Ontario
Division of Mines

HONOURABLE FRANK S. MILLER, *Minister of Natural Resources*

DR. J. K. REYNOLDS, *Deputy Minister of Natural Resources*

G. A. Jewett, Executive Director, Division of Mines *E. G. Pye, Director, Geological Branch*

Geology of the
Redstone River Area
District of Timiskaming

By

D.R. Pyke

Geoscience Report 161

TORONTO
1978

Publications of the Ontario Ministry of Natural Resources
and price list
are obtainable through the
Map Unit, Public Service Centre,
Whitney Block, Queen's Park, Toronto, Ontario
and
The Ontario Government Bookstore
880 Bay Street, Toronto, Ontario.
Orders for publications should be accompanied by cheque,
or money order, payable to Treasurer of Ontario.

Pyke, D.R.
1978: Geology of the Redstone River Area, District of Timiskaming; Ontario Div. Mines, GR161, 75p. Accompanied by Maps 2363 and 2364, scale 1:31,680 or 1 inch to ½ mile.

Review Geologist: D.G. Beggs

1000-300-78-Car

Contents

Tables

Photographs

Figures

Geological Maps

(back pocket)

Map 2363 (coloured)–McArthur and Douglas Townships, District of Timiskaming.
Scale 1 inch to ½ mile (1:31,680).

Map 2364 (coloured)–Bartlett and Geikie Townships, District of Timiskaming.
Scale 1 inch to ½ mile (1:31,680).

ABSTRACT

This report describes the geology and mineral occurrences in McArthur, Bartlett, Douglas and Geikie Townships (Redstone River area), comprising an area of about 360 km^2 (140 square miles), located about 32 km (20 miles) south of the City of Timmins.

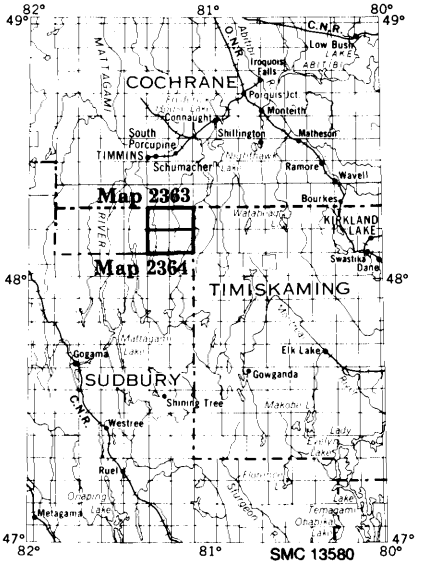


Figure 1–Key map showing location of the Redstone River area. Scale 1:3,168,000 (1 inch to 50 miles).

The bedrock in the area is of Precambrian age. Two volcanic cycles are recognized in the area and are largely confined to a steep-dipping, east to northeast facing, homoclinal sequence, forming the southern part of a synclinal structure trending northwest across the northern part of the area. The composite thickness of the section is about 12 000 m (40,000 feet). The lower sequence consists of mafic metavolcanics overlain by intermediate to felsic metavolcanics with abundant intercalated iron formation. Ultramafic metavolcanics form the base of the overlying cycle, and in turn are overlain by mafic metavolcanics and an upper unit of intermediate to felsic metavolcanics.

A thick, sill-like body of gabbro was emplaced along the contact of the lower mafic and intermediate-to- felsic metavolcanic sequence.

Felsic intrusions include subvolcanic trondhjemitic porphyries, the marginal phases of a large granitic batholith extending into the western part of the area, and large stocks of late tectonic, porphyritic granodiorite.

Diabase dikes of Early, Middle and Late Precambrian age traverse the area.

Regional metamorphism of the Early Precambrian volcanic and sedimentary rocks took place under greenschist facies conditions.

The Texmont Mine nickel ore body occurs in the ultramafic rocks near the base of the second volcanic cycle. This appears to be the same stratigraphic interval in which the nickel deposits in Langmuir and Eldorado Townships occur to the northeast of the map-area.

Geology

of the

Redstone River Area

District of Timiskaming

by

D.R. Pyke[1]

INTRODUCTION

The northern boundary of the Redstone River area is located about 24 km (15 miles) south of the City of Timmins. The area is within the District of Timiskaming, is bounded approximately by Longitudes 81°04′W to 81°20′W and Latitudes 48°06′N to 48°16′N and includes the Townships of McArthur, Bartlett, Douglas and Geikie. Each township is 9.7 km (6 miles) square.

An all-weather, gravel, Forest Access road extends south from Timmins to the central part of Bartlett Township, where a branch road extends east to the Texmont Mine at the Bartlett-Geikie Township boundary. The southern extension of the main road, which is not maintained during the winter months, connects with the Wicks lumber road near the south boundary of English Township, which in turn extends eastward to Highway 566 leading to Matachewan. A lumber road extends north from the Wicks road in southern Zavitz Township to Lower Forks Lake in south central Geikie Township. Subsequent to the mapping of the area, a gravel road has been completed along the western margin of Fallon Township facilitating access to eastern Douglas Township. Much of Douglas Township, however, is best reached by helicopter; float equipped fixed wing aircraft are suitable for parts of north Geikie Township.

Physiography

The area is one of low relief, rarely exceeding 45 m (150 feet), and commonly in the order of 15 to 30 m (50 to 100 feet). The highest local relief – 90 m

[1]Geologist, Precambrian Geology Section, Geological Branch, Ontario Division of Mines, Toronto. Approved for publication by the Chief Geologist, October 27, 1975.

(300 feet) – coincides with some valleys following major joints in the granodiorite in Geikie Township.

Glacial debris mantles much of the bedrock: till, morainal and outwash deposits blanket the western and southern parts of the area, and glacial lacustrine deposits cover much of the northern part of Douglas Township and the northeast part of McArthur Township.

Three main rivers, the Mountjoy, Redstone and Forks, drain the area northward into James Bay via the Mattagami River and Abitibi River systems.

Previous Work

E.M. Burwash (1896) was the first to describe the geological features in the area, while accompanying an Ontario land survey party during the cutting of the Algoma-Nipissing boundary (Niven's meridian), which forms the eastern margin of the area.

In 1911, J.G. McMillan (as reported in Bruce 1926) was the geologist attached to a field party conducting a survey for a possible branch of the Timiskaming and Northern Ontario Railway to extend from Gowganda to Porcupine. McMillan submitted a report on the geology along the proposed line, which traversed the northern part of the Redstone River area.

Hopkins (1924) was the first to provide a sketch map of the geology of McArthur Township, and in the accompanying notes described some of the gold occurrences.

In 1911, Goodwin (reported in Burrows 1911) mapped some of the general geology near the western boundary of Fallon and Cleaver Townships.

Cooke (1919) mapped the Matachewan area in 1917-1918; this area included the southern half of Cleaver Township adjacent to Geikie Township.

In 1925, Bruce (1926) mapped the Redstone River area at a scale of 1 inch to ¾ mile. Prior to the present survey, this report provided the most comprehensive information on the map-area.

Adams and Eldorado Townships, immediately north of the area, were mapped by Harding and Berry (1938) in 1937 at a scale of 1 inch to 1 mile, and later by Pyke (1975a) in 1969 at a scale of 1 inch to ¼ mile.

Fallon Township which adjoins the east boundary of Douglas Township was mapped by Pyke (1973a) in 1968 at a scale of 1 inch to ¼ mile. English and Zavitz Townships, which border the southern part of the area, form part of the Groundhog River area mapped by Gledhill (1926) at a scale of 1 inch to 1½ miles; and later by Bright (1974) at a scale of 1 inch to ¼ mile.

Field Work

The field work for this report was done during the summer of 1970 and 1971. Vertical aerial photographs at a scale of 1 inch to ¼ mile, supplied by the Ontario Division of Forests, provided mapping control. The base map was prepared by the Cartography Section, Ontario Division of Lands, from map-sheets of the

Forest Resources Inventory of the Ontario Division of Lands. Traverses by pace and compass were not spaced at regular intervals, rather only those outcrops or potential outcrop areas that were identified from the aerial photographs were visited. It is believed that very few outcrops were missed. The geology in the report is not tied to surveyed lines.

Acknowledgments

In 1970, the writer was assisted in the field by R.M. deChazal, senior assistant and W.D. (Roy) Burstow, J.H. Clarke, and R. Walker, junior assistants. In 1971, the writer was assisted by R.P. Bowen, senior assistant, and R.G. Tyson, junior assistant.

The consideration extended by Mr. and Mrs. V.G. Emard of Timmins to the writer and his assistants during their stay at Papakomeka Lake is gratefully acknowledged.

Mr. E. Carr of Texmont Mines Limited and Mr. P. Sheridan of Sheridan Geophysics Limited kindly made available to the author much of the information on the Texmont Mine.

GENERAL GEOLOGY

The bedrock in the area is of Precambrian age. Unconsolidated deposits of Pleistocene and Recent age mantle much of the area.

The Redstone River area affords a relatively continuous stratigraphic sequence for this part of the Timmins area. Pillowed mafic metavolcanics are the oldest rocks and a maximum thickness of about 1700 m (5,500 feet) is exposed in the western part of the map-area. Intermediate to felsic metavolcanics overlie the mafic metavolcanics, have a maximum thickness of about 3900 m (13,000 feet) and mark the termination of the lowermost volcanic cycle recognized in the area; intercalated iron formation is common in the central and upper parts of this unit. A more complete section of this lower cycle is present in the western part of the Peterlong Lake area (Pyke 1973b), where it is seen that ultramafic metavolcanics form part of the basal portion of the sequence. The onset of a second cycle of volcanism in the Redstone River area is marked by the extrusion of ultramafic metavolcanics; maximum thickness is about 1500 m (5,000 feet). Approximately 3700 m (12,000 feet) of pillowed mafic metavolcanics overlie the ultramafic metavolcanics, and in turn are superceded by about 900 m (3,000 feet) of intermediate to felsic metavolcanics marking the top of the exposed section.

A sill-like body of gabbro was emplaced along the mafic – intermediate to felsic metavolcanic contact of the lower volcanic cycle. Numerous gabbroic dikes traverse the overlying intermediate to felsic metavolcanics, and may in part represent feeders to the upper volcanic cycle.

Epizonal, trondhjemitic intrusions, of probable subvolcanic origin form a number of small stocks near the contact of the two volcanic cycles in the area. The eastern margin of a large granitic batholith (Pyke, Ayres and Innes 1973)

TABLE 1 | TABLE OF LITHOLOGIC UNITS FOR THE REDSTONE RIVER AREA

CENOZOIC

QUATERNARY

PLEISTOCENE AND RECENT

Clay, sand, gravel, and swamp and stream deposits

Unconformity

PRECAMBRIAN

LATE PRECAMBRIAN

MAFIC INTRUSIVE ROCKS

Olivine diabase

Intrusive Contact

MIDDLE PRECAMBRIAN

MAFIC INTRUSIVE ROCKS

Quartz diabase

Intrusive Contact

EARLY PRECAMBRIAN (ARCHEAN)

MAFIC INTRUSIVE ROCKS

Diabase

Intrusive Contact

FELSIC INTRUSIVE ROCKS

Pyroxene amphibolite, forming marginal phase of monzonite; porphyritic granodiorite, quartz diorite; quartz diorite, diorite, granodiorite; trondhjemitic quartz-feldspar porphyry, trondhjemite

Intrusive Contact

METAMORPHOSED MAFIC INTRUSIVE ROCKS

Gabbro, quartz gabbro, anorthositic gabbro, pyroxenite

Intrusive Contact

METAVOLCANICS AND METASEDIMENTS

METASEDIMENTS

Iron Formation, chert, siltstone

INTERMEDIATE TO FELSIC METAVOCANICS

Massive, largely unstratified tuff; tuff and lapilli tuff, breccia; intercalated massive fine-grained tuff and flows

MAFIC METAVOLCANICS

Massive to well foliated flows, pillowed and variolitic flows, tuff and breccia, amphibolitized and layered or gneissic mafic metavolcanics

ULTRAMAFIC METAVOLCANICS

Massive, polysutured serpentinized flows, serpentinite sills (?), spinifex-textured flows, pyroclastics, carbonatized ultramafic rocks

extends into the western part of the area. Two large stocks of late tectonic granodiorite, are largely enclosed by the upper volcanic cycle rocks.

Diabase dikes of Early, Middle and Late Precambrian age traverse the area.

Most of the rocks of the area are part of a steeply dipping, northeast facing homoclinal sequence, located on the south limb of a synclinal structure, the axis of which trends northwest across the northern part of the area.

Regional metamorphism of the Early Precambrian volcanic and sedimentary rocks took place under greenschist facies conditions.

Early Precambrian (Archean)

METAVOLCANICS AND METASEDIMENTS

Ultramafic Metavolcanics

Ultramafic metavolcanics are confined to one stratigraphic interval, and mark the onset of a second cycle of volcanism in the area. Relative to many other rocks in the area, the ultramafic rocks are fairly well exposed. The ultramafic metavolcanics are fine grained, bluish black on fresh surfaces, and weather grey to orange brown.

No definite flows were recognized in the ultramafic rocks in McArthur and Douglas Townships, though the author does not doubt that they exist. Failure to recognize flows probably stems from the fact that these townships were mapped before the discovery of the excellent exposures of ultramafic flows in Munro Township (Pyke, Naldrett and Eckstrand 1973) and as a result flow contacts were probably overlooked. Definite ultramafic flows ranging in thickness from 1.8 to 3.6 m (6 to 12 feet) were recognized in Geikie and Bartlett Townships, and contain most of the internal features observed in the ultramafic flows of Munro Township (Figure 2); the B_3 layer is generally absent. Chilled and fractured flow tops, and variation in the size of the olivine blades in the spinifex zones readily indicate that the flows form an eastward facing succession.

One feature common to nearly all the ultramafic rocks mapped as flows is a peculiar type of fracturing or polygonal structure, herein referred to as polysuturing (Photo 1). In this structure the rock is fractured into a number of semi-equant polygons ranging in diameter from about 1 to 60 cm (½ inch to 2 feet), and commonly in the order of 5 to 25 cm (2 to 10 inches). Superficially the weathered surface bears some resemblance to mud-cracks, as the periphery of the polygons is outlined by a slightly elevated "lip" (*see* Pyke 1970, Photo 5). Polysuturing, however, is a pervasive structure in that it extends throughout the ultramafic rocks and probably represents some type of cooling phenomena caused by extremely rapid heat loss from thin flows at an initially high (1350°C., Naldrett 1972) temperature. A tendency for the size of the polygons to decrease towards the top of the flow has been observed where individual flows can be recognized. From the author's observations, polysuturing is only found in those

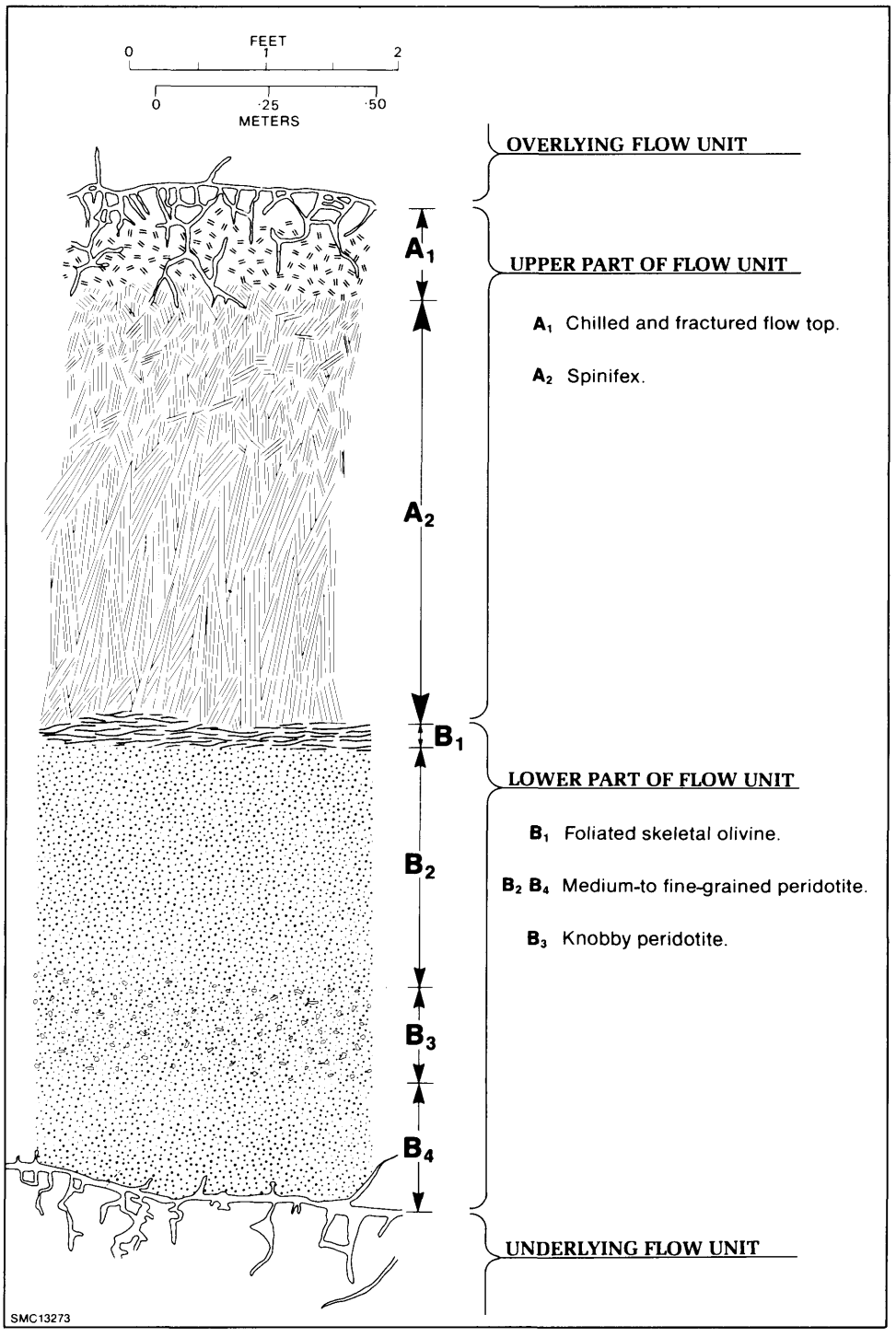


Figure 2–Diagrammatic section of a typical ultramafic flow in Munro Township (after Pyke, Naldrett and Eckstrand 1973).

ODM9704

Photo 1–Polysuturing in ultramafic metavolcanics. Outcrop on power line on Serpentine Mountain, McArthur Township.

ultramafic rocks which can be demonstrated (by the means of flow contact) to be of extrusive origin, and are not found in intrusive ultramafic bodies, which by comparison display a markedly regular joint pattern. Moreover, polysuturing does not appear to occur in other metavolcanics, and can therefore be an exceedingly useful structure in distinguishing ultramafic volcanic rocks which have been subjected to extensive metasomatic replacement (e.g. carbonatization). Furthermore, polysuturing can still be discerned in many ultramafic volcanic rocks that have undergone extensive shearing.

Along at least part of the basal portion of the ultramafic unit, for example extending north from the Texmont Mine area to the McArthur-Bartlett Township boundary and again northeast of this in the vicinity of McArthur Creek, the ultramafic rocks are massive, and no evidence for a flow origin was observed. Although spinifex textured zones are locally common within the massive basal portion, as demonstrated in the vicinity of the Texmont Mine (Eckstrand and Miller 1972), they tend to be discontinuous, and display rapid and irregular variation in crystal habit and size, unlike that which is characteristic of known flows (Eckstrand 1972). Polysuturing, a structure characteristic of known ultramafic flows, is absent. Perhaps the lack of polysuturing and the irregular character of the spinifex zones may be explained by invoking the formation of much thicker flows than have previously been recorded; the flows may thereby acquire a superficial similarity to intrusive ultramafic rocks. Alternatively, they may in fact represent high-level subvolcanic sills emplaced along the basal contact of the ultramafic flows. Further discussion on the origin of the massive ultramafic rocks is

TABLE 2 CHEMICAL ANALYSES OF ULTRAMAFIC FLOWS FROM THE REDSTONE RIVER AREA.

Sample Number	P-2-72	P-4-72	P-101-72	P-177-70
SiO_2	38.60	41.30	43.50	41.10
Al_2O_3	3.69	7.68	7.68	5.07
Fe_2O_3	7.02	5.05	2.99	3.04
FeO	3.67	7.15	8.55	6.70
MgO	33.30	24.20	19.80	30.60
CaO	3.23	7.06	8.73	4.38
Na_2O	.19	.73	1.60	.35
K_2O	.02	.05	.12	.02
TiO_2	.27	.49	.49	.30
P_2O_5	.05	.11	.18	.07
S	.04	.03	.01	.04
MnO	.16	.19	.24	.19
CO_2	.23	.10	.16	.59
H_2O^+	8.86	5.05	4.12	7.21
H_2O^-	.10	.05	.08	.06
Total	99.40	99.20	98.20	99.70

Sample Locations

P-2-72	Massive ultramafic metavolcanic, Geikie Township 1.5 km (1 mile) northeast of Texmont Mine. Sample is from a 2.1 m (7 feet) thick flow, midway between the basal contact and spinifex-texture top.
P-4-72	Spinifex-textured ultramafic metavolcanic, from same outcrop as P-2-72, but from the upper part of the overlying flow.
P-101-71	Spinifex-textured ultramafic metavolcanic from the northwest corner of Geikie Township.
P-177-70	Massive, polysutured ultramafic metavolcanic, near north end of large island in McArthur Lake, McArthur Township.

presented in the section dealing with the Texmont Mine.

Microscopically, the ultramafic flows are seen to be altered largely to serpentine, chlorite, and tremolite, lesser talc, and minor carbonate and magnetite. When shearing is prevalent, talc-tremolite alteration predominates, and extensive carbonatization occurs adjacent to the epizonal intrusions south of McArthur Lake. Some of the flows contain up to 35 percent relict olivine (approximately Fo_{90-94}); grain size is generally 0.5 to 1.0 mm. Pseudomorphs of serpentine after olivine are generally not well preserved, except in the basal portions of the massive ultramafic rock-units. It was possible to establish that some basal portions were of dunitic composition. Elsewhere, in the polysutured flows, the abundance of tremolite, often in the order of 20 to 30 percent, suggests a dominantly peridotitic composition (assuming most of the tremolite is from the alteration of pyroxene). In spinifex zones, former blades of olivine are largely altered to serpentine and chlorite, whereas the interblade areas, originally composed mainly of clinopyroxene and glass, are largely altered to tremolite and lesser chlorite.

