Ontario

We are committed to providing accessible customer service.
If you need accessible formats or communications supports, please contact us.

Nous tenons à améliorer l’accessibilité des services à la clientèle.
Si vous avez besoin de formats accessibles ou d’aide à la communication, veuillez nous contacter.

TRANSITION METALS CORP.

Property Summary

PROPERTY NAME: Seabrook Lake – Maeck Twp

COMMODITY: Nb, REE

DEPOSIT MODEL: carbonatite

NUMBER of CLAIMS: 09 units
41J14K010 (199120)
41J14K011 (265755)
41J14K012 (246198)
41J14K030 (186947)
41J14K031 (179504)
41J14K032 (281409)
41J14K050 (134305)
41J14K051 (123565)
41J14K052 (108853)

PROPERTY STATUS: application for COVID relief is pending

AGREEMENT DETAILS:

LOCATION- **PROVINCE**: Ontario
TOWNSHIP: Maeck
NTS: 41J14

OWNER(S)- **Name**: 33% Cliff Hicks
33% George Lucuik
34% Jim Ralph
Company:
Address:
e-mail:
phone :

INFRASTRUCTURE:
Located approximately 84 km north of Thessalon, and about 8 km west of highway 129

PREVIOUSLY REVIEWED/FIELD EXAMINED: NO

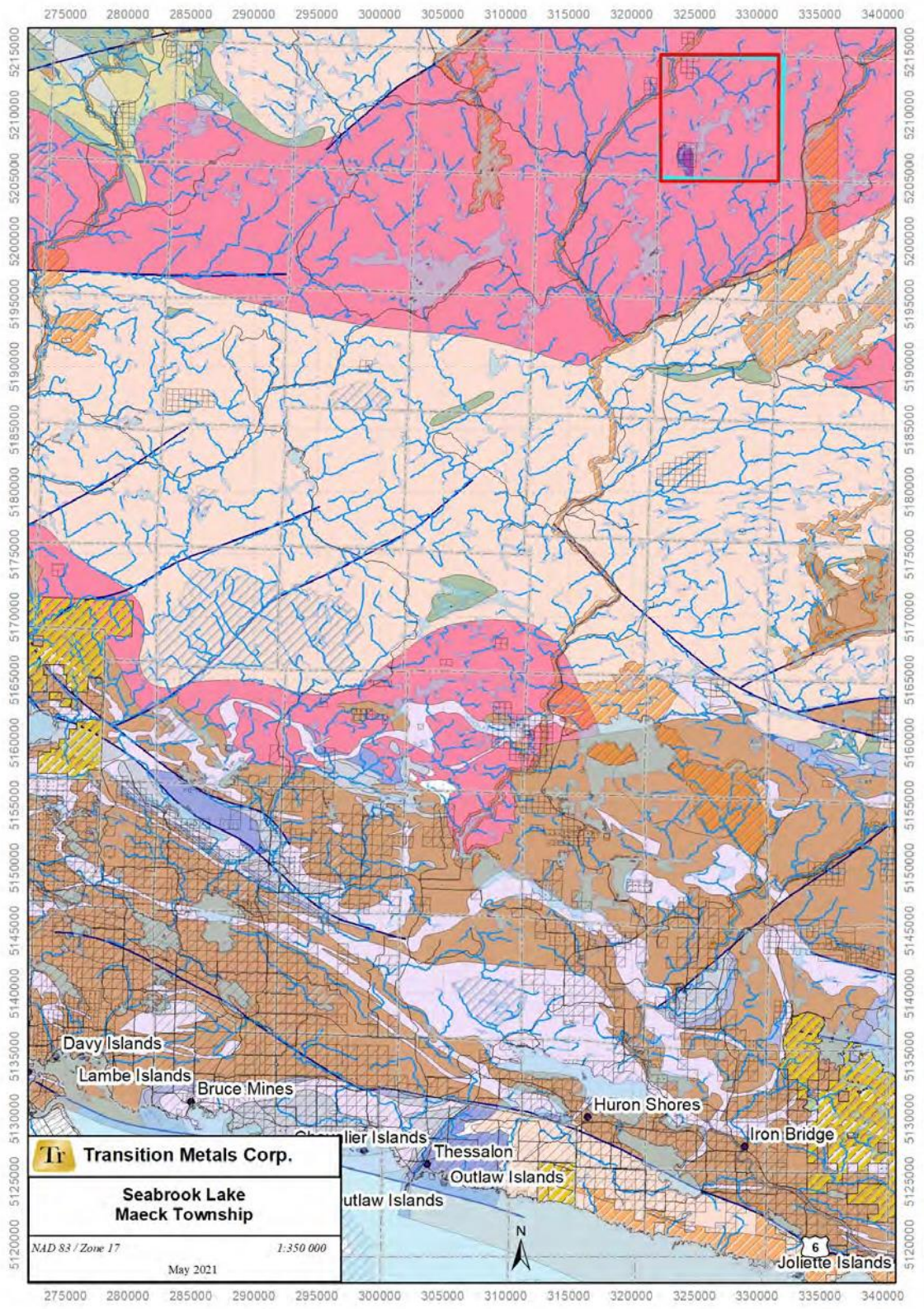
OFFICE REVIEW:
Previous Work:
From OGS report S031

1955: W. Bussineau drilled four holes totalling 173 m to test for niobium mineralization, but results were negligible and only 2 of the holes were collared in the main body of the carbonatite. The higher niobium values were reported to be associated with abnormal radioactivity and concentrations of magnetite. Parsons (1961) reported that bulldozer stripping was attempted to extend the showings of hematite-bearing rock. Reports indicate that some trenching was completed and that four selected grab samples assayed 0.60, 1.50, 4.70 and 10.30% niobium oxide.

