Mining in Eastern Bradford County & Western Clay County

Past and Potential Future Environmental Impacts
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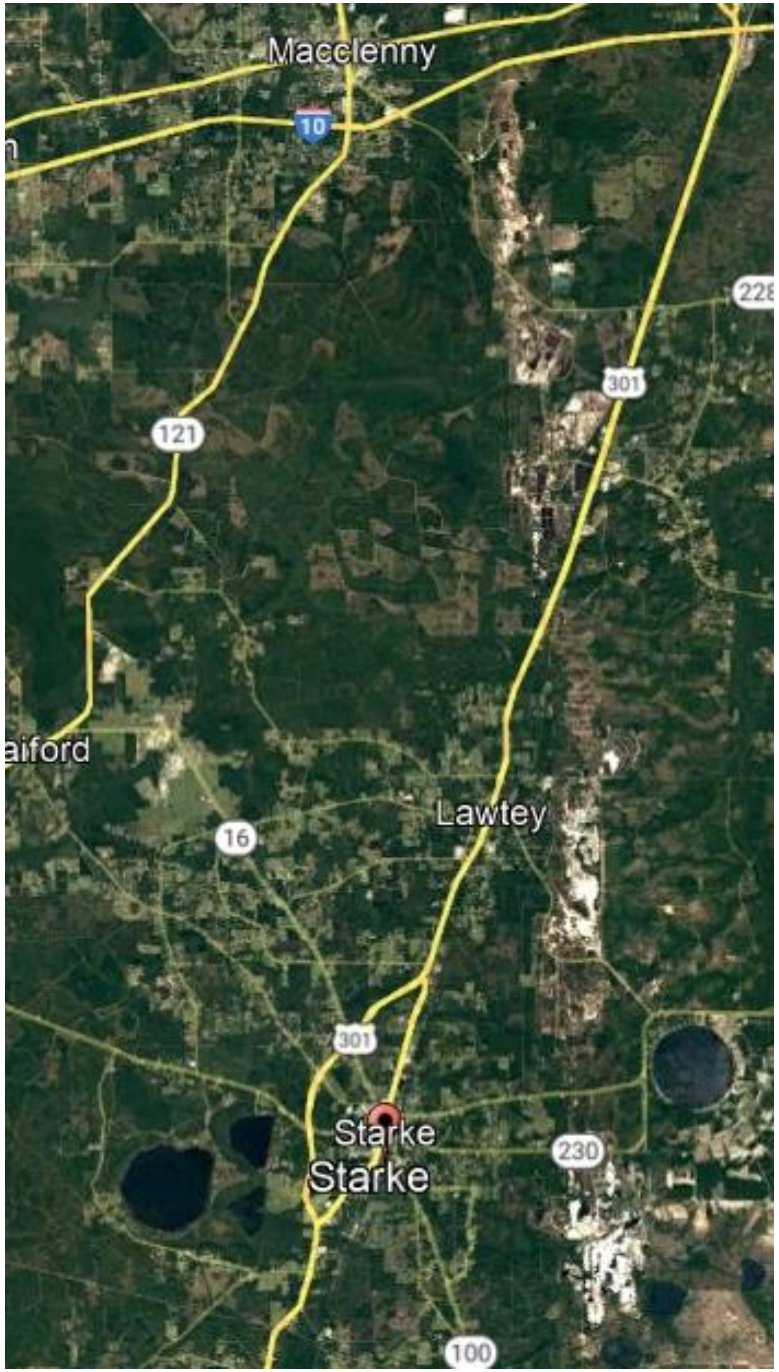
Mining along Trail Ridge east of Starke for titanium containing minerals by the DuPont Company began around 1949. The processing plant was east of Starke on Camp Blanding property. In 1958 a processing plant was added at Lawtey.

In 2015 DuPont spun off Chemours.

Current mining is in Baker County and the Trail Ridge South mine north of the Keystone Heights Airport.