The chemical analyses of four samples from the ultramafic metavolcanics are given in Table 2. Two samples are from spinifex zones, and two from the

massive polysutured portion of the flows. The analyses are similar to those reported by Pyke, Naldrett and Eckstrand (1973) for the ultramafic flows of Munro Township, where it was concluded that the composition of the spinifex is representative of the liquid portion of the flows. The polysutured, or non-spinifex portion of the flows (B zone, Figure 2) consists largely of cumulate olivine (60 to 70 percent); the intercumulus liquid largely crystallized as clinopyroxene and glass (Pyke, Naldrett and Eckstrand 1973). The composition of the ultramafic metavolcanics differs somewhat from the komatiites (Viljoen and Viljoen 1969a) of South Africa in that they do not have as high a Ca/Al ratio (1.5 for peridotitic komatiite versus about 1.0 for ultramafic flows from the Abitibi Belt). In this regard, those from the Abitibi Belt (Naldrett and Mason 1968; Pyke, Naldrett and Eckstrand 1973) more closely resemble the ultramafic flows from the Yilgarn Block of Western Australia (Nesbitt 1971).

Mafic Metavolcanics

Mafic metavolcanics occur mainly at two stratigraphic intervals in the area: a lower sequence outcropping along and near the western part of the area, and an upper sequence confined largely to Douglas Township. The base of the lower sequence is not exposed, being engulfed by the eastern margin of the Peterlong Lake Complex (Pyke 1973b).

The mafic metavolcanics are fine to coarse grained, dark grey to green weathering, medium to dark green on fresh surfaces, and generally massive to weakly foliated. Medium- to coarse-grained gabbroic appearing metavolcanics are rare in the lower sequence, but common throughout the upper sequence in Douglas Township. In the lower sequence individual flows were rarely recognized; the thickest observed was 34 m (110 feet) thick, and is coarse grained and gabbroic appearing toward the lower contact; only the upper 6 m (20 feet) are fine grained. In Douglas Township some of the flows are up to 60 m (200 feet) thick, although it is rare that both contacts are observed; the abundance of coarse-gabbroic phases however, suggests that many of the flows are relatively thick. Amygdules are most common in the lower sequence of metavolcanics and are generally filled with one or more of the minerals, quartz, chlorite, or calcite. Variolitic pillow lava was observed at two localities in the upper sequence of metavolcanics; individual varioles range up to a maximum of about 2.5 cm in diameter. Pillow structure is common throughout all the mafic metavolcanics. Colour index varies from about 35 to 80 percent, and is generally greater than 50 percent.

Mineral assemblages in the mafic metavolcanics are indicative of the greenschist facies of regional metamorphism. In most thin sections it is seen that the original plagioclase is altered to aggregates of sodic plagioclase, epidote-clinozoisite, and minor chlorite. Sericite and lesser calcite are also common alteration products in the lower sequence of metavolcanics, whereas in some thin sections the plagioclase appears as a dull brown semi-opaque matte. Relict andesine persists in some of the coarse gabbroic flows, locally to the complete exclusion of sodic plagioclase. Overall, albite is the dominant plagioclase composition. The main mafic constituent in the lower sequence of metavolcanics is a pale green,

weakly pleochroic, somewhat shreddy appearing actinolitic amphibole. The hornblende in the upper sequence of mafic metavolcanics differs in that it is markedly pleochroic and does not have the matted or shredded appearance of the amphiboles in the lower sequence of metavolcanics. This may reflect a higher sub-facies of the greenschist facies (i.e. the quartz-albite-epidote-almandine subfacies) for the upper sequence of metavolcanics. However, as pointed out by Fyfe *et al.* (1958) there is difficulty in optically distinguishing hornblende from actinolite. Quartz is a persistent though minor constituent in all the mafic metavolcanics, varying from 2 to 12 percent. Leucoxene, commonly occurring as an alteration of ilmenite-magnetite intergrowths, forms up to 5 percent of some of the coarse-grained central parts of flows. Pyrite and apatite are rare additional accessories. In many of the rocks examined the original volcanic texture is largely preserved.

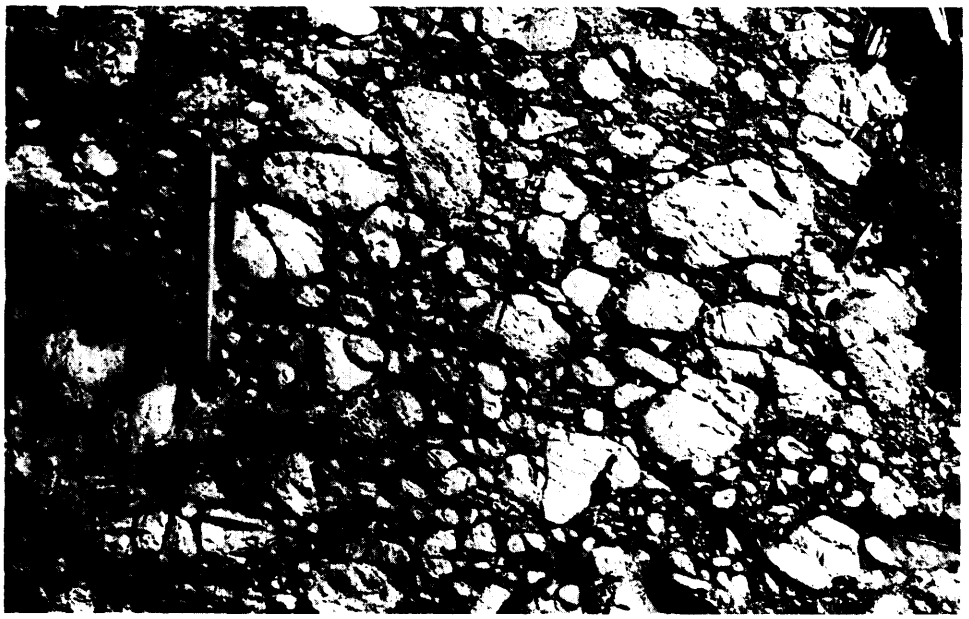
Mineral assemblages in the contact aureoles of the granitic plutons (with the exception of the epizonal intrusions) are often more typical of the almandine amphibolite facies than the hornblende hornfels, as epidote is a common constituent and co-exists with plagioclase of oligoclase to andesine composition. This is particularly so within about 0.5 km (¼ mile) of the contacts. The hornblende is medium green, strongly pleochroic and recrystallized to a fine-grained aggregate of crystals with sharp distinct boundaries. Most of the plagioclase is recrystallized to a fine grained non-twinned mosaic, although rare relict phenocrysts do persist. Mafic metavolcanics up to 1.5 km (1 mile) from the granitic stocks, notably the Geikie Pluton, megascopically appear to be in the amphibolite facies (needles of hornblende are readily visible in hand specimen); however, in thin section the hornblende is not recrystallized to the mosaic-type texture as found close to the contacts, and the plagioclase is albitic, indicative of the albite-epidote hornfels facies.

The magnetic anomaly (GSC 1970a) extending southeast from the small lake near the central part of Douglas Township, can not be wholly accounted for at present. In part, at least east of Swamp Lake, it appears to be a reflection of the two north trending diabase dikes, however, further north the anomaly is displaced from the dikes; one dike being partly coincident with the eastern boundary of the anomaly. Locally the metavolcanics within the anomaly are partly amphibolitized, and appear similar to those commonly found in contact metamorphic aureoles. In part, the magnetic anomaly may therefore be a reflection of dynamothermal metamorphism imposed by an underlying granitic cupola. Alternatively, an easterly dipping normal fault coincident with the west margin of the anomaly could displace the diabase dike westward at depth, thereby accounting for the wide anomaly; this would not however explain the metamorphism.

Only one sample of the mafic metavolcanics has been analysed to date (*see* Table 3), and this is a tholeiitic pillow basalt from the lower sequence in the southwest corner of Bartlett Township.

Intermediate to Felsic Metavolcanics

Intermediate to felsic metavolcanics are largely confined to two main stratigraphic intervals: a lower sequence in the west central part of the map-area, and



ODM 9705

Photo 2–Intermediate to felsic breccia. Outcrop on powerline, 1.5 km (1 mile) north of Boomerang Lake, Bartlett Township.

an upper sequence coincident with the synclinal axis in the northern part of Douglas Township. Both sequences appear to be entirely fragmental, consisting dominantly of a variety of tuff and lapilli-tuff (lapilli-stone); crystal tuff, crystal-lapilli tuff and crystal-lithic-lapilli tuff dominate. Breccia is locally abundant. Weathered surfaces are generally light grey to white, but may also be light green, buff or pink; fresh surfaces are light to medium grey or green. Most of the pyroclastic rocks are not obviously layered. Where layering is present it is generally quite thick, commonly on the scale of an outcrop (a few tens of feet). Finer layering, imparted by chert bands, sericite rich intervals, or alternating fine and coarse tuff layers, is locally present and ranges in thickness from 1 mm to 15 cm ($^1/_{20}$ to 6 inches).

Subhedral to euhedral crystals of plagioclase varying from 10 to 60 percent by volume and averaging about 30 percent are the main fragments in the tuffs and lapilli tuffs. The plagioclase ranges from albite to sodic oligoclase in composition, and shows varying degrees of alteration to calcite and sericite. Minor (2 to 5 percent) quartz crystals and lesser lithic fragments are commonly present. The matrix is generally an extremely fine-grained (0.04 mm) mosaic of plagioclase and lesser quartz and contains variable amounts of interlaced sericite and chlorite. Minor epidote, opaque minerals and leucoxene are common accessories.

Breccia is locally abundant (Photo 2); fragments average about 8 to 10 cm (3 to 4 inches) in maximum dimension, are rarely as large as 30 to 90 cm (1 to 3

feet) and commonly form 40 to 60 percent by volume of the rock. The shape of the fragments varies from angular to rounded. The dominant fragment is a light grey to white weathering, quartz-feldspar porphyry; subordinate breccia-sized fragments include non-porphyritic felsic metavolcanics, mafic metavolcanics, chert, iron formation and vein quartz. The matrix varies from a fine-grained medium- to dark-green chloritized tuff to a light grey weathering felsic tuff, crystal tuff, or lapilli-tuff; the felsic matrices predominate. The subrounded to rounded habit of some of the fragments in the breccia is suggestive of some reworking (i.e. a possible laharic deposit). However, attrition of the fragments could also be attributed to volcanic action.

The intermediate to felsic metavolcanics west of Scott Lakes are particularly massive in appearance, and only a few definite fragmental zones were outlined in the mapping; in part this reflects the overall poor exposure. In thin section many of the massive appearing metavolcanics are seen to be fine-grained crystal-lithic tuffs; the fragmental nature although by no means always obvious, can generally be implied from the overall heterogeneity of the texture. Because of the general massive appearance of these rocks, and the lack of coarse pyroclastic zones as found in the metavolcanics east of Scott Lakes, this basal portion of the intermediate to felsic metavolcanics has been coded separately (prefixed by the code 3d) on Map 2364 (back pocket).

Within 600 to 900 m (2,000 to 3,000 feet) of the Geikie Pluton, the main mineral assemblage is characteristic of the albite-epidote hornfels facies: albite-quartz-chlorite-biotite ± hornblende, with minor epidote, leucoxene and opaque minerals.

The chemical analyses of three samples of intermediate to felsic metavolcanics are given in Table 3. All samples plot within the calc-alkaline field as defined by a standard AFM diagram, and plot within the dacitic field on a graph of a normative plagioclase *versus* normative colour index, as given by Irvine and Baragar (1971).

Metasediments

Iron formation constitutes the bulk of the metasediments, and is almost wholly confined to the lower sequence of intermediate to felsic metavolcanics in Bartlett and McArthur Townships. Exposure is relatively poor, and the continuity of many of the bands as shown on Maps 2363 and 2364 (back pocket) is largely inferred from available geophysical information (GSC 1970a; Assessment Files Research Office, Ontario Division of Mines, Toronto). Both oxide- and sulphide-facies iron formation are present; the former is prevalent. The iron formation consists mainly of interlayered magnetite-rich and quartz (chert) bands (Photo 3), minor siderite, and subordinate jasper. Thin layers (1 to 3 mm) of feldspathic siltstone and fine-grained sandstone, some of which display graded bedding and flame structure (Photo 4) are also present. Magnetite-rich bands are commonly 0.6 to 5 cm thick and rarely as much as 10 cm.

There is no sharp division stratigraphically between the oxide and sulphide facies, as both magnetite and pyrite-pyrrhotite beds may be interlayered. However, the sulphide facies does predominate in the iron formations toward the top

TABLE 3 | CHEMICAL ANALYSES OF THE MAFIC, AND INTERMEDIATE TO FELSIC METAVOLCANICS IN THE REDSTONE RIVER AREA.

Sample Number	B-29-71	P-1-72	P-27-71	P-461-71
SiO_2	51.90	64.30	66.70	64.50
Al_2O_3	12.90	15.60	15.20	16.00
Fe_2O_3	1.40	1.28	.27	.92
FeO	10.50	4.42	2.23	3.90
MgO	6.90	2.35	1.45	2.09
CaO	9.15	2.55	3.39	2.78
Na_2O	2.34	5.58	4.03	3.61
K_2O	.15	.92	2.03	1.66
TiO_2	.96	.66	.56	.90
P_2O_5	.08	.18	.14	.15
S	.01	.01	.01	.02
MnO	.21	.10	.13	.06
CO_2	.15	.54	1.13	2.05
H_2O+	1.96	2.19	1.58	2.72
H_2O^-	.05	.06	.10	.08
Total	98.70	100.70	99.40	101.40

Sample Locations

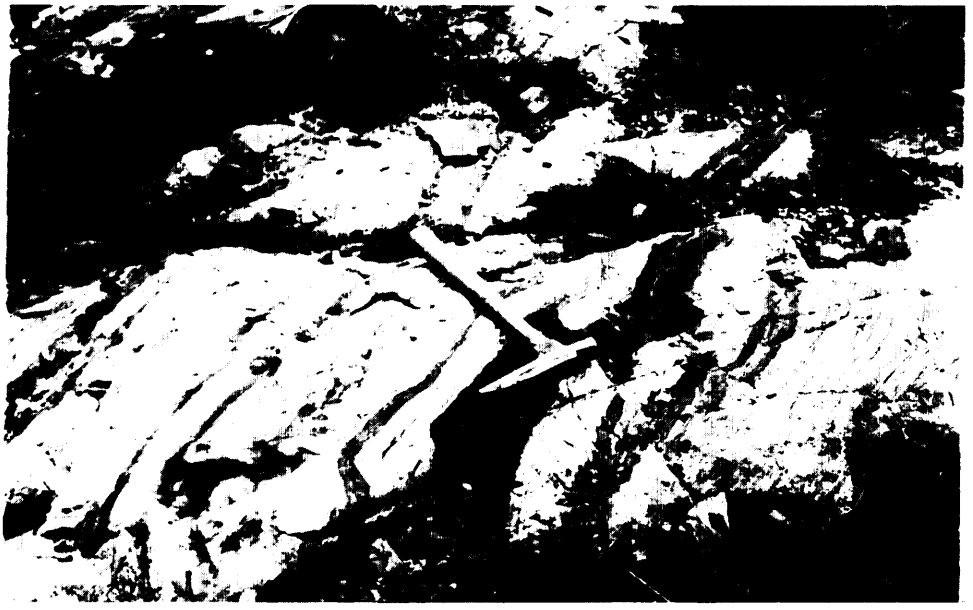
B-29-71	Pillowed mafic metavolcanic (lower sequence), southwest corner of Bartlett Township.
P-1-72	Crystal lapilli tuff, on power line about 1.5 km (1 mile) south of Boomerang Lake in Bartlett Township.
P-27-71	Crystal lapilli tuff, on power line at boundary of Bartlett and English Townships.
P-461-71	Massive tuff, 0.8 km (½ mile) east of Muskasenda Lake and 2.4 km (1½ miles) north of Bartlett-English Townships boundary.

of the intermediate to felsic metavolcanics in McArthur and Bartlett Townships. The one outcrop of iron formation in the northern part of Douglas Township consists dominantly of chert with minor pyrite-rich bands.

Iron formations are commonly 5 to 8 m (15 to 25 feet) thick, but may be as much as 30 m (100 feet). The widest zones observed outcrop on the power line in McArthur Township. Here four bands of iron formation with a total thickness of about 60 m (200 feet) are interlayered with a comparable thickness of felsic tuff, agglomerate and minor mafic chloritic tuff. Within any one iron formation zone, magnetite-rich layers do not exceed 30 percent by volume of the rock, and are commonly less than 15 to 20 percent.

METAMORPHOSED MAFIC INTRUSIVE ROCKS

Metamorphosed mafic intrusive rocks are mostly confined to a large sill-like intrusion in the western part of the area, emplaced largely along the contact between the mafic and intermediate to felsic metavolcanics. Massive, medium-



ODM 9706

Photo 3–Algoma-type iron formation; banded chert and magnetite. Outcrop on power line 2.0 km (1.3 miles) north of McArthur-Bartlett Township boundary.

ODM 9707

Photo 4–Flame structure in graded beds of fine-grained sandstone and siltstone. Outcrop on power line, 0.4 km (¼ mile) south of Boomerang Lake, Bartlett Township.

ODM9708

Photo 5–Layered gabbro, east shore Muskasenda Lake.

grained melanocratic gabbro is the dominant rock type; subordinate phases include anorthositic gabbro, quartz gabbro and pyroxenite. Fresh surfaces are light to dark grey or black, and weathered surfaces are medium to dark grey. Compositional layering is present in part of the gabbro, and may occur either on a large scale, with individual layers up to about 90 m (300 feet) thick, or a small scale, where layers range in thickness from 2.5 cm to 60 cm (1 inch to 2 feet) (Photo 5). Only three outcrops of pyroxenite were observed, and these are near the base of the intrusion. Whether this indicates that the pyroxenite forms a relatively continuous unit is not known.

Dikes of quartz gabbro (15 to 20 percent quartz) intrude the gabbro but are largely interpreted as a comagmatic phase of the latter, as many outcrops of quartz gabbro appear to be conformable with and an integral part of the gabbroic intrusion. Commonly, the quartz has a blue tinge similar to that in the diorite forming part of the Peterlong Lake Complex, (Pyke 1973b) suggesting perhaps a genetic relationship. At present, however, this interpretation is not favoured by the author, primarily because the colour index of the quartz gabbro is high (45 to 55 percent) in spite of a high quartz content. Some quartz may be accounted for by metasomatic replacement related to the faulting and associated quartz veining along Muskasenda Lake, but this could not be established. The quartz grains are semi-rounded (up to 2 mm diameter) to irregular in outline; minor quartz also locally forms a micropegmatitic intergrowth with plagioclase.

Dikes, sills, and irregular plugs of gabbro and quartz gabbro are commonly found intruding the overlying intermediate to felsic metavolcanics. In part, some

of these may represent feeders to the overlying mafic metavolcanics.

Thin section examination reveals that the mineral assemblages of the gabbro are indicative of the greenschist facies metamorphic rank. The plagioclase is altered to clinozoisite, lesser epidote, and minor chlorite, calcite and sodic plagioclase; grain size is in the order of 1.0 to 2.0 mm. Pale green, weakly pleochroic hornblende constitutes 40 to 70 percent of the gabbro, averages about 55 percent, and commonly forms semi-equant grains 2 to 3 mm in length. Many grains display patchy alteration to calcite and chlorite, or less commonly a felt-like mass of fine actinolitic hornblende. In the anorthositic gabbro, hornblende forms about 25 to 30 percent of the rock, and may be extremely altered to chlorite, carbonate and quartz. Quartz and titaniferous magnetite (now largely altered to leucoxene) are common minor constituents, either of which may be present in amounts from 2 to 6 percent.

In the quartz gabbro the plagioclase is not as saussuritized as that in the gabbro, and compositions range from about An_{20} to An_{30}. The hornblende differs in that it forms anhedral strongly poikilitic grains, with shredded appearing irregular boundaries, which contrasts with the generally blocky subhedral habit of the hornblende in the gabbro, some of which obviously pseudomorph pyroxene.

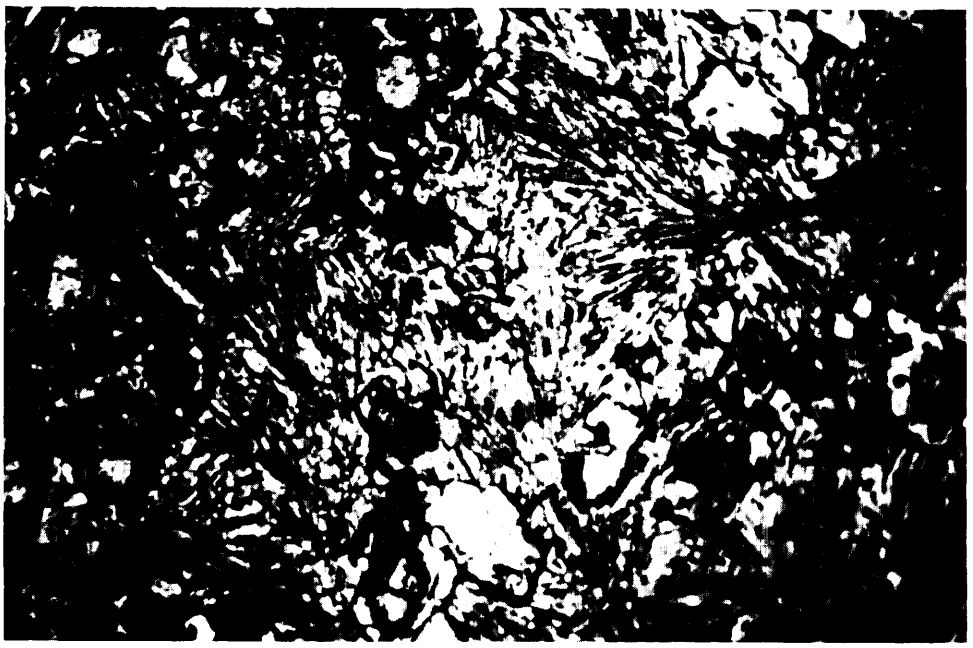
One thin section of pryoxenite was examined and consists of 85 percent pale green actinolitic hornblende, 12 percent chlorite and 3 percent leucoxene.

Thin sections of three samples from the gabbroic sills and dikes intruding the intermediate to felsic metavolcanics were examined and gave the following compositions: hornblende, 42 to 61 percent, average 53 percent; saussuritized plagioclase, 30 to 50 percent, average 37 percent; quartz, 4 to 8 percent, average 6 percent; leucoxene, 2 to 8 percent, average 4 percent; and minor to trace amounts of pyrite and magnetite.

