DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SAVANNAH DISTRICT
100 WEST OGLETHORPE AVENUE
SAVANNAH, GEORGIA 31401-3604

July 12, 2019

Regulatory Branch
SAS-2018-00554

JOINT PUBLIC NOTICE
Savannah District/State of Georgia

The Savannah District has received an application for a Department of the Army permit, pursuant to Section 404 of the Clean Water Act (33 U.S.C § 1344), as follows:

Application Number: SAS-2018-00554

Applicant: Steven R. Ingle, Twin Pines Minerals, LLC, 2100 Southbridge Parkway, Birmingham, Alabama 35209

Agents: TTL, Incorporated, 2743-B Gunter Park Drive West, Montgomery, Alabama 36109

Location of Proposed Work: The 2,414 acre site is located North of Georgia Highway 94, West of Georgia Highway 23, and East of the Okefenokee National Wildlife Refuge, Saint George, Charlton County, Georgia (Latitude 30.5214, Longitude -82.1144).

Description of Work Subject to the Jurisdiction of the U.S. Army Corps of Engineers: The applicant is proposing to operate a heavy mineral sand mining facility on approximately 12,000 acres comprised of six (6) different tracts of land. The first mining phase is the currently proposed project area of 2,414 acres which includes portions of the Keystone, Adirondack, and TIAA tracts. The area will be mined in phases. Each phase will be mined at 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 depth of mining across the property will vary based on the resource but will average 50 feet below land surface, with the exception of the TIAA property, where it will be mined 25 feet below land surface. Impacts to aquatic resources for Phase I of the project as stated by the applicant are: Temporary impacts to 522-acres of wetlands and 2,454 linear feet of tributaries, and permanent impacts to 65 acres of wetlands and 4,658 linear feet of tributaries. Permanent impacts will result from construction of infrastructure for the mining operation as shown on the enclosed figure entitled “Figure 5: Proposed Site Layout Map”. Temporary impacts are proposed for the mined area and include excavation of the draglines and backfill of the processed material as shown on the enclosed figure entitled “Figure 6. Impact Excavation Design Cross Section Z-Z”. The excavation depth will vary, as shown in the enclosed figures

entitled “Figure 4. Generalized Hydrogeologic Cross Section D – D”, and “Figure 11. Generalized Hydrogeologic Cross Section O – O”.

BACKGROUND

This project was presented at the Savannah District Interagency Review Team (IRT) meeting on August 7, 2018 as a pre-application consultation. Written comments were received by this office from U.S. Fish and Wildlife Service, Georgia Department of Natural Resources, and U.S. Environmental Protection Agency in response to the pre-application meeting and documents provided by the applicant to these agencies.

This office issued an Aquatic Resource Delineation Concurrence letter on December 18, 2018 for the Loncala and Keystone tracts. The Loncala tract is 1,012-acres and contains 405.11 acres of wetland and 3,020 linear feet of tributary. The Keystone tract is 1,034-acres and contains 544 acres of wetland and 297 linear feet of tributary.

This Joint Public Notice announces a request for authorizations from both the Corps and the State of Georgia. The applicant's proposed work may also require local governmental approval.

STATE OF GEORGIA

Water Quality Certification: The Georgia Department of Natural Resources, Environmental Protection Division, intends to certify this project at the end of 30 days in accordance with the provisions of Section 401 of the Clean Water Act, which is required for a Federal Permit to conduct activity in, on, or adjacent to the waters of the State of Georgia. Copies of the application and supporting documents relative to a specific application will be available for review and copying at the office of the Georgia Department of Natural Resources, Environmental Protection Division, Water Protection Branch, 7 Martin Luther King, Jr. Drive, Atlanta, Georgia 30334, during regular office hours. A copier machine is available for public use at a charge of 25 cents per page. Any person who desires to comment, object, or request a public hearing relative to State Water Quality Certification must do so within 30 days of the State's receipt of application in writing and state the reasons or basis of objections or request for a hearing. The application can be reviewed in the Savannah District, U.S. Army Corps of Engineers, Regulatory Branch, Albany Field Office, 1104 North Westover Boulevard, Suite 9, Albany, Georgia 31707.

State-owned Property and Resources: The applicant may also require assent from the State of Georgia, which may be in the form of a license, easement, lease, permit or other appropriate instrument.

U.S. ARMY CORPS OF ENGINEERS

The Savannah District must consider the purpose and the impacts of the applicant's proposed work, prior to a decision on issuance of a Department of the Army permit.

Cultural Resources Assessment: In compliance with Section 106 of the National Historic Preservation Act of 1966 and amendments thereto, an analysis for archaeological and historic resources was conducted. Terra Xplorations conducted a Phase I cultural resources survey for the Keystone, Adirondack, and TIAA tracts and summarized findings in three separate reports. These reports will be coordinated with the State Historic Preservation Office.

The Corps has NOT made a determination of no effect , no adverse effect, or adverse effect to archaeological or historical resources listed or eligible for listing in the NRHP.

Endangered Species: Threatened and Endangered species surveys were conducted for the project area, and consultation with the US Fish and Wildlife service will be required. The application states that the gopher tortoise and gopher frog will be impacted by the project due to construction of facilities and mining activities.

Pursuant to Section 7(c) of the Endangered Species Act of 1973, as amended (16 U.S.C. § 1531 et seq.), we request information from the U.S. Department of the Interior, Fish and Wildlife Service, the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service; or, any other interested party, on whether any species listed or proposed for listing may be present in the area and the potential effects this project may have on those species.

Public Interest Review: The decision whether to issue a permit will be based on an evaluation of the probable impact including cumulative impacts of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefit, which reasonably may be expected to accrue from the proposal, must be balanced against its reasonably foreseeable detriments. All factors, which may be relevant to the proposal will be considered including the cumulative effects thereof; among those are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, flood plain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership and in general, the needs and welfare of the people.

Consideration of Public Comments: The Corps is soliciting comments from the public; federal, state, and local agencies and officials; Native American Tribes; and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps to determine whether to issue, modify, condition or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act.

Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

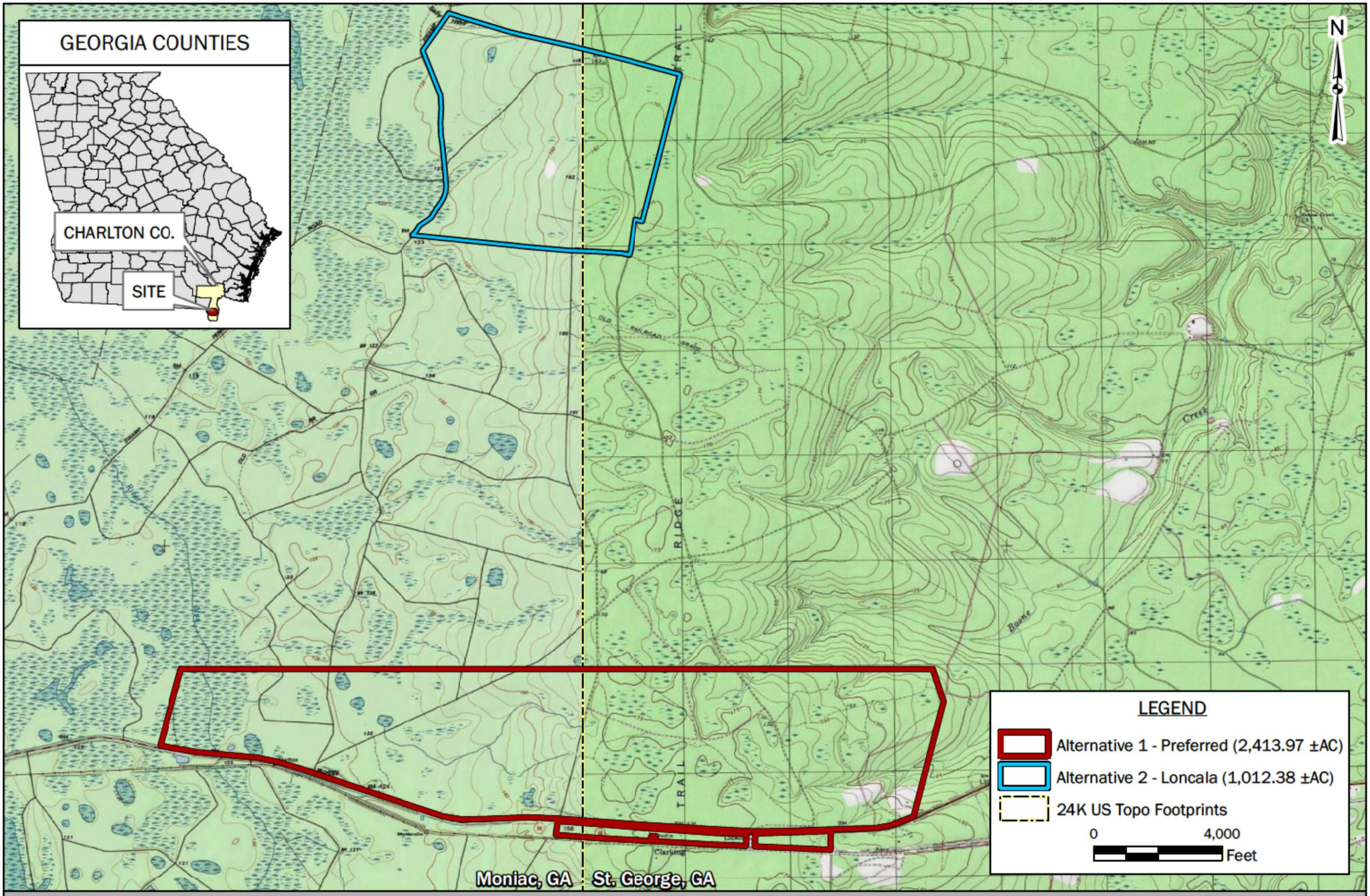
Application of Section 404(b)(1) Guidelines: The proposed activity involves the discharge of dredged or fill material into the waters of the United States. The Savannah District's evaluation of the impact of the activity on the public interest will include application of the guidelines promulgated by the Administrator, Environmental Protection Agency, under the authority of Section 404(b) of the Clean Water Act.