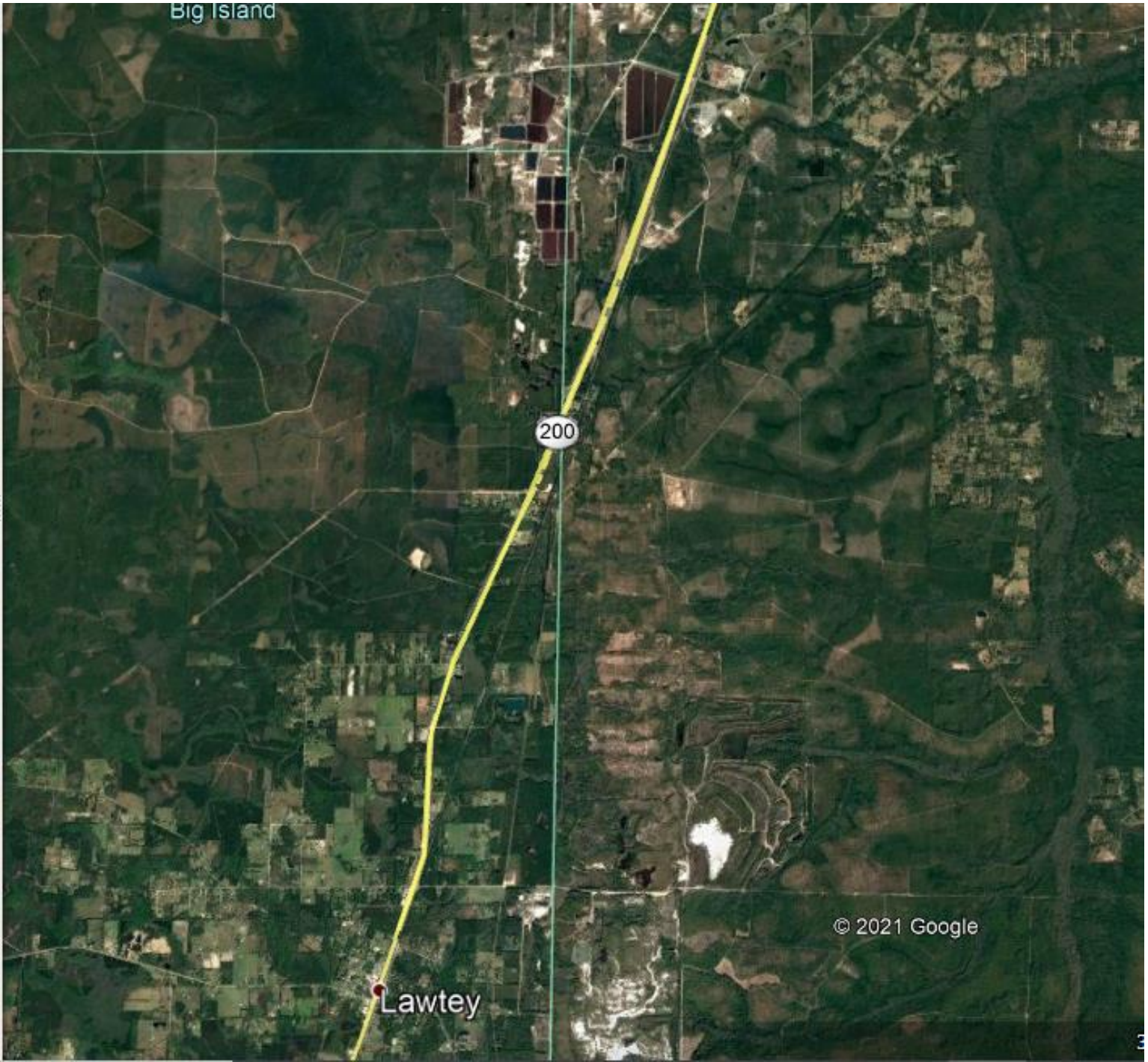
What are the minerals being mined?

- **Ilmenite**, a titanium bearing mineral, is used to produce TiO_2. It is estimated that every person in North America uses 10 pounds of TiO_2 each year for clothing, paper, paint, sun block, and other products.
- **Staurolite**, a very hard mineral, is an excellent blasting abrasive for surface preparation. This product is critical to construction and infrastructure improvement projects. As a low-dusting and recyclable abrasive, staurolite is a preferred choice for environmental or occupational health concerns.
- **Zircon**, a zirconium bearing mineral, is used in the production of porcelain tile and china. When ground to a flour, zircon is used in the casting of high-performance parts for military and aerospace applications.



Trail Ridge mined area from Macclenny to Starke

Dredge and concentrator south of Lawtey 2005



North of Lawtey

DuPont/Chemours old mined areas and new area to be mined

Mined area along CR 225 south of Lawtey. The curve in CR 225 was created to allow DuPont to mine the area under the original CR 225. The area west of the yellow line is in Bradford County.

Dredge separated from the concentrator south of Lawtey 2006

Dredge and concentrator gone in 2009

The previous two slides showed the dredge in Clay County. This fact and other satellite imagery indicates that mining in Braford County ended before 2005.

The reclamation of the area along CR 225 in Bradford County did not begin until 2023, 18 years after mining was completed.

When the Chemours attorney ask for a workshop on the revisions to the parts of the Bradford Comprehensive Plan and Land Development regulations related to mining she indicated that impacts to wetlands were temporary and that Chemours restored wetlands after they were mined.

The mined site along CR 225 south of Lawtey does not support that claim. DuPont and now Chemours has taken over 18 years to even start the reclamation process.

In reality wetlands cannot be restored after mining because the complex geological structure under the surface soils cannot be duplicated in the reclamation process. The geological structure that influenced formation of the original wetlands on a site.

The only way to protect wetlands is not to mine them.

