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PRELIMINARY REPORT ON MARGRY - PREVERT AREA, ABITIBI-EAST ELECTORAL DISTRICT

P. R. NO. 394

PROVINCE OF QUEBEC, CANADA

DEPARTMENT OF MINES

HON. W. M. COTTINGHAM, MINISTER

GEOLOGICAL SURVEYS BRANCH

PRELIMINARY REPORT

ON

MARGRY-PRÉVERT AREA

ABITIBI-EAST ELECTORAL DISTRICT

BY

J. H. REMICK

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INTRODUCTION

The Margry-Prévert area, geologically mapped by the writer during the summer of 1958, is bounded by latitudes 49°30' and 49°09' and by longitudes 75°45' and 76°06'. It comprises an area of approximately 360 square miles.

The centre of the area is about 80 miles west-southwest of Chibougamau and 90 miles northeast of Senneterre. It includes all of Margry and Prévert townships, about one-third of L'Esperance, Le Tac, Lesueur and Muy townships and small portions of Carpiquet, La Ronde, Marin, Picquet, Urban, and Effait townships.

Mapping of the area between longitudes 76°00' and 76°06' has not been completed, but this portion is included in view of the good values in gold, silver and copper obtained from small shear zones in granite about a mile south of the west end of Lichen lake.

The area has been previously studied as a part of a regional mapping programme by Retty and Norman (1938) and by Sproule (1940). Also,more detailed geological mapping of the adjacent areas and of a small portion of the western part of the present area have been carried out by various investigators. (See References).

A Quebec Department of Mines regional geological map (No. 1258) at a scale of 4 miles to the inch has been compiled by Imbault (1952) and revised by Remick (1958)

The geology of Lesueur township is reproduced here from the maps of Longley (1951), Dugas (1951), and Graham (1957).

Several aviation companies located near Chibougamau or Senneterre provide transportation into the area, the flight distances being about 75 miles and 90 miles respectively. Numerous lakes are accessible to float planes. The new Chibougamau-Beattyville-Senneterre

line of the Canadian National Railways passes about 4 miles north of the northwest corner of the area. Lichen lake is accessible by canoe from Opawica lake on the railway. The west end of Lichen lake is about 7 miles southeast of the Senneterre-Bachelor Lake highway. A good road, which joins this highway several miles west of Bachelor lake, leads southeast as far as Auger creek, and, from here, a tractor road runs to the west end of Lichen lake. A few well-cut portages render the northern part of the area accessible by canoe. The best canoe route to Nicobi lake is via Audoli lake as it avoids the long stretch of boulder rapids on Wetetnagami river. The southern part of the area is accessible from Nicobi lake south via the Wetetnagami, on Panache and Pierrefonds rivers.

PHYSICAL FEATURES

Unstratified glacial sediments and numerous small swamps cover much of the area. The land surface is flat to slightly hummocky with some ridges and hills rising 50 to 250 feet above the general level of about 1,000 feet. Lichen lake is 990 feet above the sea. Several hills of gabbro, rising up to 200 feet above Nicobi lake, occur just outside the area at the southwest end of the lake. In the northern belt of hornblende schist and volcanic rock small hills, ridges and knobs rise 50 to 100 feet above the general level.

Surface water drains northward via Nicobi lake, Wetetnagami river and Lichen lake to Opawica lake, and thence through the Waswanipi-Nottaway system to James bay. An exception to this is Prévert lake, which drains southward into Panache river.

GENERAL GEOLOGY

The consolidated rocks of the area are Precambrian in age, and about four-fifths of these are granitic. A belt of hornblende schist and altered basic to intermediate volcanic rocks, with included sills of gabbro and diorite, strikes roughly east across the northern quarter of the area and continues eastward and westward into the adjoining map-areas. A small band of gabbro and hornblende schist underlies a small area west of Nicobi lake. Discontinuous northeasterly striking dykes of diabase and gabbro cut diagonally across the other formations. Unconsolidated sediments of Pleistocene and Recent age overlie the Precambrian rocks.