Public Hearing: Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held to consider this application for a Department of the Army permit. Requests for public hearings shall state, with particularity, the reasons for requesting a public hearing. The decision whether to hold a public hearing is at the discretion of the District Engineer, or his designated appointee, based on the need for additional substantial information necessary in evaluating the proposed project.

Comment Period: Anyone wishing to comment on this application for a Department of the Army permit should submit comments in writing to the Commander, U.S. Army Corps of Engineers, Savannah District, Attention: Ms. Holly Ross, 1104 North Westover Boulevard, Suite 9, Albany, Georgia, 31707, or by email to holly.a.ross@usace.army.mil, no later than 30 days from the date of this notice. Please refer to the applicant's name and the application number in your comments.

If you have any further questions concerning this matter, please contact Ms. Holly Ross, Project Manager, Albany Field Office at 648-422-2727 or via email at holly.a.ross@usace.army.mil.

Enclosures:
1. Topographic map of project areas – current proposal and Loncala tract
2. Aerial Image map of project area – current proposal
3. Project Location in reference to Okefenokee National Wildlife Refuge
4. Hydrologic unit code (HUC) map
5. Impacts and work plan for preferred alternative
6. Estimated Mining Timeline
7. Proposed Site Layout
8. Impact Excavation Design Cross Section
9. Excavation Depth cross-sections (2 pages)
10. Purpose and Need Statement provided in the application
11. Alternative Site Selection Factors as provided in the application
12. Alternative 1 Summary (4 pages) provided in the application



TTL

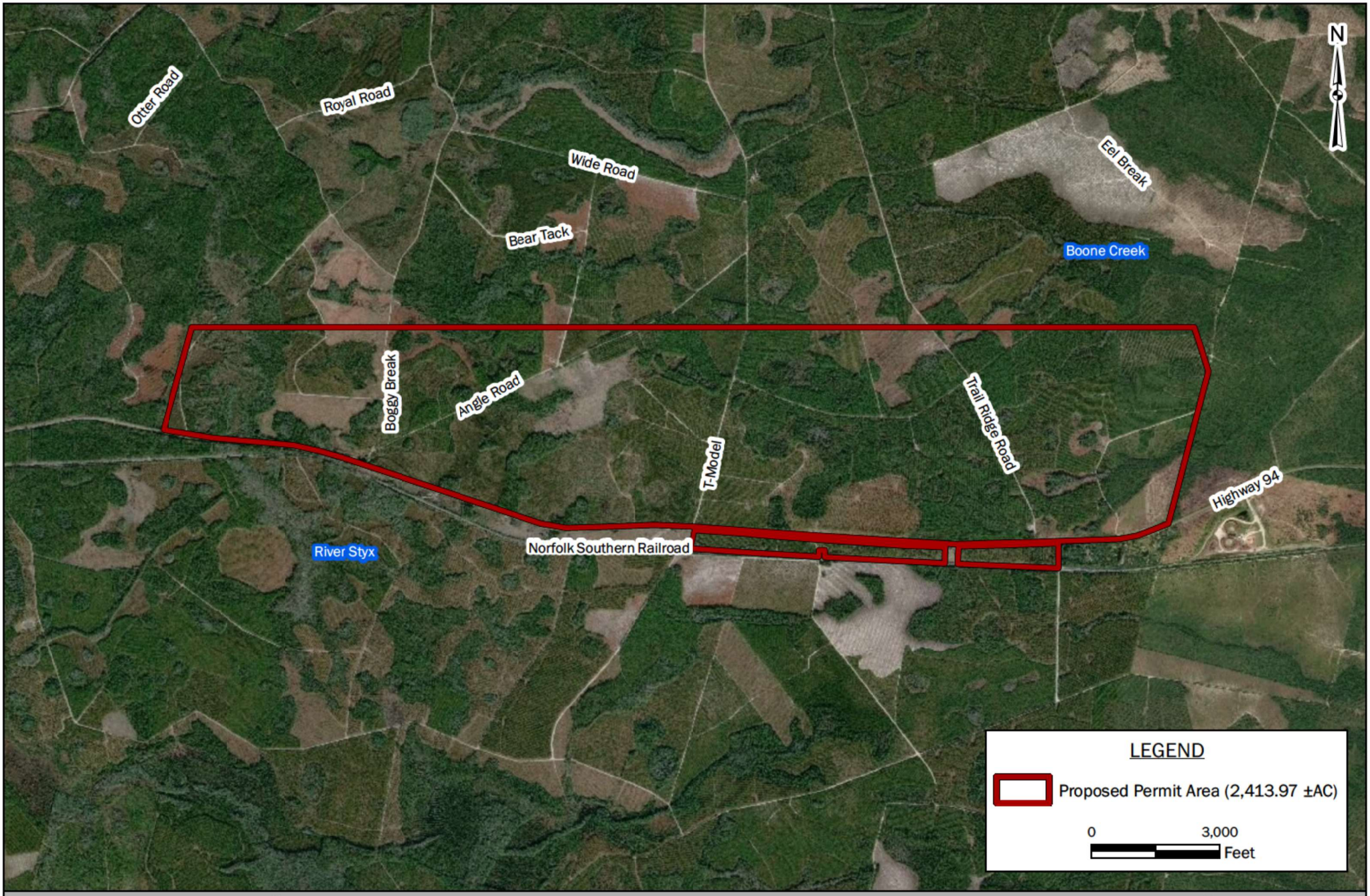
FIGURE 1: SITE LOCATIONS & TOPOGRAPHIC MAP

TWIN PINES MINERALS

USACE INDIVIDUAL PERMIT APPLICATION

BASEMAP: Moniac, Georgia & Saint George, Georgia USGS 7.5 Minute Quadrangle Map, 1994.

