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Report on the Geological Definition of Historical Geochemical Anomaly on Claim 4209871, Limerick Twp.

Introduction

Mr. A Ross, President of Hastings Highlands Resources Ltd. has requested that the writer investigate the nickel-copper soil anomaly detected on claim 4209871 in the late 1960s. Claim 4209871 covers the extension of the geology that hosted the north and south mineralized deposits outlined by Macassa Mines in the early 1960s and the 1970-72 period. A soil survey by Macassa Mines filed with the OGS had shown a copper-nickel anomaly crossing the claim. Earlier investigations showed that this anomaly was coincident with semi massive sulphide mineralization on the adjacent property near the mutual boundary.

In 2003 Limerick Mines Inc. acquired the claim from the owners and cut a 100 metre spaced grid across it and the adjacent properties, all of which formed a single land package under the control of Limerick Mines. Limerick Mines failed before any field work could be carried out.

The first phase of mapping and was designed to identify the rocks present, their internal variations and their relationships to each other. This program was aimed at detailing the Macassa nickel-copper anomaly and exposing some of the mineralization which was exposed in sub- outcrop. Grid mapping proved to be very difficult due to the poor state of the lines and markings. Where possible the lines were used and were complimented by old logging trails. The latter were of considerable value because they scraped off considerable of the shallow overburden. Since the last survey, the beaver ponds had been abandoned with the water level dropping a metre. This change permitted observations to be made along the ponds edge.

On the last field day, September 29, I escorted Ms. S. Andersen, Economic Development Officer, Alderville First Nations, to the area of work on the claim so that she could see first-hand the work that was being carried out. The day ended with a visit to the MNDM office in Tweed, Ontario.

Property Location and Description (Figure 1)

Claim 4209871 consists of nine, 50 acre pioneer land grant units described a lots 16 to 20 East Hastings Road and lots 30 and 31 Concessions 4 Limerick Township. It is situated in the southwest part of Limerick Township, Hastings County. Access is from the Old Hastings Road, either by the North Steenburg Lake Road from Highway 62 or south from Ormsby on Highway 620. Logging roads access most of the claim block and predate the cut grid.

The northern, two thirds of the block is underlain by the Thanet ultramafic-mafic complex and exhibits a rugged area of sub-outcrop and beaver swamps. Forest cover is mixed hardwoods and evergreens. To the south and southeast the rocks change to clastic