Environmental Impacts of Mining

Loss of functioning wetlands systems

Loss of productive forestry sites

Reduction in surface water quality

- Iron and toxicity

Reduction in groundwater quality

- Iron

Alteration of surface water flows

Flooding

Area being reclaimed that we will be viewing from CR 225

Serious erosion
East of CR 225

Chunks of humate
and black water
With high humate

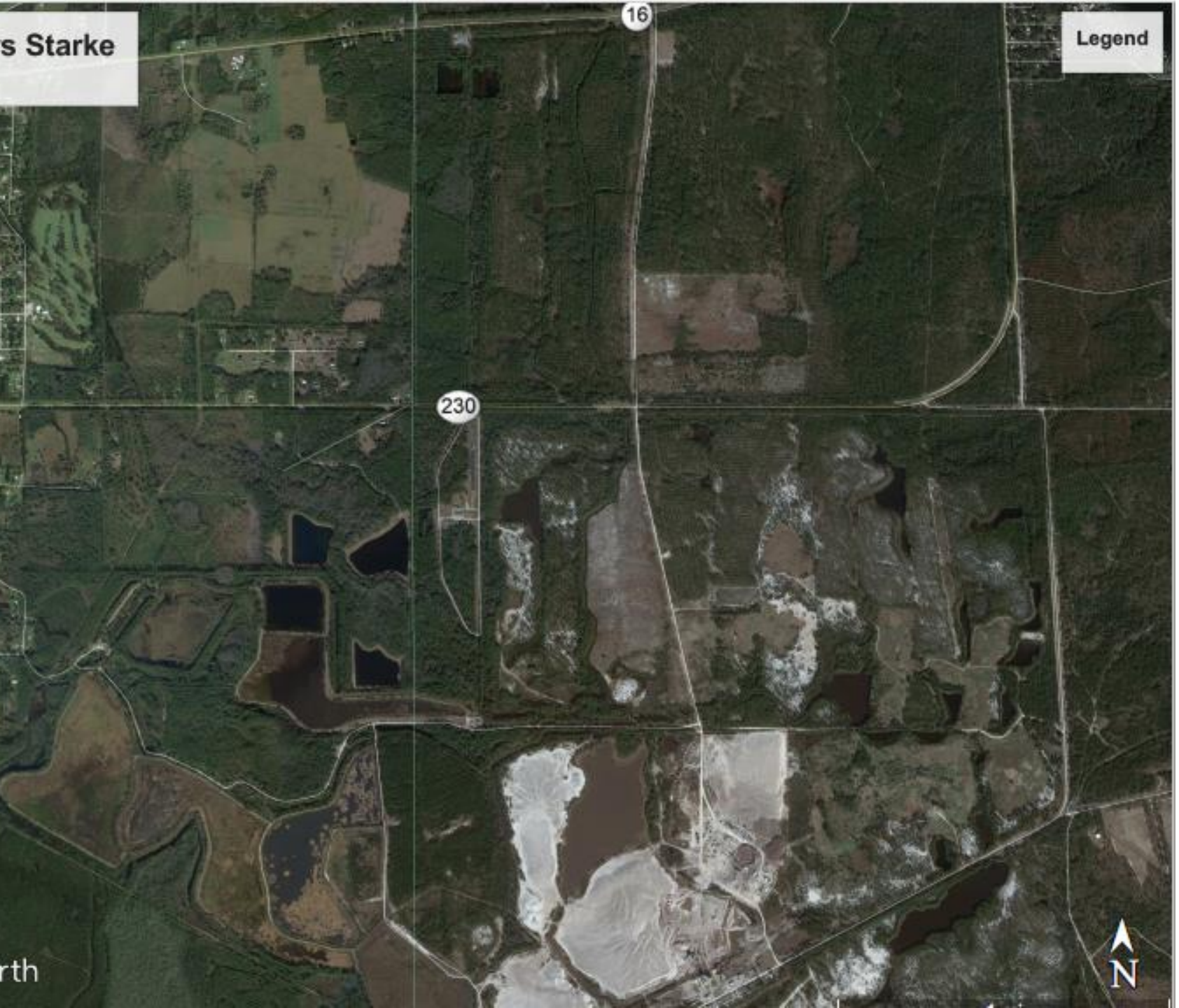
Black water on the west side of CR 225 curve

Serious erosion
East of CR 225

Reclamation site in 2013 note the large rocks to help reduce erosion

Reclamation underway June 2023 large rocks still visible

Reclamation underway
June 2023



Chemours processing facility east of Starke bottom center right and Industrial Wastewater settling ponds center left.

The black humate containing water seen in the previous sides was treated by adding iron salts. Tons of iron were added and remain in the settling ponds.

Pre mining in 1949 with the DuPont plant being constructed

2019 Bradford Property Appraiser web site. Note how close homes to west are to the elevated settling pond dams.

3/1/2018, Florida Mine Trail Ridge Treatment Pond System: Pond G exterior dam wall, heavy vegetated, railroad track visible in distance, looking southwest

3/1/2018, Florida Mine Trail Ridge Treatment Pond System: Pond N interior, smouldering humate next to berm

3/1/2018, Florida Mine Trail Ridge Treatment Pond System: Pond K interior, areas of subsidence where humate burned last year

3/1/2018, Florida Mine Trail Ridge Treatment Pond System: Pond K exterior, berm is forested, open water in linear borrow pit/ditch within 20-30 feet of toe of berm; water is iron-stained

3/1/2018, Florida Mine Trail Ridge Treatment Pond System: Pond L berm interior, high-water outfall structure visible at left of photo (allows water to discharge to toe ditch outside of pond system)

3/1/2018, Florida Mine Trail Ridge Treatment Pond System: Pond L berm exterior, high-water outfall culvert (allows water from pond L to discharge to toe ditch outside of pond system)

Chemours appears to be claiming the water held on the outside of settling pond dams is not Industrial Wastewater even though it appears that the source of the water could be the pipe in the previous slide and that source was Industrial Wastewater that had not completed the water treatment process.

3/1/2018, Florida Mine Trail Ridge Treatment Pond System: NPDES D-001 outfall flowing during inspection

SR 230 Bridge over Alligator Creek near the Clay County line on 6/25/21. The Chemours Industrial Wastewater Canal joins the original Alligator Creek just up stream of the two bridges. Image taken form the bridge note currently used for traffic