DRAWN BY:AGW
CHECKED BY: CMS
DRAWING DATE: 7/2/2019
REVISION DATE: N/A
TTL JOB NO.: 000180200804.00
APPROXIMATE SCALE: 1" = 3,000'



TTL

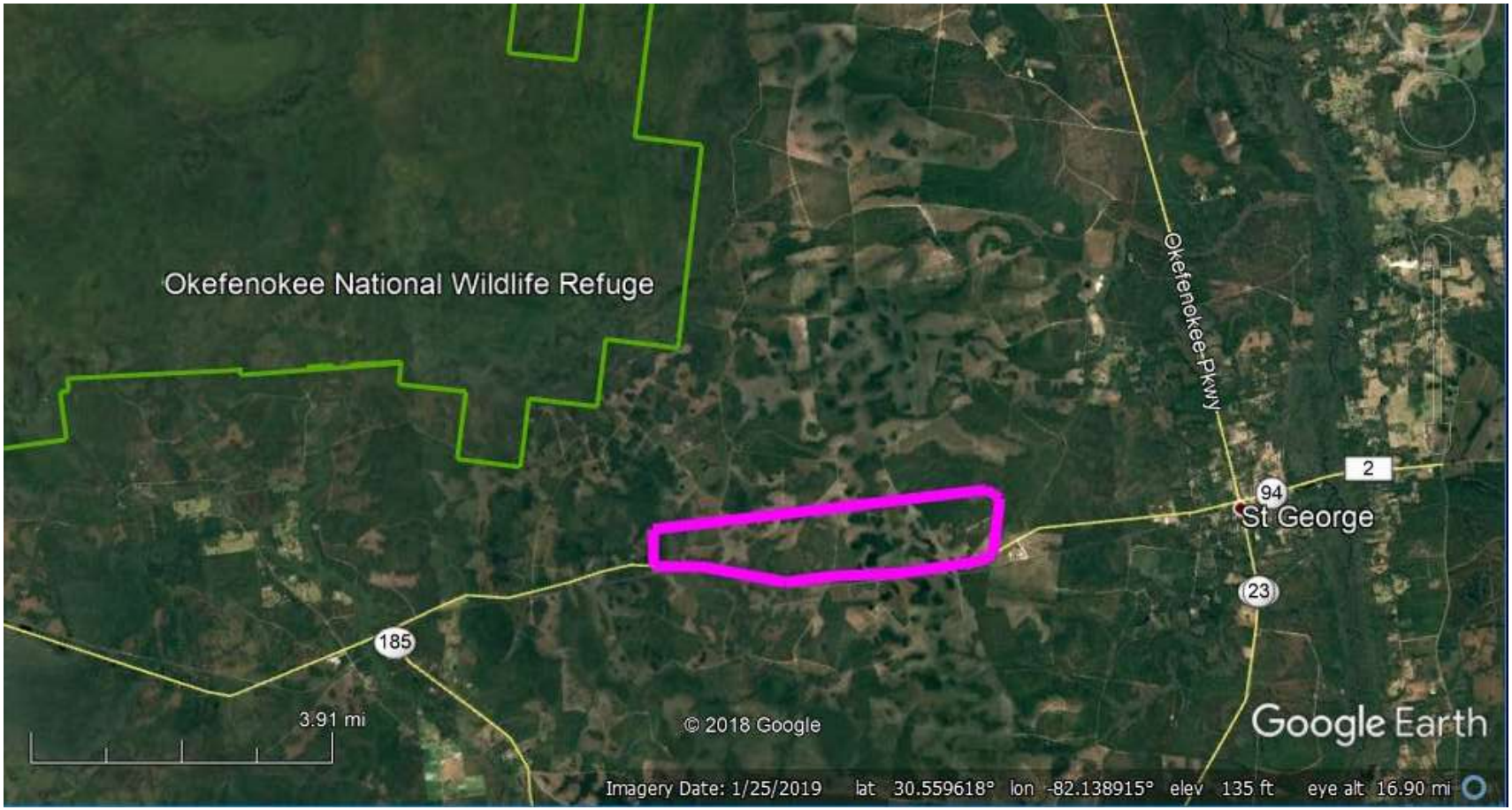
FIGURE 3: SITE LOCATION & AERIAL PHOTOGRAPH

TWIN PINES MINERALS

USACE INDIVIDUAL PERMIT APPLICATION

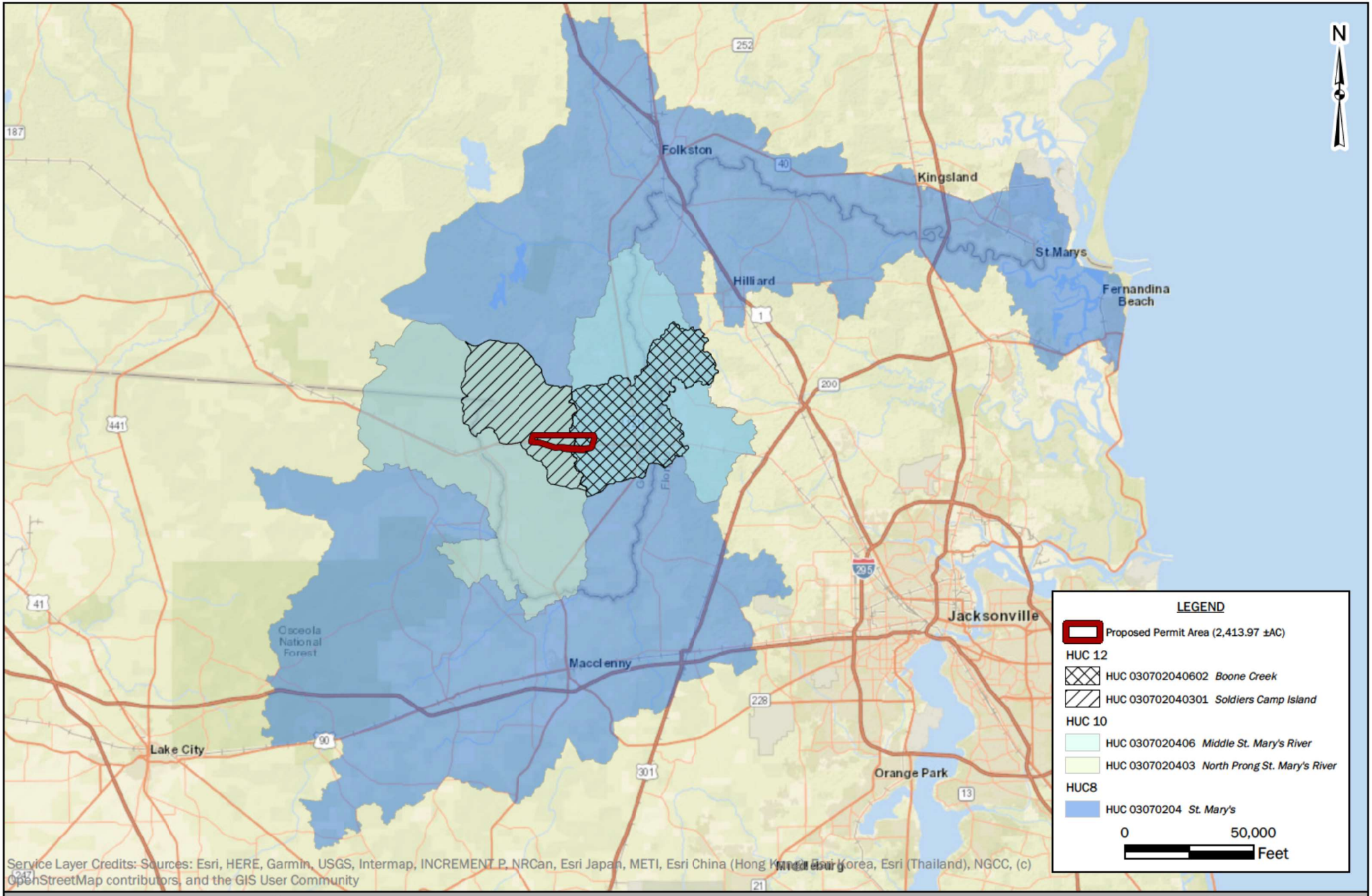
BASEMAP: DigitalGlobe, 1/24/2016 and 9/17/2017.

DRAWN BY:AGW
CHECKED BY: CMS
DRAWING DATE: 7/2/2019
REVISION DATE: N/A
TTL JOB NO.: 000180200804.00
APPROXIMATE SCALE: 1" = 3,000'



Approximate project location of Phase I, shown in the pink polygon, in reference to The Okefenokee National Wildlife Refuge.