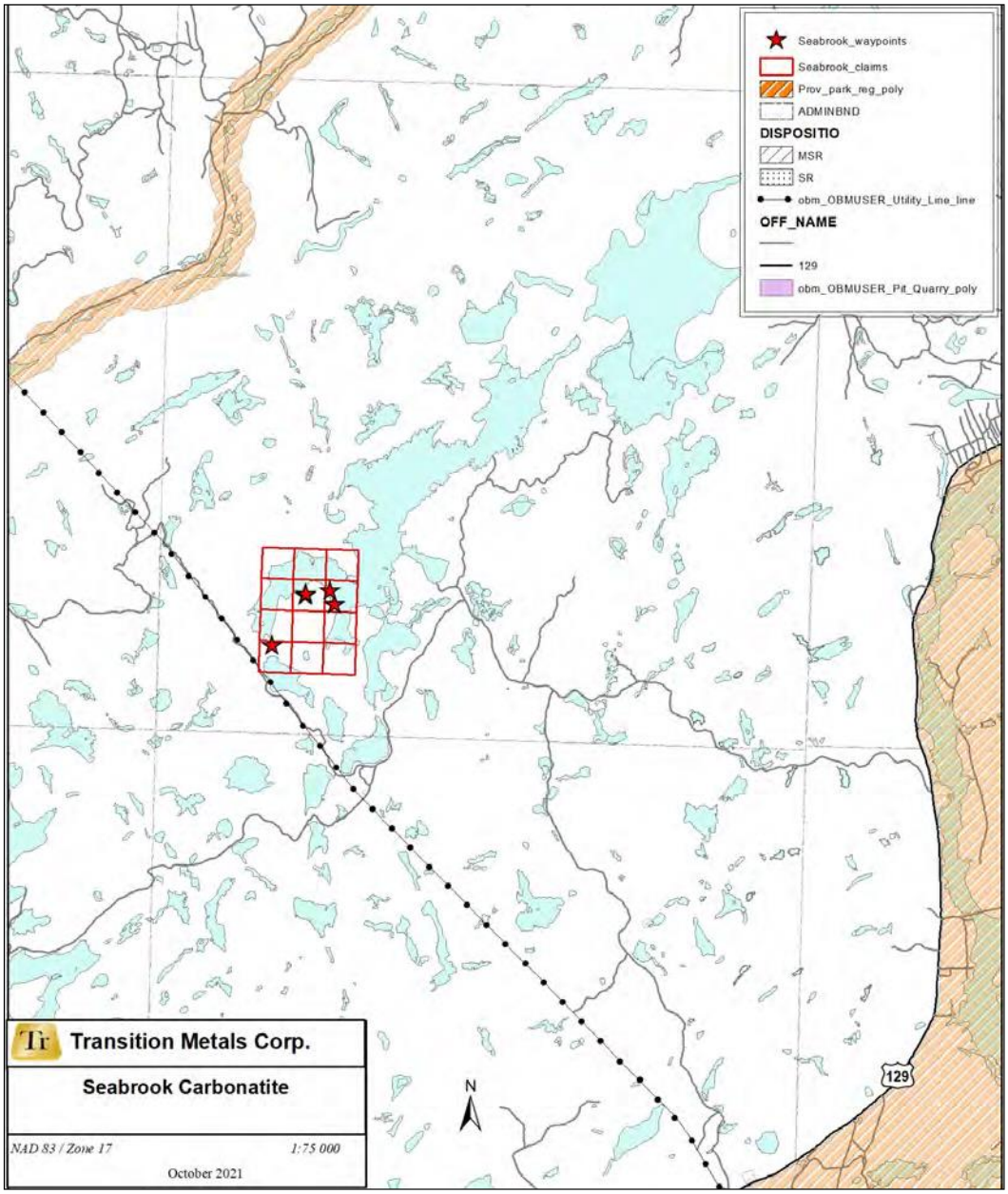
1956-1957: K.R. Taylor and R. Ahearn filed logs for the five holes previously mentioned under the

Bonin property. Sketch maps accompanying the logs would indicate some pitting was also completed. There is also a record of 3 diamond drill holes totalling 122.4 m with the drill logs indicating the holes encountered traces of chalcopyrite.

1957: L.M. Taylor completed two diamond drill holes totalling 108.6 m but the location of the holes is not known, and it is unclear if any mineralization was intersected.



1957: F.R. Joubin completed a geochemical soil survey and a limited amount of trenching concentrating on the main peninsula jutting into Seabrook Lake. Higher niobium values were reported to occur in association with concentrations of magnetite.



