

Wiedl, Stephen

To: Ross, Holly A SAS
Cc: Somerville, Eric; Bill Wikoff; Imm, Donald; Zeng, Wei; Smith, Bradley; Lusk, Michael; William M SAS Rutlin; Justin A SAS Hammonds
Subject: Additional GaEPD Comments for Twin Pines Mineral Mine, Charlton County, GA

To: Holly Ross, Project Manager
U.S. Army Corps of Engineers, Savannah District
Albany Field Office
1104 North Westover Boulevard, Suite 9
Albany, GA 31707

Re: Twin Pines Mineral Mine, Charlton County, GA

Dear Ms. Ross,

Following initial comments submitted as of September 12, 2019, the Georgia Environmental Protection Division (EPD) Wetlands Unit is providing additional comments on the Twin Pines Mineral Mine project at this time. We note that we have received information from the applicant/consultant dated October 31, 2019 and forwarded by you as of November 1, 2019, specifically: Item 1 of 3, Hydrologic Characterization at Twin Pines Mine; and Item 3, Water Quality Data at Twin Pines Mine. We also note that we have recently received a larger document from the applicant/consultant again dated October 31, 2019 but not forwarded by you until November 18, 2019, specifically: Item 2, Geologic Characterization at Twin Pines Mine. These documents are massive, comprising some 1563 pages. However, the vast majority of these documents are made up of technical information such as boring logs; pumping well, observation well and piezometer logs and data; slug and bail test sheets; water quality data; etc. As of December 3, 2019 we have received by E-mail forwarding from you 7 of 11 parts of an applicant/consultant report dated November 22, 2019, specifically: Local Groundwater/Surface Water Hydrology at Twin Pines Mine. This latest transmittal is even more massive, being 13,589 pages in size for parts 1 through 7 of an eventual 11-part document. This latest information contains: some eight pages of summary text; site maps; rain gauge, piezometer and staff gauge hydrographs; and thousands of pages of 10-minute interval data logger measurements for precipitation, piezometer and staff gauge data.

A key item, as promised in the July 2019 404/401 application, a submittal of Groundwater Models of the Twin Pines Project Area, Trail Ridge, Georgia, has not yet been received by EPD. Note is made in the recently received Geologic Characterization at Twin Pines Mine document that "These data were collected to characterize the pre-mining conditions along Trail Ridge, provide data for models to predict the impact of mining operations on groundwater discharge to streams and wetlands adjacent to the proposed mine, and aid in the evaluation of post-mining hydrologic conditions to assist reclamation/restoration efforts." But this impact-predictive model has not yet been submitted to regulatory agencies for consideration. We reiterate our concern and position that an appropriate project review for 401 water quality certification is not yet possible since complete substantive and important information about the proposed hydrogeologic effects of this project relative to the surrounding landscape has not yet been submitted by the applicant.

With a focus on characterization of wetland impacts, wetland mitigation and landscape reclamation, we have reviewed the 404 permit/401 water quality certification application package submitted in July 2019. We first observe that the document space dedicated to on-site wetland mitigation/restoration is brief, amounting to no more than 3-4 pages of total text. Considering that the first mining phase of this project is 2,414 acres in size (out of a total potential future project expanse of approximately 12,000 acres) and that a total of 587.042 acres of wetlands will experience disturbance (65.132 acres submitted as "permanent" wetland impacts by the applicant/consultant and another 521.910 acres characterized as "temporary" impacts), we submit that this level of documentation of wetland

mitigation/restoration is not sufficient; it is not worked out and described in detail – essentially it is too generalized and brief for a project of such magnitude.

We do want to commend the applicant for developing an approach whereby a minimized footprint of mining excavation and exposure will occur over a given period of mine operation – this as opposed to wholesale open-pit excavation of large areas which are left un-reclaimed for long periods of time. Nevertheless, we are concerned about the characterization of the large majority of wetland impacts at the project site as temporary. This concern is from the perspective of both the duration and the degree of disturbance of wetland resources.

As described and illustrated in the project's 404/401 application information, mineral sand mining, whether by dozers and tracked excavators or by mobile dragline, will occur in a series of back-and-forth east-to-west then west-to-east swaths or strips. The size of the active pit along these excavation strips will be approximately 100' wide at the bottom, extending up to approximately 250' width at the excavated ground surface as a result of 34-degree side slopes. Interpreting "Figure 4 – Estimated Mining Production Timeline" of the project application package, the west-east/east-west strips on the Keystone and Adirondack parcels will require about 40-50 days each for a single cycle excavation pass to occur. "Figure 6 – Impact Excavation Design Cross-Section" illustrates that: any given pit portion, which is approximately 250' wide at the ground/wetland surface, will have only part (approximately 40-45% width) of the surface footprint "closure backfilled" after the first excavation pass, such a pit portion will have a second portion (again, approximately 40-45% width) of the surface footprint "closure backfilled" after a second adjacent excavation strip pass, and may have a final approximately 10-15% portion ultimately backfilled after a third adjacent excavation strip pass. This excavation/backfill sequence, proceeding in adjacent strips across the landscape, with associated 34-degree side slopes, will result in perhaps 40-60% of a given excavation surface footprint being in an actively disturbed mining phase for approximately 100 days, and in some smaller footprint instances up to 150 days. We note that this exceeds the 90-day term applied within the Corps of Engineers Savannah District 2018 Standard Operating Procedure (SOP) for Compensatory Mitigation as a definition of "temporary impact".