Table of Formations

Cenozoic: Pleistocene and Recent	Glacial and glacio-fluvial deposits	Drift; some sand and silt; minor gravel
Precambrian	Basic dykes	Diabase; gabbro
	Intrusive Contact	
	Acidic intrusive rocks	Porphyritic biotite granite, biotite granite
		Nicobi Lake hornblende granite
		Chlorite granite
		Pegmatite, aplite Biotite granite, biotite-hornblende granite, hornblende granite
	Intermediate intrusive rocks	Quartz diotite, diorite, amphibolite
	Intrusive Contact	
	Altered basic intrusive rocks	Gabbro
		Meta-diorite, meta-gabbro
	Intrusive Contact	
	Metamorphosed volcanic and sedimentary rocks	Hornblende schist; biotite gneiss
		Andesitic lavas, tuff, agglomerate; minor sedimentary rocks

Volcanic Rocks

Andesitic Lava , Tuff, and Agglomerate

Altered lava flows are associated with dioritic sills and pyroclastic rocks west of Wetetnagami river in the northern belt of volcanic rocks and hornblende schist. This belt continues westward and is believed to join with the band of metamorphosed volcanic and sedimentary rocks of the Bachelor Lake area.

The lavas are andesitic, light greenish grey, fine-grained and, in some places, pillowed. The pillows are slightly elongated. Some of the rock has a sheen caused by the alignment of flaky minerals. Much of the weathered surface is pitted. In general, these rocks are finer grained than the diorites and more slabby and schistose.

The dioritic rocks are light greenish grey and fine- to medium- grained. They are interlayered with the lavas.

Bedded to massive pyroclastic rocks with some andesitic lavas occur on both sides of the mineralized granite in the western part of the volcanic belt and extend westward to Malouin lake and beyond. Outcrops of agglomerate were noted a few hundred feet west of the western end of Lichen lake. Bedded tuffs or sedimentary rocks, composed of alternating light and dard layers 2-4 mm. thick, occur south of the mineralized granite.

Hornblende Schist

Hornblende schist, with small bodies of meta-gabbro, occupies an east-west belt averaging less than a mile wide in the northern part of the area. This belt continues for 14 miles to the east of the area. Westward, it widens considerably as Wetetnagami river is approached and, west of the river, the rocks on strike with the schist are volcanics with diorite sills.

A more southern belt of hornblende schist, 1/2-2 miles wide extends westward from Nicobi lake to and beyond the western boundary of the area. The eastern portion of this belt, just north of Yolande lake, has been more noticeably metamorphosed by the granite than the rock on the west shore of Nicobi lake, and contains biotite, garnet, feldspar and small granitic masses. A fine-grained biotite gneiss occurs in places.

Other occurrences include a few outcrops east of Londry lake and a few outcrops near the southern boundary of the area. The latter probably represent altered outliers of a band of volcanic and sedimentary rocks lying about a mile south of the area.

The hornblende schist, in general, consists of uniformly distributed fine hornblende needles and feldspar grains aligned parallel to the schistosity. In places, a faint layering is defined by lenticular layers slightly richer or poorer in hornblende or feldspar. Both fresh and weathered surfaces of the rock are bluish black, although the weathered surface has a grey tinge where much feldspar is present. The rock breaks into slabs. Paper-thin layers of feldspar parallel the schistosity in some outcrops. Light green lenses and thin laminae rich in fine granular epidote stand out on the weathered surface of the hornblende schist in many places throughout the northern belt. A few lenses consist of coarse epidote and quartz with a little pyrite and an occasional grain of chalcopyrite.

Outlines of what appear to be pillow structures were noted about a mile east of Wetetnagami river and just west of Audoli lake. The"pillow" rims are 3 to 10 mm. thick and consist of black hornblende with, in many cases, rust stains. They are the less resistant and most intensely altered part of the pillows and are usually marked by a slight depression. Resistant cores rich in epidote were noted in some pillows. It is believed that much of the hornblende schist is the recrystallized equivalent of volcanic rocks such as are found west of Wetetnagami river. The rocks containing well-defined laminae rich in epidote alternating with those rich in hornblende would probably be the metamorphosed equivalents of banded tuffs or sedimentary rocks.

Biotite Gneiss

A few outcrops of fine- to medium-grained biotite gneiss occur on the peninsula just south of the large island in the centre of Nicobi lake, with the hornblende schist a mile to the south and about a mile south of Londry lake. The rock contains about 5 per cent fine biotite.