Seabrook Carbonatite with the red stars indicating the sample sites

1957: Tarbutt Mines Ltd. completed a grid and magnetometer survey and likely completed at least 16 packsack diamond drill holes, but the logs of only 11 can be located. The company completed 3 holes totalling 37.1 m, on located on the south side of a small bay on the east side of Seabrook Lake. Five holes totalling 49.5 m were drilled south of Sigel Lake, Rollins Township with the logs recording mostly granite and diabase, however carbonate veinlets and brecciation, both of which may be related to the complex, were noted. Available drill records indicate that the 11 holes for which records could be found totalled 111.7 m.

1957: Isaic Bonin completed five diamond drill holes totalling 180 m, but the collar locations are not known. The drill logs indicate that mineralization of economic interest was not encountered.

1971: Canpac Minerals and Gunnex Limited cut a grid, completed a geological survey, a geochemical survey, a magnetometer survey, and scintillometer survey. The complex was interpreted to

be basin shaped with contacts dipping steeply inward. The geochemical soil survey indicated that the more anomalous niobium values occur along the margins of the complex. Samples taken from old pits and trenches returned niobium values of 0.02 to 0.90% but of 28 niobium assays only 4 were in excess of 0.10%.

1974: International Minerals and Chemical Company completed a geological survey of the complex and 19 samples were collected and assayed for P_2O_5. The samples averaged 1.39% P_2O_5 with the highest value being 5.16% and the lowest 0.10%. The values are erratic, with the most consistent values being associated with ijolite at the south end of the complex.

1988: Ron Sage (S031) considered that these zones are not likely to contain a large tonnage of niobium mineralization. Development of this complex could most likely happen if an area could be delineated from which several mineral commodities could be produced, that is, pyrochlore, apatite and vermiculite. However, a hematite-rich carbonate sample from the complex returned 0.47% cerium oxide and 0.22% lanthanum oxide.

2009-2012: TNR Gold Corp. and C. R. Hicks conducted brief field programs in 2011 that returned indicated Nb_2O_5 values over 300 ppm. In 2011 and 2012 soil sampling programs were conducted consisting mainly of an 8-line kilometre soil sampling survey along 13 east-west trending line and consisting of 338 samples.

Geology:

From OGS report S031

The Seabrook Lake Carbonatite Complex has a K-Ar isotopic ages from biotite of 1109 and 1107 Ma and consists predominantly of carbonatite and ijolite. The carbonatite rocks are found in the northern portion of the complex, are highly variable in mineral content and texture, and are locally rich in hematite. Carbonate and biotite are the dominant minerals but pyroxene may locally be present in major quantities.

South from the carbonatite rocks is an elongated body of ijolite, composed principally of nepheline and pyroxene. This rock unit is highly variable in composition changing from pyroxenite with <10% nepheline to pegmatitic segregations of urtite with >70% nepheline. The unit is massive, medium to coarse grained, equigranular, varying from black to dark green in the pyroxene-rich phases to pale pink in the urtite phases. In thin section most samples that were originally mapped in the field as pyroxenite contain sufficient nepheline to be classed as ijolite with 30 to 70% nepheline. One sample contains sufficient potassium feldspar to be classed as malignite.

Enveloping the carbonatite and ijolite rocks is a zone of fenitized granite breccia consisting of pink to red-brown clasts of altered granitic rock in a fine-grained dark matrix of altered and comminuted rock. Outward from the altered breccia is an up to 300 m zone of fenitized granite. Farther away from the complex the granite becomes increasingly less altered and fenitized.

The granitic rocks, but not the carbonatite complex, are cut by a set of northwest-striking diabase dikes. Small dikes of carbonate-rich rock and lamprophyre cut the granitic rocks in several places.

2012 sampling results

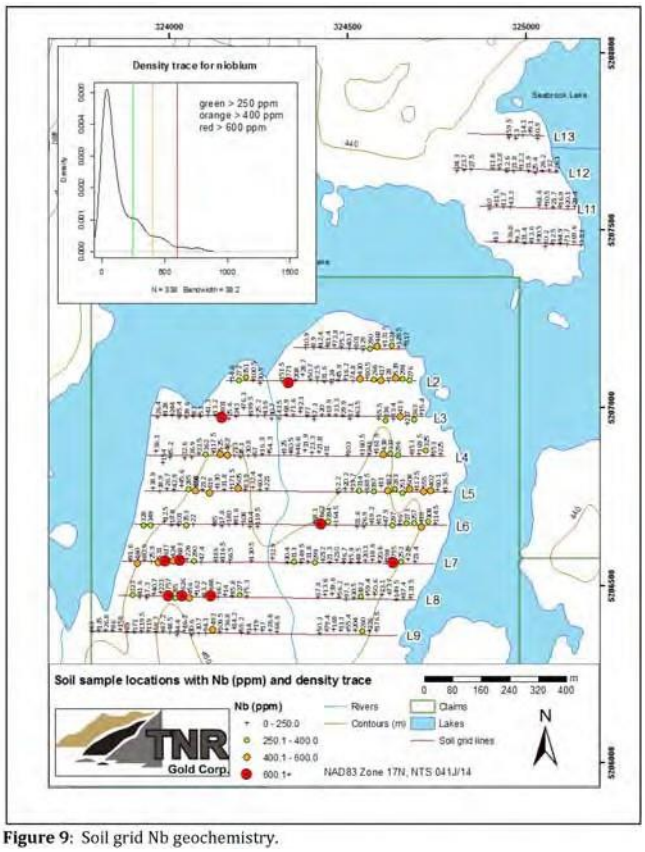


Figure 9: Soil grid Nb geochemistry.