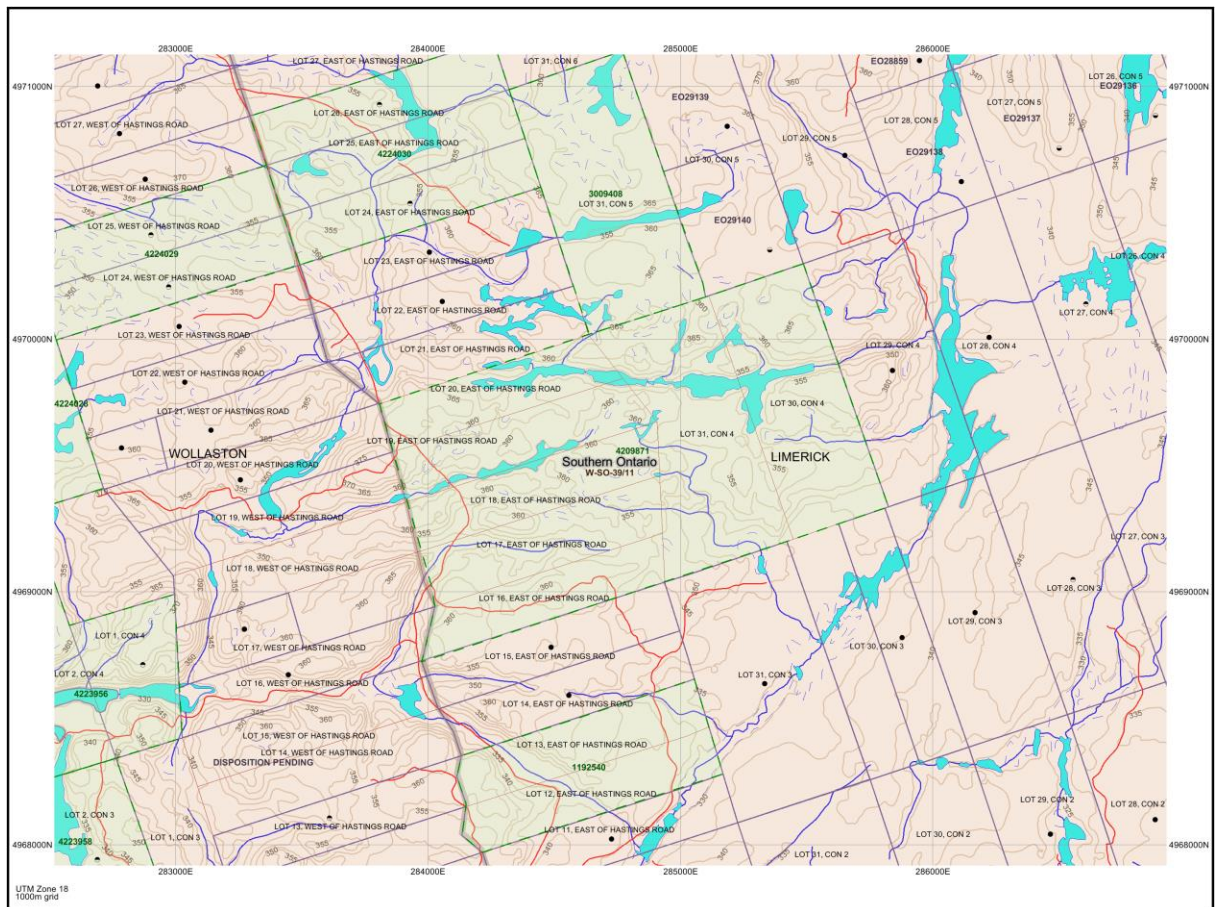
sedimentary arenites of the Vansickle group and the topography is more gentle and the forests more open hardwoods. Relief seldom exceeds 15 metres.

The area of interest for this study occurs in the southeastern part of the Thanet Complex in proximity to the Vansickle Group (Figure 2).

Regional Geology

The most recent geological mapping was performed in 1961 and 1962 (Lumbers, 1969). He differentiates the complex into three phases of uralitized gabbro with minor uralitized diorite, uralitized diorite with minor uralitized gabbro and tonalite with quartz-bearing diorite. The phases are described as heterogeneous commonly with them rapidly changing. The average compositions for the two main phases, uralitized gabbro and uralitized diorite do not show much difference (Lumbers, 1969, Table 7).

Figure 1
Map Showing Position of Claim 4209871 in the
Southwest Part of Limerick Township



Lumbers' map (Map 1267) shows the Thanet Complex to be in an intrusive contact with the surrounding feldspathic clastic and calcareous feldspathic clastic sedimentary rocks. These rocks form part of the Van Sickle Formation which has undergone regional metamorphism and deformation to the upper greenschist or lower amphibolite grade of metamorphism and northeast trending folds and a later second period of cross folds. This interpretation was made at a time when all ultramafic rocks were considered intrusive; it was not until a few years later that ultramafic volcanic rocks were recognized (Lumbers, 1969).

Geology of Claim Block 4209871 (See 2009 Report in MNM files)

The entire claim block was mapped using the restored grid put in by Limerick Mines Inc. in the late winter of 2004. 100 metre-spaced lines run at 125 degree azimuth with base lines at 75+00E and 80+00E; pickets are 25 metres apart along all lines.