The rock is fairly homogeneous, but fine lines or thin folia slightly richer in biotite or, more rarely, hornblende, give the rock a faint gneissic structure. Some of the rocks are massive and closely resemble a fine-grained granite. Small lenses or, in a few cases, lines of reddish-brown garnet parallel the gneissic structure here and there. Biotite weathers out leaving fine linear depressions on the weathered surface, whereas hornblende is resistant. The biotite granite and the Nicobi Lake granite are in sharp contact with some of the shoreline outcrops.

Altered Basic Intrusive Rocks

Meta-gabbro

Small concordant bodies of meta-gabbro occur within the hornblende schist just west of Audoli and Nicobi lakes. The rock is slightly schistose to massive, fine- to medium-grained, and black. It commonly has several sets of joints and due to the greater resistance of hornblende a rough weathered surface.

It shows none of the lenticular layering noted in the hornblende schist. Disseminated pyrite is found in some of the outcrops.

Meta-diorite

Dioritic sills occur with the volcanic rocks west of Wetetnagami river. The intrusives are fine- to medium-grained, greenish grey, massive, and rough weathering. They tend to break along closely spaced joints. Usually they are interlayered with the volcanic rocks, the width of each rock type being a few tens to a few hundred feet. The dioritic rocks may, in part, represent coarser-grained facies of the lava flows, but most appear to be shallow sills which originated from the same source magma as the flows. Very small amounts of pyrite, chalcopyrite, and pyrrhotite occur as disseminations and minute fracture fillings in a few of the outcrops.

Gabbro

A rather large body of gabbro consisting of several facies outcrops on several large hills just west of the southwest end of Nicobi lake. Only the eastern edge is shown on the accompanying map. The body is believed to outcrop for several miles to the west. The relations of the gabbro to the granite are not known. Noranda Mines has found several small copper-nickel showings in the eastern part of the body.

The rock, in general, is gabbroic and medium grained. However, some facies are light coloured and may be diorites, and a few are nearly pegmatitic in grain size. Finer-grained facies fill straight or, more rarely, curved joints and fractures in the coarser-grained gabbro. Joints are generally poorly developed in these rocks.

Intermediate Intrusive Rocks

Quartz Diorite, Diorite, Amphibolite

Rocks containing various proportions of feldspar and hornblende with, in some cases, a little quartz and biotite underlie the southernmost part of the area. Most are dioritic, containing between 15 and 35 per cent hornblende and the remainder white feldspar. Quartz (5-10 per cent) and a little biotite are present in some of the rocks in the southwest corner of the area. Hornblende is usually in individual stubby prismatic grains. The diorite is similar to that noted in the southern part of the area to the east (Remick, 1958).

A few outcrops of massive, medium- to coarse-grained amphibolite, consisting of 95 per cent equant prismatic hornblende grains and about 5 per cent feldspar, occur with the diorite.

Acidic Intrusive Rocks

Acidic intrusive rocks underlie about 90 per cent of the area. Biotite granite, biotite-hornblende granite and a little hornblende granite, all showing a light gneissic structure, underlie the area north of the northern belt of hornblende schist and volcanic rock. Gneissic biotite granite underlies the southwestern part of Nicobi lake. Chlorite granite outcrops on a high ridge south of the west end of Lichen lake and on the shoreline to the north. A quartz-poor hornblende granite outcrops along the shores of Nicobi lake and continues westward beyond the area. Rather massive and homogeneous biotite granite, in part porphyritic, underlies most of the southern half of the area.

Biotite Granite, Biotite-hornblende Granite, Hornblende Granite

The rocks included in this group are similar to those found in the area adjacent to the east (Remick, 1958). They lie north of the northern belt of hornblende schist and volcanic rock and terminate a few miles west of the map-area against the northeasterly trending volcanic belt that crosses Auger lake. Their mineralogical and textural characteristics are relatively uniform over a small area, although there is some gradational variation from east to west. Several similar types of granite occur together in some of the outcrops and their contacts are often gradational although biotite granite cuts hornblende granite in at least one locality. White feldspar, 20 to 30 per cent quartz, 0 to 5 per cent biotite and 0 to 5 per cent hornblende are the main minerals. The weathered surface is white and, owing to the greater resistance of quartz, is rough.

