United States Department of the Interior

FISH AND WILDLIFE SERVICE
1875 Century Boulevard
Atlanta, Georgia 30345

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In Reply Refer To:
FWS/SAG-MB/ES

Colonel Daniel Hibner
U. S. Army Corps of Engineers
Savannah District - Regulatory Division
100 West Oglethorpe Avenue
Savannah, Georgia 31401-3640
Attention: Ms. Holly Ross

Re: USFWS File Number 2019-0650

Dear Colonel Hibner:

The U. S. Fish and Wildlife Service (Service) has reviewed the U. S. Army Corps of Engineers (USACE) Joint Public Notice (JPN) SAS-2018-00554 and associated information concerning the proposed Twin Pines Mine Project (project) in Charlton County, Georgia. We appreciate the efforts expended by USACE to include the extensive supporting information in the JPN to aid in the review. Because of the location, scale, and associated activities, we have concerns that the proposed project may pose risks to the Okefenokee National Wildlife Refuge (OKENWR) and the natural environment. We provide the following as information on issues to be considered in your decision on the level of environmental review that is appropriate for this proposed project. Our comments are submitted in accordance with provisions of the Endangered Species Act (ESA) of 1973, as amended; (16 U.S.C. 1531 *et seq.*) and the National Environmental Policy Act of 1969, as amended; (42 U.S.C. 4321 *et seq.*).

Project Description Overview

As currently proposed, the mine site is approximately 12,000 acres with the northwest boundary within ½ mile from the Okefenokee NWR boundary and 400 ft from the edge of Okefenokee Swamp and north and west of the St. Mary's River. The initial project location will be 1.7 miles southeast of the Okefenokee NWR boundary. Operationally, dredging of targeted materials (titanium and zirconium) will extend on average to a depth of 50 foot, but could reach a depth of up to 100 feet. The first mining phase has a proposed project area of 2,414 acres. The rate of mining will be approximately 25-40 acres per month, and backfilled and graded within approximately 30 days following excavation. Planting will occur during the appropriate planting season.

The mining would occur on Trail Ridge. Geologically, Trail Ridge is one of the historical sand beachfronts that are inland and generally parallel to the current beachfront of coastal Georgia. To the west, or inland of a portion of Trail Ridge is a large depression; the Okefenokee Swamp.

Trail Ridge serves as the eastern hydrological barrier of the swamp. These beach fronts contain heavy minerals as a small portion of their volume (2 – 9%). These metals and minerals are valuable and can be mined with current technology.

Issues Overview

The Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1500 – 1508) Section 1502.3 'Statutory requirements for statements' includes the following: "As required by 102(2)(C) of NEPA environmental impact statements are to be included in every recommendation or report on proposals for legislation and other major federal actions *significantly affecting the quality of the human environment* (italics added)."

The Service recommends USACE consider the information that follows in developing a determination as to whether the proposed action meets the definition of the term 'significantly' as described in the terminology section, 1508.27, both in (a) context and (b) intensity.

As you are aware, "context" refers to scope of the proposed action, i.e. nationally, regionally, or locally. With this in mind, the future of the Okefenokee Swamp, surrounding landscape and the species that depend on them are directly tied to maintaining the integrity of the ecosystem's complex ecological processes. The Okefenokee Swamp represents one of the very few self-contained, naturally functioning wetlands in the world. Recognizing the need for federal protection, the majority of the Okefenokee Swamp was set aside as a National Wildlife Refuge (Refuge) in 1937 by Executive Order. The Refuge, currently 406,650 acres in size, was designated a National Natural Landmark in 1974 and a Wetland of International Importance by the Wetlands Convention in 1986. The Okefenokee Wilderness Act of 1974 designated the majority of the Refuge as a National Wilderness Area. The Okefenokee Swamp has shaped the culture of southeast Georgia. Most local residents have ancestors who once lived or worked in the swamp as a part of their heritage.

Today, the Refuge receives more than 600,000 visits annually. Visitors come from all 50 states, Puerto Rico and more than 46 countries. Ten percent are international visitors. The 2017 Banking on Nature Report (Caudill and Carver 2019) identifies the total recreational expenditures for the four counties surrounding the refuge to be $64.7 million with non-residents accounting for $59.8 million. This was associated with the creation of about 753 jobs, $17.2 million in employment income generated, and $5.4 million in total tax revenue for the counties. The future of people and communities surrounding the swamp is dependent on conserving this popular natural landmark.

"Intensity" refers to the severity of the impact and has a number of considerations. The regulation identifies several items in section 1508.27(b), including:

- Item 3; the unique characteristics of the area. The swamp is of national importance as described above and is the largest National Wildlife Refuge and the third largest nationally designated Wilderness area east of the Mississippi River.
- Item 4; controversial effects of the proposed action. As proposed, a wide range of possible outcomes may result, and possibly impact surrounding areas. Based on currently

available information, the most likely outcome appears to be some impacts to hydrology. Hydrologic change could indirectly result in modifications to fire behavior, hydrology, and vegetation; thereby impact wildlife and recreational opportunities within the NWR and the surrounding area.