Outcrop is abundant in areas underlain by the Thanet Complex and the soil veneer is usually less than a metre, but good exposures are rare due to the mosses and grasses. Usually only the rock type can be determined at any location. Roads provide most of the good exposures. Mapping concentrated on a detailed description of the rock at each outcrop. It rapidly became clear that the main variations were the grain size and ratio of pyroxene to felsic material especially in the northwestern two thirds of the claim. The cause for these variations seems complex, however exposures suggests that the explanation lies in part due to the fragmental nature of the unit. Banding and the regional schistosity were also seen. Minor barren quartz veins are present, but rare. One boulder and an outcrop in the central part of the grid illustrate the complexity of the Thanet Complex. The outcrop shows a good compositional banding and folding. Similar compositional banding and folding is seen in boulders. Closer to the contact the Thanet Complex becomes finer-grained and sandy in appearance until it resembles black sandstone. This rock rapidly becomes a quartz arenite first with black beds and finally a thinly bedded pale grey, quartz arenite sequence which show considerable folding.

The relationships described above are more common in the eastern and southeastern part of the claim block. To the west the contact seems more abrupt between medium to coarse-grained Pyroxenite-gabbro and grey quartz arenites. That being said, the gradational contacts seen to the east strongly suggest that the Thanet rocks are volcanic in origin and slowly are buried by clastic sedimentary rocks.

Mineralization is usually restricted to disseminated pyrite in the igneous rocks; in the adjacent quartz arenites pyrite up to 10 percent is common near the contact especially to the northeast of the claim block. Where line 31 N crosses the Old Hastings Road sulphides in the Complex ran 0.5 percent nickel and 100 ppb palladium. Elsewhere disseminated rusty gabbro coincides with the old Macassa soil nickel anomaly and on the eastern boundary of the claim block up to 15 percent pyrite forms a two metre wide band in the southern creek bed. It is this part of the Complex that is the subject of this investigation.

Present Survey

The property is isolated and can only be reached by crossing private land from Hwy 62. Part of the 14 year old logging road system had to be cleared for access. From the end one can follow more roads and skidder trails. The travel time was over an hour from Hwy 62, even with this access. These roads were incorporated into the new geological map (Figure 3). Initially, the 2004 grid was followed, but it proved to be difficult and a waste of time. The old roads were surveyed and tied using a GPS receiver and any old grid points as well. The Thanet Complex gives a hummocky topography with knobs of frost broken material with mixed forest. On the other hand, the Vansickle clastic sediments form a more gentle surface with more hardwood forest.

Macassa's nickel-copper anomaly lies in the Thanet Complex in proximity to the Vansickle sedimentary rocks to the south. Sulphide mineralization has been observed in the narrows of the swamp just east of the claim boundary. From there it heads west, northwest to the long linear swamp before turning sharply south and terminating (Figure 3).

Current mapping has helped to better define the rocks associated with the soil anomaly. On the edge of the swamp an outcrop of Sedimentary rock was located that pushes the contact further north and more in line with the trace of the anomaly (Photo 1)



Photo 1
North-south striking Vansickle clastic Sedimentary Rocks South Side Swamp,
Line 41N, UTM 285215E, 4969860N.

Outcrop on the north side of the pond indicates that the contact underlies it. South where line L 39N crosses the road junction a ridge of sedimentary rocks continues southerly for approximately 200 metres. It consists of similar bedded quartzwackes. (Photo 2).

Photo 2
Bedding in Sedimentary Rocks, Part of Ledge South, UTM 285305E, N4969480



These outcrops show that the Sedimentary rocks follow the north-south arm of the pond north to the larger east-west pond and demonstrate how important mapping exposures on old roads can be. Line 37N was followed from the road northwest; after 79+00E, the hummocky topography contains many small exposures of gabbroic rock which vary from fine to coarse-grained and usually contain less than 50 percent white feldspar. The anomaly was traversed between 78+50 and 77+50 E. The line enters the swamp at 77+15E. Mineralization was not seen in these rocks.

Line 38E was not found and a new line was run from its approximate location (UTM 284910E, 4969857N) just west of a swampy area. An exposure at 77+80 E has associated float that has a pronounced schistosity (Photo 3). This schistosity is seen elsewhere in the gabbros of the Thanet Complex (see 2009 report). Its intensity varies directly as the amount of finer-grained material in the rock and is also expressed by deformed mineral grains. Compositional layering is also common as illustrated by photos 4 and 5. Photo 4 shows a streaky fabric that is interpreted as representing subtle depositional layering while 5 shows layers contrasting in grain size and texture both are crossed by a later coarse-grained dikelet. Another feature of these rocks is inclusions of angular and rounded fragments of totally different rocks in the typical gabbro (Photo 6).

