwater outfalls will be constructed in a manner (concrete, rip-rap, etc.) to prevent erosion of their stream channels. Mine site entrances will be constructed with stone to reduce tracking of soil/sediment off the site by truck traffic. Soil/sediment, which will be predominantly a sandy material, that may be tracked off site onto Highway 94 will be removed daily.

The safety berm to be located along the southern mine site boundary will function to aid in soil stability and to prevent erosion by directing stormwater to outfall locations. The safety berm will be removed following reclamation of the mine site.

11. Protected Mountains - Will the project involve the alteration of lands with high elevations and steep slopes?

Under House Bill 643, which was passed by the 1991 Session of the General Assembly, land which lies above 2,200 feet in elevation and has slopes of twenty-five (25%) or more, are identified as Protected Mountains. In accordance with the Act, DNR is charged with promulgating Rules for implementation of a "Mountain Protection" program.

Protected mountains will not be affected by the project. The TPM Saunders Demonstration Mine site is not located on or near protected mountains, as defined by Rule 391-3-16-.05(2)(i). The maximum elevation of the TPM Saunders Demonstration Mine is 175 feet above mean sea level.

12. Protected Species - Will the proposed action harm or reduce the population of protected species?

Endangered species is used in both the generic sense for protected species and in a more narrow definition sense under the U.S. Endangered Species Act. Protected species includes those plant and animal species protected by the State in accordance with Georgia Wildflower Preservation Act of 1973 and the Georgia Endangered Wildlife Act of 1973. DNR Rules, Chapter 391-4-10, provide more detailed criteria for the state's protected species.

The proposed project will have a minimal effect on protected species. The TPM Saunders Demonstration Mine site was evaluated for the presence of protected species and/or their associated critical habitat(s) during 2018 - 2020. Referenced species surveys and habitat assessment reports are provided as Exhibit C of the Surface Mining Land Use Plan. The following tables summarize the State and Federally protected species reviewed on site:

Summary of Potential Impacts to Federal Status Species in Project Vicinity

Group	Name	Federal Status	Supporting Habitat in or near the Site	Effects to Species from Project	Mitigation Measures Proposed to Avoid Adverse Effect
Amphibians	Frosted flatwoods salamander (*Ambystoma cingulatum*)	T	Habitat on site is too degraded to support. Species not observed.	No effect anticipated.	No mitigation measures proposed.
	Gopher frog (*Lithobates capito*)	C*	Habitat is present on site. No occupied habitat is within impact area.	No effect anticipated.	No mitigation measures proposed.
Birds	Red-cockaded woodpecker (*Picoides borealis*)	T	Habitat not observed. Species not observed. May forage on site.	No effect anticipated.	No mitigation measures proposed.
	Wood Stork (*Mycteria americana*)	T	Habitat present on site. May forage on site. No nesting/ rookeries observed on site.	No effect anticipated.	No mitigation measures proposed.

Group	Name	Federal Status	Supporting Habitat in or near the Site	Effects to Species from Project	Mitigation Measures Proposed to Avoid Adverse Effect
Flowering Plants	Florida hartwrightia (*Hartwrightia floridana*)	Under Review	Habitat is present on site. Species not observed.	No effect anticipated.	No mitigation measures proposed.
	Floodplain tickseed (*Coreopsis integrifolia*)	Under Review	Habitat is present on site. Species not observed.	No effect anticipated.	No mitigation measures proposed.
	Purple Honeycomb-head (*Balduina atropurpurea)*	Under Review	Habitat is present on site. Species not observed.	No effect anticipated.	No mitigation measures proposed.
Reptiles	Eastern indigo snake *(Drymarchon corais couperi)*	T	Habitat observed on site. No individuals observed. May forage on site.	No effect anticipated.	No mitigation measures proposed.
	Gopher tortoise *(Gopherus polyphemus)*	C*	Habitat is present on site. Species not observed.	No burrows observed in impact area.	No mitigation measures proposed.
* Candidate species are not provided protection under the ESA.					
T = Threatened; C = Candidate					

Other State Special Concern Species in Project Vicinity

Group	Name	State Status	Supporting Habitat in or near the Site
Birds	Bald eagle *(Haliaeetus leucocephalus)*	Threatened	Habitat not observed. Species not known to occur on-site.
	Bachman's sparrow (*Peucaea aestivalis*)	Rare	Habitat is present. Was not observed on-site.
Fish	Red face top minnow (*Fundulus rubifrons*)	None	Habitat is present. Observed on site.