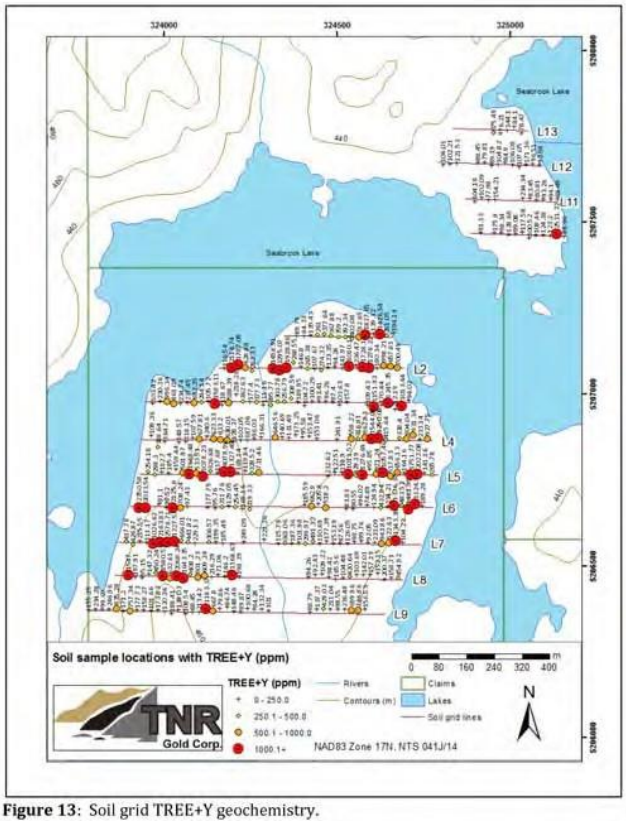


Figure 13: Soil grid TREE+Y geochemistry.

The recommendations from the 2012 program which do not appears to have been followed up were:

1. Increase soil sampling density around areas with elevated Nb values to test for potential geochemical trends.
2. Investigating into which technique would be best suited for geochemical sampling of bog areas to test for Nb mineralization.
3. Compiling all historic and current data, in order to plan a preliminary drill testing program the most effectively.
4. Preliminary drill testing for subsurface carbonatite occurrences and rare metal mineralization at depth.
   4.1 Preliminary drill testing of areas with Nb mineralization >600 ppm, especially where there are known outcropping carbonatites. Attention should particularly be paid to the southwest and northwest portions of the silicocarbonatite rim where Nb mineralization has been reported in the past.
   4.2 Preliminary drill testing of bog areas where there is potential underlining sovite to test for subsurface carbonatite occurrences and rare metal mineralization at depth.
5. Special care should be taken with core logging and mineralogical descriptions, particularly to recognize and locate potential rare metal hosting minerals that may be present which would ultimately help to constrain mineralization.

FIELD VISIT:

The property was visited on September 15, 2021 by Grant Mourre and Tom Hart with Cliff Hicks and Jim Ralph, two of the three property holders. Once a boat was located, the group travelled across Seabrook Lake to the south shore to visit four locations. Three of the locations were within the carbonatite while the fourth location was along the south contact with the adjacent Archean gneisses. A total of eight samples were collected and submitted for analyses using a lithium borate fusion – acid digestion method to decrease the chances of less than complete digestion of any refractory mineral phases (Figure)

Samples consisted mainly of ijolite, locally brecciated with sovite as shown in the photo 1 at site 1 along the east shore of the peninsula. Site 2 was underlain by sovite and sovite dykes with portions of the outcrop displaying a banded texture. Site 3 lacked outcrop and a sample was collected from the rubble of a completely overgrown historic trench and consisted of a very hematite-rich sovite. The trench at site 3 was undercut by a diamond drill hole located about 15 m to the south. Site 4 was underlain by a fenitized granite to granite gneiss which is the country rock along the south side of the carbonatite.

Boat was Rented for $60 and the motor was my own which rents for $60 for a total of $120.

Sample	Site	East	North	map	description
L782583	1	324799.34	5206930.57	ijolite locally brecciated, sovite	dk gry-blk, tr-1% mg diss py 3-5% bio w rndd frag to 5 cm of siliocarb (bx?)
L782584	1	324799.34	5206930.57	ijolite locally brecciated, sovite	dk gry-blk, tr-1% mg diss py 3-5% bio w rndd frag to 5 cm of siliocarb (bx?)
L782585	1	324799.34	5206930.57	ijolite locally brecciated, sovite	vcg bio-feld-px w carb, hly frtd with n-trending fabric, rusty weathered surface
L782586	1	324799.34	5206930.57	ijolite locally brecciated, sovite	dk gry-blk w 15% wh carb, m-cg, mass
L782587	2	324724.32	5207132.52	sovite, sovite dykes, hematite sovite	m-cg wh to gry qtz-feld-carb w flow bndd text
L782588	2	324724.32	5207132.52	sovite, sovite dykes, hematite sovite	m-cg wh to gry qtz-feld-carb w flow bndd text
L782589	2	324724.32	5207132.52	sovite, sovite dykes, hematite sovite	dk gry-blk w 15% wh carb, m-cg, mass
L782590	3	324372.35	5207082.40	hematite area, silicocarbonatite, locally brecciated, sovite	mg mass red-brn hly oxidized from trench rubble drill test near casing
	ddh	324357.21	5207064.38		north dipping
L782591	4	323868.10	5206319.55	fenitized granite	mass to gn text mg dk gry blk interbndd with gr