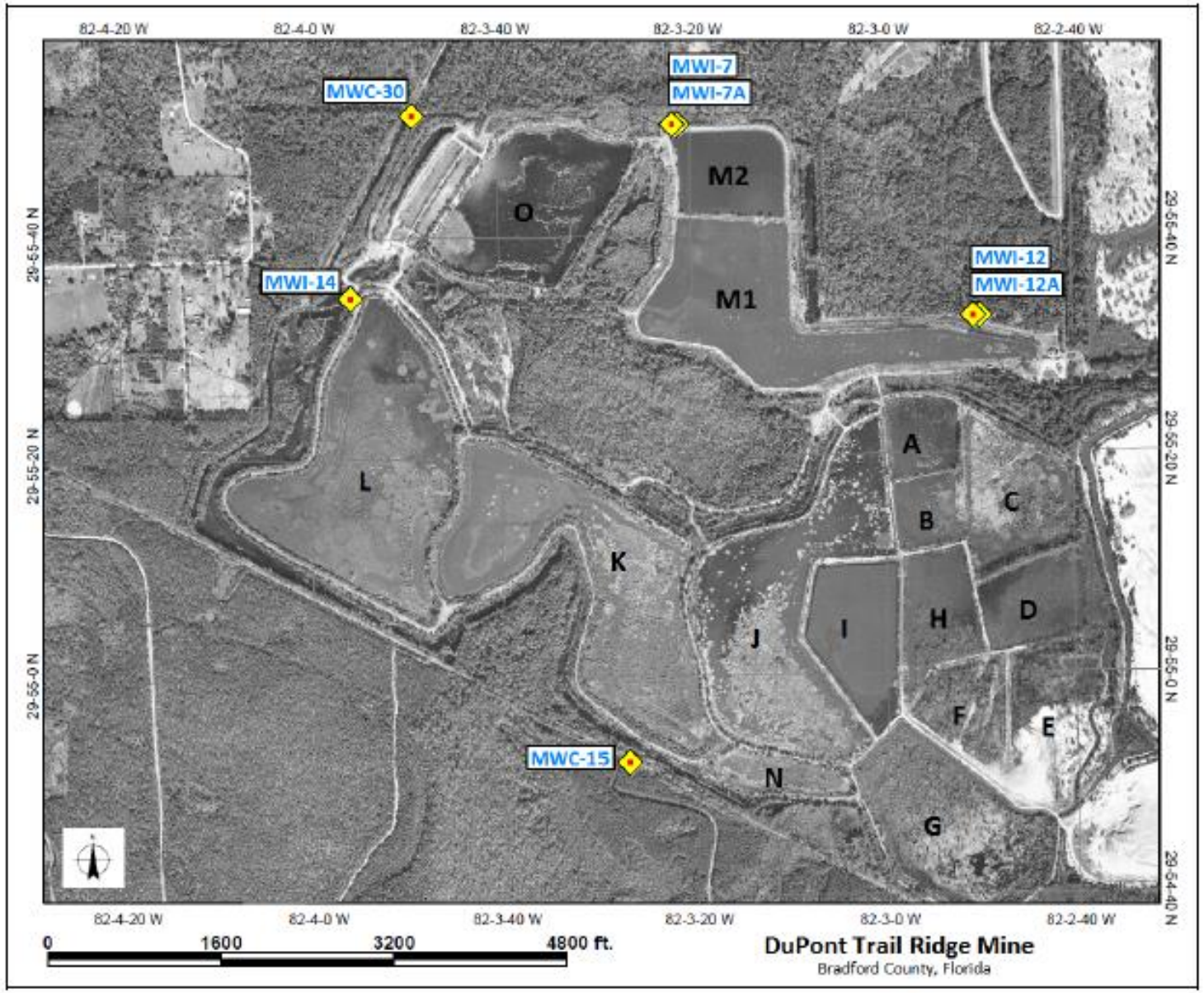
SR 230 7/8/21
During high flow events the water from the Industrial Wastewater Canal on the left can be more turbid than flow from the original Alligator Creek on the right.

Water being discharged can look good but can have a high iron content and be toxic to test organisms

Clean Water Act iron limit for surface water is 1 mg/L which Chemours was not able to meet.

The Florida Department of Environmental Protection has allowed Chemours to discharge water with iron concentrations up to 2 mg/L for 5 years while Chemours works to bring iron levels down to below 1 mg/L