SAS-2018-00554 Twin Pines Minerals Standard Permit Application



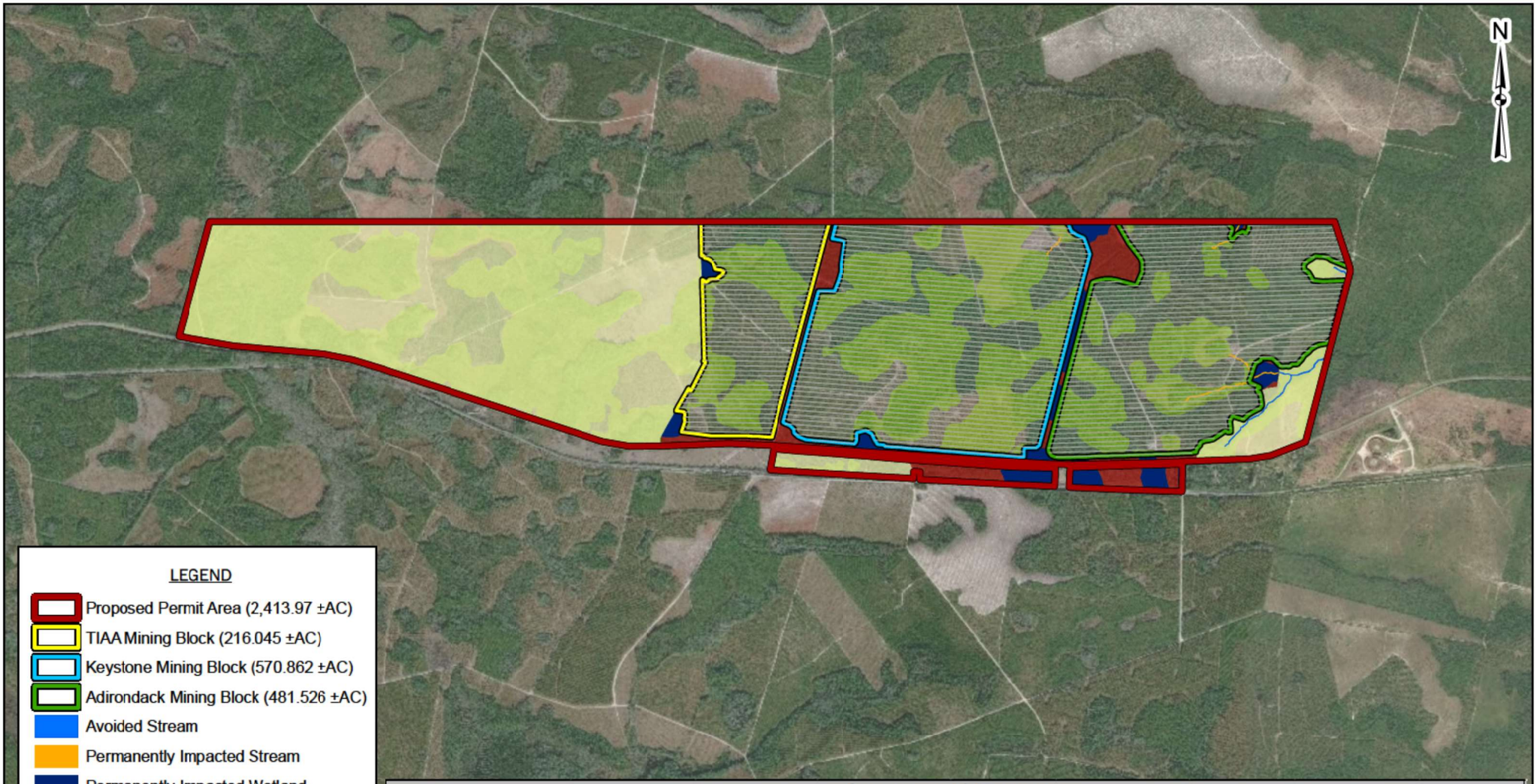
TTL

FIGURE 5: HYDROLOGIC UNIT CODE (HUC) MAP

TWIN PINES MINERALS

USACE INDIVIDUAL PERMIT APPLICATION

DRAWN BY:AGW
CHECKED BY: CMS
DRAWING DATE: 7/2/2019
REVISION DATE: N/A
TTL JOB NO.: 000180200804.00
APPROXIMATE SCALE: 1" = 50,000'



Summary of Features								
Aquatic Feature	Total		Temporary Impacts		Permanent Impacts		Total Avoided	
	Length (LF)	Area (AC)	Length (LF)	Area (AC)	Length (LF)	Area (AC)	Length (LF)	Area (AC)
Wetland	---	1,201.230	---	521.910	---	65.132	---	614.188
Perennial Stream	387	0.064	0	0	0	0	387	0.064
Intermittent Stream	7,703	0.623	0	0	4,658	0.199	3,045	0.424
Ephemeral Stream	273	0.020	0	0	0	0	273	0.020

TTL

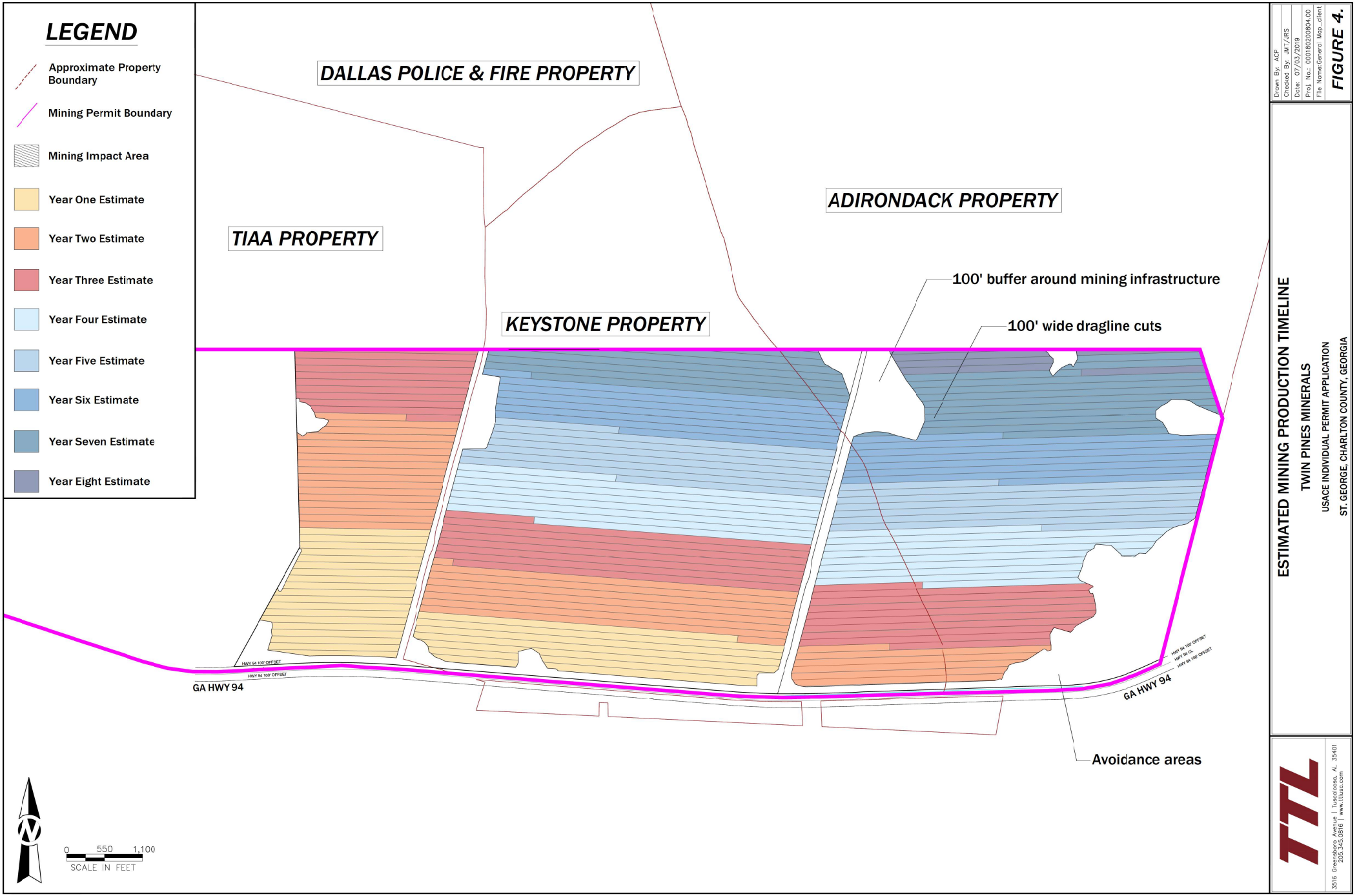
FIGURE 4.1a: ALTERNATIVE 1

TWIN PINES MINERALS

USACE INDIVIDUAL PERMIT APPLICATION

BASEMAP: Saint George, Georgia USGS 7.5 Minute Quadrangle Map, 1994.