One thin section from an isolated outcrop of gabbro on the peninsula separating the two easternmost bays in McArthur Lake revealed the rock to be of interest both texturally and mineralogically. At the time of mapping it was thought that the gabbro might be related to the ultramafic flows, however, except for a spatial association, no definite relationship could be established. The gabbro consists of 40 percent plagioclase, 30 percent olivine (forsterite), 30 percent augite, and trace amounts of opaque minerals. The mafic minerals are virtually unaltered[1]: the olivine displays only local, incipient conversion to serpentine, varies in length from 0.2 to 2.5 mm, and averages about 1.0 mm. Colourless, semi-equant, non-pleochroic crystals of augite average about 1 to 2 mm in length, and enclose some of the crystals of olivine. The plagioclase (labradorite) forms radiating bundles of prismatic crystals averaging about 0.5 mm in length and 0.01 mm in width (Photo 6). Superficially the texture of the plagioclase is somewhat similar to bundles of tremolite. The parallel growth of the prismatic plagioclase crystals is suggestive of a rapid cooling phenomena, however, there is no suggestion of any skeletal habit.

The chemical analyses of two samples of gabbro and one of pyroxenite are given in Table 4.

[1]Although in outcrop the gabbro did not appear to be a diabase dike, the preservation of the primary mineralogy suggests this possibility.



ODM9709

Photo 6–Photomicrograph of gabbro containing radiating clusters of plagioclase. Specimen from the east bay of McArthur Lake.

FELSIC INTRUSIVE ROCKS

Three main types of felsic intrusive rocks are found in the area: (1) small epizonal stocks and sills of porphyritic trondhjemite, which may represent a subvolcanic phase of the intermediate to felsic metavolcanics; (2) quartz diorite, which forms the eastern margin of a large granitic batholith (Peterlong Lake Complex; Pyke 1973b) which extends into the western part of the Redstone River area (Pyke, Ayres and Innes 1973), and (3) large stocks of porphyritic granodiorite (Adams and Geikie Plutons), which were largely emplaced in the upper sequence of metavolcanics. It is the author's opinion that the above listing represents the general age relationships from oldest to youngest amongst the various plutons. Also included as part of the felsic intrusions is a coarse-grained amphibolitic rock, that is very similar to the pyroxene amphibolite mapped by Pyke (1970) in Langmuir Township. Here, the pyroxene amphibolite forms the marginal zone of a small stock of monzonite and was interpreted to be a contaminated phase resulting from the assimilation of the adjacent metavolcanics.

TABLE 4 | CHEMICAL ANALYSES OF THE METAMORPHOSED MAFIC INTRUSIVE ROCKS.

Sample Number	P-162-71	P-188-71	P-57-71
SiO_2	49.20	51.10	42.40
Al_2O_3	14.90	11.90	10.00
Fe_2O_3	2.80	4.22	2.08
FeO	7.90	13.10	11.80
MgO	8.09	3.85	18.10
CaO	9.90	7.25	7.30
Na_2O	2.56	3.61	.47
K_2O	.31	.18	.05
TiO_2	.84	2.17	.55
P_2O_5	.06	.16	.01
S	.05	.02	.01
MnO	.21	.29	.23
CO_2	.51	.18	.26
H_2O^+	2.69	1.94	4.94
H_2O^-	.04	.04	.12
Total	100.10	100.00	98.40

Sample Locations

P-162-71 Layered gabbro, east shore of Muskasenda Lake, about 1.5 km (1 mile) north of the Bartlett-English Township boundary.

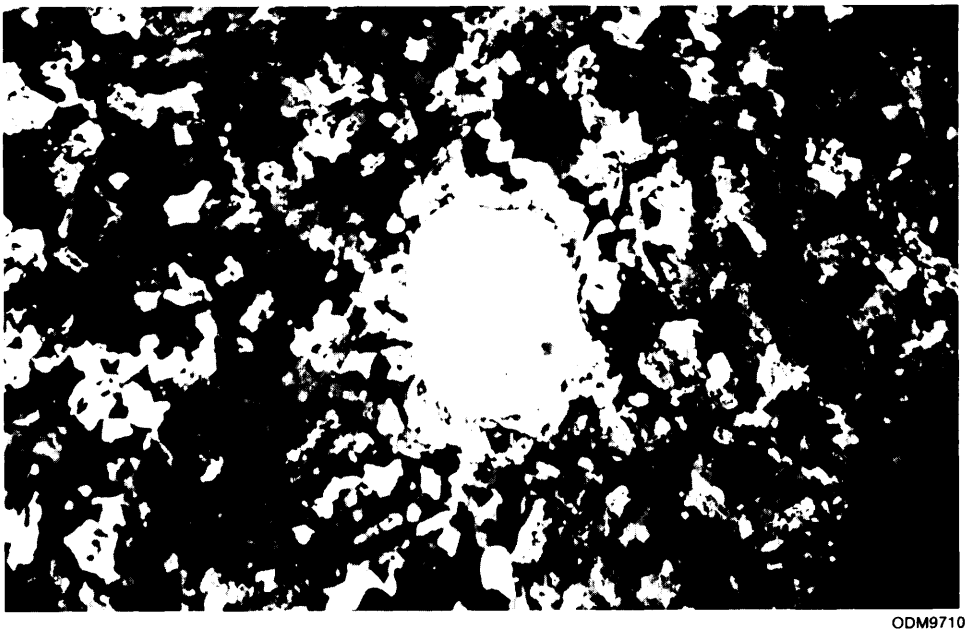
P-188-71 Massive gabbro 0.8 km (½ mile) west of Muskasenda Lake, and 1.5 km (2.3 miles) north of the south boundary of Bartlett Township.

P-57-71 Pyroxenite 1 km (0.8 miles) west of Muskasenda Lake near south boundary and within Bartlett Township.

Epizonal Intrusive Rocks (Trondhjemite)

The largest stock of trondhjemite is mainly confined to the northeast part of Bartlett Township, and intrudes the upper part of the lower sequence of intermediate to felsic metavolcanics. Bruce (1926) has indicated that this stock may extend as far south as Scott Lakes. This may well be, however, during the current mapping no exposures of trondhjemite were detected in the vicinity of Boomerang Lake to Scott Lakes. Small stocks and sills of trondhjemite intrude the base of the overlying metavolcanic sequence.

The largest stock is the best exposed and consists of a fine-grained porphyritic margin, and a fine- to medium-grained equigranular central portion. Weathered and fresh surfaces are light shades of grey, pink, and locally green. Minor miarolitic cavities were observed near the northern part of the intrusion. The periphery of the trondhjemite intrusion locally has a strong fracture cleavage developed; the central portion is massive. The porphyritic marginal phase commonly contains 5 to 7 percent phenocrysts of plagioclase, and 1 to 3 percent phenocrysts of quartz. The phenocrysts average a millimetre or less in maximum



ODM9710

Photo 7–Photomicrograph of quartz-feldspar porphyry, showing micrographic intergrowth of plagioclase and quartz at margin of quartz phenocryst.

dimension, and are set in a groundmass consisting almost entirely of anhedral, interlocking fine grains (0.15 to 0.2 mm) of quartz and plagioclase. Micrographic intergrowths of quartz and plagioclase form a narrow rim surrounding many of the quartz phenocrysts (Photo 7). The porphyritic marginal phase is about 300 m (1000 feet) wide and rapidly grades into a fine grained central portion with an average grain size of about 1 mm. The plagioclase is albite to sodic oligoclase in composition, and shows varying degrees of alteration to epidote, clinozoisite, chlorite and sericite. Chlorite and lesser biotite form the mafic constituents. Five thin sections were examined from the stock in northeast Bartlett Township and gave the following compositions: albitic plagioclase, 55-60 percent, average 61 percent; quartz, 29 to 37 percent, average 33 percent; chlorite (plus minor biotite), 1 to 8 percent, average 5 percent. Accessory minerals include microcline, allanite, leucoxene, apatite, sphene, zircon and opaque minerals.

That the trondhjemite is an epizonal (high-level) intrusion is evident from the chilled margins, locally abundant fracturing, porphyritic texture and miarolitic cavities.

The small trondhjemitic stocks emplaced near the base of the upper sequence of metavolcanics in the vicinity of McArthur Lake and the northwest corner of Geikie Township, are in general not as quartz-rich as the stock in Bartlett Township, nor do they possess a fine-grained chill margin. They do, however, have a porphyritic texture, locally display rapid compositional variations

TABLE 5 | CHEMICAL ANALYSES OF THE TRONDHJEMITIC INTRUSIONS FROM THE REDSTONE RIVER AREA.

Sample Number	P-528-70	P-209-71
SiO_2	77.20	68.00
Al_2O_3	12.80	15.00
Fe_2O_3	.67	1.90
FeO	.66	3.24
MgO	.10	1.31
CaO	.82	3.89
Na_2O	5.24	4.18
K_2O	2.17	1.23
TiO_2	.06	.60
P_2O_5	.01	.16
S	.01	.01
MnO	.04	.16
CO_2	.29	.22
H_2O^+	.74	1.41
H_2O^-	.06	.09
Total	100.80	101.40

Sample Locations

P-528-70 Trondhjemitic quartz-feldspar porphyry forming fine-grained marginal phase of epizonal intrusion in northeast Bartlett Township.

P-209-71 Medium-grained trondhjemite from epizonal intrusion in northeast part of Bartlett Township.

(i.e. colour index variations from 10 to 50 percent), and contain miarolitic cavities, all of which suggest a high level of emplacement. Five thin sections of typical trondhjemite of the McArthur Lake-Geikie Township intrusions gave the following compositions: plagioclase (albite to sodic oligoclase, largely saussuritized), 66 to 78 percent, average 73 percent; quartz, 14 to 22 percent, average 18 percent; hornblende (largely altered to chlorite), 5 to 10 percent, average 8 percent. Minor constituents include microcline, apatite, leucoxene, calcite and opaque minerals. One felsic porphyritic phase contained 71 percent albite, 28 percent quartz, and minor muscovite, apatite and opaque minerals. One sample of a mafic quartz dioritic phase taken on the boundary of McArthur and Bartlett Townships contains 49 percent saussuritized plagioclase, 10 percent quartz, 17 percent hornblende, and 22 percent felt-like actinolite replacing the hornblende.

The chemical analyses of two samples from the stock in northwest Bartlett Township are given in Table 5. Both analyses indicate a high Na/K ratio; the marginal phase is a particularly felsic trondhjemite.

Whether or not the epizonal trondhjemitic intrusions are related to the volcanism or represent high level satellitic intrusions of the larger granitic batholiths is difficult to demonstrate. Mineralogically, the saussuritization of the plagioclase and the chloritization of the mafic constituents in the trondhjemites could be ascribed to deuteric alteration. However, the author considers this unlikely, as both plagioclase and hornblende have generally survived in the granitic

rocks post-dating regional metamorphism elsewhere in the area. Also the high Na/K ratio of the trondhjemite and the spatially associated felsic pyroclastics suggest a common parentage. Moreover, no contact metamorphic aureole was detected at the margins of the epizonal intrusions, suggesting that emplacement preceded regional metamorphism.

Peterlong Lake Complex (Diorite and Quartz Diorite)

Massive, medium-grained hornblende diorite and quartz diorite which form part of the eastern margin of a large granitic batholith (Peterlong Lake Complex), extends into the western part of the Redstone River area. A more detailed description of a much larger portion of the northeastern margin of the batholith is given by Pyke (in press). A characteristic feature of many of the marginal rocks in Bartlett and McArthur Townships is the presence of 5 to 25 percent blue opaline quartz. Weathered surfaces are light to dark grey, and some possess a rough weathered knobby to almost cindery texture. Fresh surfaces are generally medium grey. The colour index is commonly 30 to 35 percent, but is locally 60 percent or more near the contact, due to contamination by the adjacent mafic metavolcanics.

Three thin sections of the diorite-quartz diorite were examined and contained: 53 to 68 percent plagioclase, average 59 percent; 30 to 44 percent hornblende, average 37 percent; and 3 to 6 percent quartz, average 4 percent. The plagioclase varies in composition from calcic andesine to sodic labradorite and shows spotty to locally complete alteration to epidote and chlorite. The hornblende is pleochroic from medium green to light brown and is variably altered to actinolite and chlorite. Apatite, sphene and opaque minerals are minor accessories. A minor quartz-rich biotite phase occurs near the McArthur-Bartlett Township boundary, and intrudes the hornblende diorite quartz diorite. One thin section of biotite quartz diorite was examined and contains 44 percent plagioclase (andesine), 34 percent quartz, 15 percent biotite, and traces or minor amounts of chlorite, K-feldspar, calcite, apatite and zircon.

Adams and Geikie Plutons

Two large stocks of medium-grained porphyritic granodiorite occur in the area: the Geikie Pluton, centred in Geikie Township, and the Adams Pluton (Pyke 1973b) which extends into the northern part of the area. The stocks are very homogeneous, displaying little variation in texture or composition. Phenocrysts of K-feldspar, and less commonly plagioclase, form 10 to 15 percent by volume of the granodiorite, and range in length from 3 to 25 mm (0.1 to 1 inch), averaging about 8 mm (0.3 inch). The stocks are massive, and weathered and fresh surfaces are light greyish white to pink. Locally the phenocrysts were noted to have a weak preferred orientation, however, low mafic content and relatively coarse grain size (2.0 to 3.0 mm) could tend to obscure a much more pervasive foliation than indicated on the accompanying map, as a weak foliation

would not always be apparent.

Contacts with the host rocks are usually very sharp, with little evidence of assimilation or contamination between the granodiorite and metavolcanics. One notable exception is in the southeast part of Bartlett Township, north of the Redstone River. Here the marginal phase of the Geikie stock is highly contaminated, displaying variable mafic content (10 to 60 percent) and containing numerous partly assimilated and amphibolitized mafic metavolcanic inclusions.

Dikes of felsite and locally fine-grained pegmatite intrude the granodiorite and are probably comagmatic phases.

The massive to weakly foliated nature of the stocks and the apparent general conformability of the contacts with the stratigraphy in the surrounding metavolcanic sequence suggest that the Adams and Geikie Plutons are late tectonic intrusions.

Seven thin sections of the Adams Pluton were examined by Pyke (1975a) and gave an average composition of about 61 percent plagioclase, 10 percent K-feldspar, 20 percent quartz, 3 percent hornblende and 2 percent biotite. Four thin sections of the Geikie Pluton were examined and gave a similar composition: 60 percent plagioclase, 17 percent quartz, 16 percent K-feldspar, and 4 percent combined hornblende, chlorite and biotite. Minor accessories in the stocks include apatite, sphene, epidote, allanite, zircon, magnetite, and pyrite. The plagioclase is albite to sodic oligoclase in composition, commonly shows weak saussuritization preferentially toward the central portions of the grains, and occasionally displays oscillatory, and rarely normal, zoning. The K-feldspar is microcline, and is generally perthitic; string and patch perthite are the most common, although bead and rarely zoned perthite do occur. The quartz is anhedral, shows marked strain extinction, and is generally interstitial, although some grains are comparable in size to the plagioclase. The hornblende is light to medium green, weakly pleochroic and partly altered to chlorite, biotite, magnetite and epidote.

Pyroxene Amphibolite (Marginal Phase of Monzonite)

A small area of pyroxene amphibolite is exposed in the northeast corner of Douglas Township. The rocks are variable in colour index (40-85 percent), generally coarse grained (hornblende crystals up to 1.2 cm in length), and are very similar in appearance to the marginal phase of the monzonite in Langmuir Township (Pyke 1970), where intrusive relationships with the surrounding metavolcanics were observed. In Douglas Township, intrusive relationships were not established for the pyroxene amphibolite. Minor monzonite occurs as dikes, and in addition some phases of the pyroxene amphibolite contain pink coloured feldspar, suggestive of a mafic monzonite, however only traces of K-feldspar were observed in thin section. It is inferred by the author that a monzonitic stock is close to the surface near the northeast corner of Douglas Township.

In thin section the hornblende (in part chloritized) is seen to be poikilitic, largely enclosing crystals of clinopyroxene. The plagioclase is partly saussuri-

tized, and oligoclase to andesine in composition. Minor apatite, sphene, epidote and opaque minerals are common.

Age Relationships of the Felsic Intrusive Rocks

The relative ages of the granitic plutons discussed in the preceding sections are largely inferred, as the intrusions are separated spatially, thereby precluding an interpretation on contact relationships. As outlined previously, the author regards the trondhjemites as subvolcanic intrusions, and as such, the oldest felsic intrusive rocks in the area.

The Peterlong Lake Complex forms only a small part of a vast batholithic complex underlying several hundred square kilometres to the west of the map-area (Ayres *et al.* 1971). The meagre information available on this batholith (Pyke, in press; Milne 1972) suggests that it is generally soda-rich, consisting in large part of trondhjemite, quartz diorite and diorite. By comparison, the Geikie and Adams Plutons are relatively potassic. Moreover it has been established in several Early Precambrian (Archean) areas (Ayres 1974; Glikson 1971; Viljoen and Viljoen 1969b) that the oldest granitic rocks are generally sodic, and that the potassium content increases both from differentiation within a given series, as well as in the overall evolution from older to younger series of granitic rocks. For example, Viljoen and Viljoen (1969b) describe an older series and younger series of granitic rocks in the Barberton area of South Africa. The oldest series varies from trondhjemite to granite in composition, the younger series from granodiorite to granite; within both series the oldest rocks are the most sodic. It is therefore by analogy with this and similar areas that the Adams and Geikie Plutons are considered to be younger than the Peterlong Lake Complex. Similarly, what is interpreted to be the marginal phase of a monzonitic stock (i.e. the pyroxene-amphibolite), is therefore considered to be the youngest intrusive phase associated with felsic plutons in the map-area.

MAFIC INTRUSIVE ROCKS

Diabase dikes intrude all the major rock types in the area, and are interpreted to represent three ages of emplacement, Early, Middle, and Late Precambrian respectively. In general, this subdivision is largely based on indirect evidence, as crosscutting relationships between various dikes are rarely observed, and no rocks younger than Early Precambrian (other than diabase) are present in the area, although Middle Precambrian sedimentary rocks in adjacent townships do provide important age relationships on some of the dikes which extend into the map-area.

Diabase

In the past it has generally been assumed that many or all of the north-trending diabase dikes in this part of the Abitibi belt are part of the Matache-

wan swarm (Fahrig *et al.* 1965) and are of Early Precambrian (Archean) age (Fahrig and Wanless 1963). The radiometric age (K-Ar determination) of 2485 m.y. reported by Fahrig and Wanless (1963) for the Matachewan swarm was from a sample taken in the vicinity of the town of Matachewan where it has been clearly demonstrated that Middle Precambrian sedimentary rocks of the Cobalt Group unconformably overlie the north trending diabase dikes (Lovell 1967).

More recently, dating by Leech (1965) as reported by Ferguson *et al.* (1968) for the Timmins area, indicated no Early Precambrian ages for the dikes sampled. Of particular interest are the ages (K-Ar) of two north trending dikes: 1930 m.y. and 1220 m.y. respectively.

Remnant magnetism studies by Middleton (1969) in the Jamieson Township area northwest of Timmins showed that the north-trending dikes have magnetic properties similar to the Abitibi swarm dikes of Late Precambrian age.

The recent compilation of the Timmins-Kirkland Lake area (Pyke, Ayres and Innes 1973) illustrates that there are probably two major swarms of north-trending dikes in the western part of the Timmins-Kirkland Lake area: (1) north-trending "Matachewan-type" diabase dikes centred near the town of Matachewan and (2) diabase dikes which trend north-northwest in the southern part of the Timmins-Kirkland Lake area (for example, near Shining Tree) and then swing to a north strike further north. This latter swarm would correspond to the dikes for which Middleton (1969) did remnant magnetism studies, and which Leech (1965) dated in the Timmins area.

Nevertheless, some north-trending diabase dikes of Early Precambrian (Archean) age are probably present in the Redstone River area, for in Fallon Township, adjacent to the northeastern boundary of the area, none of the north-striking diabase dikes in mafic metavolcanics were found to continue into Middle Precambrian sedimentary rocks. Therefore, until further evidence is available to confidently discriminate between differing ages of north-trending diabase dikes, all these dikes have arbitrarily been assigned an Early Precambrian (Archean) age on the accompanying map, with the reservation that many in fact may be much younger.

The diabase is massive, weathers dark brown to orange brown, and is dark green to greenish grey on fresh surfaces. Some diabase contains scattered light green saussuritized phenocrysts of plagioclase. Both olivine- and quartz-bearing varieties occur; the former contains up to 60 percent clinopyroxene and 6 percent olivine, whereas the colour index of the quartz-bearing varieties is rarely over 45 percent. The plagioclase is labradorite in composition and commonly shows minor normal zoning. Accessories include minor magnetite and traces of pyrite and apatite.

Currently, a more detailed examination by the author of the diabase dikes is underway to ascertain if there is a consistent relationship between the overall trend and composition. Certainly this appears to be true for the northeast-trending diabase dikes (Pyke 1975a).

Middle Precambrian

MAFIC INTRUSIVE ROCKS

Quartz Diabase

Two quartz diabase dikes, up to 150 m (500 feet) thick, trend northeast across McArthur and Geikie Townships, and are intrepreted to be of Middle Precambrian age. A few minor dikes of similar trend are also assigned the same age.

The reasons for a Middle Precambrian age have been outlined by Pyke (1972; 1975a), and are basically two-fold: (1) the quartz diabase dikes intrude the Gowganda Formation (Middle Precambrian), and (2) the quartz diabase dikes show a much greater displacement along many north-trending faults (Pyke, Ayres and Innes 1973) than do a series of olivine diabase dikes which trend east-northeast and form part of the Abitibi swarm (Late Precambrian age, Fahrig *et al.* 1965).

Outcrops weather grey to orangish brown, and fresh surfaces are medium grey to greenish grey; locally near the central portions of the dikes hematization of the plagioclase imparts a pinkish hue to the fresh surface. A detailed description of the dikes is given by Pyke (1972; 1975a). Typically the quartz diabase contains about 55 percent plagioclase (labradorite), 30 percent clinopyroxene, 5 percent hornblende (after pyroxene), minor (1 to 2 percent) hypersthene, and 3 to 4 percent magnetite-ilmenite.

Late Precambrian

MAFIC INTRUSIVE ROCKS

Olivine Diabase

Northwest-trending olivine diabase dikes are interpreted to be of Late Precambrian age. This interpretation is largely based on the olivine diabase dike which extends northwest across Geikie Township. This dike intrudes the Gowganda Formation southeast of the map-area (Pyke, Ayres and Innes 1973) and therefore definitely postdates the early part of the Middle Precambrian. Moreover, field evidence, though not conclusive, suggests that this same dike intrudes the Middle Precambrian quartz diabase in Geikie Township. In addition, the magnetic expression of the dike (GSC 1964) appears to transgress the magnetic expression of north-trending diabase dikes in the Kamiskota area; it was previously suggested that these north-trending dikes may be of Middle to Late Precambrian age. Furthermore, the north-trending faults throughout the western

part of the Timmins-Kirkland Lake area (Pyke, Ayres and Innes 1973) do not cause any major dislocations of the dike, which is also true of the Late Precambrian northeast-trending dikes. As previously mentioned, it is the Late Precambrian northeast-trending olivine diabase dikes that have been dated by Fahrig *et al.* (1965); a portion of one of these dikes extends across the northwest corner of McArthur Township, west of Papakomeka Lake.