Group	Name	State Status	Supporting Habitat in or near the Site
Flowering Plants	Savannah milkweed (*Asclepias pedicellata*)	None	Habitat is present. Was not observed on site.
	Dwarf pawpaw (*Asimina pygmea*)	None	Habitat is present. Individuals are abundant and widespread on site.
	Florida orange-grass (*Ctenium floridanum*)	None	Habitat is present. Was not identified on site.
	Green-fly orchid (*Epidendrum magnoliae*)	Unusual	Habitat is present. Was not identified on site.
	Southern umbrella-sedge (*Fuirena scirpoidea*)	None	Habitat is present. Individuals are abundant and widespread on site.
	Florida milk-pea (*Galactia floridana*)	None	Habitat is present. Was not identified on site.
	Chapman's skeleton grass (*Gymnopogon chapmanianus*)	None	Habitat is present. Was not identified on site.
	Narrowleaf water-willow (*Justicia angusta*)	None	Habitat is present. Was not identified on site.
	Southern bog-button (*Lachnocaulon beyrichianum*)	None	Habitat is present. Was not identified on site.
	Pond spice (*Litsea aestivalis*)	Rare	Habitat is present. Was not identified on site.
	Odorless bayberry (*Morella inodora*)	Threatened	Habitat is present. Was not identified on site.
	Palafoxia (*Palafoxia integrifolia*)	None	Habitat is present. Was not identified on site.
	Arrow arum (*Peltandra sagittifolia*)	None	Habitat is present. Was not identified on site.
	Pennyroyal (*Piloblephis rigida*)	None	Habitat is present. Was not identified on site.
	Chapman’s fringed orchid (*Platanthera chapmanii*)	None	Habitat is present. Was not identified on site.

Group	Name	State Status	Supporting Habitat in or near the Site
	Yellow fringeless orchid (*Platanthera integra*)	None	Habitat is present. Was not identified on site.
	Wild coco (*Pteroglossaspis ecristata*)	Threatened	Habitat not present. Was not identified on site.
	Chapman oak (*Quercus chapmanii*)	None	Habitat is present. Individuals observed on site.
	Nuttall meadowbeauty (*Rhexia nutallia*)	None	Habitat is present. Individuals are abundant and widespread on site.
	Fernald's beakrush (*Rhynchospora fernaldii*)	None	Habitat is present. Was not identified on site.
	Hooded pitcherplant (*Sarracenia minor* var. *minor*)	Unusual	Habitat is present. Individuals observed on site.
	Parrot pitcherplant (*Sarracenia psittacina*)	Threatened	Habitat is present. One individual observed on site
	White sunnybell (*Schoenolirion albiflorum*)	None	Habitat is present. Was not identified on site.
	Sandhill skullcap (*Scutellaria arenicola*)	None	Habitat is present. Was not identified on site.
	Florida ladies-tresses (*Spiranthes floridana*)	None	Habitat is present. Was not identified on site.
	Wireleaf dropseed (*Sporobolus teretifolius*)	None	Habitat is present. Was not identified on site.
	Stokes aster (*Stokesia laevis*)	None	Habitat is present. Was not identified on site.
	Sprawling goats' rue (*Tephrosia chrysophylla*)	None	Habitat is present. Was not identified on site.
	Bartram's air-plant (*Tillandsia bartramii*)	None	Habitat is present. Individuals not observed on site.
	Diverse-leaf crownbeard (*Verbesina heterophylla*)	None	Habitat is present. Was not identified on site.