Iron in groundwater

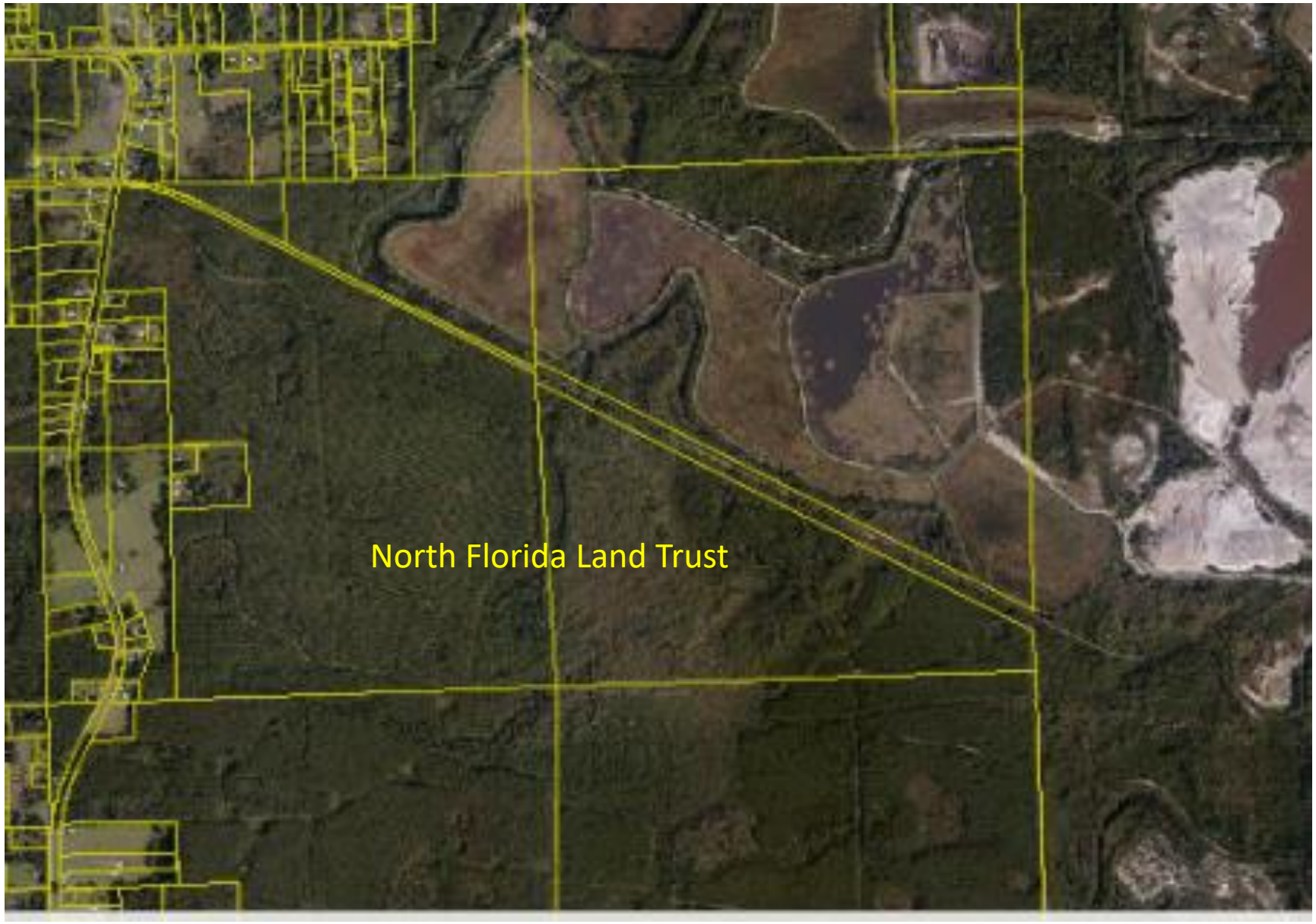


Iron drinking water standard 0.3 mg/L

Iron Levels mg/L June 2021

Background well	0.22
MWI-7	3.7
MWI-7A	11
MWI-12	5.6
MWI-12A	49
MWC 30	22
MWI-14R	17
MWC-15	30

Impacts of Iron on Wetlands and Waterbodies



Iron bacteria and iron staining in railroad ditch receiving water from the Chemours property.

Wetland impacted by fire and high iron content water.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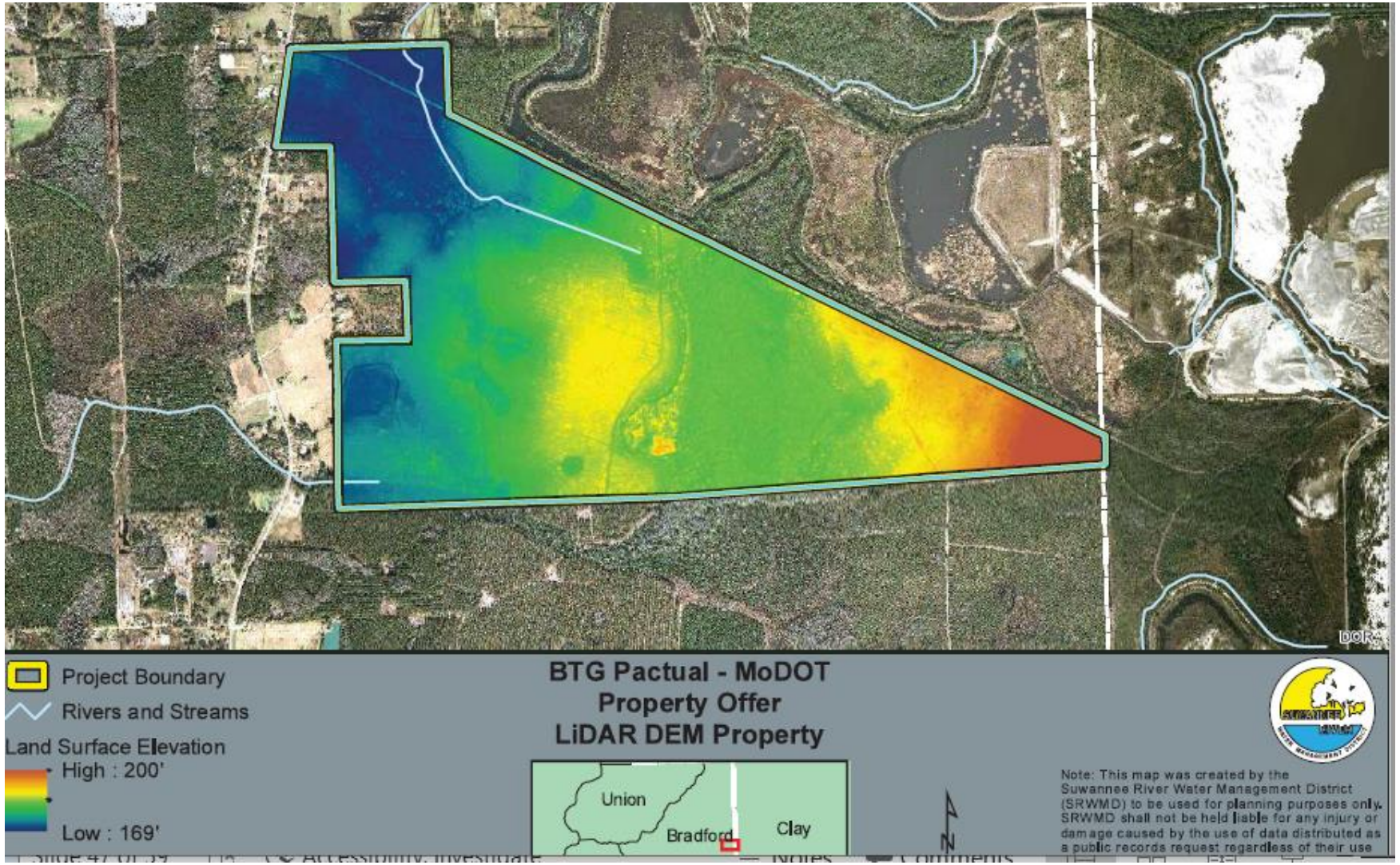
North Florida Land Trust wetland impacted by fire and high iron content water.