Cenozoic

QUATERNARY

Pleistocene and Recent

The northern part of the area is largely covered by glacial lacustrine deposits of clay and fine sand, which were deposited in glacial Lake Barlow-Ojibway (Stockwell 1957, p.480), which covered a large part of northeastern Ontario during the Pleistocene Epoch.

Outwash deposits of sand and minor gravel extend into the northwest part of McArthur Township. Numerous east-southeast trending barchan dunes occur in the sandy deposits west of the north half of Papakomeka Lake. Deposits of sand and minor intercalated lenses of gravel are up to 25 m (80 feet) thick as revealed in terraces flanking the Mountjoy River north of Triple Lake. Sandy outwash deposits also mantle the south central part of Geikie Township.

Recent deposits consist mainly of organic material accumulating in the swamps and muskegs, and some detrital material being deposited in stream beds.

STRUCTURAL GEOLOGY

Layering within the tuffs, iron formation, ultramafic metavolcanics and mafic intrusions is readily discernable at many localities. Throughout most of the area dips are in an easterly direction and are invariably steep, greater than 50 degrees and commonly 70 to 80 degrees. Foliation is not everywhere parallel to layering. This was particularly evident in some of the intermediate to felsic tuffaceous rocks in Bartlett and McArthur Townships. Here the layering has a general north trend throughout Bartlett Township, and swings northwest in McArthur Township. Foliation on the other hand may either be subparallel to the layering or strike approximately east to southeast. In addition an eastward trending fracture cleavage is common in a few outcrops. This east trend to foliation and cleavage would be compatible with a compressive force directed west to southwest by the emplacement of the Geikie and Adams Plutons, in conjunction with a complementary force from the Peterlong Lake Complex. However, some of the gabbroic dikes occupy east trending fractures in Bartlett Township sug-

gesting that subparallel foliation and fracture cleavage also predate the emplacement of the granitic rocks.

Foliations throughout the area are steep (70 degrees to vertical) and generally dip in the same direction as the strata.

Folds

Most of the map-area forms part of the steeply dipping south limb of a syncline, the axial trace of which trends southeast across the northern part of Douglas Township. No repetition of stratigraphic units was detected in the southern limb of the syncline, which, as such, reveals a continuous section for this part of the Timmins area. Numerous top determinations on the south limb of the syncline all indicate an eastward facing sequence, and although minor folds may well exist in some of the stratigraphic units, notably in the poorly exposed intermediate to felsic metavolcanics in Bartlett and McArthur Townships, none were found.

The Adams Pluton appears to be a basin-shaped or lopolithic structure; the northeast side of the pluton is bordered by the southwest-facing Shaw dome (Pyke 1974), and on the southwest side of the granodiorite, tops are to the northeast (Pyke 1973b). A somewhat different geometry is suggested for the Geikie granodiorite whereby the metavolcanics face outward from the granodiorite in Geikie, Douglas and Cleaver Townships (Pyke 1973b), but inward toward the granodiorite in Bartlett and McArthur Townships. This suggests at least two possible conditions of emplacement: *(1)* the granodiorite is largely post-deformational, emplaced after the tilting of the volcanic strata, and forcefully intruded more or less along the dip plane of the strata, or *(2)* the granodiorite is predeformational, and was emplaced as a lopolithic mass which was subsequently tilted into the observed position; the western margin in this case would be the floor of the lopolith. Structurally, the former explanation is preferred by the writer, as presumably both the Adams and Geikie Plutons would have undergone the same deformation as the volcanic rocks, and it is difficult to account for the apparent geometry of the Adams granodiorite by any tilting mechanism. However, either of the above emplacement mechanisms mainly implies forceful intrusion rather than magmatic stoping, as the structure appears to largely wrap around the plutons. Petrologically the granodiorites show little or no evidence of a cataclastic texture (other than minor auto-brecciation) and they have not undergone the dynamothermal metamorphism imposed on the volcanic assemblage; a late tectonic emplacement as indicated under "Adams and Geikie Plutons" is considered pre-eminent.

Faults

The Redstone River area is marginal to the eastern boundary of the Onaping lineament (Wilson 1949), a major north-northwest striking series of faults which extend from the Sudbury area to the Kapuskasing Structural Zone (Ayres

ODM9711

Photo 8–Quartz stockwork in gabbro, Muskasenda Lake.

et al. 1971). Many of the north- to northwest-trending faults in the area may be related to this structure, which Wilson (1949) suggested was the western margin of the Cobalt graben, the eastern margin being delineated by the Timiskaming lineament.

No definite age relationships were established between the different trending faults: some may be coeval, and many may have undergone repeated movement. Where fault offsets were observed, most indicated left-lateral displacement.

The southward extension of the Burrows-Benedict Fault (Ferguson *et al.* 1968) extends through Douglas and Geikie Townships. A marked magnetic lineament (GSC 1970b; 1970c) best serves to outline the fault, which is also indicated by offsets in geological boundaries and extensive shearing of some outcrops.

The Scott Lakes Fault is the most extensive northwest-trending fault in the area; differential movement of at least 1.5 km (1 mile) is indicated by the strike separation on the Middle Precambrian diabase dike in southwest McArthur Township.

Extensive epidotization and quartz veining (Photo 8) on small islands and shoals in Muskasenda Lake, attest to the presence of a fault coincident with the lake. Relative movement on the fault is not known.

The fault extending north from the Redstone River in southeast Bartlett Township is the projection, on the basis of a topographic lineament, from a

known fault in the southern part of the Peterlong Lake map-area (Pyke 1973b, information on fault taken from assessment files).

ECONOMIC GEOLOGY

Following the discovery of gold in the Porcupine area in 1909, prospectors soon worked their way south into the Redstone River area. Early prospecting was largely confined to the intermediate to felsic metavolcanics located several kilometres on either side of the McArthur-Bartlett Township boundary. At this time two notable gold discoveries were made in quartz and feldspar porphyry veins: *(1)* on the east-central shore of Triple Lake (Triple Lake Porcupine Gold Mines Limited), and *(2)* near the south shore of McArthur Lake (J. Theriault). Although samples from both these showings returned favourable assays and received considerable sporadic prospecting until the 1940s, no economic deposits were outlined.

In 1951, Dominion Gulf Company discovered nickel-bearing sulphides in the ultramafic metavolcanics along the north half of the Bartlett-Geikie Township boundary. The property was subsequently acquired by Texmont Mines Limited, and later, in July 1971, brought into production by Sheridan Geophysics Limited. Ore reserves at that time were estimated at 3.8 million tons grading 1.0 percent nickel after dilution (The Northern Miner, September 30, 1971, p.985). The Texmont ore zone is near the base of the second cycle of volcanism in the area; this is interpreted to be the same stratigraphic interval at which the nickel mineralization occurs in the Langmuir mine and the McWatter's deposit, to the northeast of the map-area (Pyke 1974).

Minor disseminated copper mineralization is associated with the metamorphosed iron formation in Bartlett and McArthur Townships.

Magnetite-rich Algoma-type iron formation occurs intercalated throughout the intermediate to felsic metavolcanics in McArthur and Bartlett Townships; none are known to attain sufficient thickness to be economic.

Only minor narrow seams of asbestos were observed in the ultramafic rocks.

Most of the exploration work in the area has been concentrated in the intermediate to felsic metavolcanics and intercalated iron formation in Bartlett and McArthur Townships, and the overlying ultramafic metavolcanics.

Description of Properties

Following are descriptions of all former and existing properties up to September 1972, for which assessment work was recorded with the Ministry of Natural Resources. Former properties which have been restaked are discussed under the name of the current recorded holder. Former properties which are currently open to staking are discussed under the name of the last holder to file assessment work, and the date of that work is given in square brackets.

To assist the reader in sorting out the various former properties, sketch maps (Figures 3 and 4) outline the unpatented claim groups for which assess-

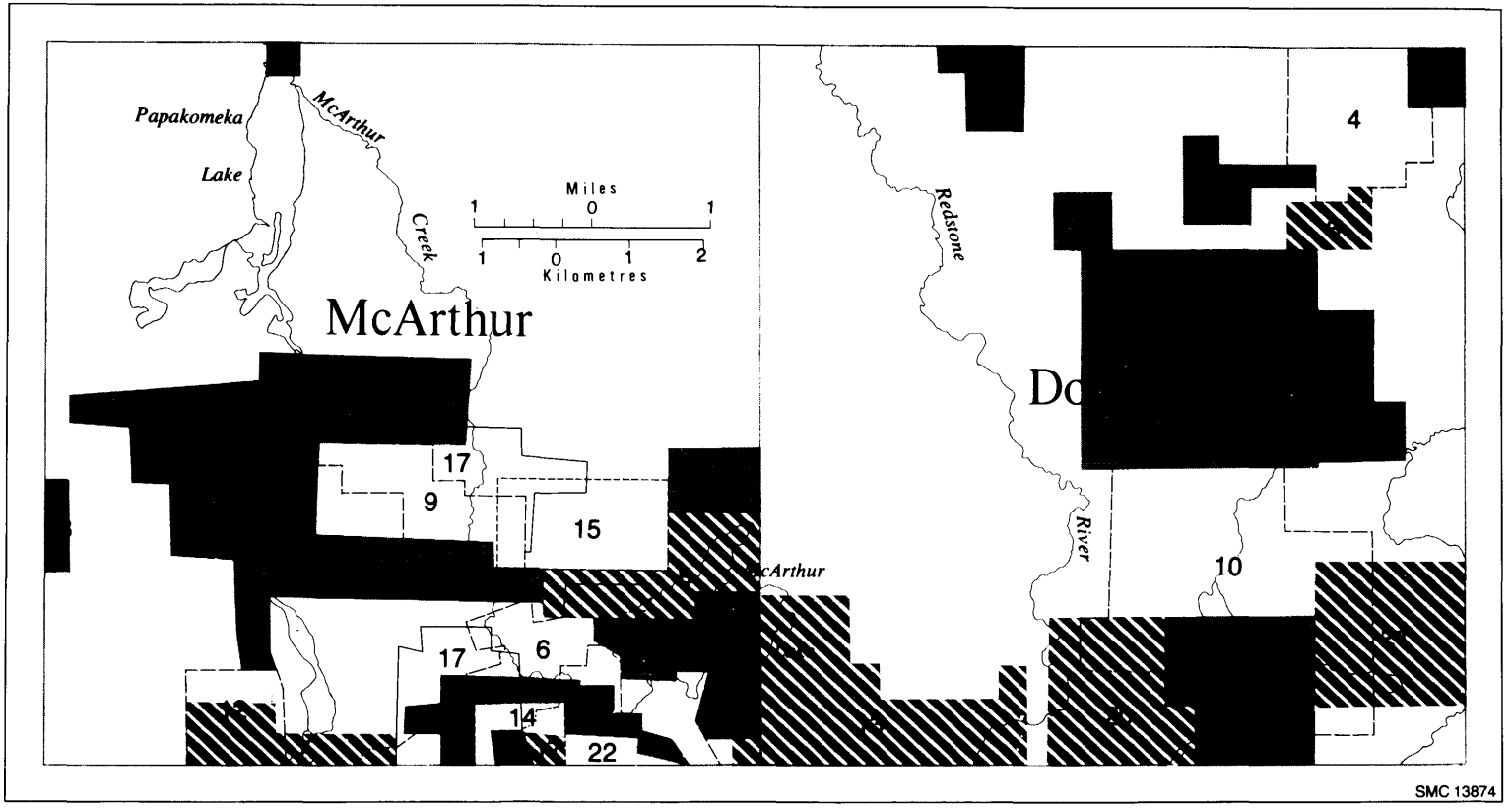


Figure 3–Unpatented claim groups no longer in good standing in McArthur and Douglas Townships, for which assessment work was submitted.

Figure 3 — Legend.

McARTHUR AND DOUGLAS TOWNSHIPS

1. Acme Gas and Oil Company Limited
2. Andover Porcupine Gold Mines Limited
3. Bradex Mines Limited
4. Canadian Lencourt Mines Limited
5. Carr, L.
6. Clodan Gold Mines Limited
7. Conigo Mines Limited
8. Consolidated Canorama Explorations Limited
9. Dominion Gulf Company
10. Falconbridge Nickel Mines Limited
11. Hewitt Mining Company Limited
12. Hubert, A.
13. Lakehead Mines Limited
14. Marceau Lake Explorations Limited
15. Northern Frontier Explorations Limited
16. Obaska Lake Mines Limited
17. Paymaster Consolidated Mines Limited
18. Perrault, G.
19. Rowan Consolidated Mines Limited
20. Silver Town Mines Limited
21. Texmont Mines Limited
22. Westport Porcupine Gold Mines Limited

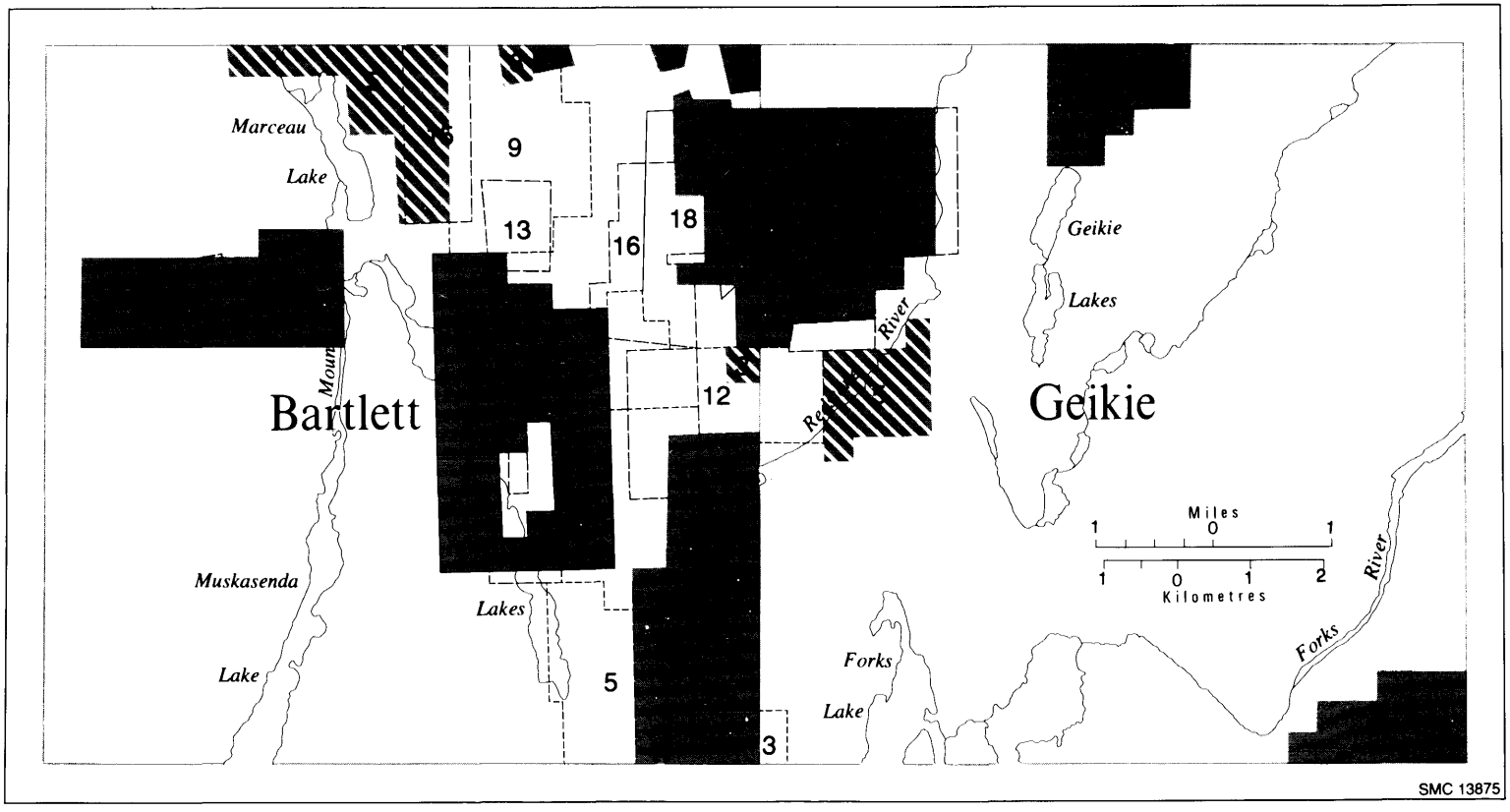


Figure 4–Unpatented claim groups no longer in good standing in Bartlett and Geikie Townships, for which assessment work was submitted, with the exception of the Texmont Mine property (see Figure 7).

Figure 4 — Legend.

BARTLETT AND GEIKIE TOWNSHIPS

1. Andover Porcupine Gold Mines Ltd.
2. Cameron Porcupine Gold Mines Limited
3. Canadian Nickel Company Limited
4. Canadian North Inca Mines Limited
5. Conigo Mines Limited
6. Dominion Gulf Company
7. Gauthier, H.
8. Hewitt Mining Co. Ltd.
9. Marceau Lake Explorations Limited
10. Marvel Minerals Limited
11. Paymaster Consolidated Mines Limited
12. Payqueen Nickel Mines Limited
13. Peterson-Bannerman-Brisson
14. Queenston Gold Mines Limited
15. Silver Ore Zone Mines Limited
16. Silver Summit Mining Company Ltd.
17. Silver Town Mines Limited
18. Sturdy Mines Limited
19. Texmont Mines Limited[1]
20. Westport Porcupine Gold Mines Ltd.
21. Zenmac Metal Mines Limited

[1]Former claims of Texmont Mines Limited, near mine property, are shown on Figure 7.

ment work was submitted but are no longer in good standing (as of September 1972).

Figure 5 shows the approximate outline of unpatented claims in good standing as of September 1972: these claim groups are discussed in the following property descriptions only if assessment work has been submitted by the current claim holder or by a previous claim holder for any portion of the property; claims in good standing for which no assessment work has been submitted are not discussed[1].

Table 6 lists all claims staked in the Redstone River area for which assessment work was filed, regardless of whether or not they were in good standing in 1972.

Abitibi Asbestos Mining Company Limited (1)

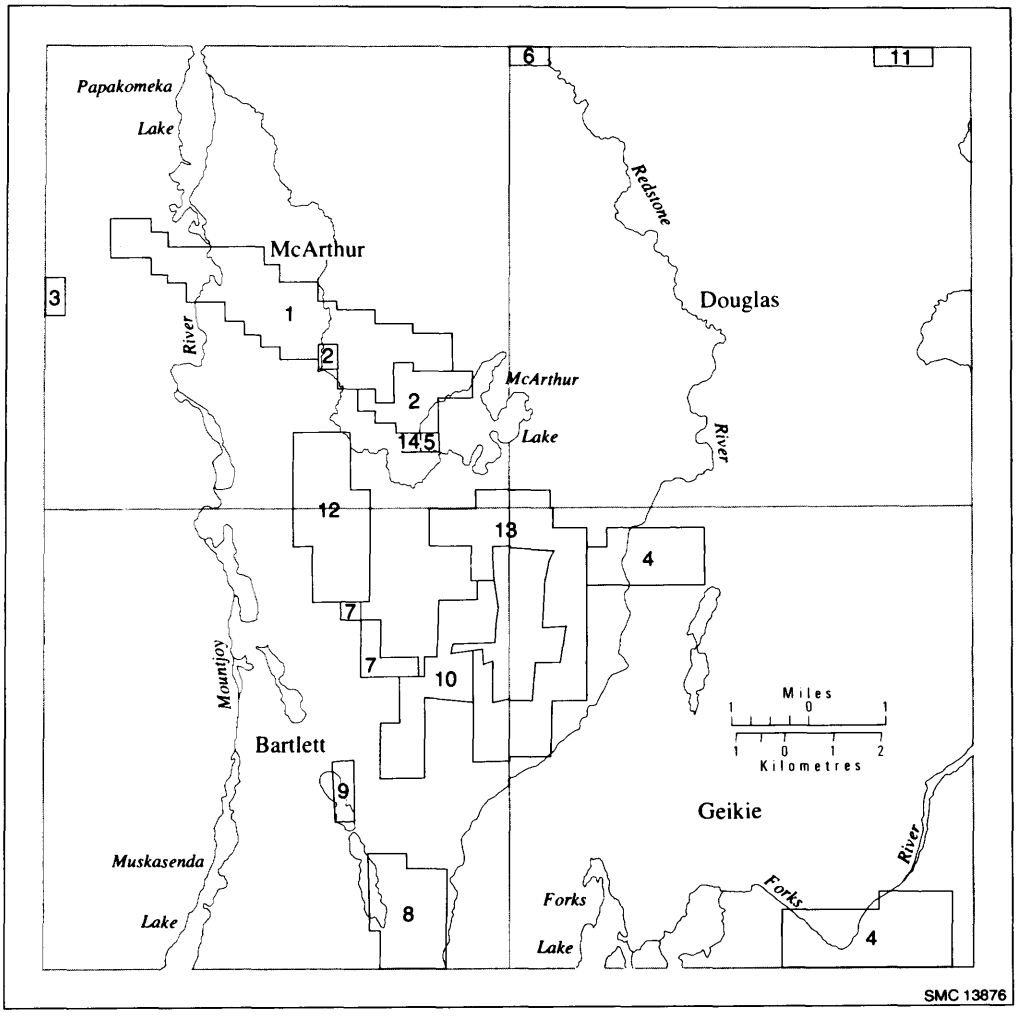
In 1972, Abitibi Asbestos Mining Company Limited held 56 unpatented claims which formed a southeast-trending block across the central part of McArthur Township. The claims included P319995 to P320000 inclusive, P320870 to P320881 inclusive and P344458 to P344495 inclusive. Southeast of the Mountjoy River the claims are mainly underlain by ultramafic metavolcanics. In part, the southernmost claims straddle the ultramafic-intermediate to felsic metavolcanic contact, which is the favourable stratigraphic interval for nickel mineralization at the Texmont Mine. The periphery of the Adams Pluton extends into the northern part of much of the claim group. West of the Mountjoy River the claims are drift covered and interpreted from airborne magnetic data (GSC 1970a) to be underlain largely by the contact zone between the Adams Pluton and mafic metavolcanics; the magnetic data do not readily suggest a continuation of the ultramafic metavolcanics west of the river.

As yet, Abitibi Asbestos Mining Company Limited has not submitted any assessment work for the property, but a large portion of the claim group was formerly held by Dominion Gulf Company, Acme Gas and Oil Company Limited, Paymaster Consolidated Mines Limited and Northern Frontier Explorations Limited, who conducted exploration work on their respective claim blocks.

Dominion Gulf Company formerly held a group of claims extending from Mountjoy River to just east of McArthur Creek, covering a large portion of the claims now held by Abitibi Asbestos. In 1952-53 detailed geological mapping, and a ground magnetic survey were completed. No significant mineralization was observed, and the claims were subsequently dropped.