Group	Name	State Status	Supporting Habitat in or near the Site
Mammals	Black bear (*Ursus americanus floridanus*)	None	Habitat is present. Individuals not observed on site.
Reptiles	Spotted Turtle (*Clemmys guttata*)	Unusual	Extremely limited habitat is present on site. Individuals not observed on site.
	Southern hog-nosed snake (*Heterodon simus*)	Threatened	Extremely limited habitat is present on site. Individuals not observed on site.
	Black swampsnake (*Liodytes pygaea*)	None	Habitat is present on site. Individuals not observed on site.
	Mimic glass lizard (*Ophisaurus mimicus*)	Rare	Extremely limited habitat is present on site. Individuals not observed on site.
	Florida pine snake (*Pituophis melanoleucus*)	None	Habitat is present on site. Individuals observed on site.

One specimen of parrot pitcherplant (*Sarracenia psittacena*), which is State listed as threatened, was identified within the limits of the proposed year 4 mining progression area. Prior to future mining activities in this location, TPM will coordinate with the appropriate agencies to ensure that applicable relocation protocols are utilized to avoid impacting the parrot pitcherplant specimen.

13. Critical Habitats - Is the proposed action expected to involve any critical habitats?

Critical Habitats, including U.S. Forest lands, U.S. Wildlife Refuges, Wilderness Areas, and Wild or Scenic Rivers, will not be affected by the project.

The proposed demonstration mine will not affect any "critical habitats," as that term is defined under the federal Endangered Species Act. The project will not affect any U.S. Forest lands, U.S. Wildlife Refuges, Wilderness Areas, or Wild and Scenic Rivers. At its closest point, the project site is 2.9 miles away from the boundary of the Okefenokee National Wildlife Refuge, which is the nearest critical habitat identified. The groundwater model submitted to EPD (*Impact of the Proposed Twin Pines Mine on the Trail Ridge Hydrologic System*, January 14, 2020), predicts that the groundwater level of the surficial aquifer at the nearest Okefenokee National Wildlife Refuge boundary (2.9 miles from the demonstration mine) will have a negligible decrease (0.0004 foot) due to mining operations.

14. Historical - Will the proposed action involve disturbance of any historic property?

Applicant will need to consider any structure on or adjacent to the mine with the National Register of Historic Places.

Historical properties will not be disturbed by the project. No properties listed on the National Register of Historic Places are located on or adjacent to the proposed mining operation. Copies of the Cultural Resources Assessments were included as Exhibit B of the Surface Mining Land Use Plan.

15. Archaeological - Will the proposed action involve disturbance of any archeological property?

Archeological properties are the physical remains of the past that can be studied by archaeologist and other scholars to answer questions about prehistory and history. In addition, the regulations of the President's Advisory Council on Historic Preservation (36 CFR 800) which implements Section 106 of the National Historic Preservation Act contains definition and criteria of adverse effect for the protection of historic properties.

A desktop and subsequent Phase I Cultural Resources Survey was conducted for the Keystone review area (Parcel 0059001002 as shown on Sheet 2 of the Surface Mining Land Use Plan) by TerraX (report dated October 26, 2018). Phase I investigations of this property led to the discovery of six archaeological sites and four isolated finds. Based on the results of the field investigation, none of these resources were considered significant, having been heavily impacted by numerous years of repeated pine cultivation activities. All six archaeological sites were recommended ineligible for NRHP inclusion under Criterion D based on their lack of integrity. As no significant cultural resources will be impacted by the proposed mining operation, TerraX recommended clearance for the project.

An additional Phase I Cultural Resources Survey for the Adirondack tract (Parcel 0058001 as shown on Sheet 2 of the Surface Mining Land Use Plan) was conducted by TerraX (report dated April 2020). The Phase I investigation of this property led to the identification of one archaeological site and two isolated finds. The single archaeological site and both isolated finds date to the early-to-middle twentieth century. Neither the single archaeological site nor the isolated finds are recommended as eligible for NRHP inclusion under Criterion D. An architectural survey identified four resources within view of the proposed project area. Of these four, only the Georgia Southern and Florida Railway (GS&F) is considered significant. TerraX concluded that the proposed mining project would not cause an adverse visual effect on the GS&F.

The proposed project is not expected to significantly impact cultural resources. No archaeological sites eligible for the NRHP will be disturbed. If archaeological resources are discovered during mining activities, TPM will cease mining activities in the vicinity of the discovery and immediately coordinate with the appropriate agencies. Copies of the Cultural Resources assessments were included as Exhibit B of the Surface Mining Land Use Plan.