Ijolite is a foidolites which are coarse-grained intrusive igneous rock with a feldspathoid mineral content greater than 60% depending on the relative proportion of dark-coloured minerals (most of all, clinopyroxene and biotite) in their composition. Ijolite contains clinopyroxene (diopside, aegirine-augite or aegirine) and 30-70% modal nepheline

Sovite. is the coarse-grained variety (or facies) of carbonatite often a medium-to-coarse-grained calcite rock with variable accessory amphibole, biotite, pyrite, pyrochlore and fluorite

The table attached to this report contains the results of the analyses for the samples described above along with the results from the work completed by TNR Gold, the last company to complete work on the carbonatite. Although the historic mapping indicates that site 1 is sovite, the material sampled on this visit was much more mafic and probably ijolite as the samples were more mafic and biotite-rich than a typical sovite. Sovite was present, a white to light grey carbonate-rich unit but it was not sampled but this would explain the difference in the results for our samples and the TNR sample.

Site 2 was historically mapped as sovite and this would describe some of the material sampled, especially the third sample (L782589). The other two samples may have been the more hematitic sovite also described for this location, and the analytical results more closely resemble the results for site 3. Sample L782587 returned the highest Nb with 996 ppm Nb.

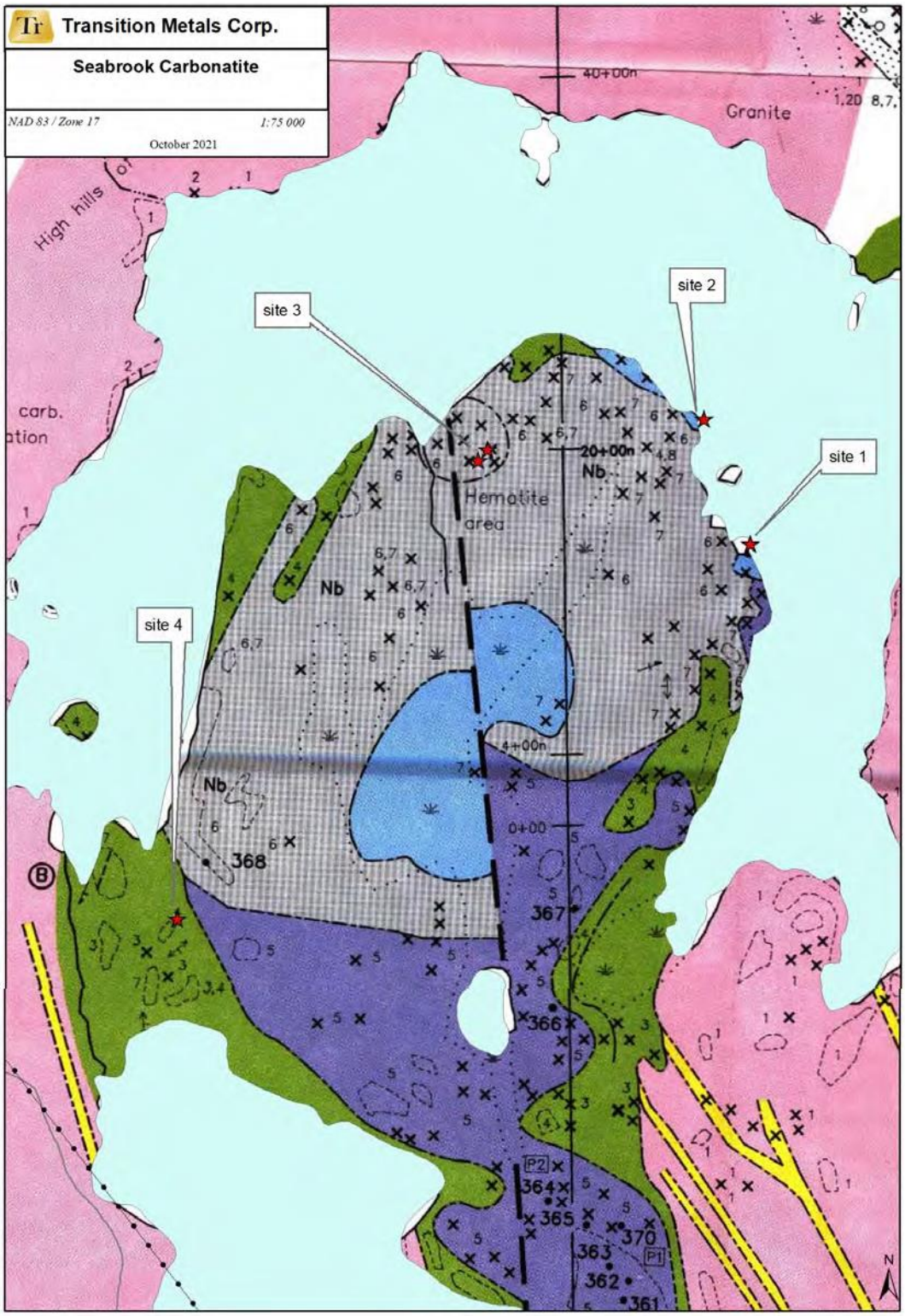
The sample for site 3 was the hematitic rubble for the old pit that had been undercut by the diamond drill hole. There were 5 samples collected by TNR Gold for this area, but the outcrop that was sampled could not be located. Like the TNR samples, L782590 returned some of the highest REE values but a low Nb value. This is the area which returned some of the better anomalous soil sample results for TNR Gold, and in general the hematitic sovite seems to be the target lithology of additional work was completed on the property.