Hornblende and biotite are characteristic mafic minerals in the granite in the western part of Lichen lake; biotite alone occurs in the granite along the shore of Lessard lake and the eastern part of Lichen lake. A few outcrops of hornblende diorite and a few inclusions of volcanic rock were noted along the western parts of Lichen and Wachigabau lakes.

A rather massive, medium- to coarse-grained biotite granite characterized by large, well-aligned flakes of biotite (5-10 mm. in diameter) and lenticular grains of quartz (4-8 mm. long) outcrops along the shores of Lessard lake and much of the eastern part of Lichen lake. Biotite weathers more easily leaving pits or slit-like voids on the weathered surface.

The granite south of Lessard lake is gneissic and, in places, contains lenses of biotite or of hornblende. The rock is grey, medium-grained and consists of white feldspar (mainly plagioclase) about 25 per cent quartz, and between 5 and 10 per cent biotite and hornblende, mainly the former. The outcrops are usually flat and poorly jointed.

Biotite granite, similar to that in the eastern part

of Lichen lake, outcrops in the southwest part of Nicobi lake and continues westward into the adjoining area. The minerals are well oriented near the contact with the southern belt of hornblende schist. Biotite, the only dark mineral present, makes up between 5 and 8 per cent of the rock.

Chlorite Granite

White, medium-grained, chlorite granite occurs on the western shore of Lichen lake and in the mineralized granite plug about a mile to the south. The rock contains white feldspar, between 20 and 25 per cent quartz (some of which occurs in very light blue, slightly opalescent eyes), between 2 and 6 per cent chlorite and hornblende and, in a few outcrops, a little biotite. Chlorite appears to be the alteration product of hornblende and biotite.

Pegmatite and Aplite

Small pegmatite dykes, which appear to follow joints, were noted in the granite on the north shore of Lichen lake and, on the east shore of Wachigabau lake, pegmatite cuts an aplite dyke. Pegmatite, containing one per cent biotite, outcrops just west of the large bend in Laforest river.

Grey aplite, in dykes and larger masses, outcrops on the east shore of Wachigabau lake and on the north shore of Lichen lake. The rock appears to have the same composition as the surrounding granites.

Nicobi Lake Hornblende Granite

The Nicobi Lake hornblende granite, best exposed on the shores of Nicobi lake and extending westward beyond the area, is an independent mass of quartz-poor granite.

The rock is massive to lightly foliated, medium-grained and equigranular. It consists of white feldspar, between 4 and 6 per cent hornblende, between 5 and 15 per cent quartz, from 0 to 1 per cent biotite, from 0 to 4 per cent chlorite, and accessory amounts of epidote, sphene and, in places, magnetite. The hornblende is in well-formed, long, individual prisms. The quartz content appears to decrease northward. Several outcrops very near the contact with the the belt of hornblende schist and volcanic rocks are dioritic in composition and contain 15 to 20 per cent hornblende. The weathered surface is usually grey to white. Locally, and as a result of alteration, the hornblende is chloritized, the feldspars are light pink and joints and fractures are filled with epidote and pink feldspar.

The rock is massive to lightly foliated in its central part but near the outer margins all the minerals are oriented approximately parallel to the contact with the belt of hornblende schist and volcanic rock to the north. The orientation of several

small lenses on the large island in Nicobi lake and a few thin foliae at the northeast end of the lake, being richer in hornblende than the surrounding rock and being aligned parallel to the foliation, are believed to be primary.

Where well exposed, two sets of vertical joints and, in places, a horizontal set may be seen.

Porphyritic Biotite Granite and Biotite Granite

Massive, grey to light pink, medium- to coarse-grained biotite granite, in places porphyritic, covers much of the southern part of the area, and forms large hills south of Yolande lake and west of Belleval and Sandy lakes. Similar granite is found to the east (Remick, 1957).

The rock consists of potash and plagioclase feldspar, from 15 to 20 per cent quartz, from 2 to 5 per cent biotite and, in a few places, hornblende. Accessory magnetite, sphene and epidote are commonly present. Phenocrysts of microcline between 1/4 inch and 2½ inches long occur in many outcrops; some have distinct crystal outlines.

The granite of this rock body is distinguished from the biotite granite north of the northern belt of hornblende schist and volcanic rocks by: 1) its massive character; 2) smaller amount and grain size of biotite; 3) presence of octahedra of magnetite; 4) porphyritic texture; 5) general association with pegmatites; and 6) the absence of inclusions of other rock types, especially hornblende schist.