16. Parks/Recreation— Will the proposed action involve disturbance or otherwise have a significant impact on the State's cultural resources?

In addition to the archeological or historic value, cultural resources may also include park lands, preserves, and other public lands or areas of recognized scenic and/or recreational value.

Park lands and public lands will not be disturbed or significantly affected by the proposed project. The TPM Saunders Demonstration Mine is 2.9 miles southeast from the Okefenokee National Wildlife Refuge property boundary, over five miles from the St. Marys River, and approximately 25 miles southeast of Stephen C. Foster State Park. Impacts to the Okefenokee National Wildlife Refuge and surrounding recreational waterways will be negligible. The groundwater model submitted to EPD (*Impact of the Proposed Twin Pines Mine on the Trail Ridge Hydrologic System*, January 14, 2020), predicts that the groundwater level of the surficial aquifer at the nearest Okefenokee National Wildlife Refuge boundary (2.9 miles from the demonstration mine) will have a negligible decrease (0.0004 foot) due to mining operations.

17. Energy Supplies— Will the proposed action have significant impact on the reduction in the available energy supplies?

This primarily refers to the source of energy (electrical, gas/oil, solar, etc) that will be consumed by the project in relation to the total available in the area.

The TPM Saunders Demonstration Mine will use electricity to power the dragline and the mineral processing equipment. Sufficient power is available to support the mining operations without impacting other power users in the area.

Power lines will be run, and power supplied by Okefenokee Rural Electric Membership Corporation (OREMC). A shared (OREMC and Georgia Power) 115 KV transmission substation is located east of St. George, and a dedicated line will be installed for the mining and mineral separation operations. The Mineral Separation Plant site, which is the location of a former chip mill, currently has a dedicated 25 KV line. There will be no impact to local homeowners or small businesses due to the distribution line originating from the shared 115 KV transmission substation. The TPM Saunders Demonstration Mine site will use approximately 18 megawatts per hour (MWH).

18. Beaches— Will the proposed action involve the disturbance of any ocean beach area?

The Georgia General Assembly has found that ocean beaches provide an unparalleled recreation resource which is vitally lined to the economy of Georgia's Coastal Zone and to that of the entire state. They are also part of the sand-sharing system which provides habitats and acts as a protective buffer for other areas. This natural resource system is costly, if not impossible to reconstruct or rehabilitate once adversely affected by man-related activities. Therefore, any action in these areas should be considered highly significant

Beaches will not be affected by the project. The TPM Saunders Demonstration Mine site is located approximately 40 miles inland from the Atlantic Coast and associated beaches.

19. Dunes— Will the proposed activity alter coastal sand dunes?

Coastal sand dunes, beaches, sandbars, and shoals, comprise a vital natural resource system, known as the "sand-sharing system", which acts as a buffer to protect real and personal property and natural resources from the damaging effects of floods, winds, tides, and erosion. The coastal sand dunes are the most inland portion of the sand-sharing system and because they are a fragile product of shoreline evaluation, they are easily disturbed by action harming their vegetation or inhibiting their natural development. they are protected under the Georgia Shoreline Assistance Act of 1979.

Dunes will not be affected by the project. The TPM Saunders Demonstration Mine site is located approximately 40 miles inland from the Atlantic Coast and associated dunes.

20. Shoreline— Will the project involve activities in the Georgia Coastal shoreline area or in areas covered under the river corridor protection requirements of Georgia House Bill 643?

In accordance with DNR Rules, Chapter 391-2-2, protective measures and procedures are provided for the implementation of the Georgia Shoreline Assistance Act. Construction, erection, or engaging in any shoreline engineering activity or land alteration which alters the natural topography or vegetation of any area is highly regulated under the Act. In addition, the 1991 General Assembly passed House Bill 643 which also provides for the protection of coastal river corridors. DNR is authorized to promulgate Rules for the implementation of House Bill 643 and they are currently being developed.

Shoreline will not be affected by the project. The TPM Saunders Demonstration Mine site is located approximately 40 miles inland from the Atlantic Coast.