DISCUSSION:

Overall, the results of the sampling from the September property visit are anomalous but are not in the same range as the economic deposits. However, three of the samples collected by TNR Gold were in the 0.5-0.7% TREO range which is the low end of the economic resources (see tabled table 04 from USGS professional paper 1802-0). The final sample site was historical mapped as a fenitized granite, a lithology which appears to surround the carbonatite. The USGS noted that the presence of a fenitized aureole produced by alkali metasomatism during the emplacement of a carbonatite was generally a favourable indication of REE enrichment

A number of factors become important when evaluating REE occurrences and a paper by Hellman and Duncan, 2017) provides a good summary of these factors. The more important considerations include knowledge of the mineralogy, mineral extraction, rock density, degree of oxidation, and the presence of deleterious elements such as Th and U. The reason for this is that "*Simply totalling the extracted and refined market value of each REE contained in a block of 'ore' will not reflect its true resource value as it is extremely unlikely that all individual REE contained in the block can be extracted and refined at an economic profit. The capital and operational costs invariably preclude production of all REE, particularly small volume demand products and elements such as Tm*."

The hematitic sovite returned the best TREO and Nb values for the carbonatite, and this unit has been mapped as being a major lithology present on the peninsula. Samples by TNR Gold to the southwest and southeast of the samples collected during the visit support the interpretation of this broad hematitic sovite with anomalous TREO.



Units 3 and 4 are the fenite, unit 5 is ijolite, unit 6 is silicocarbonatite and sovite, unit 7 is sovite and hematitic sovite; the southern red star at site 3 is the drill hole collar

There is the issue of the camps and at least one year around home located on the lake. The camps appear to be located towards the north end of the lake, and there may be access to the carbonatite from the power line located to the south so that initial work would not disturb the camp holders. But the carbonatite probably extends under the lake, and historically mining of carbonatite is an open pit operation. However, we are a project generator and as such we are not looking to mine this property but to pass it one to a potential operator.

There are few carbonatite intrusions available, and little is known if this carbonatite hosts economic or only near economic mineralization. There is also a push by governments at the present time to locate sources of the "green" metals required in alternate energy generation. As noted by the USGS, China accounted for more than 90 percent of global production and supply, on average, during the past decade, and it has began placing restrictions on the supply of REEs in 2010 through the imposition of quotas, licenses, and taxes. There may be government funding or assistance with any exploration work conducted on the Seabrook Intrusion.

RECOMMENDATIONS:

GEOLOGIST:_ *Thomas Hart* **DATE**: **October 12, 2021**

attachments:

Sample		Ce	Dy	Er	Eu	Gd	Ho	La	Lu	Nd	Pr	Sm	Tb	Tm	Y	Yb		TREO +Y	Nb
16201	Site 1	23.6	0.77	0.37	0.29	1.03	0.13	12.0	0.05	7.2	2.27	1.72	0.15	0.05	3.5	0.39		62.92	10.2
L782583		696.0	18.30	5.67	13.30	33.60	2.92	373.0	0.40	305.0	73.80	52.10	3.73	0.61	69.4	3.55		1937.79	274
L782584		596.0	21.50	7.49	14.90	38.60	3.27	301.0	0.50	306.0	71.90	53.30	4.37	0.72	78.8	4.10		1763.82	353.0
L782585		486.0	15.35	5.19	12.80	29.40	2.29	217.0	0.40	275.0	63.80	49.70	3.10	0.55	59.1	3.00		1434.72	357.0
L782586		992.0	13.10	4.32	14.20	31.70	1.84	512.0	0.40	404.0	105.00	55.30	3.09	0.45	47.9	2.97		2564.38	595.0
16202	Site 2	421.0	12.00	4.67	8.64	20.90	1.88	199.5	0.38	189.50	49.00	39.40	2.79	0.54	56.3	3.15		1185.86	466.0
L782587		1330.0	18.75	5.60	19.80	44.10	2.66	619.0	0.30	554.00	144.50	75.10	4.25	0.55	59.8	2.38		3375.32	996.0
L782588		777.0	32.80	11.50	17.30	50.20	4.96	385.0	0.60	291.00	73.50	62.10	6.33	1.14	121.0	5.48		2162.65	425.0
L782589		132.0	2.94	1.00	2.03	5.47	0.49	65.5	0.06	51.10	13.10	8.10	0.66	0.10	10.2	0.60		344.024	138.0
16204	Site 3	1730.0	41.30	9.86	38.30	93.00	5.15	718.0	0.50	913.0	224.00	169.00	11.85	0.94	132.5	4.83		4796.62	1330.0
16205		2760.0	21.00	4.77	37.10	69.30	2.61	992.0	0.24	1525.0	378.00	214.00	8.79	0.43	73.2	2.16		7127.17	415.0
16206		1580.0	23.30	7.80	27.30	58.20	3.38	770.0	0.49	685.0	188.00	122.50	6.89	0.90	90.5	4.90		4183.01	211.0
16207		1095.0	14.45	5.59	13.40	26.70	2.29	311.0	0.34	602.0	159.50	76.00	4.15	0.63	75.0	3.55		2801.34	101.0
16220		2410.0	20.00	4.38	35.30	65.90	2.59	911.0	0.22	1420.0	345.00	183.50	5.37	0.42	63.4	1.65		6401.14	448.0
L782590		1205.0	20.00	5.20	17.55	45.90	2.39	605.0	0.40	456.0	116.00	70.80	5.03	0.52	60.4	3.11		3062.66	184.5