Paymaster Consolidated Mines Limited formerly held two groups of claims in McArthur Township. One group occupied what is currently the central part of the Abitibi Asbestos claim block, extending from the Mountjoy River to about 0.8 km (½ mile) east of McArthur Creek; the second group extended north from the south central boundary of McArthur Township. Only the former group is discussed in this section, the latter group is dealt with in the section on Texas

[1]Properties 4 (T. Cere), 19 (C. Guiho), and 23 (F. Tagliamonte) on Map 2363 fall into this category and are not described in this report.



1. Abitibi Asbestos Mining Co. Ltd.
2. Bazinet, E.W.
3. Cere, T.
4. Falconbridge Nickel Mines Ltd.
5. Forget, M.
6. Guiho, C.
7. McKeen, S.
8. Murphy, J.A.
9. Roby, P.
10. Silver Summit Mining Co. Ltd.
11. Tagliamonte, F.
12. Texas Gulf, Inc.
13. Texmont Mines Ltd.
14. Whitmarsh, B.

Figure 5–Unpatented claim groups in good standing as of Sept. 1972 in McArthur, Douglas, Bartlett and Geikie Townships.

TABLE 6 | SUMMARY OF EXPLC

Property Name	Number of Claims	Geophysics MAG	EM	IP	Geological Map	Diamond Drilling Number of Holes	Total Footage	Described in
Abitibi Asbestos Mining Co.Ltd.	56							Abiti
Acme Gas and Oil Co.Ltd.	102	*	*			2	764	Abiti Texa
	79	*	*					Acm
Andover Porcupine Gold Mines Ltd.	8							Texn
Bazinet, E.	12							Bazi
Bradex Mines Ltd.	7	*	*					Brad
Cameron Porcupine Gold Mines Ltd.	6							Can.
Canadian Lencourt Mines Ltd.	24	*	*					Can.I
Canadian Nickel Co.Ltd.	5					5	1418	Texn
Canadian North Inca Mines Ltd.	30	*	*		*			Can.I
Carr, L.	1					2	163	Carr
Clodan Gold Mines Ltd.						12	962	Texa
Conigo Mines Ltd.	37	*	*					Coni
	10	*	*					Texn
	22	*	*			12	7106	Murp
	14	*	*					Coni
Consolidated Canorama Expl.Ltd.	18	*	*	*	*	6	2316	Bazi
Dominion Gulf Co.	61	*	*		*	23	6231	Texn Sum
	18	*			*			Abiti
	12	*			*			Texn
Donaldson, E.T.	15							Dona
Falconbridge Nickel Mines Ltd.	77	*	*		*			Falc
	17							
	31	*	*		*			
Forget, M.	1							Forg
Gauthier, H.	30		*		*			Texn
Hewitt Mining Co.Ltd.	2				*			Texa
Hubert, A.	9				*			Coni
Lakehead Mines Ltd.	30	*	*		*	5	1987	Lake
	6	*	*					
Marceau Lake Expl.Ltd.	35	*	*		*	4	994	Texa

Corresponding Property Number on Map	Assessment File Number	Township: McArthur	Douglas	Bartlett	Geikie	Year Work Done	Remarks
1		*					Part of claims formerly held by Dominion Gulf, Paymaster, Acme Gas and Oil and North Frontier.
–	T-1273	*				1964-66	Airborne magnetic and electromagnetic surveys flown for large parts of McArthur and Douglas Twps. Much of former property in McArthur Township now held by Abitibi Asbestos. Aeromagnetic contour maps available for both properties.
15			*				
–	T-1273	*		*			Recorded assessment work by Erie Canadian Mines Limited in 1938.
2		*					Much of the property formerly held by Consolidated Canorama.
16	T-1251		*			1966	
–				*			Discussed by Bruce (1926).
17	T-1287		*			1966	
–				*		1966	Claims optioned from Texmont.
25	T-58			*		1960	Part of the claim group was formerly held by Cameron Porcupine Gold Mines Ltd.
3	T-700	*				1962	
–	T-30	*				1946	
,26		*		*		1965	
–				*			
–				*			
35	T-1057				*		
–	T-1122	*				1964-65	Much of the former property now held by E. Bazinet.
–	T-463			*	*	1949-52	Site of Texmont Mine, part of property now held by Silver Summit.
–	T-526	*					Now held largely by Abitibi Asbestos.
–	T-520			*		1952	
6		*					Former Triple Lake Porcupine Gold Mines Ltd.
18	T-969		*			1970	Part of property formerly held by Texmont, Acme Gas & Oil, Silverton and Obaska Lake.
36					*	1972	Line-cutting completed by 1972, in preparation for geophysical & geological surveys.
36					*	1970	Part of property formerly held by Texmont.
7		*					Property formerly held by Acme Gas & Oil as part of large claim block.
–	T-662				*		Claims originally held by Dominion Gulf.
–	T-1199	*		*			Recorded assessment work by Erie Canadian Mines Limited in 1938.
–	T-671	*				1959	
,20	T-1304	*	*			1966	
8		*					
–	T-1199	*	*			1965	

Continued

Table 6 continued

Property Name	Number of Claims	Geophysics MAG	Geophysics EM	Geophysics IP	Geological Map	Diamond Drilling Number of Holes	Diamond Drilling Total Footage	
Marvel Minerals Ltd.	31	*	*		*			Ro
McKeen, S.	6							Mc
Murphy, J.A.	22							Mu
Northern Frontier Expl.Ltd.	18	*	*	*	*	9	3110	Abi
Obaska Lake Mines Ltd.	18		*					Fal
Paymaster Consolidated Mines Ltd.	23	*	*			7	2975	Abi
	32		*		*	5	2514	Tex
	72	*	*		*	12	5470	Silv
Payqueen Nickel Mines Ltd.	27				*	4	2373	Tex
Perrault, G.	3		*					Per
Peterson-Bannerman-Brisson	6							Mcl
Queenston Gold Mines Ltd.	40				*	5	2412	Tex
Roby, P.	3							Rol
Rowan Consolidated Mines Ltd.	9	*	*			2	585	Rov
Sheridan Geophysics Ltd.	26							Tex
Silver Ore Zone Mines Ltd.	20	*	*					Tex
Silver Summit Mining Co.Ltd.	30	*	*			10	5339	Silv
Silver Town Mines Ltd.	37	*	*					Silv
Sturdy Mines Ltd.	29		*			5	1847	Silv
Texas Gulf, Incorporated	30	*	*					Tex
Texmont Mines Ltd.					See report for detailed description o			
Theriault, A.	6					2	675	The
Triple Lake Porcupine Gold Mines Ltd.	15					2		Dor
Westport Porcupine Gold Mines Ltd.	14				*	12	2608	Wes
Whitmarsh, B.	1							Whi
Zenmac Metal Mines Ltd.	72	*			*			Silv

Property Number on Map	Assessment File Number	Township: McArthur	Township: Douglas	Township: Bartlett	Township: Geikie	Year Work Done	Remarks
–	T-1271			*		1966	Forms part of property currently held by P. Roby.
27				*			Property forms much of the former Peterson-Bannerman-Brisson claim group.
28				*			Property formerly held by Conigo Mines.
–	T-1069	*				1965	Much of the former property now held by Abitibi Asbestos.
–	T-1192		*			1965	Much of the former property was recently held by Falconbridge.
–	T-526	*				1957-60	Airborne electromagnetic survey flown in 1957.
–	T-526	*				1957-60	Airborne electromagnetic survey flown in 1957. Much of the former property now held by Abitibi Asbestos.
–	T-620			*		1957-60	Airborne electromagnetic survey flown in 1957. Much of the former property now held by Zenmac Metal.
–	T-302			*	*	1957	
9	T-1285	*				1965	
–	T-445			*			Currently part of claim group of S. McKeen.
	T-520			*		1957	Included 12 claims formerly held by Dominion Gulf.
29				*			Claims were formerly held by Marvel Minerals.
21	T-1283		*			1966	
–				*	*		In 1960, leased the Texmont Mines for 20 years.
–	T-1331			*		1965	
30	T-1091			*		1965-70	
?, 37	T-1191		*		*	1965	Much of the property formerly held by Sturdy Mines.
–	T-661			*		1958	Former claims covered by property currently held by Silver Summit.
), 31		*		*		1972	Part of property formerly held by Hewitt Mining, Clodan, Marceau Lake, Paymaster, Silver Ore Zone and Acme Gas & Oil.
perties held in the Redstone River area.							
12	T-139	*					
–	T-761	*				1938	Property now held by E. Donaldson.
13	T-1273	*		*			
14	T-616	*					
–	T-610		*			1955-56	Property now held by Silver Summit.

Gulf, Incorporated. An airborne electromagnetic survey by Aerophysics of Canada Limited, was completed for Paymaster in 1957. The same year, the geology of the claims was mapped in detail, and four diamond-drill holes, totalling 691 m (2,266 feet) were sunk near the basal contact of the ultramafic metavolcanics immediately west of McArthur Creek. Only trace amounts of sulphides were encountered and the assays from the ultramafic rocks indicated a relatively uniform distribution of nickel averaging about 0.20 percent. In 1959 a 94 m (308 feet) hole was drilled near the Mountjoy River at the northwest extremity of the ultramafic metavolcanics; no mineralization was encountered.

Northern Frontier Explorations Limited formerly held a group of claims covering much of the area east of McArthur Creek now held by Abitibi Asbestos. In 1964-65 Northern Frontier conducted magnetic and vertical loop electromagnetic surveys on the claims. A number of conductors were outlined, which were subsequently confirmed by an induced potential (I.P.) survey. Detailed geological mapping was also completed in 1965. Following the results of the surveys, nine holes, totalling 948 m (3,110 feet) were diamond drilled in the ultramafic metavolcanics to test the conductive zones and some of the magnetic highs. Although minor disseminated pyrrhotite was encountered, it was reported to be barren of nickel[1].

In 1966, Canadian Aero Mineral Surveys Limited performed an airborne magnetic and electromagnetic survey for Acme Gas and Oil Company Limited over a number of claim groups in McArthur Township. One group covered a large part of west central McArthur Township including the area near Mountjoy River presently held by Abitibi Asbestos. A number of conductive zones all at the same apparent stratigraphic interval were outlined and attributed to sulphide bearing iron formation. This was confirmed by drilling in 1967 when two diamond-drill holes were completed totalling 233 m (764 feet). Abundant pyrite and pyrrhotite was encountered with only traces of chalcopyrite and sphalerite[1]. In addition the magnetic survey aided in delineating a dominantly oxide-bearing iron formation about 300 to 450 m (1,000 to 1,500 feet) stratigraphically below the sulphide-bearing iron formation. It is of interest to note that this is the same stratigraphic positioning of iron formations (i.e. sulphide above oxide) as found in parts of the Shaw dome (Pyke 1974).

Acme Gas and Oil Company Limited [1966] (15)

Acme Gas and Oil Company Limited[2] formerly held a large group of claims in east central Douglas Township, and a smaller group in northwest Douglas Township. The area in central Douglas Township straddles the intermediate to felsic metavolcanic – mafic metavolcanic contact on the south limb of the syn-

[1] Regional Geologist Files, Ontario Ministry of Natural Resources, Timmins.

[2] Acme Gas and Oil Company Limited have held additional properties in the Redstone River area, and these are discussed under the sections dealing with Abitibi Asbestos Mining Company Limited, and Texas Gulf, Incorporated.

cline, the axial trace of which trends northwest across the north part of the township. The area of the northern property appears to be largely underlain by intermediate to felsic metavolcanics within the axial portion of the syncline. The Burrows-Benedict Fault traverses the west part of the claim group, separating metavolcanics from the Adams Pluton.

In 1966, Acme Gas and Oil Company Limited engaged Canadian Aero Mineral Surveys Limited to fly an airborne magnetic and electromagnetic survey covering most of Eldorado Township, and parts of surrounding townships, including Douglas Township. Flight lines were oriented N32E at a spacing of 200 m (660 feet); mean terrain clearance was about 45 m (150 feet). An aeromagnetic contour map at a scale of 1 inch to ¼ mile (1:15,840) was submitted for assessment work, covering claim blocks in Eldorado, Langmuir, and Douglas Townships. In addition a ground electromagnetic survey was completed in 1966, for a large block of ground in the northeastern part of Douglas Township. About half of the area covered by the ground survey corresponded to the two claim blocks discussed above; the remaining survey filled in between the two claims blocks and extended the coverage about 0.8 km (½ mile) further southeast.

In 1964, a combined aeromagnetic and electromagnetic survey was flown over much of the same area by Hunting Survey Corporation for Mespi Mines Limited (the recorded holder however, was Acme Gas and Oil Company Limited). Flight lines were flown northwest-southeast at a spacing of 200 m (660 feet); terrain clearance was generally between 135 and 150 m (450 and 500 feet). An aeromagnetic contour map at a scale of 1 inch to ¼ mile (1:15,840) was submitted for assessment work. The claim blocks for which credits were applied in Douglas Township included much the same area described for Acme Gas and Oil above.

E. Bazinet (2)

In the southeast part of McArthur Township, 12 unpatented claims, P320800, P320802 to P320810 inclusive, P320812 and P320813, were held by E. Bazinet in 1972. Eleven of the claims are contiguous and adjacent to the west side of McArthur Lake; one claim occurs near near McArthur Creek, immediately northwest of the main property. The claims are mainly underlain by ultramafic metavolcanics. A mafic trondhjemite sill trends northwest across part of the property. No assessment work has been filed by E. Bazinet, however much of the property was formerly held by Consolidated Canorama Explorations Limited. In 1965, Consolidated Canorama completed magnetic and vertical loop electromagnetic surveys and geological mapping of the property. Subsequently an induced potential survey was conducted to check the electromagnetic anomalies. Confirmation of the anomalies led to the drilling of six diamond drill holes totalling 705 m (2,316 feet). Only traces of sulphides were encountered[1].

[1]Regional Geologist's Files, Ontario Ministry of Natural Resources, Timmins.

Bradex Mines Limited [1966] (16)

Bradex Mines Limited formerly held a group of claims in the northeast part of Douglas Township. The claims appear to have been situated (*see* Figure 3) almost entirely within the upper sequence of intermediate to felsic metavolcanics, and largely on the north side of the synclinal axis. An Early Precambrian diabase dike trends north across the west part of the former property. In 1966, Bradex Mines completed magnetic and electromagnetic (in-line method) surveys[1]. No further work was recommended.

Canadian Lencourt Mines Limited [1966] (17)

Canadian Lencourt Mines Limited formerly held a group of claims in the northeast part of the area, adjacent to the Douglas-Eldorado Township boundary. The claims' location is mainly underlain by southward facing mafic metavolcanics of the upper metavolcanic sequence. A small intrusion of pyroxene amphibolite extends into the northeast part of the property. Two north-trending diabase dikes are present; one along the west boundary of the area, and the other in the northeast part of the property. In 1966, Canadian Lencourt conducted magnetic and electromagnetic surveys on the claims. No follow-up work was undertaken, and the claims were allowed to lapse. Subsequently, in the north part of the area, F. Tagliamonte acquired three claims, which formed part of a larger claim group extending into Eldorado Township. In 1972, the claims were in good standing, but recorded assessment work, three drill holes totalling 482 m (1,583 feet), was confined to Eldorado Township.

Canadian North Inca Mines Limited [1960] (25)

Canadian North Inca Mines Limited formerly held a group of claims in the northwest part of Bartlett Township, extending westward from approximately the south end of Marceau Lake. The property straddled the contact between the quartz diorite forming the marginal phase of the Peterlong Lake Complex, and the mafic metavolcanics and gabbro to the east. In 1960, the geology of the claims was mapped in detail, and magnetic and horizontal loop electromagnetic surveys completed. The results of the surveys did not warrant further exploration on the property.

Part of the Canadian North Inca claim group was originally held by Cameron Porcupine Gold Mines Limited. Bruce reported on this property in 1926. Most of the work by Cameron Porcupine was concentrated in the quartz diorite near the east margin of the Peterlong Lake Complex. Three shallow shafts, 13 m (42 feet), 11 m (35 feet), and 5 m (15 feet) respectively, and a number of trenches

[1]Regional Geologist's Files, Ontario Ministry of Natural Resources, Timmins.

were blasted by 1923. Bruce (1926) had two channel samples from quartz veins assayed; neither contained any gold.

L. Carr [1962] (3)

L. Carr formerly held one claim near the north end of Papakomeka Lake, adjacent to the McArthur-Adams Township boundary. The claim area is largely underlain by granodiorite; a northeast-trending olivine diabase dike extends into the north part of the area. In 1962, L. Carr drilled two diamond drill holes totalling 50 m (163 feet). Both holes were in the diabase[1].

Conigo Mines Limited [1965] (5, 26, 35)

Conigo Mines Limited formerly held four claim blocks in the Redstone River area: (1) along and straddling the eastern part of the McArthur-Bartlett Township boundary (5 and 26 on Map 2363 and Map 2364 respectively), (2) near the west central boundary of Geikie Township (35 on Map 2364), (3) near the southwest corner of the patented claims of Texmont Mines Limited, and (4) adjacent to the south boundary of Bartlett Township between the Redstone River and Scott Lakes. The last two claim blocks are discussed in the sections dealing with Texmont Mines Limited and J.A. Murphy respectively.

On the first of the above properties, along the McArthur-Bartlett boundary, exploration work was largely confined to the eastern half of the claims: the gabbro in the vicinity of the Mountjoy River, and the overlying intermediate to felsic metavolcanics. In 1965, a magnetic and electromagnetic survey were completed over the eastern part of the claim groups. Minor chalcopyrite mineralization was reported from the gabbro by the company and one grab sample assayed[1] 0.40 percent copper. An old gold-showing originally described by Bruce (1926, p.54) was re-examined, sampled, and found to contain only traces of gold. This showing formed part of a claim group held by A. Hubert prior to acquisition of the property by Conigo Mines. In 1959, R. Ginn, Resident Geologist at Timmins, examined the property; at that time Hubert reported grab samples assaying $1.00 to $72.00 per ton for gold ($35.00 per ounce). Ginn recommended that channel sampling be carried out on the various quartz, quartz-carbonate veins and shear zones in the gabbro with which the mineralization was associated. No information is available on whether the recommendations were implemented.

The former property of Conigo Mines Limited in Geikie Township is largely underlain by granodiorite, but in part straddles the granodiorite-ultramafic metavolcanic contact at the southeast corner of the patented claims of Texmont Mines Limited. In 1965, a magnetic and vertical loop electromagnetic survey was completed on the property, but no further work was undertaken.

---

[1]Information from Regional Geologist's Files, Ontario Ministry of Natural Resources, Timmins.

E.T. Donaldson (6)

In 1972, E.T. Donaldson held 15 patented claims (outlined on Map 2363, back pocket) near the south central boundary of McArthur Township. The claims include numbers TRP11209, TRP11210, TRP11742, TRP12112, TRP17779, TRP17780, TRP18110, TRP18111, TRP18189 to TRP18191 inclusive, TRP20371, TRP20372, TRP23571 and TRP23919. The property is largely drift covered, but appears to be underlain mainly by intermediate to felsic metavolcanics and lesser mafic metavolcanics based on the northward extrapolation of the metavolcanic unit from Bartlett Township. A band of intercalated iron formation occurs in the northeast part of the claims.

The property was originally held by Triple Lake Porcupine Gold Mines Limited, and the following information is taken from a report[1] by Erie Canadian Mines Limited in 1938.

By 1938, a two-compartment shaft had been sunk to a depth of 17 m (55 feet) on a quartz vein near the east shore of Triple Lake. The quartz vein strikes N50E, dips 60° south, is exposed for over 8 m (25 feet) and varies in width from 45 to 90 cm (1.5 to 3.0 feet). Two drill holes to check the vein at depth gave indefinite results. Free gold and $50.00 channel assays (gold probably at $20.67 per ton) were reported[1]; no further work is recorded in the assessment files. Photo 9 shows an old steam boiler on the property, probably dating back to about the 1930s.

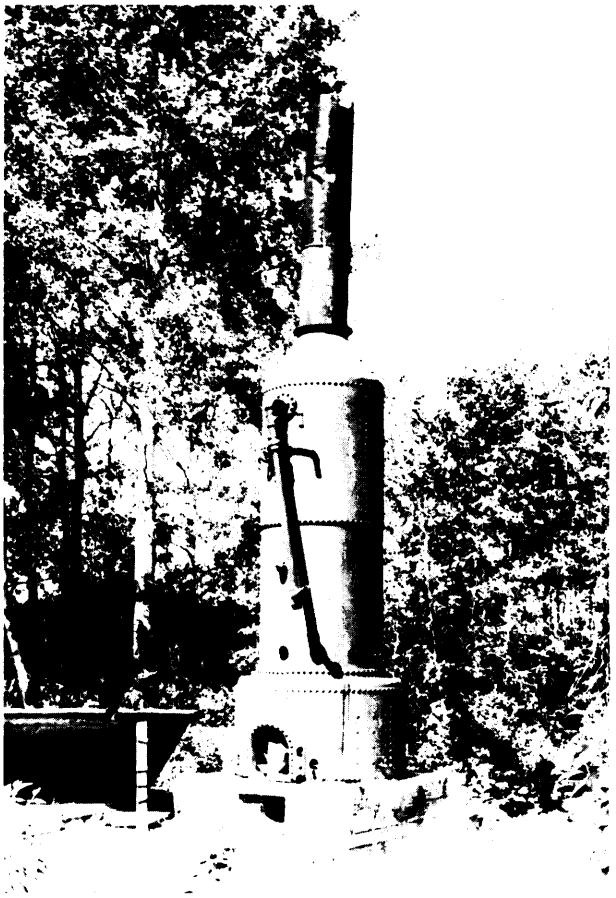
Falconbridge Nickel Mines Limited (36)

In 1972, Falconbridge Nickel Mines Limited held two claim groups in Geikie Township: 1) 17 claims, P307757 to P307773 inclusive, immediately northwest of Geikie Lakes, and 2) 31 claims near the southeast corner of Geikie Township numbered P235436 to P235447 inclusive, P235459 to P235467 inclusive and P235481 to P235490 inclusive.

The northern claim group encompasses the detached band of ultramafic flows engulfed by part of the Geikie Pluton, east of the Redstone River, in addition to part of the ultramafic and overlying mafic metavolcanics west of the river. The ultramafic metavolcanics may form a continuous "neck" across the Redstone River, however, the combined effect of shearing and contact metamorphism has obscured any obvious continuity. By 1972, Falconbridge had completed line cutting on the property in preparation for detailed mapping and geophysical programs.

The southern property straddles the contact between the Geikie Pluton and the mafic metavolcanics of the upper sequence. Contact metamorphism has locally led to the development of extensive epidote-rich lenses and layers in the recrystallized metavolcanics. In 1970, Falconbridge completed detailed mapping of most of the property as well as magnetic and horizontal loop electromagnetic surveys. The results did not warrant further exploration work on the property.