The porphyritic and coarser facies have a rough weathered surface owing to the greater resistance of microcline phenocrysts and quartz. Joints are characteristic of this granite mass. Two vertical sets are present in most outcrops and, in many places, are accompanied by a nearly horizontal set. Northeasterly trending joints form long cliffs on some of the northwest-facing slopes of the granitic hills west of Belleval and Sandy lakes. The rock is massive except toward the south where the minerals are slightly oriented.

Small masses and veins of fine-grained biotite granite having only one per cent or less biotite intrude the medium-grained granite. Small masses of quartz-feldspar pegmatite occur as joint fillings or irregular masses in many outcrops. Quartz veins are rare.

Unaltered Basic Intrusive Rocks

Diabase Dykes

A northeasterly-trending diabase dyke is exposed for ½ mile or more northwest of Lachance lake in the southern part of the area. It is 130 feet wide in one place. The rock is fine- to medium-grained, massive and rusty weathering. Pyrite and magnetite are pre-

sent as accessory minerals. Chilled zones occur on both sides of the dyke. Exfoliation is common. The joint pattern is rectangular, one set being parallel and the other normal to the strike of the dyke.

Gabbro Dykes

A large dyke of massive gabbro is indicated by 8 isolated outcrop-areas that, joined together, would extent southwesterly across the map-area. It is probably continuous with one of the dykes found by Fairbairn (1946) just south of the southwest corner of the area. The rock is similar to the more easterly of two large dykes found to the northeast (Remick, 1957). The most continuous exposures are along a ridge ranging between 25 and 75 feet high separating Arsenault and Nicobi lakes. The gabbro is exposed for widths up to 250 feet across this ridge. The principal minerals are plagioclase and pyroxene with epidote, magnetite, pyrite and, in one place, chalcopyrite as accessories. The rock is medium- to coarse-grained and weakly diabasic. Many of the plagioclase laths are light greenish grey and show good albite twin lamellae; in some outcrops they vary from a light to fairly deep pink. The weathered surface is slightly rough, pyroxene being more resistant than plagioclase. Exfoliation is general.

Unconsolidated Sediments

Glacial moraine covers much of the bedrock. An almost continuous plain of sand with scattered eskers stretches southwesterly from Audoli lake for some 12 miles. A few drumlins were noted west of the west end of Lichen lake. Many small, winding, southeasterly-trending glacial hills, from 5 to 30 feet above the general level, occur throughout the area.

The trend of glacial striae is between S. 36°W. and S.48°W.

STRUCTURAL GEOLOGY

Pillow Structures

Poorly-defined and generally-elongated pillow structures were noted in a few places in the hornblende schist and in many places in the andesitic lava.

Schistosity

The schistosity in the northern and southern belts of hornblende schist volcanic rocks is about east-west and the dips are steep to the north or vertical. Schistosity in the chlorite granite just south of the west end of Lichen lake is also about east-west.

Flow Structure in the Granite

Pronounced to faint alignment of biotite flakes in the granite just north of the northern belt of volcanic rocks and hornblende schist is about east-west and about parallel to the schistosity of this belt. This alignment may be primary, resulting from flowage of the rock before complete consolidation. The minerals in the Nicobi Lake granite in outcrops near the northern belt of hornblende schist and in the biotite granite on the southwest shore of Nicobi lake are aligned east-west.

Joints

Joints are characteristic of the porphyritic biotite granite and biotite granite south of the northern belt of hornblende schist. A nearly horizontal set, and two vertical sets at about right angles are common. One vertical set strikes northeast to north-northeast and another set strikes west to west-northwest. The outlines of most of the hills of porphyritic biotite granite, especially those around Belleval and Sandy lakes are controlled by joints. A hill about one mile west of Sandy lake has a vertical northwesterly facing joint cliff 100 feet or more high. Wetetnagami river and the shore of Lichen lake are parallel to joints.

Shear Zones

Several shear zones striking west-northwest were noted near the western end of Lichen lake, and two shear zones striking northeasterly occur on the shore in the central part of the lake. Several small schistose zones striking N. 80° E. occur in the granite near the northern boundary of the area along the shore of Wachigabau lake. These may be the eastward extension of some of the shears found near Auger lake.