Flooding

Chemours water flowing over train tracts on 7/8/21 from Elsa



Flow of water under and over train tracks was documented during Elsa. The blue added line appears to be the path that carries the water north and eventually into Alligator Creek

Potential flow of water along train tracks to Alligator Creek. This flow has not been measured and the iron content officially monitored.

3/1/2018, Florida Mine Trail Ridge Treatment Pond System: NPDES D-001 outfall flowing during inspection

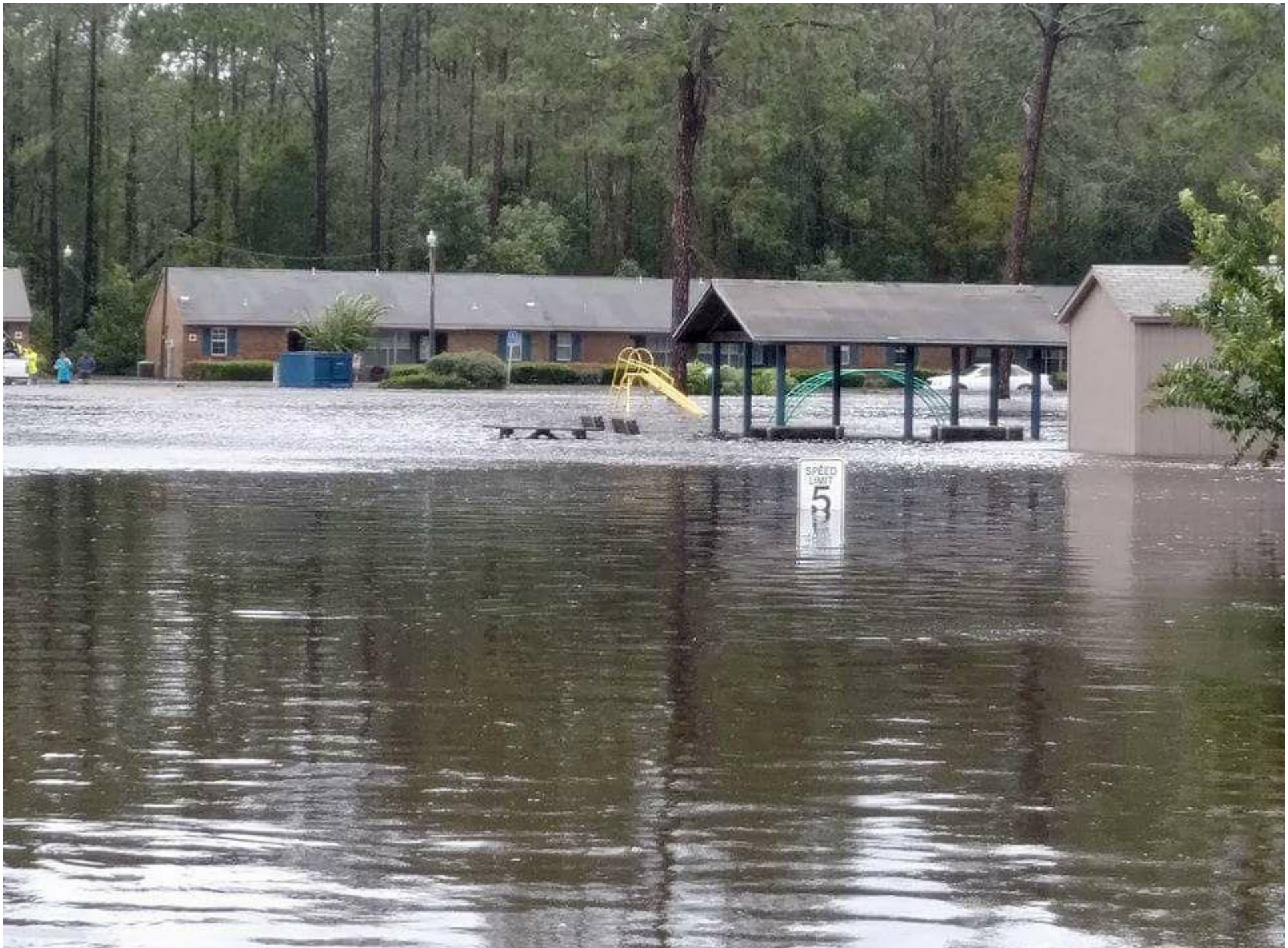
The Chemours permit allows it to discharge
40 Million Gallons a Day of treated wastewater