Photo 4
Fine Laminations in Fine-to Medium- Grained Gabbroic Rocks Line 39E
UTM284996E, 4969785N



Photo 5
Compositional Layering in Thanet Complex Gabbro, North side of Swamp L39N
UTM 284954E, 4969823N



Photo 6
Angular and rounded Fragments of Fine-Grained ultramafic? Fragments in typical Medium-Grained Gabbro UTM 284913E, N4969521



All of the above features confirm that the rocks in proximity to the geochemical anomaly are volcanic in origin.

Mineralization

Mineralization is associated with some of the Thanet gabbroic rocks in proximity to the soil anomaly, but it is usually finely disseminated pyrite. Normally only minor amounts were observed; amounts were much less than found just east of the property. A possible pit was located near the property boundary, Minor pyrite mineralization was seen at this location (Photo 7)

Interpretation and Conclusions

The present program was designed to locate and evaluate the Macassa soil anomaly. It modified the geology and demonstrated that the anomaly does follow it in the gabbroic rocks. Mineralization in the form of disseminated pyrite was located at numerous locations in the correct geological setting, but no minerals or indications of copper or nickel were observed.

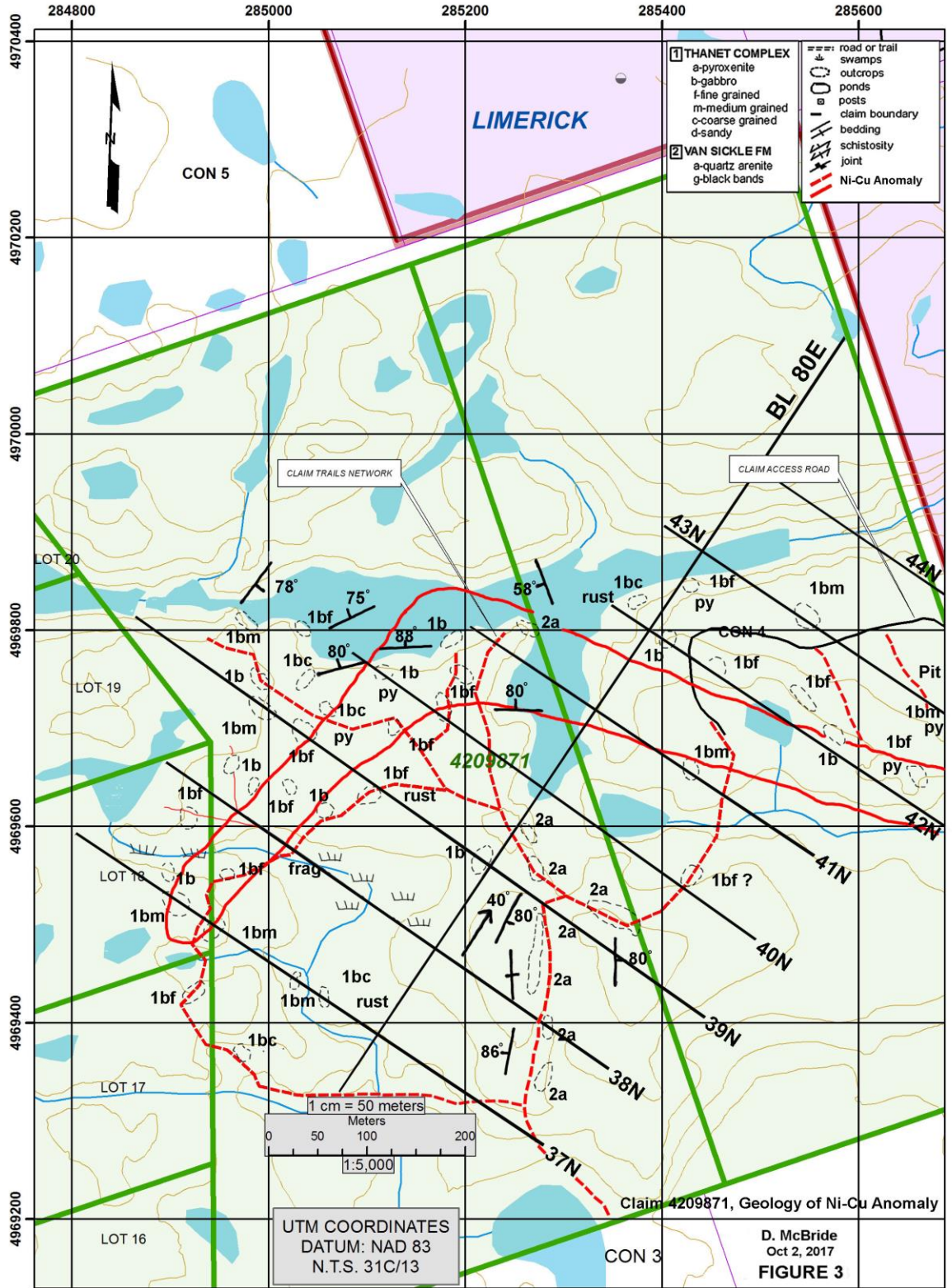
The anomaly remains of interest because it is the extension of known sulphide mineralization just off the property on trend and the extension of known mineralization