[1]Regional Geologist's Files, Ontario Ministry of Natural Resources, Timmins.



ODM9712

Photo 9–Steam boiler on property of E.T. Donaldson (formerly Triple Lake Porcupine Gold Mines Limited property).

Texmont Mines Limited formerly held part of the southern claim group. In 1965, Texmont completed a horizontal loop electromagnetic survey over much of the granodiorite-metavolcanic contact area, in addition to adjoining claims in Cleaver and Hincks Townships. Three weak conductors were detected in the metavolcanics in southeast Geikie Township; no drilling was undertaken.

Falconbridge Nickel Mines Limited [1970] (18)

Falconbridge Nickel Mines Limited formerly held a group of claims in the southeast part of Douglas Township. The area of the property is largely underlain by mafic metavolcanics of the upper sequence, with minor intercalated felsic

pyroclastics. Early and Late Precambrian diabase dikes extend across part of the area. Parts of this property were previously held and examined by Texmont Mines Limited, Acme Gas and Oil Company Limited and Obaska Lake Mines Limited. Only Obaska Lake Mines held a substantial part of what was later to be part of Falconbridge's claim group, and is therefore included in this section. The remaining companies are discussed separately in the text.

In 1970, Falconbridge completed detailed geological mapping and magnetic and vertical loop electromagnetic surveys on the property in southeast Douglas Township. Two minor copper occurrences consisting of disseminated chalcopyrite in narrow quartz-carbonate veins were known to occur on the property. The survey did not suggest the occurrences of additional sulphide mineralization here, or elsewhere on the property, and no follow-up work was undertaken.

In 1965, Obaska Lake Mines Limited conducted a vertical loop electromagnetic survey over a group of claims covering much of the southern half of what was later to be part of Falconbridge's claim group. Obaska's property extended to the southern township boundary, and therefore included the metavolcanic-granodiorite contact. No additional work was undertaken by Obaska Lake Mines Limited.

Two grab samples taken by the author from the showing 300 m (¼ mile) east of Bologna Lake were analyzed by the Mineral Research Branch, Ontario Division of Mines, and found to contain 0.50 percent and 0.12 percent copper respectively.

Minor molybdenite occurs along fracture surfaces within quartz veins intruding a small intrusion of porphyritic granodiorite east of Swamp Lake. One grab sample collected by the author and analyzed by the Mineral Research Branch contained 0.07 percent molybdenum.

M. Forget (7)

In 1972, M. Forget held one claim, P354949, on the southwest shore of McArthur Lake, McArthur Township. The claim is adjacent to the east side of the property of B. Whitmarsh. No assessment work was filed by M. Forget for the claim. However the claim did form part of a claim block formerly held by Acme Gas and Oil Company Limited, who in 1966, flew airborne electromagnetic and magnetic surveys of the south half of McArthur Township. No follow-up ground work was done for the property near McArthur Lake, for which assessment credits were applied. The property is mainly underlain by part of a small stock of trondhjemite and minor ultramafic metavolcanics.

Lakehead Mines Limited [1966] (8, 20)

Lakehead Mines Limited formerly held two claim groups in the Redstone River area; a small group (number 8 on Map 2363) immediately north of McArthur Lake adjacent to the east boundary of McArthur Township, and a much larger group (number 20 on Map 2363) in the southwest corner of Douglas

Township. Very little outcrop occurs on the area formerly covered by the northern claim group which appears to straddle the contact between the Adams Pluton and the mafic metavolcanics. The area of the southern claim group is largely underlain by the Geikie Pluton, however the southwest part of the area straddles the metavolcanic-granodiorite contact, and this is where most of the exploration work was concentrated. In 1966, Lakehead Mines completed magnetic and electromagnetic surveys; the latter did not include much of the Geikie Pluton. Three claims, two in the southwest corner of Douglas Township and one in the southeast corner of McArthur Township were mapped in detail. Subsequently, five diamond drill holes totalling 606 m (1987 feet) were sunk in the ultramafic metavolcanics. All the nickel assays[1] indicated a relatively uniform background level of about 0.12 percent.

S. McKeen (27)

S. McKeen held six unpatented claims, P333027 to P333032 inclusive, in northeast Bartlett Township in 1972. The southern part of the claims is largely underlain by trondhjemite, the northern part by intermediate to felsic lapilli-tuff and breccia cut by numerous dikes of gabbro and quartz gabbro.

The property forms much of the eastern part of the former Peterson-Bannerman-Brisson claim group, originally staked and extensively trenched for gold in the 1920s. The best assays[1] reported gave 5.2 percent copper across 1 m (3.5 feet). In 1970, R. Allerston did some minor trenching in the iron formations exposed along the power line (Figure 6). Three grab samples of iron formation taken from this showing by the author were analyzed by the Mineral Research Branch of the Ontario Division of Mines and found to contain 0.10, 0.24, and 0.54 percent copper respectively. Trace amounts of gold and silver were present in all three samples; only one sample contained more than a trace of nickel (0.08 percent), and none of the samples contained measurable amounts of lead or zinc.

J.A. Murphy (28)

In 1972, J.A. Murphy held a group of 22 unpatented claims, P59088 to P59091 inclusive, P75183 to P75193 inclusive, and P78215 to P78221 inclusive, in the southeast part of Bartlett Township between the Redstone River and Scott Lakes. The claims are largely drift covered, but are located near the top of the lower sequence of intermediate to felsic metavolcanics; the contact with the overlying ultramafic metavolcanics is very close to the eastern boundary of the property.

No assessment work has been submitted by J.A. Murphy, however the property was formerly held by Conigo Mines Limited, who in 1965 performed a magnetic and electromagnetic survey on the claims. Subsequently, a total of 2166 m (7,106 feet) of diamond drilling was completed in 12 diamond-drill holes, mainly

[1]Regional Geologist's Files, Ontario Ministry of Natural Resources, Timmins.

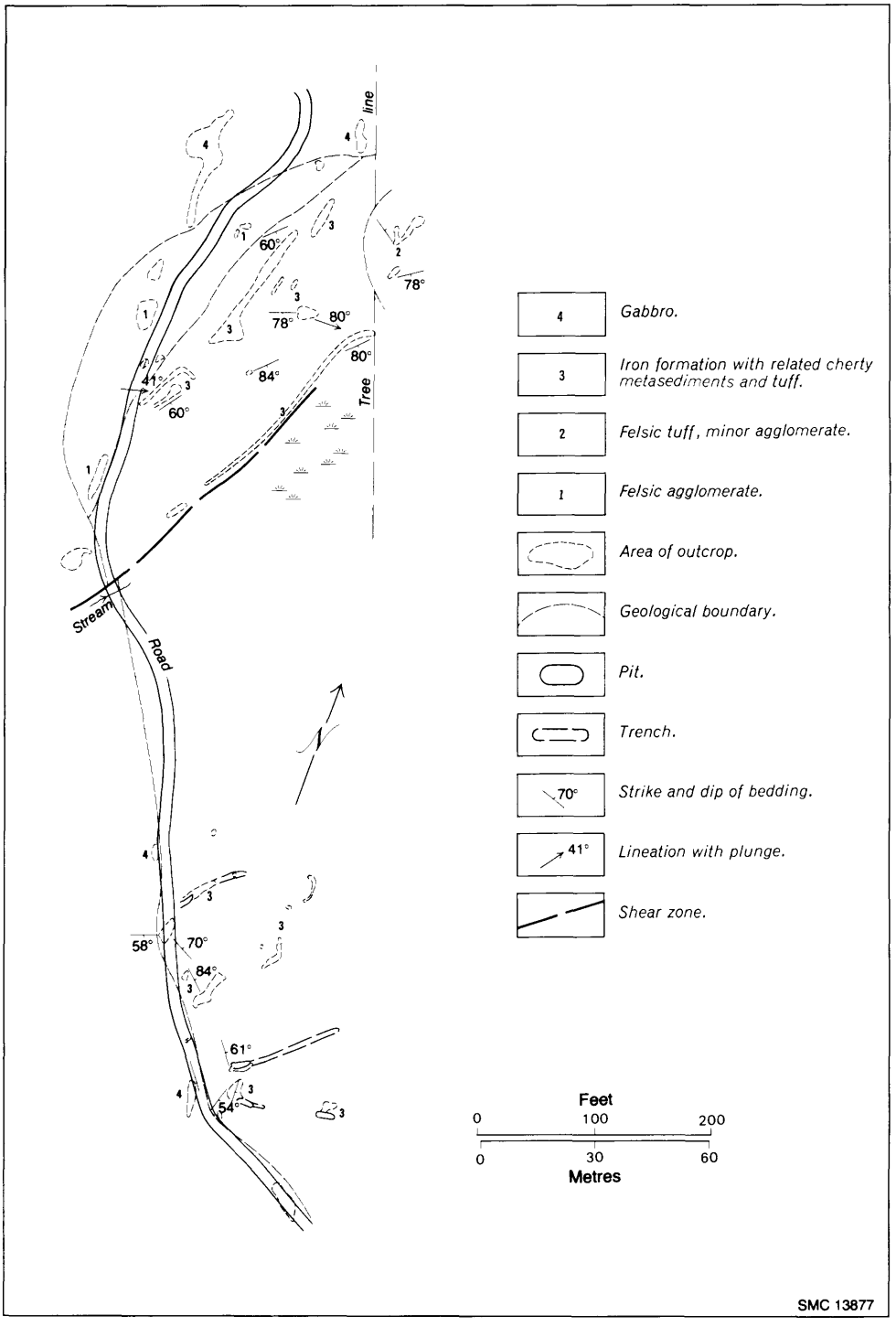


Figure 6–Former R. Allerston copper showing, Bartlett Township. Geology by D.R. Pyke.

located near the contact zone along the eastern part of the claim group. No assays are reported; presumably no significant values were obtained as the claims were allowed to lapse by Conigo Mines.

In the 1950s Dominion Gulf Company and Queenston Gold Mines Limited formerly held claim blocks which extended into the eastern part of J.A. Murphy's claims. Exploration work conducted by these companies is discussed in the section dealing with Texmont Mines Limited.

G. Perrault [1965] (9)

G. Perrault formerly held a small claim group straddling the Fripp-McArthur Township boundary near the 2-mile post. The area is underlain mainly by mafic metavolcanics. In 1965, G. Perrault hired Tri-J Mineral Surveys to conduct a horizontal loop electromagnetic survey on the property. No conductive zones were encountered.

P. Roby (29)

In 1972, P. Roby held three unpatented claims, P354441, P354442, and P354444 near the middle of the Scott Lakes. No outcrop occurs on the claims, but they are probably underlain largely by intermediate to felsic, pyroclastic metavolcanics. The Scott Lakes Fault extends through the southern part of the claims.

No assessment work has been submitted by P. Roby, however, Marvel Minerals Limited formerly held a group of claims enclosing what are now the claims of P. Roby, and covering an area extending from Scott Lakes to Boomerang Lake. In 1966, Marvel Minerals completed magnetic and electromagnetic surveys over the property, as well as detailed geological mapping. A total of 680 soil samples were analyzed for total heavy metals. Anomalous geophysical conditions were attributed to iron formation units and shear zones. This, in conjunction with the negative results of the geochemical survey indicated that further work was not warranted.

Rowan Consolidated Mines Limited [1970?] (21)

Rowan Consolidated Mines Limited formerly held a small group of claims in northeast Douglas Township. The area is mainly underlain by intermediate to felsic metavolcanics of the upper sequence; the northern part may straddle the contact with the underlying mafic metavolcanics.

In 1966, Rowan completed magnetic and electromagnetic surveys of the claims. Subsequently, two diamond-drill holes were sunk, totalling 178 m (585 feet). No mineralization was encountered[1].

[1]Regional Geologist's Files, Ontario Ministry of Natural Resources, Timmins.

Silver Summit Mining Company Limited (30)

In 1972, Silver Summit Mining Company Limited held 21 unpatented claims, numbers P79379, P79380, P79382, P79398, P79399, P82753, P82754, P79405 to P79407 inclusive, P79409 to P79413 inclusive, and P83054 to P83059 inclusive, in the northeast part of Bartlett Township, extending from the vicinity of Boomerang Lake to the west boundary of the Texmont Mines Limited property. Originally Silver Summit's property included an additional nine claims, largely bordering the northwest part of the present property.

The claims are underlain by the lower sequence of intermediate to felsic metavolcanics consisting largely of pyroclastic rocks. The eastern margin of the small epizonal trondhjemitic stock in northeastern Bartlett Township extends into the northern part of the claim group. Numerous dikes of gabbro and quartz gabbro intrude the metavolcanics, particularly in the northern part of the claims. Late Precambrian, northwest-trending olivine diabase dikes are also common in the northern part of the claims.

In 1965, Silver Summit Mining Company Limited completed five diamond-drill holes totalling 957 m (3,139 feet) in the northeast corner of the property; only low nickel and copper values were encountered[1].

Subsequently, limited horizontal loop electromagnetic surveys were undertaken in the northeast and southwest parts of the property; a magnetic survey was also completed for the latter location. Follow-up diamond drilling totalled 670 m (2,200 feet) in five holes; all the mineralized zones encountered were within sulphide-bearing iron formation, containing only minor traces of copper, zinc, nickel and gold. The best intersection[1] contained 0.5 percent zinc over a core length of 2.9 m (9.5 feet).

The claims currently held by Silver Summit Mining Company Limited cover much of the property formerly held by Sturdy Mines Limited, and parts of claim groups previously held by Dominion Gulf Company, Paymaster Consolidated Mines Limited and Zenmac Metal Mines Limited.

In 1950-51, Dominion Gulf Company completed detailed geological mapping and ground magnetic and electromagnetic surveys over a large claim block straddling the northern part of the Bartlett-Geikie Township boundary. Part of Dominion Gulf's claims covered what is currently the northeastern part of Silver Summit Mining Company Limited's property. The results of Dominion Gulf's exploration work are summarized in the section dealing with the Texmont Mine.

Zenmac Metal Mines Limited formerly held a large group of claims (about 4 by 2.5 km or 2.5 by 1.5 miles) in east central Bartlett Township. The eastern part of the claims overlapped what is now the southwest part of the Silver Summit Mining Company Limited property, the western margin of the claim group extended to the centre of Bartlett Township. The property was entirely within the lower sequence of intermediate to felsic metavolcanics. In 1955, Zenmac mapped the property geologically and completed a ground magnetic survey over the eastern half of the property. In 1956 a number of trenches were dug and blasted, mainly on the iron formation. One grab sample assayed[1] 2.4 percent

[1]Regional Geologist's Files, Ontario Ministry of Natural Resources, Timmins.

copper with a trace of gold; the best exposure contained about 1.0 percent copper over 60 to 90 cm (2 to 3 feet). Also, in 1956, a more detailed magnetic survey was conducted over part of the property to better delineate the iron formation.

Paymaster Consolidated Mines Limited acquired the Zenmac Metal Mines Limited property when the claims lapsed, and the property formed one of a number of claim blocks in McArthur and Bartlett Townships for which Paymaster engaged Spartan Air Services to fly an airborne electromagnetic survey in late 1957. In January 1958, three diamond-drill holes totalling 589 m (1,932 feet) were sunk to test electromagnetic conductors; mineralization consisted mainly of barren sulphides associated with iron formation[1]. Later in 1958, the property was mapped in detail, and five additional diamond-drill holes totalling 491 m (1,611 feet) were completed; the best assay[1] was 0.42 percent copper across 1.5 m (5 feet) of core containing 40 percent pyrrhotite in a sulphide iron formation. In 1959, a vertical loop electromagnetic survey was done for that portion of the claim block east of Boomerang Lake; Zenmac had previously completed a magnetic survey for this part of the property. Three diamond drill holes totalling 456 m (1,495 feet) were sunk to test two conductive zones; the best assay was 0.12 percent copper over 1.5 m (5 feet)[1]. In 1960 two additional geophysical surveys over selected parts of the claims were completed for Paymaster Consolidated Mines Limited: a ground magnetic and electromagnetic survey by Cremac Surveys Limited, and a horizontal loop electromagnetic survey by Sheridan Geophysics Limited, to ascertain if the property warranted further attention. One electromagnetic conductor was diamond drilled (132 m or 432 feet), and the claims were subsequently allowed to lapse.

Sturdy Mines Limited formerly held a group of claims which covered the northeastern part of the claim block currently held by Silver Summit Mining Company Limited. In 1958, horizontal loop electromagnetic and soil geochemistry surveys were completed over the property. A total of 2,225 soil samples were analyzed for nickel; background was reported to be about 40 ppm[1]. Those samples containing more than 60 ppm of nickel were also analyzed for copper. Four main geochemical anomalies were located, containing nickel concentrations up to 650 ppm and copper concentrations up to 430 ppm. Follow-up diamond drilling included five holes totalling 563 m (1,847 feet); negligible sulphide mineralization was encountered[1].

Silver Town Mines Limited [1965] (22, 37)

Silver Town Mines Limited formerly held a group of claims straddling the central portion of the Douglas-Geikie Townships boundary. The north-trending Burrows-Benedict Fault crosses the western part of the property. The south half of the area is largely underlain by the Geikie Pluton, although minor east-trending ultramafic metavolcanics protrude into the area just north of Geikie Lakes. The northern half of the area is largely underlain by mafic and lesser ultramafic metavolcanics; west of the Burrows Benedict Fault is the northern extension of

[1]Regional Geologist's Files, Ontario Ministry of Natural Resources, Timmins.

the Geikie Pluton.

In 1965, Silver Town Mines completed magnetic and horizontal loop electromagnetic surveys on the property. Four possible conductive zones were indicated, but no follow-up work was undertaken.

Texas Gulf, Incorporated (10, 31)

Texas Gulf, Incorporated held 30 unpatented claims, P297885 to P297889 inclusive, P297892 to P297898 inclusive, P297900 to P297907 inclusive, P297909 to P297914 inclusive, P297916 to P297918 inclusive and P313801 in 1972, straddling the central part of the McArthur-Bartlett Townships boundary. The power transmission line roughly bisects the property.

The claims are confined to the lower sequence of intermediate to felsic metavolcanics, consisting largely of pyroclastic rocks. Two prominent bands of iron formation are intercalated with the metavolcanics in the northern part of the claim group; further south the magnetic expression (GSC 1970a; Assessment Files Research Office, Ontario Division of Mines, Toronto) of the underlying or more westerly iron formation dissipates, suggesting a pinching out, or a facies change to a non-magnetic (cherty?) unit. Numerous sills, dikes and small stock-like masses of gabbro and quartz gabbro intruded the metavolcanics. A Late Precambrian olivine diabase dike extends across the north part of the property.

In 1972, Texas Gulf, Incorporated completed ground magnetic and horizontal loop electromagnetic surveys on the property. The magnetic and electromagnetic anomalies were attributed to magnetite and minor sulphide or graphite horizons respectively in the iron formations.

Part of the Texas Gulf property was formerly held by a number of companies which included Hewitt Mining Company Limited, Clodan Gold Mines Limited, Marceau Lake Explorations Limited, Paymaster Consolidated Mines Limited, Silver Ore Zone Mines Limited, and Acme Gas and Oil Company Limited.

Hewitt Mining Company Limited formerly held two claims near the 2-mile post on the boundary line between McArthur and Bartlett Townships. In 1938, Erie Canadian Mines Limited examined the property and reported[1] the occurrence of visible gold in narrow quartz veins filling cross fractures in iron formation. Apparently little surface work had been done to trace the extent of the quartz veins, but a small shaft was sunk to a depth of 37 m (120 feet).

Clodan Gold Mines Limited formerly held a group of claims covering much of Texas Gulf's property in McArthur Township, and extending northeast to McArthur Lake. In 1946, Clodan Mines diamond drilled 12 holes totalling 293 m (962 feet) to test a number of quartz veins for gold, and one iron formation unit. Eight of the holes were abandoned due to caving. Assays revealed only trace amounts of gold[1].

Paymaster Consolidated Mines Limited formerly held a group of claims covering much of the property currently held by Texas Gulf, Incorporated in McArthur Township. In 1957, Paymaster Consolidated Mines Limited engaged

[1] Regional Geologist's Files, Ontario Ministry of Natural Resources, Timmins.

Spartan Air Services to conduct an airborne electromagnetic survey over much of Bartlett and McArthur Townships. On the basis of this survey, the above property was one of the claim groups subsequently staked in 1958. In 1959, Cremac Surveys Limited completed ground magnetic and vertical loop electromagnetic surveys for Paymaster Consolidated Mines Limited. In 1960, the company contracted Sheridan Geophysics Limited to perform a horizontal loop electromagnetic survey. The geophysical exploration led to the diamond drilling of seven holes totalling 907 m (2,975 feet). Most of the drill holes intersected one or other of the two bands of iron formation trending northwest across the property. Assays reported[1] for copper and for nickel do not exceed 0.10 percent and only trace amounts of gold are present. The best recorded[1] analysis for iron was 27.4 percent across a drill hole length of 8.9 m (29 feet).

Marceau Lake Explorations Limited formerly held a group of claims covering much of the eastern half of Texas Gulf's property, and extending as far south as Boomerang Lake. In 1965, magnetic and horizontal loop electromagnetic surveys were completed on the property. The same year a total of 288 m (994 feet) of drilling was completed in four holes. Sulphide bearing sections of the core, all from iron formation, were analyzed[1] for Cu, Zn, Pb, Co, Ni, Fe, S, Au, and Ag. The best intersection returned 0.2 percent copper, 2 percent zinc, 0.05 percent lead, 0.01 percent nickel and traces of gold and silver over a core length of 76 cm (2.5 feet)[1].

Silver Ore Zone Mines Limited formerly held ground extending south from the north boundary of Bartlett Township, overlapping the west boundary of Texas Gulf's claims. Magnetic and horizontal loop electromagnetic surveys were performed in 1965; no follow-up work was undertaken.

Acme Gas and Oil Company Limited formerly held a group of claims along and near the south boundary of McArthur Township, extending from about the 3-mile post to the east boundary of the township. This property, and the claim group of Acme Gas and Oil previously discussed under "Abitibi Asbestos Mining Company Limited" formed the claim blocks for which assessment credits were applied for on airborne magnetic and electromagnetic surveys flown over much of the southern half of McArthur Township in 1966. The surveys were performed for Acme Gas and Oil by Canadian Aero Mineral Surveys Limited. No follow-up ground exploration was undertaken on the southern claim group. The eastern portion of this claim group encompassed the former property of Westport Porcupine Gold Mines Limited which was located west of the Theriault claims (no.12 on Map 2363), and much of the former Andover Porcupine Gold Mines Limited property in the southeast corner of McArthur Township and northeast corner of Bartlett Township.