Based on information provided in the JPN and other information currently available to the Service, there appears to be great uncertainty regarding the extent to which alteration of hydrologic processes that sustain the ecosystem may occur.

The range of possible impacts includes moderate to intermittent alteration of hydrologic processes which could indirectly result in seasonally lowered water tables. Lowered water tables within the Okefenokee basin could elevate fire frequency and intensity and alter fire behavior due to increased exposure of traditionally wetted areas. Further, even slight changes in the low mean water table or altered seasonal hydrology could result in a reduction of organic peat soils that dominate the basin. Slight changes in soils, hydrology, and fire behavior would result in changed vegetative patterning that govern habitat conditions. Ultimately, these environmental factors (fire, soils, vegetation) and associated habitat conditions define the ecological and recreational value of the National Wildlife Refuge. To date, data and model results are continuing to be collected and evaluated, therefore, the most likely direct and indirect impacts of the proposed project have yet to be determined.

Several state and federally-listed and federal candidate species may be present or occasionally utilize habitat within the proposed mine footprint. It is unknown how long the effects of the mining will affect these species and the habitats that are currently on and near the site. The effects to the habitat may be permanent and thereby eliminating the species from the local landscape. Also, based on currently available science, it is unknown if the water level and holding capacity of the Okefenokee Swamp will be altered and what impacts this might have on the swamp and surrounding natural features, such as the St. Marys River.

Because of the uncertainty of impacts the Service cannot definitively say that the mining proposal will significantly *affect* the environment. However, we have concerns that the proposed project could pose substantial risks for adverse impacts to OKENWR and the surrounding environment that may be irreversible even with mitigation.

- Item 6; establish a precedent. Though USACE will be primarily considering the impacts of the proposed action from the standpoint of wetlands impacts and compliance with the Clean Water Act; overall, considering the entirety of the project footprint (uplands included), the mine footprint and timeframe are large and impactful. Future mining projects in adjacent portions of Trail Ridge, where there has been mineral interests in the past, could further magnify any environmental impacts by impacting the whole eastern side of the swamp that is adjacent to the sand ridge known as Trail Ridge.

These and other concerns are further described below.

Hydrologic Alterations

Numerous studies have examined the hydrology of the Okefenokee Swamp and Trail Ridge (Hyatt 1984; Rykiel 1977, Blood 1981, Burklew 1988, Yu 1986). There are inconsistencies between studies indicating that the hydrologic system is complex and/or scientists have not perfected techniques or know how to study the ecological processes associated with the hydrological connections between the swamp and Trail Ridge. Trail Ridge forms a rim or geomorphological "dam" on the east side of the swamp contributing to the hydrologic budget of the swamp. The soil of Trail Ridge has a profile or distinct layers. This gives it water holding and water movement characteristics. The mining is proposed to go an average of 50 feet deep from the ground surface which is below the level of the Okefenokee Swamp depression. After heavy mineral removal the soil will be returned to the site. It will have been homogenized or mixed, and no longer have the same distinct layers it had before mining. This will likely change the hydrological properties both temporally and spatially of the entire area. There is much uncertainty as to how dramatic and far reaching this change will be. Similarly, it is uncertain what effects such hydrologic changes may have on the environment.

Alteration of surface water drainage patterns associated with soil disturbance on the project site could occur. Destruction of soil profiles that contain and channel surface and sub-surface waters may change the habitat properties of the site and those that they flow into. Impacts to ground water characteristics including water table elevation, and rate and direction of flow are also possible as the soil profile is permanently homogenized ~50 feet deep. Such changes could result in the potential for increased fire frequency and intensity in the swamp and surrounding private commercial forest associated with the changing hydrology. Other associated questions include issues such as changes to the seasonal water storage capacity of Trail Ridge and disruption of the interaction of surface waters with the natural aquifer and with the waters of the swamp.

Similarly, we have concerns regarding potential impacts on the swamp and local environment as a result of pumping ground water for mine processes. Disrupted seasonal hydrology can, in turn, influence fire frequency and behavior, ecosystem health, and plant and animal communities, some of which may contain ESA listed species. Vegetation is dependent on slight elevation changes and the associated soil moisture, characterized by the sandy soil which allows water to quickly move down from the surface or the humate barriers that hold the water near the surface. The depth of the water table, perched water, and subsurface water flows may be disrupted by ground water withdrawal, and thus disrupt hydrology that maintains the natural habitats.