It is recommended that a new soil geochemical survey be performed to update the 1969 survey. Trenching is required to further expose the mineralization found on the claim block. This claim block was originally part of the major land position of Limerick Mines Ltd. and this mineralization is interpreted as a continuation of that described in Limerick's NI43-101 report of 2004.

Photo 7
Shallow Pit? Near Eastern Property Boundary Line 43N
UTM 285694E, N4969706



Dr. Derek McBride P.Eng.
October 4, 2017



References

Lumbers, S. B. 1969: Geology of Limerick and Tudor Townships, Hastings County; Ministry of Northern development and Mines, Geol. Rept. 67.

McBride, D. E. 2000: Limerick Township Nickel-Copper Deposit; Abs. Ann. Mtg. Ontario Prospector's Association.

McBride, D. E. 2011: Report on the Geological Mapping of Claim 4209871, Limerick Twp. 7p.

McBride, D. E. 2015: Report on the Geological Mapping of Claim 1500808 and Parts of Claim 4209871, Limerick Twp. South-Eastern, Ontario; 16 p.

Onodera, V.T. 1972: A geochemical Soil Survey of Wilroy Mines Ltd. (Formerly Macassa Gold Mines), West Limerick Township Claims, Ormsby, Ontario: OGS Assessment Rept., 31C13SE0004.

Pressacco, R. 2004: A review of the Nickel-Copper Mineralization at the Limerick Property, Limerick Township, Ontario, Canada, NTS 31 C/13; Limerick Mines report on SEDAR

Statement of Qualifications, Date and Signature Page

- 1) I, Dr. Derek McBride P.Eng. of 20 Forsythia Drive, West Hill, Ontario, M1E 1Y1, hold a diploma of Mining Technology, B.Sc. Eng., M.Sc. Eng. From Queen's University and Doctoral Degrees in Geology from the University of New Brunswick.
- 2) I am the author of this report titled "Report on the Geological Definition of Historical Geochemical Anomaly on Claim 4209871, Limerick Twp.".
- 3) I am a geological engineer and a member of the Association of Professional Engineers of Ontario and British Columbia. My experience spans 40 years in mineral exploration and am attributed with the discovery of the Nugget Pond Gold Mine in the Province of Newfoundland. My work has taken me to 17 countries and I have managed major projects in four of them in addition to Canada.
- 4) I have managed the exploration program.
- 5) I am responsible for all sections of this report.
- 8) As of the date of this certificate, as qualified person, it is to my knowledge, information and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the technical report accurate and not misleading.

Signed original

Dr. Derek McBride P.Eng.

November,22 , 2017