21. Coastal Marshland- Will the proposed action alter the Georgia coastal marshlands environment?

Georgia's coast contains the saltwater marshes. These marshes have been identified as one of the most extensive and productive marshland systems in the United States. Georgia's marshes, sands and near-shore ocean water produce more food and energy than any other estuaries zone on the eastern seaboard. They are also an essential life support system for Georgia's multi-million dollar seafood industry. Any activities that affect this area are closely regulated under the Georgia Coastal Marshlands Protection Act

Coastal marshland will not be affected by the project. The TPM Saunders Demonstration Mine site is located approximately 40 miles inland from the Atlantic Coast and associated coastal marshland.

22. Forest Land - Will the proposed action involve changes in forested areas?

Please include the harvesting of five acres or more of trees over two inches in diameter at breast height. The secondary effects of tree removal as well as other land disturbing activities that may impact a forested area are of concern. Depending on the type of harvesting methods, tract locations and other variable criteria, there may exist a potential for erosion and sedimentation, habitat alteration, and other changes of concern. Manuals on Best Management Practices (common sense forestry associated practices which minimize the impact on the environment) are available from the Georgia Forestry Commission. These practices were developed by statewide task force, appointed by the Governor, with input from all aspects of forestry in Georgia.

Most of the project site has been used solely for silviculture for the last 50+ years, with periodic removal of the timber, followed by regrowth. The same is true for the vast majority of the land surrounding the entire OWNR. Timber will be removed prior to mining.

TPM intends to observe naturally re-establishing herbaceous/shrub vegetation and hydrologic regimes post-mining to select tree plantings suited for the respective reclaimed habitats (FNAI Natural Community Classification Guide 2010). In a pine flatwoods landscape, small differences in elevation (just a few centimeters) and soil saturation can produce quite different plant communities. The best assurance of successful reclamation of forestland is to work with current (i.e., post-mining) conditions. TPMs groundwater modeling indicates that areas designated as mesic pine flatwoods will have similar surface hydrology post-mining, so those areas will likely be replanted to pine. Areas currently designated as wetlands will likely remain wetlands post-mining, although specific wetland community goals will need to be established as post-mining conditions dictate. Areas currently designated as wet pine flatwoods will likely be a mosaic of fine-scale elevational and hydrologic conditions.

Tree species that may be utilized to reestablish pine flatwoods will primarily include pine species such as slash pine (*Pinus elliottii*) and longleaf pine (*Pinus palustris*). Tree species that may be utilized to reestablish depressional wetlands include species such as swamp tupelo (*Nyssa biflora*), pond cypress (*Taxodium ascendens*), pond pine (*Pinus serotina*), slash pine, and loblolly bay (*Gordonia lasianthus*).

23. Barrier Island - Will the proposed action involve activity on or near a barrier island?

Along the Georgia Coast, an extensive system of salt marshes, tidal estuaries, and sounds separate a chain of eight major and several smaller barrier islands from the mainland. Two-thirds

of Georgia Barrier Islands are parks, refuges, or preserves. Sand beaches and dunes protect the islands from erosion and flooding. The islands shelter the marshes from the force of storms. Any proposed action that involves the barrier islands should be considered highly significant.

Barrier islands will not be affected by the project. The TPM Saunders Demonstration Mine site is not located on or near barrier islands.

24. Aquatic Life/Trout Streams - Will the proposed action involve an action that significantly impacts freshwater aquatic life?

Georgia has an abundance of freshwater lakes, streams, and bodies of water that support aquatic life. The freshwater fisheries are important for the total food chain. Primary and secondary trout streams should be protected.

No primary or secondary trout streams will be affected by the project (reference Georgia Department of Natural Resources Wildlife Resource Division – Trout Streams of Georgia Interactive Map). Impacts to aquatic resources will be limited to the non-jurisdictional wetlands within the proposed mine footprint. Discharges of stormwater will be covered under an applicable NPDES permit. Discharges will be in compliance with NPDES permit limitations as may be set by the EPD, which are designed to be protective of aquatic life. Samples of stormwater will be collected for the parameters and at the frequency specified by the permit.