Chemours Irma discharges

9/11/2017	58 MGD
9/12/2017	63 MGD
9/13/2017	59 MGD
9/14/2017	55 MGD
9/15/2017	52 MGD

NE 17th Ave
Irma

NE 17th Ave
Irma



Orange Wood Apartments on SR 100 south after Irma

Location of the new Trail Ridge South Mine that is beginning operation

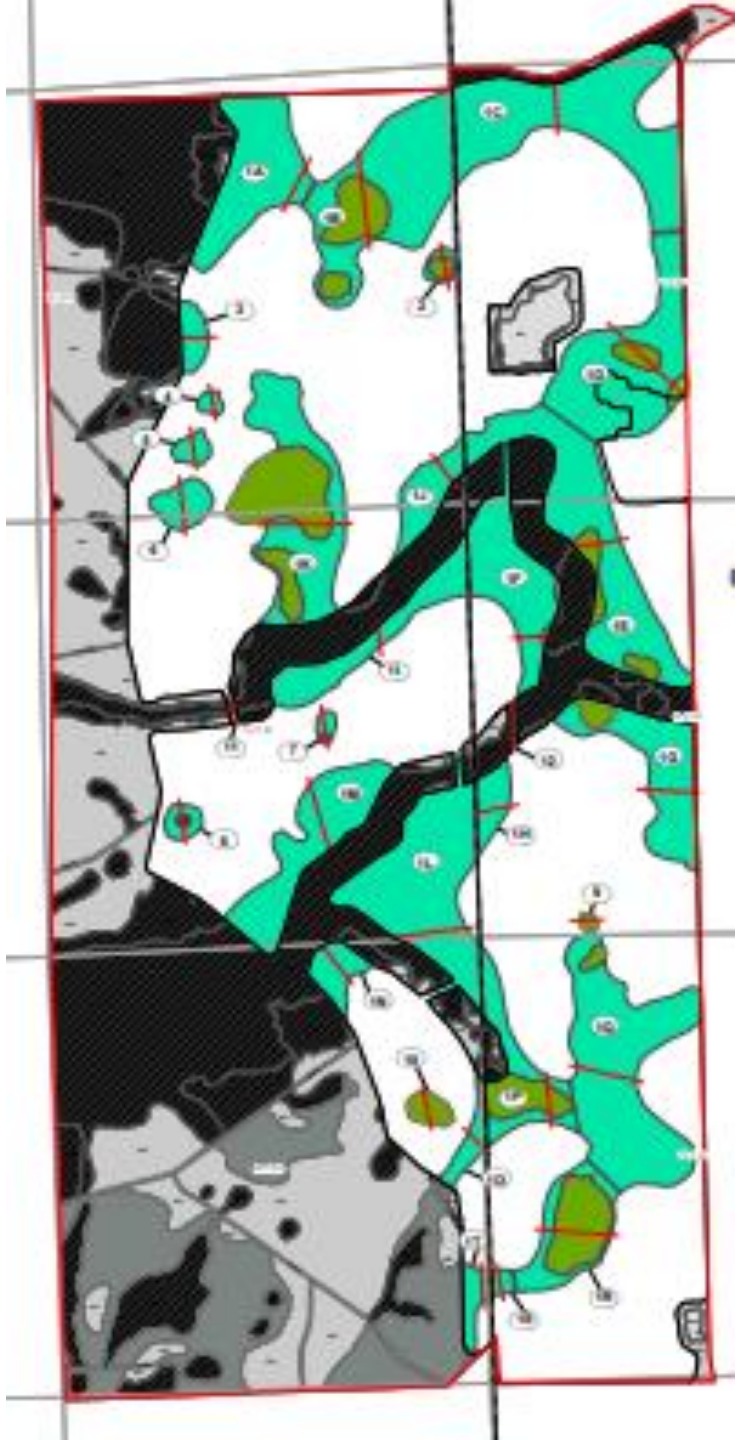
The proposed new mine will not use a dredge.

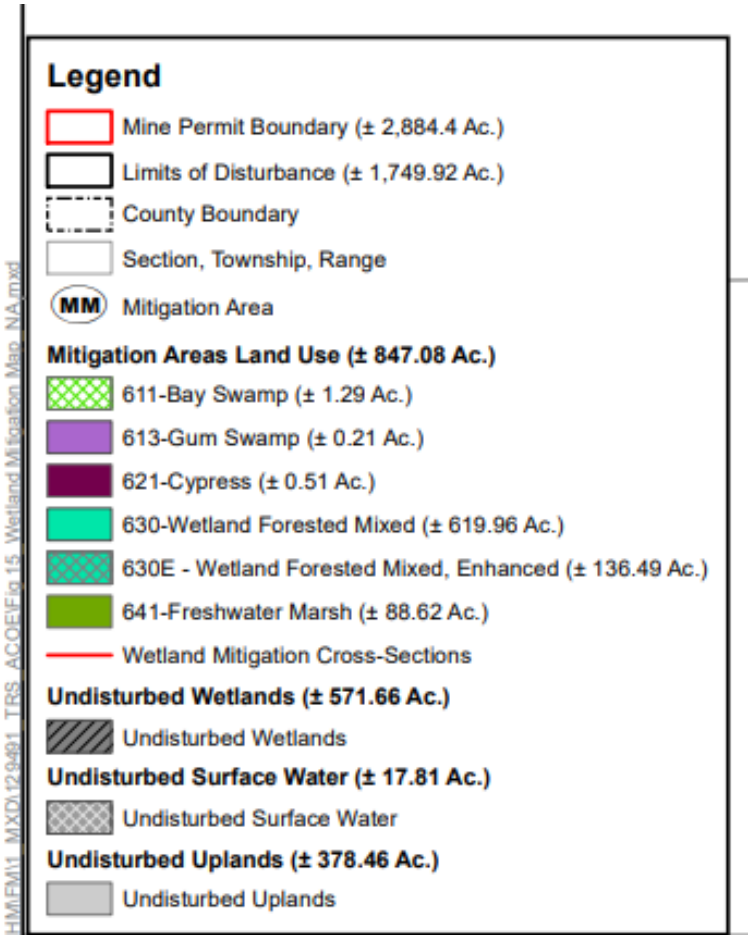
Chemours will dump the dry materials in a mixing
unit add water and pump the material in pipes to a land based
concentrating plant and them pump the unwanted sand and
humate back to a finished mine pit.