The TNR Gold samples are in italics and not all TNR samples have been included in this table

Table 04. Advanced rare-earth-element(REE) exploration projects and the reported estimates of their REEresources, by deposit type.

[Mt, million metric tons; t. metric ton; %, percent: TREO, total rare-earth oxide. Chemical elements: Ag, silver, Au. gold Cu, copper; Dy, dysprosium; Mo, molybdenum; Nb, niobium; REE, rare-earth element; U, uranium; Zr, zirconium]

Deposit	location	Reported resources	Reference(s)
		Carbonatites	
Araxá	Minas Gerais. Brazil	Measured and indicated resources=6.34 Mt at 5.01% TREO; inferred resources=21.94 Mt at 3.99% TREO	MBAC fertilizer Corp. (2012)
Ashram project (formerly Eldor project)	Quebec, Canada	Measured resources=1.59 Mt at 1.77% TREO; indicated resources=27.67 Mt at 1.9% TREO: inferred resources=219.5 Mt at 1.88% TREO	Commerce Resources Corp. (2016)
BearLodge	Wyoming, United States	Measured and indicated resources= 16.3 Mt at 3.05% TREO; inferred resources= 28.9 Mt at 2.58% TREO	Dahlberg (2014, p. 1-5.1-S)
Cummins Range	Western Australia, Australia	Inferred resources=4.9 Mt at 1.74% TREO	Hatch 0-015)
Elk Creek	Nebraska, United States	Indicated mources = 80.5 Mt al 0.71% Nb oltide; inferred resources= 99.6 Mt at 0.56% Nb oxide; **REE resources exist, but are not estimated**	Pittuck and others (2015, p. 150)
Gle.uover project	South Africa	Indicated resources=16.78 Mt at 1.45% TREO; inferred resources=12.14 Mt at 0.98% TREO	Galileo Resources PLC (2015)
Lave, gne-Spriug, r property	Ontario. Canada	Indicated resources=4.2 Mt at 1.14% TREO; inferred resources=12.7 Mt at 1.17% TREO	Hatch (2015)
Lofdal project	N31llloia	Indicated resources=0.90 Mt at 0.62% TREO; inferred resources=0.75 Mt at 0.56% TREO	Namibia Rare Earths Inc. (2012)
Monlviel project	Quebec. Canada	Indicated mourc,s=82.4 Mt at 1.51% TREO; inferred resources=184.2 Mt at 1.43% TREO	GeoMegA Inc.(2015)
Mrima Hill	Kenya	Measured and indicated resources=48.7 Mt at 4.40% TREO; inferred resources=110.7 Mt al 3.61¾ TREO	Pacific\Vtldcat Resources Corp. (2013)
Ngualla	**Tanzania**	Measured resources=81 Mt at 2.66% TREO; indicated resources=94 Mt at 2.02% TREO; inferred resources=20 Mt at 1.83% TREO	Peak Resources Ltd.(2013)
Nolans Bore	Northern Territory, **Australia**	Measured resources=4.3 Mt at 3.3% TREO; **indicated resources=21 Mt at 2.6% TREO; inferred resources=22 Mt at 2.4% TREO**	Arafura Resources Ltd. (2014)
Sarfartoq	Greenland	Indicated resources=5.884 Mt al 1.77% TREO; inferred resources=2.459 Mt at 1.59% TREO	**Hudson Resources Inc.** (2012)
Songwe Hill	Malawi	Indicated resources=6.2 Mt at 2.05% TREO; inferred resources= 5.1 Mt al 1.83% TREO	Mkango Resources Ltd. (2012)
Wigu Hill	**Tanzania**	Inferred resources=3.3 Mt at 2.6% TREO	Montero Mining & Exploration Ltd. (2011)
Zandkopsdrift	South Africa	Measured resources=23.0 Mt at 2.07% TREO; indicated resources=22.7 Mt at 1.73% TREO; inferred resources= I.I Mt al 1.52% TREO	Frontier Rare Earths Ltd. (2014)