ESA Concerns

The best available scientific information indicates single-event surveys for at-risk and federally-listed plants may be incomplete in the area of the proposed mining activity. Similarly, surveys for at-risk and listed animal species are limited to recent records and may insufficiently represent possible occurrence of these species on and near the proposed mining area. Based on the best available scientific information, however, we offer the following comments.

The gopher tortoise *(Gopherus polyphemus)* has been observed on the proposed mine site. Based on recently conducted surveys by applicant sub-contractors, 118 (active, inactive) gopher tortoise burrows that were found in 4-5 areas along the crest of the ridge. While not listed as threatened or endangered under the ESA in Georgia, the gopher tortoise is a candidate species, meaning listing has been determined to be warranted but such listing has been precluded by higher priorities. The gopher tortoise is considered a keystone species as its burrow can be home for up to 250 other species. After the mining activity has occurred, the soil will have been homogenized and its properties (such as temperature, humidity, structure and texture) changed. As a result, it is unknown whether this area may still be suitable as gopher tortoise habitat. Suitable habitat also requires herbaceous forage for tortoises.

The JPN supporting information states '… the gopher tortoise has successfully recolonized areas that were previously mined for heavy mineral sands.' Areas known to the Service were recolonized greater than 15 years after reclamation and after numerous and repeated prescribed burns to stimulate herbaceous vegetation growth. The applicant does not propose any assurances that the site will become suitable habitat or when this may likely occur.

The Service recommends that a habitat restoration plan/vegetation management plan is developed to; 1) improve fire/fuel conditions to minimize wildfire impacts in the future, and 2) develops a vegetation management plan composed of native species that is a) conducive with prescribed burning and b) facilitates the development of pine savanna habitat that will support gopher tortoise as well as other listed and at-risk species.

The federally-threatened eastern indigo snake *(Drymarchon couperi)*, is known to occur on the Trail Ridge, and utilize gopher tortoise burrows during cold winter months and to avoid summer heat. It is known to move as much as five miles from known locations. Information in the JPN indicates no indigo snakes were detected on the site and states " A lack of indigo snake observations during focused surveys doesn't demonstrate that the species is never present …" Individual eastern indigo snakes are large with extensive territories (>1000 ac.). Because of the large acreage utilized and the ability to diurnally and seasonally adapt their use of the habitat within each territory, individual snakes are difficult to detect or capture in any given area on any given day. Therefore, documentation of presence and abundance is difficult. The Service recommends that the applicant closely adhere to standard avoidance and minimization measures that can be used to avoid and minimize potential impacts to individual eastern Indigo snakes that may occasionally pass through the project area.

The Trail Ridge is part of a recovery unit for the indigo snake. Eliminating a significant area of habitat from a recovery unit may eliminate the value of the entire unit, and delay species recovery. Again, the Service recommends that a habitat restoration plan is developed to support pine savanna species as well as connectivity in mined over areas as well as with other adjacent habitats. The development of these habitat restoration plans should be closely coordinated with Service personnel.

One of our greatest concerns is that, following post-mining restoration activities, tortoises will prematurely attempt to burrow, but the homogenized soils will no longer be structurally capable of sustaining a burrow. If this were to happen, tortoises would dig out of a collapsed burrow, but

other commensal species would not be able to; therefore becoming entombed and die, and leave little to no evidence of what has occurred. The Service recommends that the mining community, including this applicant, should investigate the following question; 1) once the landscape has been restored following mining, how much time is needed before a) gopher tortoises will resume burrowing, and b) how sustainable are newly created burrows in these post-restoration project areas. The Service recommends that such studies be conducted as part of the permitted project.

The gopher frog (*Lithobates capito*) (another candidate species) was documented during species surveys of the site. The gopher frog is one of the commensal species that utilizes gopher tortoise burrows. It also utilizes shallow isolated wetland habitats in part of its lifecycle. These wetlands appear to be present in the proposed mining area. The mining will homogenize the soil in these areas and would likely cause the hydrology of these isolated ponds to change permanently. This would likely permanently destroy the habitat of these amphibians.

Other Okefenokee National Wildlife Refuge Related Concerns

The Refuge includes a designated National Wilderness area where solitude is emphasized. Potential light, noise, dust, smoke, and exhaust pollution from operations may affect the wilderness resource itself, Refuge visitors' experiences, and natural inhabitants and ecosystems/environments.

We appreciate the opportunity to provide comments on this project. If you have any further questions, please contact Donald W. Imm, Field Supervisor, Georgia Ecological Services at 706-208-7501.

Sincerely yours,

Acting for Catherine Phillips
Assistant Regional Director,
Ecological Services

David Viker
Regional Chief,
for National Wildlife Refuge System

cc: Eric Somerville, EPA, Athens, Georgia
Bradley Smith, GADNR-EPD, Brunswick, Georgia
Jason Lee, GADNR-WRD, Brunswick, Georgia
Michael Lusk, Okefenokee Refuge Manager, USFWS Folkston, Georgia

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