DRAWN BY: CMS
CHECKED BY: AGW
DRAWING DATE: 7/2/2019
REVISION DATE: N/A
TTL JOB NO.: 000180200804.00
APPROXIMATE SCALE: 1" = 3,000'

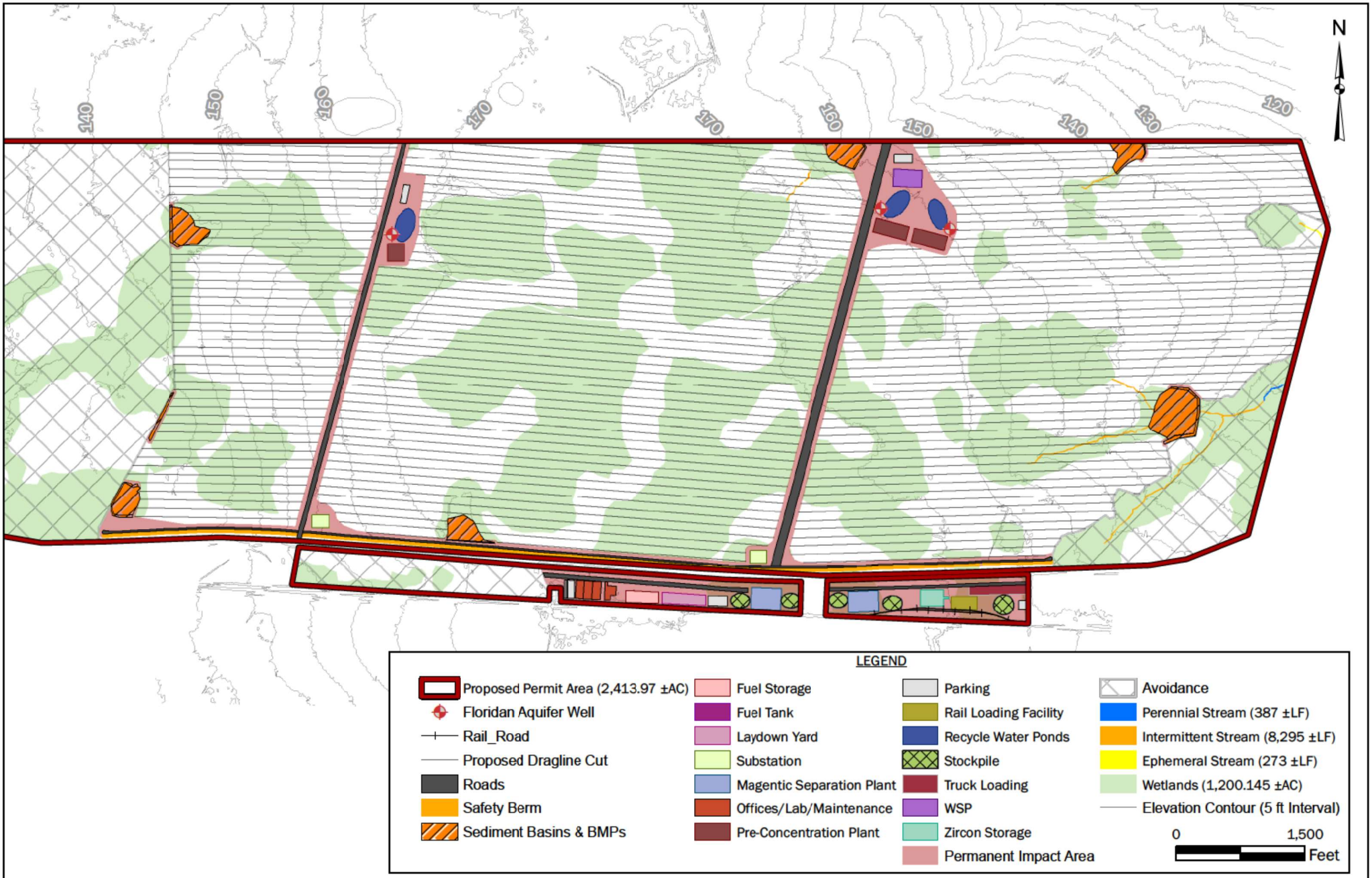


Drawn By: ACP
Checked By: JMT/JRS
Date: 07/03/2019
Proj. No.: 000180200804.00
File Name:General Map_client

FIGURE 4.

ESTIMATED MINING PRODUCTION TIMELINE
TWIN PINES MINERALS
USACE INDIVIDUAL PERMIT APPLICATION
ST. GEORGE, CHARLTON COUNTY, GEORGIA