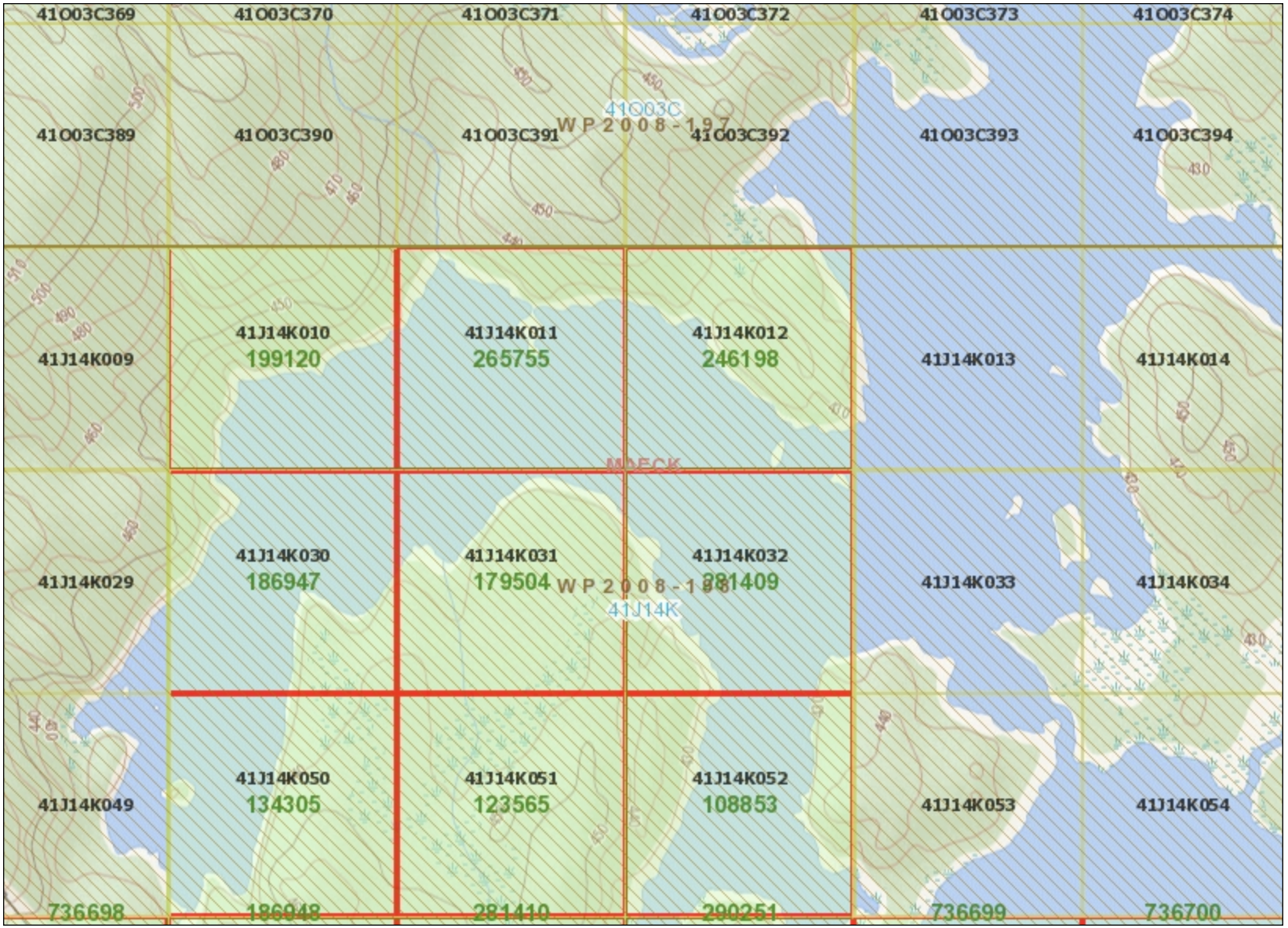
Ontario

Ministry of Mines (MINES)

MLAS Map Viewer

MLAS Map

Notes:



Legend

Provincial Grid Cell
- Available
- Pending
- Unavailable

Mining Claim
- Mining Claim
- Boundary Claim

Alienation
- Withdrawal
- Notice

MINES Administrative Boundaries
- MINES Townships and Areas
- Geographic Lot Fabirc
- UTM Grid 1K
- UTM Grid 10K
- Mining Division
- Mineral Exploration and Development Region
- CLUPA Protected Area - Far North
- Resident Geologist District
- Federal Land Other
- Native Reserves
- AMIS Sites
- AMIS Features
- Drill Hole
- Mineral Occurrences

MLAS Mining History
- Withdrawal - History
- Notice - History
- Mining Claim - History
- Mining Land Tenure - History
- Legacy Claim

Provincial Grid
- Provincial Grid 250K
- Provincial Grid 50K
- Provincial Grid Group

Land Tenure
- Surface Rights
- Mining Rights
- Mining and Surface Rights
- Order-in-Council

Those wishing to register mining claims should consult with the Provincial Mining Recorders' Office of the Ministry of Mines (MINES) for additional information on the status of the lands shown hereon. This map is not intended for navigational, survey, or land title determination purposes as the information shown on this map is compiled from various sources. Completeness and accuracy are not guaranteed. Additional information may also be obtained through the local Land Titles or Registry Office, or the Ministry of Natural Resources and Forestry. The information shown is derived from digital data available in the Provincial Mining Recorders' Office at the time of downloading from the Ministry of Mines (MINES) web site.

0 0.63 km

N

Projection: Web Mercator