Texmont Mines Limited (11, 24, 32, 33, 34, 38, 39, 40)

In 1972, Texmont Mines Limited held one large contiguous block of claims in the Redstone River area. Most of the claims are located along the north half

[1]Regional Geologist's Files, Ontario Ministry of Natural Resources, Timmins.

of the Bartlett-Geikie Townships boundary; four claims extend north from this group, two each into McArthur and Douglas Townships. The claim group includes 26 patented claims, and 50 unpatented claims. The patented claims include P36097 to P36099 inclusive, P36100 to P36102 inclusive, P36692, P36603, P36475, and P36883 in Bartlett Township; P36049, P36051 to P36053 inclusive, P36103, P36106 to P36115 inclusive, and P36694 in Geikie Township. The unpatented claims consist of the following: P243242 to P243249 inclusive, P256349 to P256352 inclusive, and P332611 to P332616 inclusive in Bartlett Township; P243250 to P243275 inclusive, P332609 and P332610 in Geikie Township; P332605 and P332606 in McArthur Township; P332607 and P332608 in Douglas Township.

To facilitate the discussion of exploration work undertaken by Texmont Mines Limited, a separate sketch map (Figure 7) is provided showing the location of all claim blocks currently or formerly held by the company in the general mine area. The dates on the claim blocks indicate when the main exploration work was conducted. The block of 26 claims forming the mine property is discussed separately and is presented first, as all further exploration work by Texmont stemmed from the discovery of nickel mineralization at the mine site. Much of the statistical data on the Texmont Mine is taken from an unpublished report by Derry, Michener and Booth (Leigh 1971).

TEXMONT MINE (32, 38)

History

The property originally formed part of a group of 61 claims staked by Dominion Gulf Company in 1950-51. An airborne magnetic survey, flown in 1949, led to follow-up ground work in 1950, and the subsequent staking of the property as an asbestos prospect. In 1950-51, a ground magnetic survey was completed over most of the property, and many of the claims were mapped at a scale of 1 inch to 400 feet (1:4800). It was soon evident, both from trenching and diamond drilling that nickel, not asbestos, was the commodity to be sought. The main sulphide showing was about 120 m (400 feet) south of the present shaft. In 1952, a vertical loop electromagnetic survey was completed over that part of the area considered as potential for sulphide mineralization. The same year a ½ ton bulk sample of serpentinite was analyzed and ran 0.57 percent nickel[1].

From 1951 to 1955, Dominion Gulf Company drilled about 23 diamond-drill holes for a total length of 1900 m (6,231 feet).

In 1956, the property was optioned by Fatima Mining Company Limited, and subsequently purchased in 1957. From 1957 to 1959 Fatima drilled 37 holes for a total of 8243 m (27,044 feet). In 1961, an additional 1947 m (6,387 feet) of drilling was completed.

[1]Regional Geologist's Files, Ontario Ministry of Natural Resources, Timmins.

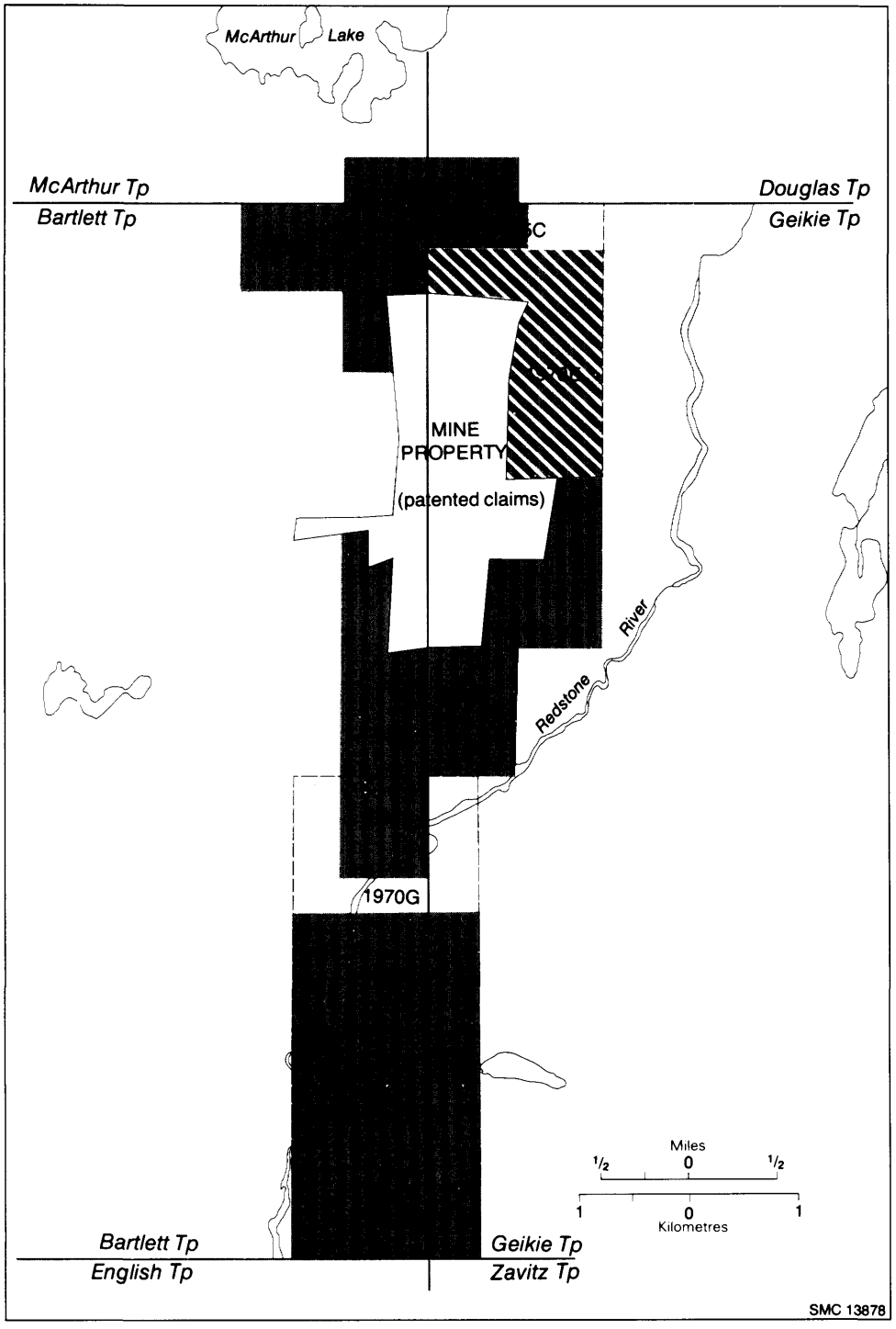
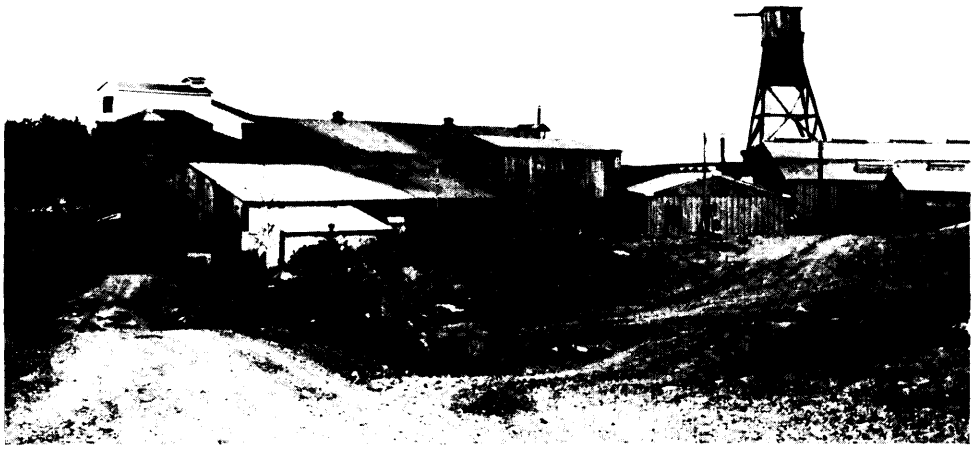


Figure 7–Claim groups currently (1972) and formerly held by Texmont Mines Limited near the Bartlett-Geikie Townships boundary for which assessment work was submitted.



ODM9713

Photo 10–Mine site, Texmont Mines Limited. Near Bartlett-Geikie Townships boundary.

In 1959, a three-compartment shaft (Photo 10) was collared and sunk to a depth of 240 m (790 feet). Five levels were established at depths of 46, 92, 137, 183, and 226 m (150, 300, 450, 600, and 742 feet). In 1960, development work included a total of 900 m (3,000 feet) of crosscutting and drifting on the 137 and 226 m (450 and 742 feet) levels. In addition, underground diamond drilling totalling 6002 m (19,690 feet) was completed in 165 holes.

In 1964, the company name was changed from Fatima Mining Company Limited to Texmont Mines Limited. In 1965-66, Texmont, in conjunction with Canadian Nickel Company Limited, drilled 74 holes for a total length of 29 062 m (95,347 feet). By participation in this drilling Canadian Nickel acquired a 15-percent interest in the property.

In May 1970, the property was leased to Sheridan Geophysics Limited for a term of 20 years. In July 1971, the mill started production at a rate of about 500 tons per day. In December 1972, mining operations temporarily ceased due to a tax increase on fuel oil; refinery operations continued on stockpiled concentrate.

General Geology

The ore zone occurs near the base of a north trending, massive, serpentinized ultramafic body which, as discussed under "Ultramafic Metavolcanics" could be interpreted as one or more thick ultramafic flows, or alternatively, ul-

tramafic sills emplaced along the contact between the intermediate to felsic metavolcanics and the overlying ultramafic metavolcanics. As suggested by Eckstrand (1972), the metavolcanics and metasediments encountered in the drilling of the ultramafic rocks hosting the mineralization probably represent stratigraphic intervals rather than xenoliths, thereby supporting a volcanic origin for the ultramafic rocks. Certainly the close spatial relationship between the ultramafic flows and underlying massive serpentinite suggests a common parentage.

The intermediate to felsic metavolcanics and associated intercalated iron formation on the west side of the property (see Map 2364, back pocket) mark the termination of what is interpreted to be the first cycle of volcanism in the area. The overlying ultramafic rocks form the base of the second cycle.

Ore Zones and Mineralization[1]

A zone of nickel mineralization, with which the ore lenses are associated, has been traced over a length of about 580 m (1,900 feet), and a width of up to 58 m (190 feet). This mineralized zone dips steeply east and trends somewhat obliquely (N20E) to the general north trend of the enclosing ultramafic body.

The nickel-bearing minerals consist mainly of pentlandite with minor associated millerite, heazlewoodite and possibly nickeliferous pyrrhotite. The mineralization is disseminated, commonly forming fine intercumulus blebs generally less than 2 mm in diameter and rarely up to 12 mm.

At least six mineralized lenses have been indicated on the property: "A" zone, "B" zone, "C" zone, "D" zone, South zone, and North zone. All but the North zone are shown on Figure 8.

The "A" zone is the main ore zone being developed at the mine, and is about 120 m (400 feet) long, trends north, and dips about 75 degrees east.

The "C" zone or footwall zone is 3 to 9 m (10 to 30 feet) below the "A" zone, and has been outlined from surface to the 137 m (450 feet) level.

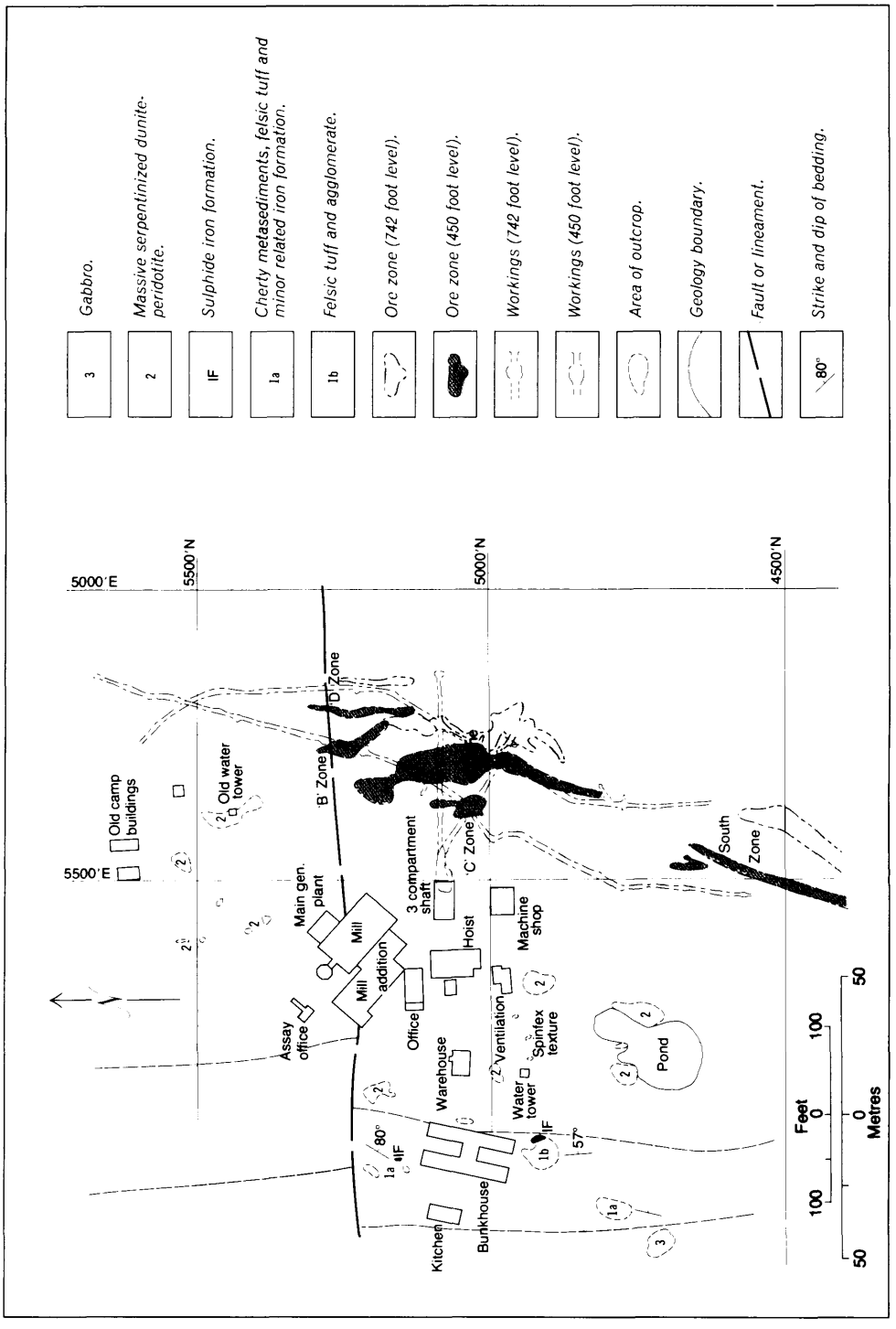
The "B" and "D" zones have been partly delineated on the 137 m (450 feet) level; little work has been done on the vertical continuity, although indications are that at least the "D" zone extends to the 226 m (742 feet) level. The South zone is the second largest ore zone on the property, and has been defined by a number of surface diamond-drill holes (Figure 9) and underground drilling. The ore zone extends from the surface to at least 408 m (1,340 feet), dips 75 degrees east, has an indicated length of 120 m (400 feet) and an approximate horizontal width of 9 m (30 feet).

The North zone occurs about 210 m (700 feet) north of the "A" zone; as yet little work has been done to delineate the mineralization. One drill hole intersection returned 1.04 percent nickel over 17 m (55 feet) at a depth of 290 m (940 feet).

Other drilling has apparently encountered encouraging mineralization between the "A" and South zone.

Ore reserves, as calculated by Derry, Michener and Booth, and taken from

[1]Information taken largely from Leigh (1971).


3 Gabbro.
2 Massive serpentinized dunite-peridotite.
IF Sulphide iron formation.
1a Cherty metasediments, felsic tuff and minor related iron formation.
1b Felsic tuff and agglomerate.
Ore zone (742 foot level).
Ore zone (450 foot level).
Workings (742 foot level).
Workings (450 foot level).
Area of outcrop.
Geology boundary.
Fault or lineament.
80° Strike and dip of bedding.
5000'E
5500'N
5000'N
4500'N
5500'E
Old camp buildings
Old water tower
B Zone
D Zone
C Zone
South Zone
Main gen. plant
Mill
Mill addition
3 compartment shaft
Hoist
Machine shop
Assay office
Office
Warehouse
Ventilation
Spinifex texture
Water tower
Pond
Kitchen
Bunkhouse
Feet
Metres

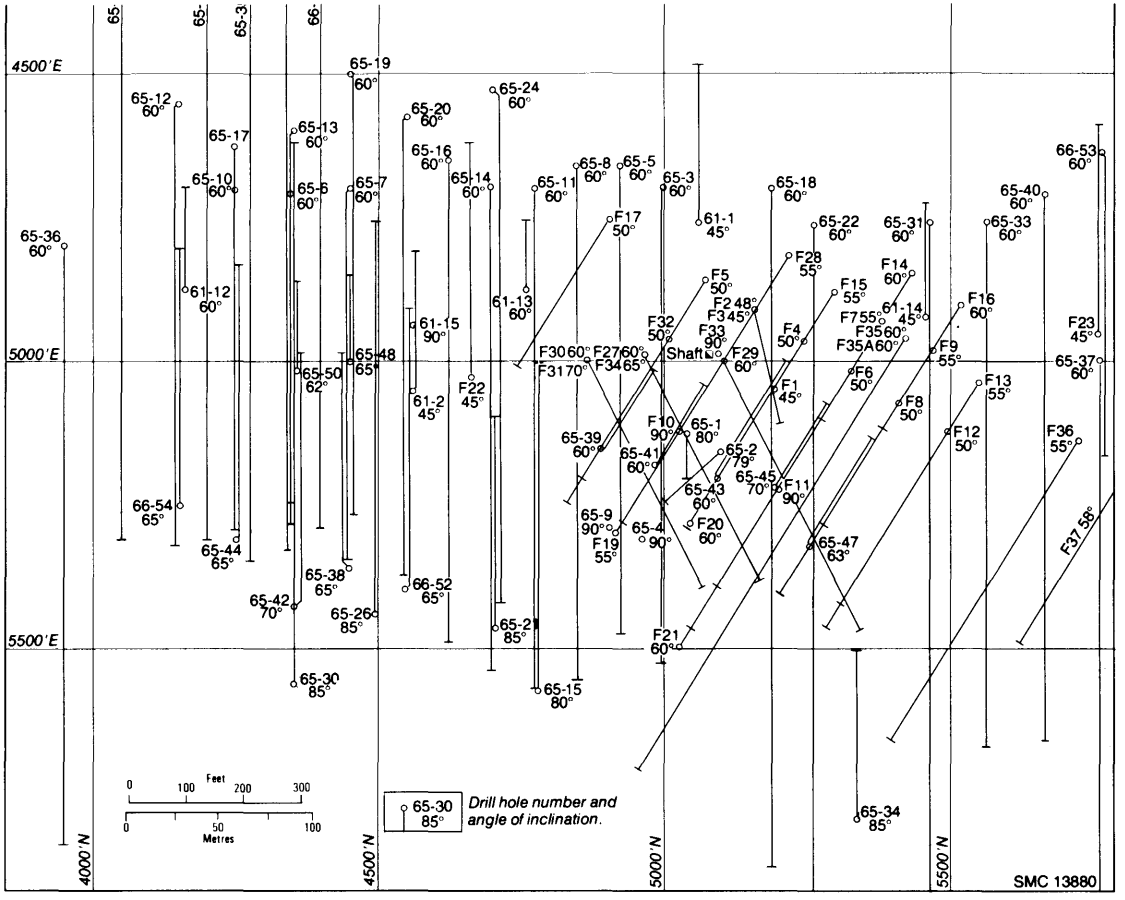


Figure 9–Location of surface diamond drill holes in the vicinity of Texmont Mines Limited nickel orebody, near the Bartlett-Geikie Townships boundary (information from Texmont Mines Limited).

TABLE 7 TOTAL TONNAGE AND GRADE OF THE "A" AND SOUTH ZONES OF THE TEXMONT MINES LIMITED ORE-BODY, BARTLETT AND GEIKIE TOWNSHIP (FROM LEIGH 1971).

		Tons	Grade % Ni
"A" zone	— Proven (30-740 ft.) (9-230 m)	730,000	0.96
	— Drill indicated (740-1,600 ft.) (230-490 m)	860,000	0.96
South zone	— Drill indicated (0-1,600 ft.) (0-490 m)	1,600,000	0.89
Total		3,190,000	0.92

an unpublished report by Leigh (1971) are given in Table 7. In general, the reserves are based on a cut-off grade of 0.7 per cent nickel over a continuous mineable width. The calculations are for the "A" and South zones only.

OTHER PROPERTIES OF TEXMONT MINES LIMITED [1966, 1970] (32, 34, 40)

Between 1965 and 1972, Texmont Mines Limited held eight separate claim blocks (A to H inclusive, Figure 7), near the Bartlett-Geikie Townships border for which assessment work was submitted. In general, these claim blocks have at one time or another encompassed most of the ultramafic metavolcanics along the Bartlett-Geikie Townships boundary. They straddle the intermediate to felsic–ultramafic metavolcanic contact which marks the end of the first and onset of the second cycle of volcanism in the area (see "Ultramafic Metavolcanics"). Stratigraphically, this is the same interval at which the Langmuir Mine of Noranda Mines Limited and The International Nickel Company of Canada Limited, and the McWatters and Paramaque deposits occur in the Timmins area (Pyke 1970; 1974). In addition to the above, claim groups were formerly held near the southeast corner of Douglas Township (Figure 3), and in the southeast corner of Geikie Township (described under Falconbridge Nickel Mines) (Figure 4).

In 1965, ground magnetic and electromagnetic surveys (mainly horizontal loop versus vertical loop) were completed on claim blocks A, B, and C (Figure 7). The same year, Texmont drilled five holes totalling 977 m (3,206 feet); two holes near the southeast corner of Bartlett Township (claim block A), one hole near the west central boundary of claim block B and two holes in claim block C, 800 m (2,600 feet) north of the 5-mile post on the Bartlett-Geikie Townships boundary. The best nickel assay was from one of the holes in claim block C (0.70 per cent nickel over a core length of 1.5 m (5 feet)[1]; most assays were significantly

[1]Regional Geologist's Files, Ontario Ministry of Natural Resources, Timmins.

lower. Additional work in 1965 consisted of a vertical loop electromagnetic survey on a group of claims near the southeast corner of Douglas Township. The claims are mainly underlain by mafic metavolcanics, and the results of the survey did not warrant follow-up work. The same year (1965) exploration work was done on the claim group in the southeast corner of Geikie Township, which is discussed in the section on Falconbridge Nickel Mines Limited.