TTL
3516 Greensboro Avenue | Tuscaloosa, AL 35401
205.345.0816 | www.ttlusa.com



TTL

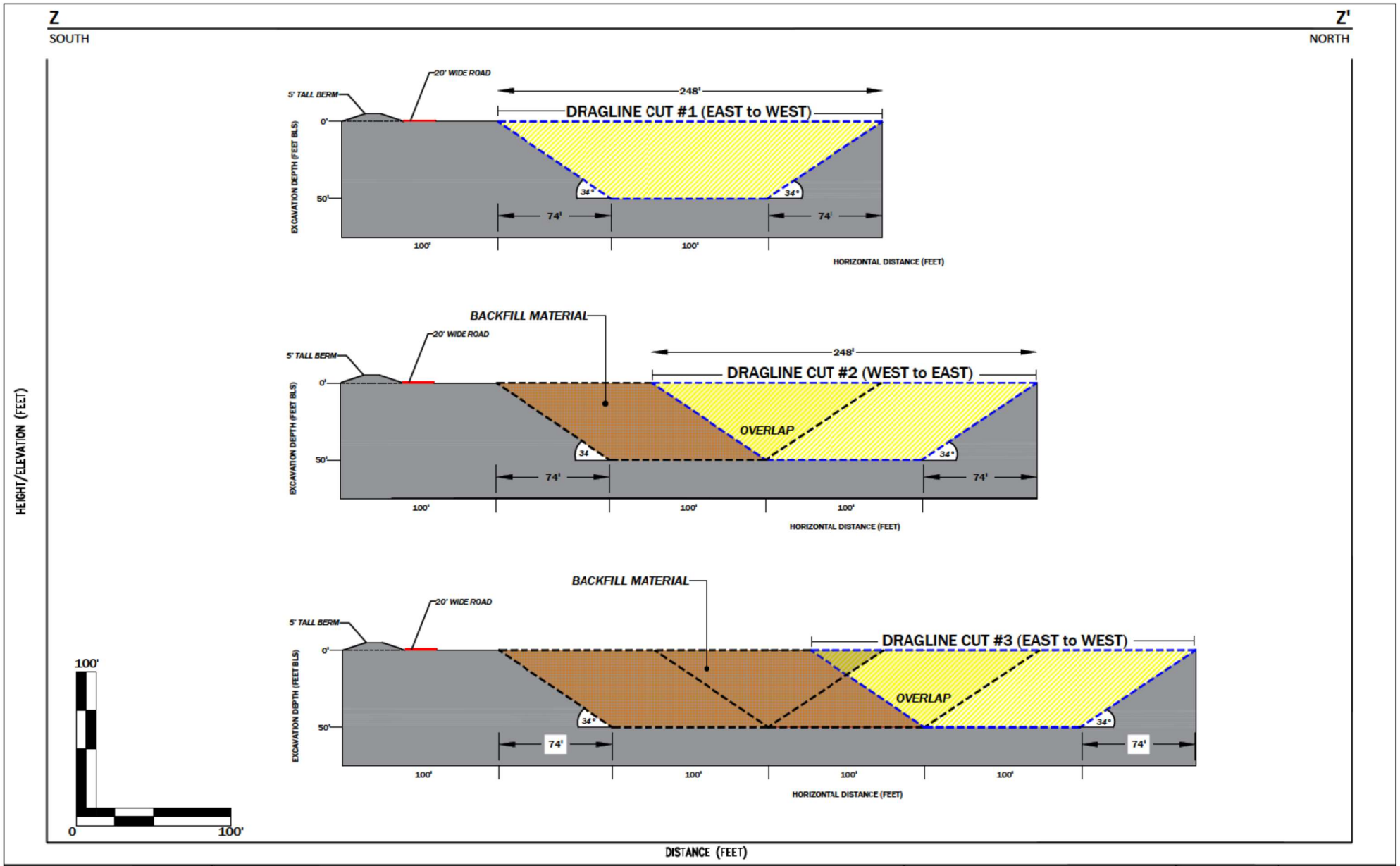
FIGURE 5: PROPOSED SITE LAYOUT MAP

TWIN PINES MINERALS

USACE INDIVIDUAL PERMIT APPLICATION

BASEMAP: DigitalGlobe, 1/24/2016 & 9/17/2017.

DRAWN BY: CMS
CHECKED BY: AGW
DRAWING DATE: 6/29/2019
REVISION DATE: N/A
TTL JOB NO.: 000180200804.00
APPROXIMATE SCALE: 1" = 1,500'



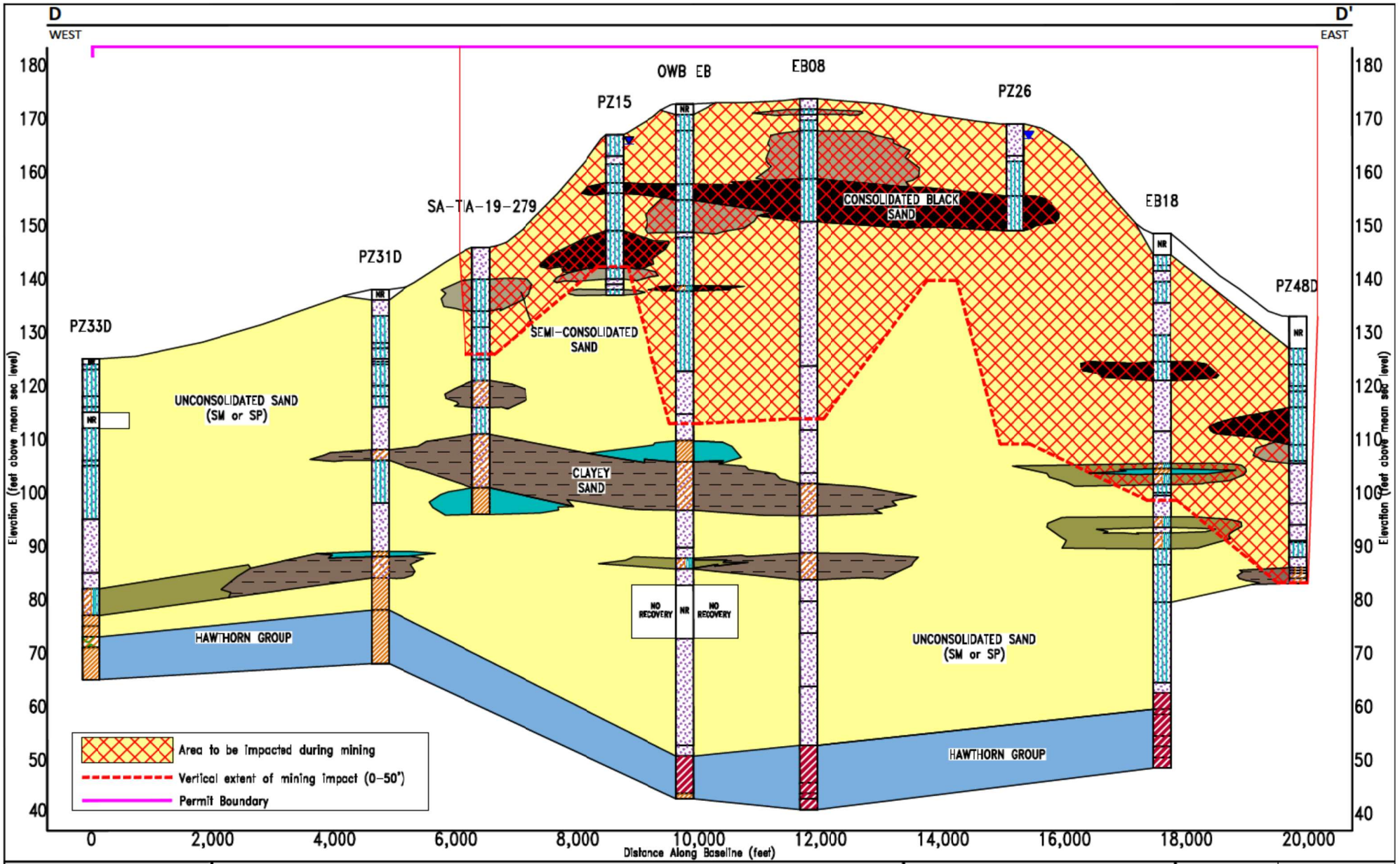
TTL

LEGEND:

UNEXCAVATED MATERIAL | DRAGLINE EXCAVATION | BACKFILLED MATERIAL | OVERLAP

Figure 6.
Impact Excavation Design
Cross-Section Z - Z'
Twin Pines Minerals
USACE Individual Permit Application
St. George, Charlton County, Georgia

DRAWN BY:	ACP
CHECKED BY:	JMT
TTL PROJECT NO.:	000180200804.00
DATE:	07/03/2019
FILE PATH:	