Shears, in places accompanying parallel joints, are common in the mineralized chlorite granite just south of the western end of Lichen lake. The directions vary from east-northeast to southeast. The dips are steeply northeast to vertical.

ECONOMIC GEOLOGY

General Features

Good values in gold, silver, copper and zinc occur in and near shear zones in the granite and volcanic rocks in the northern part of Le Tac township. Small amounts of nickel and copper are present just west of the area in the body of gabbro west of the southwest end of Nicobi lake. Small quartz-tourmaline veins and small amounts of disseminated cubical pyrite with, in places, a few grains of chalcopyrite, were noted at several places in the granite along the western shore of Lichen lake and in various places in the

belts of volcanic rock and hornblende schist.

Low gold values with pyrite and chalcopyrite and, in places, with arsenopyrite, magnetite, pyrrhotite, tourmaline, ankerite, and calcite have been noted in shear zones and quartz veins in the belt of volcanic rocks just south and southeast of the area (Milner, 1939).

The published airborne magnetometer maps cover only the northern portion of the area west of longitude 76°00'.

Gold-silver-copper Mineralization

Glencona Mining Company, Ltd., and Mid-Bachelor Mines , Ltd.

The Glencona property is south of the south end of Lichen lake and the Mid-Bachelor property is south of Céré lake. The properties have a common north-south boundary, and each consists of 15 claims.

Gold, silver and copper occur with sulphide minerals in and near shear zones that strike northeast or northwest, in northwest and northeast fractures and joints near the shear zones, and as fine fracture fillings and replacement lenses in the granite. The mineralized zone occurs along the northern side of a sheared, oval-shaped body of chlorite granite close to the contact with volcanic rocks. It appears to be about a mile long and several hundred feet wide. Throughout this interval small shears, fractures, joints and lenses several inches wide and several inches to several feet long separated by a great deal of barren granite contain cubical pyrite, chalcopyrite and, in places, quartz and tourmaline. In addition, small amounts of malachite, azurite, limonite, hematite, magnetite, calcite and ankerite were noted in various places. Arsenopyrite was noted by Graham (1950). Some slickensides were noted on the quartz-tourmaline veins.

The mineral occurrences on the Glencona property are in small localized shears and fractures separated by much barren granite. The over-all area is at least 300 feet in a north-south direction by 1,100 feet east-west. On the Mid-Bachelor property the largest area of intermittent sulphide mineralization is at least 700 feet east-west and 200 feet north-south with other mineralized areas to the west.

The assays[1] of grab samples from some of the mineralized areas on the Glencona and Mid-Bachelor properties are given

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(1) The assay samples quoted in this report represent grab samples taken by the writer from solid rock exposures.
The assay samples weighed between 2 and 3 pounds each and contained a large amount of wall rock.

below. They are similar to assays already published by the mining companies. Assays 1 through 8 are from small mineralized areas on the Glencona property and assay 9 is from a large mineralized area near the eastern boundary of the Mid-Bachelor property. Assay 10 is a composite assay of all the above samples and 3 samples (given below) from the Kerromac property. In addition, the composite assay gave 0.03 per cent zinc and no cobalt, nickel, platinum, or tellurium.

Sample Number	Oz. of gold per ton	Oz. of silver per ton	Per cent copper
1	0.094	1.028	5.675
2	0.066	0.490	1.55
3	0.020	0.236	0.32
4	0.130	1.960	7.80
5	2.150	1.614	0.95
6	0.100	0.542	2.9
7	0.135	0.876	2.8
8	0.108	1.456	9.53
9	0.010	0.655	3.34
10	0.194	1.128	4.35

These assay results, along with the size of the mineralized zones and the extensive shearing, fracturing and jointing in the granite, warrant further and careful prospecting.

Kerromac Mining Company, Ltd.

The Kerromac property appears to include the eastward extension of the mineralized zones found a mile to the west on the Glencona and Mid-Bachelor ground. The property comprises a group of 15 claims adjacent eastward to the Glencona property, both properties having a common north-south boundary. The mineralized showing is situated about 100 feet northeast of Post 3, Claim 2 of Certificate 58211 and post 2,Claim 2 of Certificate 58240. It is in chlorite granite within 50 feet of the contact with the volcanic rocks to the north and consists of narrow, parallel, easterly-striking shear and fracture zones. Probably six such zones, individually between ½ and 1 inch wide, occur across a 50-foot north-south area of otherwise massive barren chlorite granite. Pyrite, chalcopyrite and minor azurite and malachite are the ore minerals.