Also, since tree planting will occur during the winter months, that final phase of wetland zone reclamation will not at all fall consistently within a 90-day "temporary" impact window. Wetland areas which undergo mining disturbance in the springtime could see a 6-to-9 month interval before tree revegetation takes place.

In addition to the issue of excavation duration vs. final backfill of the sequential excavation strips of the mine site, we wish to raise concerns about the massive nature of disturbance to wetland zones which will occur as a result of this project. It is troubling that over 500 acres of wetland impact from this project is currently characterized by the applicant as temporary, when this wetland terrain will experience excavation to depths of 25', 50' and perhaps even 75', when the subsurface sand soil will be processed for recovery of desired mineral ore resulting in complete physical agitation/homogenization, and when a reconfiguration of these once-wetland soil masses will be attempted by a terrain mimic regrading exercise. Additionally, we note that in "Appendix F: Supplemental Information" of the application package, mention is made of the fact that humate-cemented Black Sands are present at varying locations across the site, that the lower permeability of such Black Sands may provide a subsurface confining layer thereby supporting the presence of shallow groundwater (i.e. wetland zones) in portions of the site. Since the humate component of excavated sands will be extracted or physically mixed by the mining process, the applicant mentions the possible need to reconstitute the low-permeability property of sand soils to be reconfigured as wetland footprint zones post-mining such that wetland hydrology would be confidently reestablished, and that such an undertaking would be attempted by inclusion/application/layering (?) of bentonite clay to reestablish necessary low permeability properties in such areas of "temporary wetland impact". This approach is not clearly and fully described in the project's application materials – only two modest paragraphs are dedicated to this important process.

The wetlands on-site may be judged to have jurisdictional hydrology due to terrain interception of near-surface groundwater and to the catchment and concentration of precipitation and runoff in the very shallow relief depressions and drainageway lowlands located across the generally broad level terrain of this site. As noted, this expression of jurisdictional hydrology may be influenced by the presence of locally moisture-confining soil components. This situation gives rise to a questioning whether it is appropriate to characterize as "temporary" wetland impacts the complete

excavation, mining processing, physical homogenization, and bulk refilling of 39 million cubic yards of once-wetland earthwork. And, these ostensibly temporarily impacted and now reclaimed wetland zones would, over the 8-year course of mining operations, be situated in a landscape where there exists an ongoing alteration of the upper 25-50-75 feet of soil mantle, adjacent surface topography, local groundwater and drainage patterns. As the excavation trenching process goes back and forth across the mine site, there will occur what might be thought of as a moveable, migrating hydrologic cone-of-depression as groundwater is progressively lowered during the action of full-depth mineral sand dragline excavation. This also would constitute a longer-than-90-days alteration to natural wetland hydrology. This would seem to require that a longer than 90-day duration factor be applied to wetland mitigation calculations.

We submit that the mining-then-reclamation exercise of the wetland zones proposed at this project is not truly a temporary impact. The massive wetland earthwork removal, processing, and re-placement is so profound as to more appropriately qualify as some sort of re-“creation” of wetland terrain. We emphasize the term “creation” here. The reclamation exercise proposed by this project would not even appropriately be considered a wetland restoration. We comment that wetland restorations occur in situations such as: backfilling ditched/drainage wetlands as to reestablish wetland hydrology, reestablishment of natural habitat conditions in wetlands converted to agricultural cropland, removal of earthwork fill layered over still intact hydric soil substrates of buried wetland areas, and other such undertakings to remediate wetlands which are still essentially whole, in place, intact but impaired – and not in situations where the entire wetland mass to average depths of 50’ is turned upside down. We comment that the concept of a temporary impact to wetlands should presuppose that an original, substantially natural wetland terrain is in place, remaining to re-emerge in its former guise after the end of any temporary impact. So substantial, so massive, so transformative is the effect to wetlands contemplated at the Twin Pines site that you no longer have in place the original wetland to be impacted.

According to the comments submitted here, we advise and request that the Corps of Engineers interpret the linked concepts of “temporary” impacts vs. mitigation/reclamation/re-creation such that the 521.910 acres currently characterized as temporary impacts do not escape a higher, more appropriate level of wetland impact compensation.

We observe that the undertaking proposed at the Twin Pines site is in reality a permittee-responsible mitigation exercise. As such it should have a much more detailed and robust mitigation/reclamation plan, something more akin to a wetland mitigation banking instrument (BI) as would be required for a commercial mitigation bank. Long term monitoring and well-documented success criteria should be part of such a plan.

The wetland and stream survey/impact maps, tables, descriptions for the Adirondack/Keystone/TIAA tracts are not clear or complete as provided in the consultant’s 404/401 application supporting materials. Some of the labeling/scaling of site wetland/stream impact maps is cluttered. Citation of stream impacts is confusing. The project JPN and Table 4 of the application package report temporary impacts to 2454 feet of tributaries/streams, but zero temporary stream impacts are tabulated in Table 13 Stream Impact Summary. Although Table 4 reports a total of 2454 feet of temporary stream impacts, the line items for these streams are entered as zeros. Streams S-1i, S-5, S-6, S-7, S-10 and S-1 are tabulated as having almost complete permanent impacts in Table 13, but these impacted streams are not plotted/labeled on Figure 4.1b. If indeed some amount of temporary stream impacts would occur as a result of this project, no mention is made of any reconfiguration/reestablishment/restoration of such streams.

Item #5 of Appendix F (Hydrogeology) cites collection and metals analysis of six piezometers and two surface water locations. Which metals were analyzed? Can this information be provided to EPD?

Thank you for your consideration of these comments as you review the Twin Pines Mineral Mine project.

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