11/15/2017,
Maxville Mine: new mobile mining unit

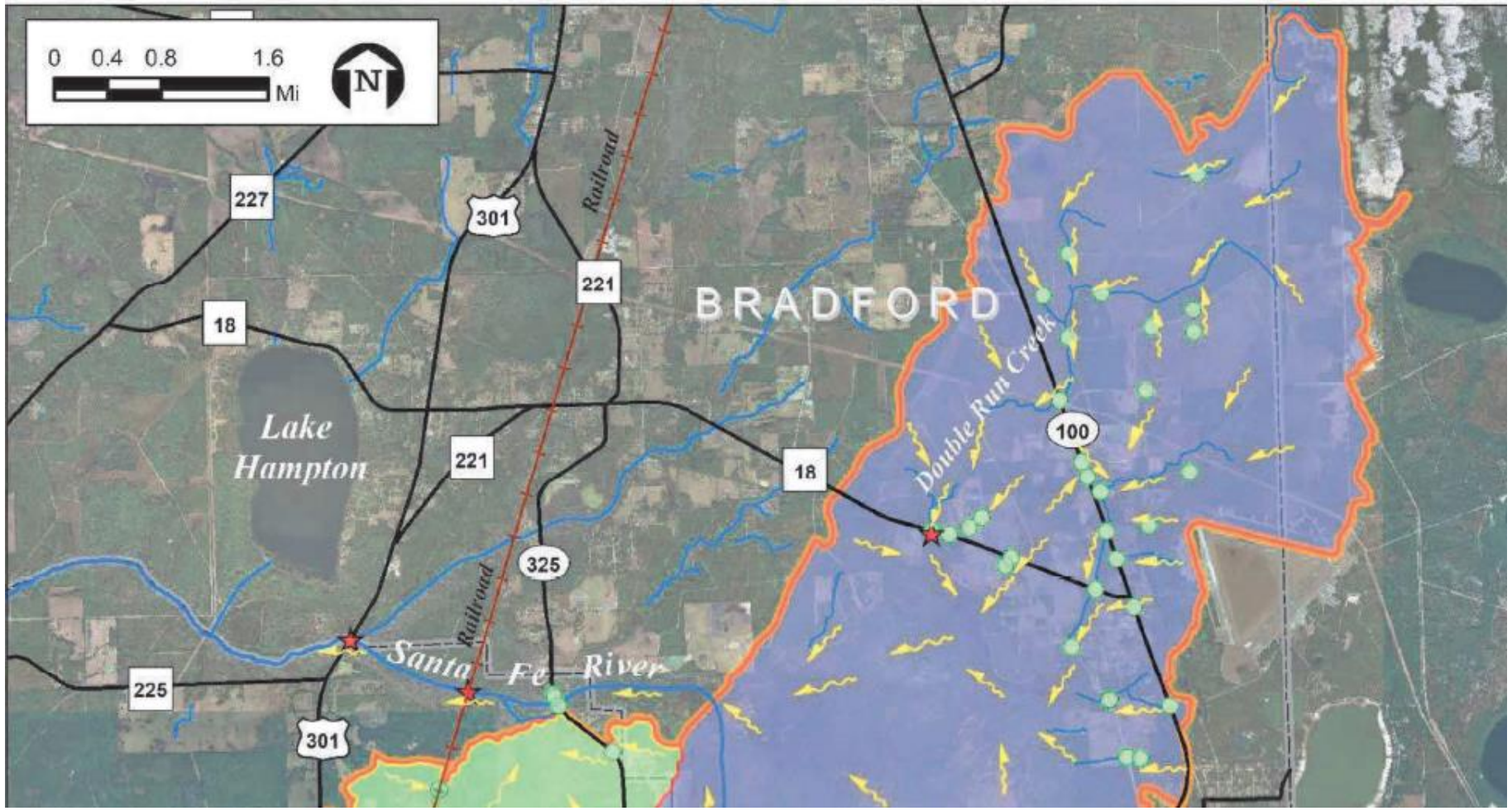
Maxville Mine, 9/6/2018: Mobile Concentrator

New mine area outlined in red the part of the mine in Bradford County is on land Owned by the Suwannee River Water Management District.





The 740 acres of wetlands to be mined
In Bradford County are in shades of green.



The stream that receives the Industrial Wastewater from the Trail Ridge South Mine is Double Run Creek shown in the drainage map. The map shows the flow going to the Santa Fe River. Water from the northern part of mined area in Bradford County not shown on the map also flow to the Santa Fe River through several different steams.