The chlorite granite contains light blue, opalescent lenses of quartz and is similar to that found to the west on the Glencona and Mid-Bachelor properties. Glacial debris and alders cover much of the area to the east.

Two assays of samples taken from the mineralized area are given below:

	Per cent copper	Oz. of gold per ton	Oz. of silver per ton	Per cent zinc
1.	3.89	0.019	0.680	
2.	9.77	0.010	1.157	.01

Several large, angular, granitic boulders resting within a few feet of the above-mentioned claim posts at the edge of a large alder swamp have chalcopyrite evenly distributed throughout the rock along minute fractures. One boulder contains a quartz-tourmaline vein. It is probable that these boulders did not travel very far. An assay of the sulphide mineralization of one of the boulders showed 3.89 per cent copper, 0.686 per cent silver, 0.086 per cent gold, and 0.05 per cent zinc.

Nickel-copper Mineralization

Small amounts of nickel and copper occur in sulphide minerals in some of the bodies of meta-gabbro in the north and south belts of hornblende schist and volcanic rock. Assays of several small mineralized zones just west of Audoli lake gave 0.01 to 0.02 per cent nickel and 0.02 per cent copper.

Noranda Mines, Ltd.

Noranda Mines holds a small group of claims at the southwest end of Nicobi lake in Le Tac township. The southern end of the claim group is bounded by the Le Tac-Muy township line. The area is underlain by a large body of medium-grained gabbro bordered by hornblende schist to the north and biotite granite to the east. In the three small showings so far known on this property, pyrite, chalcopyrite and pyrrhotite occur as replacements of the gabbro, in disseminated grains, and in lenticular pods and fracture fillings. A few hundred feet of diamond drilling on two small sulphide showings, air and ground geophysical surveys, and geological mapping have been done on the claims.

Showing "A" is at the east margin of the gabbro within a few hundred feet of the granite contact; showing "B" is about 4,000 feet northwest of showing "A" and showing "C" about 3,200 feet northwest of showing "B". A grab sample from showing "A" assayed 1.95 per cent copper and 0.14 per cent nickel. A grab sample from showing "B" assayed 0.64 per cent copper, 0.05 per cent nickel and 0.03 per cent cobalt. Assays for gold and silver gave negative results.

Copper-zinc Mineralization

Low-grade copper-zinc deposits were diamond-drilled in several places in the northwest part of Le Tac township in the area midway between the north shore of Moulin lake and the Le Tac-

Lesueur township boundary. These deposits lie just outside the area about 2½ miles west and a little north of Céré lake. The largest deposits are on claims owned by Empire Oil and Minerals, Inc. Sphalerite and chalcopyrite occur in andesitic lava and pyroclastic rocks.

Quartz-tourmaline Veins

Quartz-tourmaline veins were observed at several places in the northern part of the area. The quartz-tourmaline vein on the south shore of Lichen lake one mile west of the mouth of Wetetnagami river is bordered by a narrow shear zone (N. 20° E.) in the granite. The vein is black and consists of about 40 per cent fine, black, tourmaline needles with quartz, ankerite and a few cubes of pyrite. The tourmaline needles are between 1 and 5 mm. long in general; a few are between 10 and 15 mm. long. Most are so small that they cannot be identified with the naked eye. Light brown rusty weathering ankerite occurs in rhombohedral grains, between 5 and 15 mm. in diameter. The ankerite weathers readily, leaving voids in the vein. Pyrite and ankerite appear to be fracture fillings.

A few quartz-tourmaline veins occur with the sulphide deposits in the granite south of the west end of Lichen lake and in the northern belt of hornblende schist and volcanic rocks.

By themselves, quartz-tourmaline veins may be of little economic value but, as these minerals occur as gangue with many of the gold deposits in Ontario and Quebec, they may be regarded as indicators of high-temperature mineral deposits which may be gold-bearing. Ankerite is another characteristic gangue mineral of some Ontario and Quebec gold deposits.

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