TTL

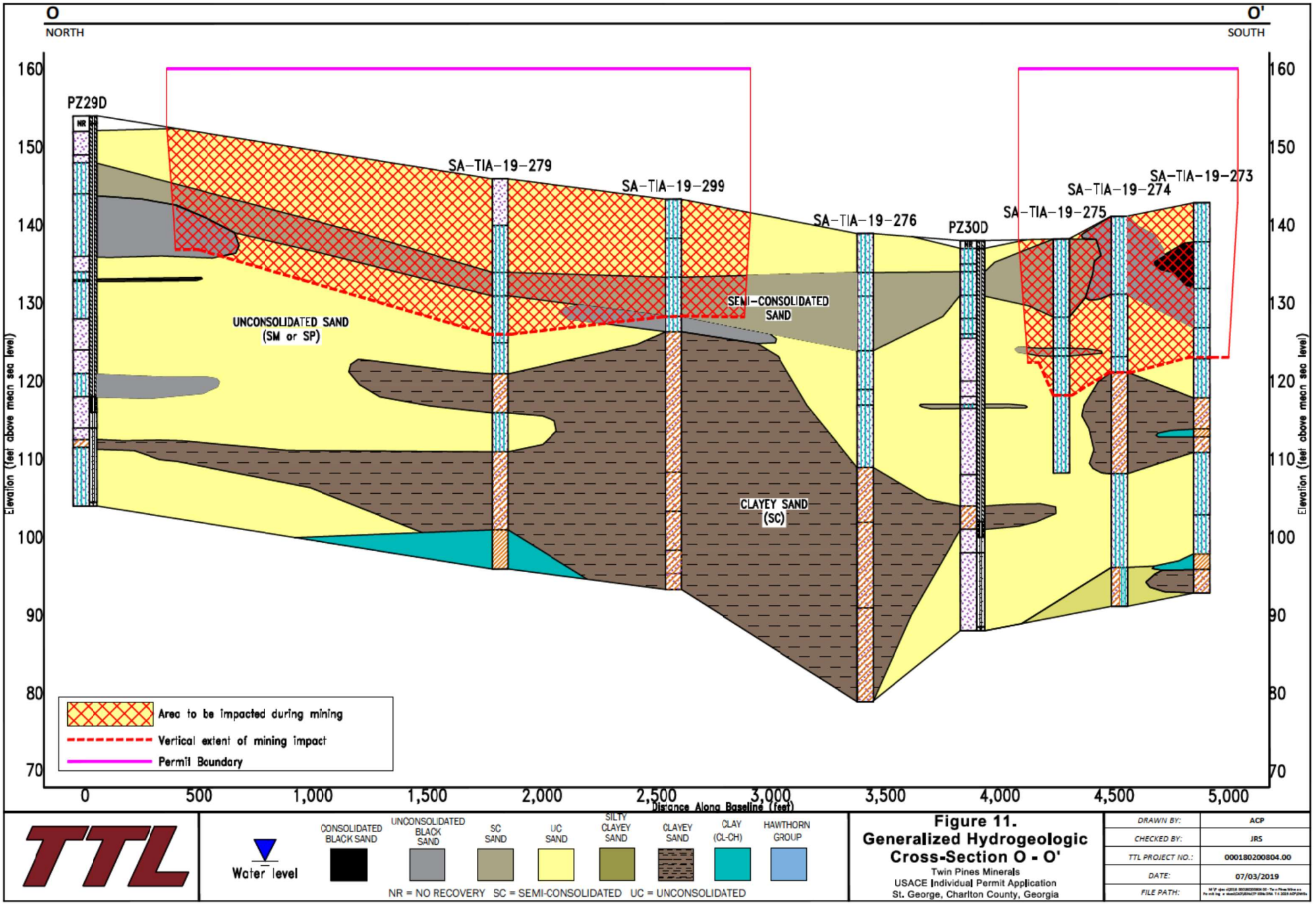
Water level

CONSOLIDATED BLACK SAND | SC SAND | UC SAND | SILTY CLAYEY SAND | CLAYEY SAND | CLAY (CL-CH) | HAWTHORN GROUP

NR = NO RECOVERY SC = SEMI-CONSOLIDATED UC = UNCONSOLIDATED

Figure 4.
Generalized Hydrogeologic Cross-Section D - D'
Twin Pines Minerals
USACE Individual Permit Application
St. George, Charlton County, Georgia

DRAWN BY:	ACP
CHECKED BY:	JRS
TTL PROJECT NO.:	000180200804.00
DATE:	07/03/2019
FILE PATH:	



TTL

Water level

CONSOLIDATED BLACK SAND | UNCONSOLIDATED BLACK SAND | SC SAND | UC SAND | SILTY CLAYEY SAND | CLAYEY SAND | CLAY (CL-CH) | HAWTHORN GROUP

NR = NO RECOVERY SC = SEMI-CONSOLIDATED UC = UNCONSOLIDATED

Figure 11.
Generalized Hydrogeologic Cross-Section O - O'
Twin Pines Minerals
USACE Individual Permit Application
St. George, Charlton County, Georgia

DRAWN BY:	ACP
CHECKED BY:	JRS
TTL PROJECT NO.:	000180200804.00
DATE:	07/03/2019
FILE PATH:	

The TTL waters of the U.S. delineations (Appendix A) were conducted during a period of time spanning from April 2018 to April of 2019 to evaluate aquatic resources within areas that the applicant proposes impacts. Figure 3 provides an aerial view of the proposed project site.

The mining area consists of forested, shrub-scrub, and herbaceous wetlands, streams, and uplands consisting of planted pine, scrub-shrub and forested habitat. The proposed mining area is primarily in use as a commercial forestry operation, therefore much of the habitat has been degraded due to the bedding activities herbicide use typically associated with silvicultural practices in the region.

2.0 PURPOSE AND NEED

The applicant's purpose and need for the proposed project includes the extraction (maximum mineral recovery based on economic consideration and landowner commitments) of high quality heavy mineral reserves in a safe, cost effective and environmentally sound manner for export by truck, rail and eventual barge to national and international customers.

Mineral sand-derived products, particularly those containing titanium dioxide and zirconium, are in high demand worldwide in the pigment, aerospace, medical, foundry, and other industrial products. Elemental components, chiefly titanium, are used as the white pigments. Titanium dioxide is nontoxic and has replaced lead as the predominant pigment in paints and coatings.

Many deposits of heavy mineral sands (HMS) have been identified in the Atlantic Coastal Plain, including more than a dozen deposits that have been mined. Three Atlantic Coastal Plain districts have seen the bulk of the heavy mineral sands production and these districts are: (1) the Jacksonville district in northeastern Florida and southeastern Georgia, (2) a sequence of deposits along the Fall Zone in southeastern Virginia, and (3) the Lakehurst district in southern New Jersey. HMS are sediments containing dense (heavy) minerals that accumulate with sand, silt, and clay in coastal environments locally forming economic concentrations of heavy minerals.

Considerable resources of HMS in the form of detrital grains of titanium, ilmenite, leucoxene, and rutile, could exist in large areas of the Atlantic Coastal Plain. These heavy mineral sand deposits represent possible domestic sources of titanium that have yet to be developed. Identifying potential domestic resources of titanium is useful because titanium has significant industrial applications, and because the great majority of titanium mineral concentrates consumed in the U.S. are imported (91 percent in 2016; Ober, 2017). Only two HMS mining operations are currently (as of 2017) active in the U.S., due to closure of the HMS mines in southern Virginia.

Many prospective areas for HMS deposits in the Atlantic Coastal Plain occur near the modern shores or on barrier islands, for example, the coasts of South Carolina, southeastern Georgia, and northeastern Florida. Much of the modern coastal areas are covered by infrastructure. Thus, land-use and permitting considerations may limit mineral development along the modern coast.

The proposed activity will result in the full-time employment of approximately 150-200 workers from the local area. It is anticipated that the proposed facility will have an operational life of 8 years.

3.0 ALTERNATIVE ANALYSIS

Once it was determined that there was significant global demand for heavy mineral sands, the applicant began the site selection process. The applicant looked at various locations to conduct the mining activity. Site criteria was developed to aid in the selection process. The site criteria considered socio-economic factors for determining a suitable location for the mining activity. Those factors include:

- The location of suitable reserves of heavy mineral sands containing the target minerals suitable for mining with an average mining cut with 2% concentration;
- A 50-mile proximity to the Port of Jacksonville;
- The costs and availability of public services, facilities and improvements required to support a proposed facility and protect public health, safety and the environment;
- Cost associated with handling/transporting of material;
- The direct access to a rail line capable of linking to a port;
- The social and economic impacts of a proposed facility on the affected community; and
- The location of a proposed facility and its potential impacts on environmentally sensitive areas including:
    1) water resources including wetlands, streams, and floodplains;
    2) threatened and endangered species,
    3) cultural resources
    4) protected natural areas including the Okefenokee Swamp National Wildlife Refuge.

The applicant and its consultants identified several potential sites initially and evaluated each based on the established criteria. Additional alternatives were evaluated but eliminated. The possible alternatives were narrowed to five alternatives and a no action alternative. The alternatives included the proposed project, an alternative site, two alternative sites with only upland areas mined, and the proposed project with an alternative mining method. The site alternatives are shown on Figures 4.1-4.3 and described below.

3.1 Alternative 1

Alternative 1, the proposed project, consists of a combination of dragline and excavator/dozer trap mining at the proposed project site. Mining at the site will be accomplished utilizing dragline mining for the majority of the site. Dragline mining involves a large crane-like earthmoving machine equipped with a bucket to scoop material. Mining and initial reclamation require moving more materials than can be accomplished with standard excavation equipment. Draglines can efficiently move large quantities of material. A large-capacity bucket swings from cables on the end of the boom, scooping material that is then moved to adjacent areas. Draglines are electrically powered and run by two employees, an operator and an oiler. When mining is occurring measures must be taken to protect the areas adjacent to the mine property. Berms are constructed to ensure that muddy water does not leave the mine property and affect local waterways.

Prior to mining the trees will be harvested and the land is cleared. The berms, ponds and best management practices for sediment control are constructed and installed. The topsoil is stockpiled for use during reclamation. The permanent facilities are then constructed and installed. The mining process proceeds as follows: The dragline moves through the mining area excavating the material to be mined which is stockpiled nearby. It is then transferred to an apron feeder which feeds to a screen. This removes roots and other large objects. The material is then transferred to a pit/feed conveyor

system. The oversized organic material will be placed near the screen area for future deposit during the reclamation process. The pit/feed conveyor systems feeds a mainline feed conveyor system. The mainline feed conveyor system will incline (or feed a stacker conveyor) and then feed the trommel (screen). The trommel feeds the Pre-Concentration Plant (PCP).

In the PCP, spiral centrifuges concentrate and separate the heavy mineral sands from the lighter clays and quartz sand and then feeds the Wet Concentration Plant. The Wet Concentration Plant (WCP) further reduces and separates the material for processing. The material from the WCP is transported to the Mineral Separation Plant (MSP). The MSP separates valuable and non-valuable mineral products such as zircon, staurolite, rutile, ilmenite, etc. After products have been separated, the final products will be containerized, bulk shipped or loaded on truck or rail dependent upon customer requirements.

The tailings from the PCP/WCP area will be temporarily stockpiled. Tailing will be loaded onto the mainline tails conveyor system. The mainline tails conveyor system will convey material onto a reclamation conveyor. The reclamation conveyor deposits the tailings back into the mined pit area for reclamation.

As part of reclamation the tailings are transported from their stockpiles to the open mined area where they are deposited. The areas are then recontoured, covered with topsoil and revegetated to meet reclamation standards. The operation is a continuous process and while the dragline is operating, backfilling of the pit is occurring as well once the operation gets under way.

On the TIAA portion of the proposed mining area, excavator/dozer trap mining method will be utilized due to the shallower depth of mineral resource. The excavator/dozer trap method is utilized to mine shallower depths. This method has a limited reach, depending on the machine. It also has a lower excavation and production rate. There is more frequent relocation of the machine which results in lost production due to the relocation time. The mining process proceeds as follows: The mining unit (excavator/backhoe/dozer trap) will mine the material. The mining unit will feed a screen. The screen material feeds a pit/feed conveyor system. The oversized/organic material will be placed near the screen area for future deposit during the reclamation process. The pit/feed conveyor system feeds a mainline feed conveyor system. The mainline feed conveyor system will incline (or feed a stacker conveyor) and then feed the trommel. The trommel feeds the PCP. Once at the PCP, the process proceeds as described above.

Alternative 1, the proposed project, consists of 2,413.97-acres as depicted on the U.S. Geological Survey (USGS) 7.5-minute Topographic Maps of Moniac, Georgia and Saint George, Georgia (Figure 1). The center of the site is located near latitude 30.52490044 and longitude -82.12419891. According to the USGS Topographic Map, the elevation at the site ranges from approximately 120 to 175 feet above mean sea level.

The northern boundary of the Alternative 1 site is located approximately 3.73 miles southeast from the nearest boundary of the Okefenokee Swamp National Wildlife Refuge, providing a substantial buffer of protection for this sensitive resource. Alternative 1 contains suitable reserves of heavy mineral sands containing the target minerals suitable for mining. The heavy mineral sands underlying the site are comprised of an average of 2% concentration of the economically viable minerals. The location of Alternative 1 is located within the reasonable 50-mile proximity to the port of Jacksonville. Public services and facilities required to support the mine and protect public health, safety and the environment are available. Alternative 1 has direct rail access, which links to the port of Jacksonville. As a result, the cost of handing/transportation of materials is reduced. The implementation of Alternative 1 is expected to have a beneficial economic impact on the adjacent community due to its projected employment of 150-200 people for 8 years.

Alternative 1 contains numerous forested, shrub-scrub, and herbaceous wetlands as well as portions of intermittent streams. Stream impacts would primarily occur within partially unstable channels that have been historically impacted by agricultural/silvicultural activities. The table below summarizes the quantities of aquatic resources for the project area.

Table 2: Summary of Aquatic Resources Within the Proposed Project Area

Review Area	Wetland	Open Water	Ephemeral Stream	Intermittent Stream	Perennial Stream	Total Stream
	acre		linear feet			
Keystone Tract	544.233	0	0	297	0	297
Adirondack Tract	149.602	0	273	7.998	387	8.658
TIAA Tract	662.712	0	0	0	0	0

The proposed facility's potential impacts on environmentally sensitive areas are discussed in detail in Sections 5, 8 and 9 but are summarized here.

Table 3: Wetland Impact Summary of Proposed Project

Property	Wetland ID	Area (ac)	Temporary Impacted Area(ac)	Permanent Impacted Area (ac)
Adirondack	WA	105.551	57.665	5.512
Adirondack	WB	7.430	6.269	1.161
Adirondack	WC	2.555	2.555	0.000
Adirondack	WD	10.327	3.766	5.993
Adirondack	WE	4.233	4.233	0.000
Adirondack	WF	4.055	4.055	0.000
Adirondack	WG	5.544	0.000	0.000
Adirondack	WH	3.180	3.180	0.000
Keystone	WA-1	58.667	58.661	0.000
Keystone	WA-2	153.254	138.572	14.164
Keystone	WA-3	103.714	98.964	4.004
Keystone	WA-4	19.097	19.097	0.000
Keystone	WA-5	5.160	5.160	0.000
Keystone	WA-6	28.786	28.786	0.000
Keystone	WA-7	11.596	10.690	0.906
Keystone	WB	2.121	0.921	0.815
Keystone	WC	0.920	0.000	0.534

Property	Wetland ID	Area (ac)	Temporary Impacted Area(ac)	Permanent Impacted Area (ac)
Keystone	WD	6.323	1.868	4.335
Keystone	WF	0.704	0.000	0.704
Keystone	WG	5.663	0.000	5.663
Keystone	WH	13.411	0.000	13.411
Keystone	WI	6.069	0.000	0.000
Keystone	WJ	1.071	0.000	0.000
Keystone	WK	0.412	0.188	0.222
TIAA	WB	0.439	0.017	0.000
TIAA	WC	639.858	77.263	7.708
	TOTAL		**521.910**	**65.132**

Table 4: Stream Impact Summary of Proposed Project

			Total		Temporary Impacts		Permanent Impacts	
Property	Stream ID	Classification	Length (LF)	Area (AC)	Length (LF)	Area (AC)	Length (LF)	Area (AC)
Adirondack	S-1p	Perennial	387	0.064	0	0	0	0
Adirondack	S-1i	Intermittent	3051	0.307	0	0	2238	0.074
Adirondack	S-3	Intermittent	2161	0.156	0	0	0	0
Adirondack	S-5	Intermittent	639	0.051	0	0	639	0.011
Adirondack	S-6	Intermittent	315	0.025	0	0	315	0.025
Adirondack	S-6A	Intermittent	486	0.027	0	0	486	0.017
Adirondack	S-7	Intermittent	485	0.033	0	0	485	0.033
Adirondack	S-10	Intermittent	198	0.019	0	0	198	0.019
Adirondack	S-11I	Intermittent	71	0.005	0	0	0	0
Adirondack	S-11E	Ephemeral	273	0.019	0	0	0	0
Keystone	S-1	Intermittent	297	0.020	0	0	297	0.02
	TOTAL		**8363**	**0.726**	**2454**	**0.204**	**4658**	**0.199**

Alternative 1 provides habitat for the federal candidate, state listed threatened gopher tortoise and federal candidate, state listed rare gopher frog. Gopher tortoise and gopher frog will be relocated. A detailed discussion of the project's effects on special status species is provided in Section 8.0. With the implementation of these mitigation measures, Alternative 1 is not expected to have an effect on these species.

A cultural resource survey identified a total of 16 archaeological locations within the extent of the permit area. These included 7 isolated finds and 9 archaeological sites. Of these sites, 5 are the remains of early-to-middle-twentieth century domestic assemblages. None of the sites were recommended as eligible for NRHP inclusion and isolated finds are, by their nature, ineligible for NRHP inclusion. One resource was located outside of the permit area boundary is recommended as potentially eligible for NRHP inclusion under Criterion C. This resource is a mid-century ranch home constructed in 1950. Though currently abandoned, the integrity of the structure is intact and its architecture is significant as a representative example of a mid-twentieth century ranch house. The