In 1966, Canadian Nickel Company Limited optioned five claims, four at the south boundary of claim block A, and one at the north end of claim block B, adjacent to the south perimeter of the mine property. Five holes totalling 432 m (1,418 feet) were drilled, one on each of the optioned claims. Two of the drill holes encountered abundant sulphides in intermediate to felsic metavolcanic breccias. No assay results were recorded; presumably the sulphides were relatively barren, perhaps similar to the sulphide-bearing iron formations.

In 1970, Texmont Mines Limited conducted geophysical (ground magnetic and electromagnetic) surveys over claim blocks D, E, F and G (Figure 7). The electromagnetic survey employed an in-line method using a Crone J.E. unit[1]. A number of electromagnetic and magnetic anomalies were encountered; most could be readily explained by sulphide-bearing iron formation, magnetic concentrations in the ultramafic metavolcanics or diabase dikes. Although no drilling was recommended, ground prospecting, mapping and soil sampling surveys were suggested.

Much of the exploration work conducted by Texmont Mines Limited beyond the mine property (Figure 7) commenced in 1965. Prior to this, a number of companies held claims (Figure 4) on groups which would subsequently be held by Texmont (Figure 7). The following is a brief description of these properties.

Andover Porcupine Gold Mines Limited formerly held a group of claims in the northeast corner of Bartlett Township and southeast corner of McArthur Township. In 1938, Erie Canadian Mines Limited examined the property and reported that one of the auriferous quartz veins from the adjacent Theriault property extended on to the claims. In addition, trenching of a feldspar porphyry dike reportedly revealed visible gold[2]. No further information is available on the property.

Queenston Gold Mines Limited formerly held a large group of claims straddling the Redstone River in the southeast corner of Bartlett Township. The property was considered favourable as it was recognized that it contained the southward extension of the ultramafic – intermediate to felsic metavolcanic contact that occurred at the Texmont Mine. In 1957, the property was mapped in detail, a number of rock trenches were blasted, and a total of 653 m (2,412 feet) of diamond drilling was completed in five holes. The drill holes were spotted to intersect possible nickel sulphide mineralization near the base of the ultramafic metavolcanics west of the Redstone River. One outcrop in this area had revealed the existence of disseminated blebs of pyrrhotite and pyrite; one sample assayed 0.25 percent nickel [2]. The drilling did not intersect a better mineralized zone. East of the river, an assay of 0.56 percent nickel is reported, although little or no follow-up work was done [2].

---

[1]For details of method see Regional Geologist's Files, Ontario Ministry of Natural Resources, Timmins.

[2]Regional Geologist's Files, Ontario Ministry of Natural Resources, Timmins.

Dominion Gulf Company formerly held a group of claims straddling the Redstone River in the southeast part of Bartlett Township. In 1952, the claims were mapped in detail and a ground magnetic survey completed. No significant mineralization was found; the best assay[1] returned values of 0.17 percent nickel.

Payqueen Nickel Mines Limited formerly held a group of claims straddling the Bartlett-Geikie Township boundary, adjacent to the south boundary of the Texmont Mine property. In 1957, detailed geological mapping and dip needle readings were completed for half the claims. Subsequent drilling of four holes for a total of 723 m (2,373 feet) failed to reveal any mineralization other than minor disseminated pyrite and magnetite.

H. Gauthier formerly held a large claim group extending from east of the Redstone River to the east boundary of the Texmont Mine property. Most of this ground formed part of the original claim group staked by Dominion Gulf Company in 1951, for which airborne and ground magnetic surveys and detailed geological mapping were completed in 1952. H. Gauthier optioned the claims to Ultra-Shawkey Mines Limited, who in 1959 conducted a vertical loop electromagnetic survey over the property. In 1960, the claims were held under an option agreement between Noranda Exploration Company Limited and R.E. Allerston. Subsequent magnetic and electromagnetic surveys in conjunction with geological mapping indicated that the geophysical anomalies resulted from pockets of disseminated magnetite in the ultramafic metavolcanics.

Conigo Mines Limited formerly held a group of claims in east central Bartlett Township; the southern part contained what would later form the northeastern corner of Texmont's 1970G property, and most of the northern part of the property was previously held by Payqueen Nickel Mines in the late 1950s. In 1965, Conigo completed magnetic and electromagnetic surveys on the property; results did not warrant additional work.

Theriault, A. (12)

In 1972, A. Theriault held six patented claims, TRP2984, TRP2985, and TRP3026 to TRP3029 inclusive, near the south shore of McArthur Lake in McArthur Township. The claims were originally staked in 1911 by J. Chouinard and D. Morrison; subsequent leasing arrangements were completed by 1921. In the 1920s the Clear Lake Porcupine Syndicate was formed, under the direction of J. Theriault. In 1936, the property was acquired by Alcide Porcupine Mines Limited, who received their charter the same year; J. Theriault was president. The company's charter was cancelled in 1957, and A. Theriault acquired the property.

The property is mainly underlain by ultramafic metavolcanics, intruded by small stocks of porphyritic trondhjemite; locally the contact zones are highly carbonatized. The largest outcrop area of trondhjemite is an elliptical-shaped northwest trending mass in the southeast part of the property, and this has been the focus of most of the exploration work. The property was examined by N.

[1]Regional Geologist's Files, Ontario Ministry of Natural Resources, Timmins

Hogg in 1947, who at that time was the Resident Geologist in Timmins, and much of the following information is taken from his report[1].

Gold mineralization is associated with four major quartz veins (Figure 10); the Ogilvie, Steel and Portage veins which strike about N50E and the Chouinard vein which strikes N30W. Coarse-grained dikes of feldspar porphyry are associated with the northeast-trending dikes.

The Ogilvie vein (Figures 10 and 11) has received the most attention and appears to be the most important economically in that the gold values are the most consistent. The vein has been exposed over a strike length of 69 m (225 feet) in three large rock cuts. The quartz does not form a continuous vein, but rather a series of lenses up to 60 cm (2 feet) wide along the northwest wall of a dike of feldspar porphyry up to 2.4 m (8 feet) wide. Minor pyrite and traces of chalcopyrite and galena occur as fine disseminations and fracture fillings both in the quartz and the enclosing trondhjemite. The best channel samples reported[1] in ounces of gold per ton, from the Ogilvie vein are 0.37 over 98 cm (3.2 feet), 0.24 over 122 cm (4 feet) and 0.14 over 122 cm (4 feet). More than 600 m (2,000 feet)of diamond drilling has been done on the property, but property records have only been kept for two holes (Figure 11), drilled to lengths of 53 m and 152 m (175 feet and 500 feet) respectively. One 1.5 m (5 feet) length of core across the Ogilvie vein assayed 0.06 ounces of gold per ton[1].

The Portage and Steel veins (Figure 10) occur in the serpentinized ultramafic metavolcanics, and are similar to the Ogilvie in that both veins contain quartz-filled fractures and lenses associated with a feldspar porphyry dike. Hopkins (1924) reported the occurrence of visible gold in the Steel vein. A quartz stockwork (Photo 11) outcrops near the north central boundary of the claims in the ultramafic metavolcanics on the south shore of McArthur Lake, but no gold values have been reported.

The Chouinard vein (Figures 10 and 11) is a quartz vein with no associated feldspar porphyry, varies in width from about 10 cm to 1.5 m (5 feet), and has been traced continuously for a strike length of 91 m (300 feet), and intermittently as far as the Ogilvie vein (Figure 11). Although a few selected samples have assayed up to about 1 ounce of gold per ton[1], most have contained only traces, and the vein in general has not proved interesting. Minor pyrite and traces of galena and chalcopyrite have been reported in the trondhjemitic wall rocks.

Little or no work appears to have been done on the property since N. Hogg (1947) examined the claims. In his report he concluded that the property warranted further exploration. The author concurs with this especially in view of the close spatial association of the gold occurrence with ultramafic volcanic rocks, which may have an important bearing on the genesis of gold deposits (Pyke 1975b). Of additional interest is that disseminated pyrite was reported throughout the trondhjemite in the two diamond-drill holes for which records are available. As minor chalcopyrite is known to occur with the gold mineralization, it may be worthwhile assaying some of the trondhjemite for copper, with a view to possible porphyry-type mineralization. Two copper assays[1] reported from samples from the Ogilvie vein gave 1.68 and 2.26 percent copper respectively.

---

[1]On file (T-139) with the Regional Geologist, Ontario Ministry of Natural Resources, Timmins.

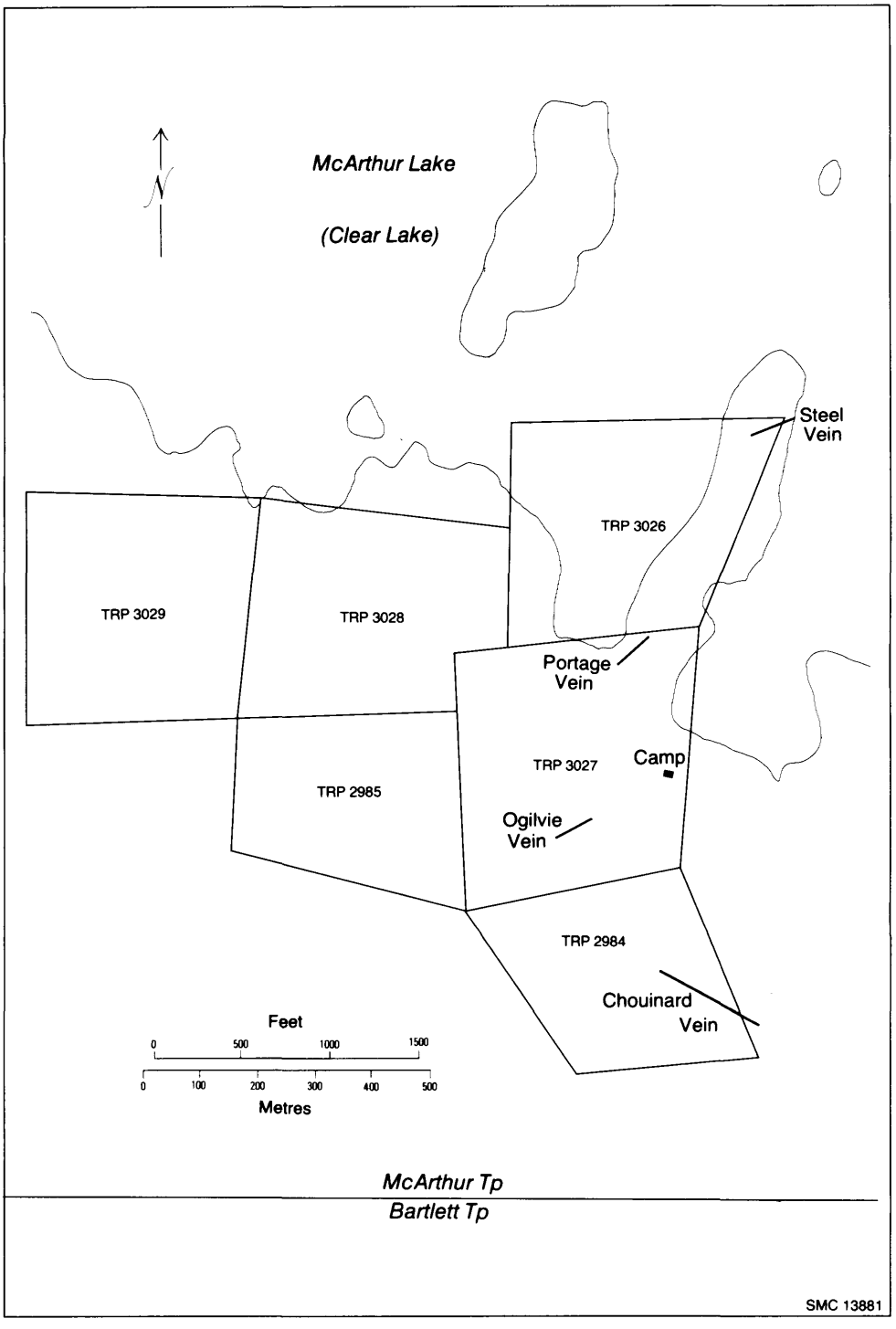


Figure 10–Patented claims of Theriault property showing location of main gold-bearing veins (information from Regional Geologist's files, Ontario Ministry Natural Resources, Timmins).

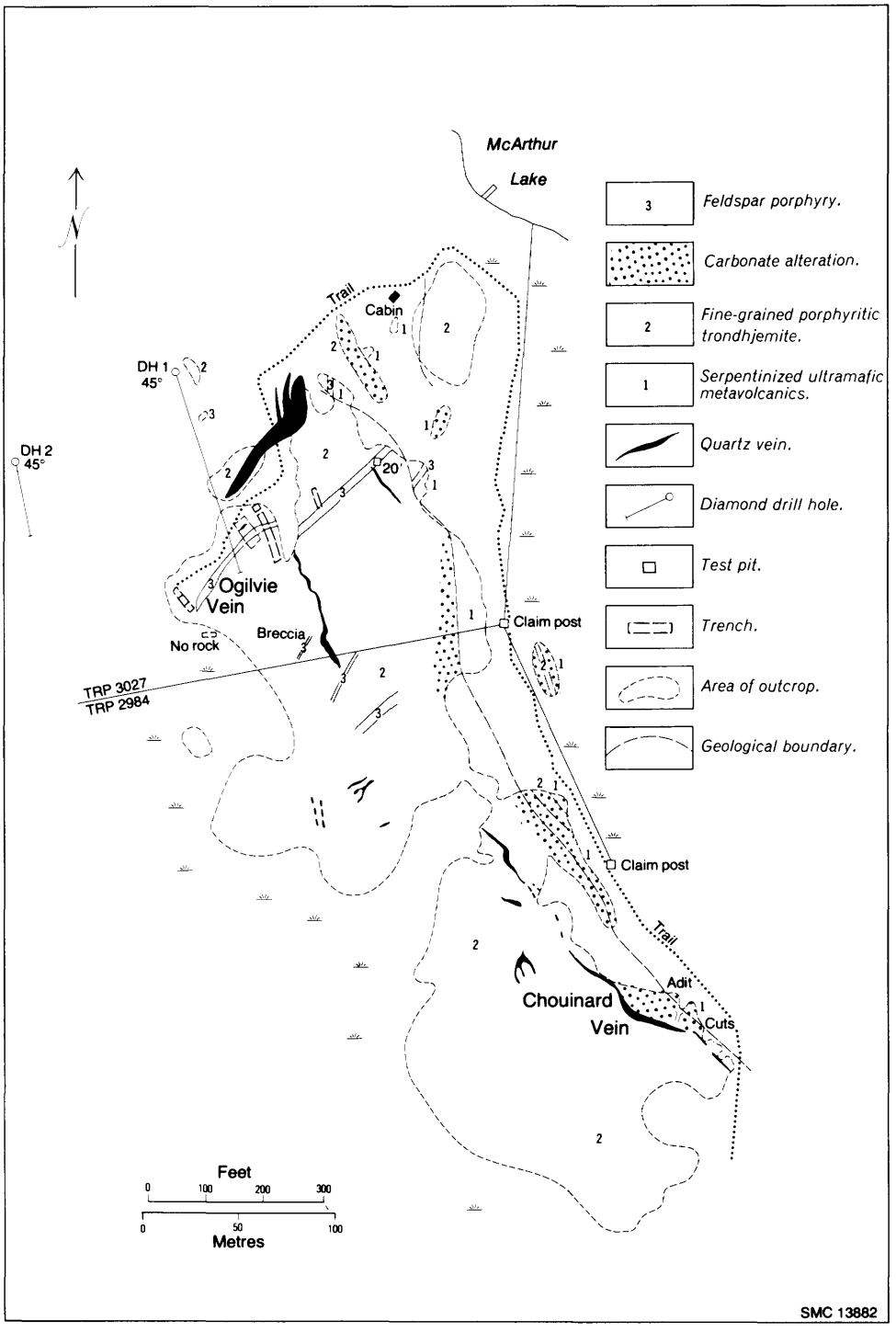
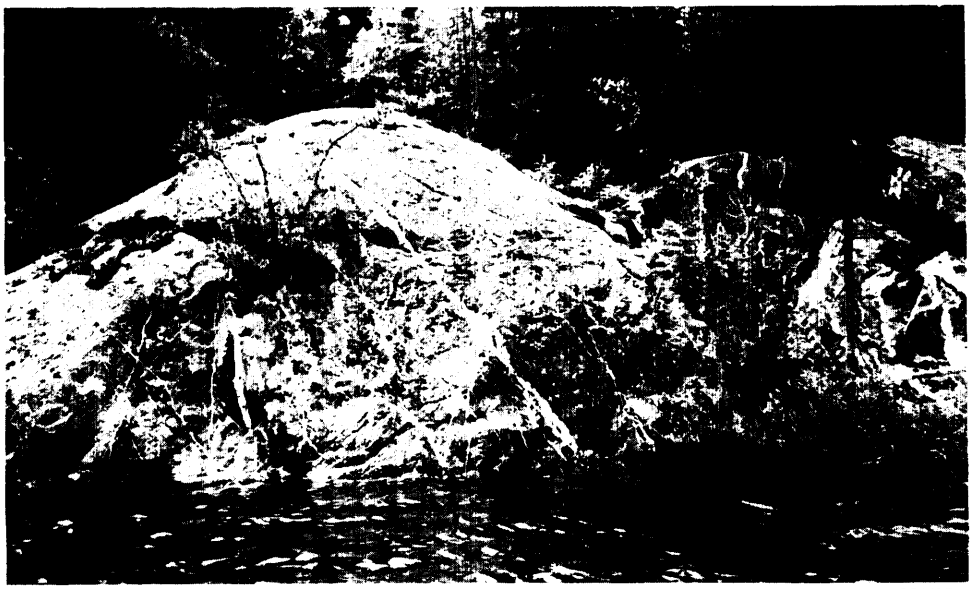


Figure 11–General geology of the gold showing on the property of A. Theriault. Included are parts of patented claims TRP 3027 and TRP 2984. Geology modified after N. Hogg (1947).



ODM9714

Photo 11–Quartz stockwork in ultramafic metavolcanics, McArthur Lake.

Westport Porcupine Gold Mines Limited [1938] (13)

Westport Porcupine Gold Mines Limited formerly held a group of claims extending southeast from McArthur Lake to the northern part of Bartlett Township. The northern extremity of the area of the claims contains the basal position of the ultramafic metavolcanics. The remaining part of the area is largely underlain by intermediate to felsic, metamorphosed pyroclastic rocks and intercalated iron formation; the northern margin of a trondhjemitic stock extends into the south part of the area. Exploration work was confined to the southern part of the claims, and the following information is taken from a report[1] by Erie Canadian Mines Limited in 1938.

Two main showings occurred near the southern boundary of McArthur Township; one about 400 m (1,300 feet) northeast of the 2-mile post, the other about 1150 m (3,800 feet) west of the southeast corner of McArthur Township. The first showing contained minor pyrite and a few discontinuous quartz veinlets in an intermediate to felsic breccia. Exploration work consisted of two trenches and six diamond-drill holes totalling 513 m (1,684 feet). Only trace amounts of gold were found[1]. The second showing, near the township line, is associated with two narrow bands of iron formation (shown as one band on ac-

[1]Regional Geologist's Files, Ontario Ministry of Natural Resources, Timmins.

companying Map 2363, back pocket), separated by about 38 m (127 feet). Gold occurs both in the iron formation and narrow parallel sills of feldspar porphyry. A number of trenches, two small shafts (about 6 m (20 feet) deep) and six diamond-drill holes totalling 282 m (924 feet) constituted much of the exploration work completed by 1938. Prior to the examination of the property by Erie Canadian, gold values up to $11.20 per ton (gold probably at $20.67 per ounce) were reported. The best channel sample by Erie Canadian, in 1938, returned $6.40 per ton (gold probably at $35.00 per ounce) over 67 cm (2.2 feet)[1].

B. Whitmarsh (14)

In 1972, B. Whitmarsh held one unpatented claim, P100427, on the southwest shore of McArthur Lake, McArthur Township. Considerable trenching has been done in the trondhjemite on the property, but no significant mineralization has been reported[1].

[1]Regional Geologist's Files, Ontario Ministry of Natural Resources, Timmins.

REFERENCES

Ayres, L.D.
1974: Geology of the Trout Lakes Area, District of Kenora (Patricia Portion); Ontario Div. Mines, GR113, 197p. Accompanied by Map 2270, scale 1 inch to ½ mile.

Ayres, L.D., Lumbers, S.B., Milne, V.G., and Robeson, D.W.
1971: Ontario Geological Map, East Central Sheet; Ontario Dept. Mines and Northern Affairs, Map 2198, scale 1 inch to 16 miles.

Bright, E.G.
1974: English and Zavitz Townships, District of Sudbury; Ontario Div. Mines, Map 2290, scale 1 inch to ½ mile. Geology 1967.

Bruce, E.L.
1926: Geology of McArthur, Bartlett, Douglas and Geikie Townships (Redstone River Area), District of Timiskaming; Ontario Dept. Mines, Vol.35, pt.6, p.37-56 (published 1927). Accompanied by Map 35h, scale 1 inch to ¾ mile.

Burrows, A.G.
1911: The Porcupine Gold Area; Ontario Bur. Mines, Vol.20, pt.2, p.1-33. Accompanied by Map 20e, scale 1 inch to 1 mile and Map 20f, scale 1 inch to 2 miles.

Burwash, E.M.
1896: Geology of the Nipissing-Algoma Line; Ontario Bur. Mines, Vol.6, Sec.5, p.167-184 (published 1897). Accompanied by sketch map.

Cooke, H.C.
1919: Geology of Matachewan District, Northern Ontario; Geol. Surv. Canada, Mem.115, 60p. Accompanied by Map 1793, scale 1 inch to 1 mile.

Eckstrand, O.R.
1972: Ultramafic Flows and Nickel Sulphide Deposits in the Abitibi Orogenic Belt; p.75-81 *in* Report of Activities, Part A: April to October, 1971, Geol. Surv. Canada, Paper 72-1, 243 p.

Eckstrand, O.R. and Miller, A.R.
1973: A Study of Sulphide and Spinifex Distribution of the Texmont Nickel Deposit; p.125-127 *in* Report of Activities, Part A: April to October 1973, Geol. Surv. Canada Paper 73-1, Part A, 297p.

Fahrig, W.F. and Wanless, R.K.
1963: Age and Significance of Diabase Dike Swarms of the Canadian Shield; Nature, Vol.200, No.4910, p.934-937.

Fahrig, W.F., Gaucher, E.H. and Larochelle, A.
1965: Paleomagnetism of Diabase Dykes of the Canadian Shield; Canadian J. Earth Sci., Vol.2, No.4, p.278-298.

Ferguson, S.A. and Associated Geologists
1968: Geology and Ore Deposits of Tisdale Township, District of Cochrane; Ontario Dept. Mines, GR58, 177p. Accompanied by Map 2075, scale 1 inch to 1,000 feet.

Fyfe, W.S., Turner, F.J. and Verhoogen, J.
1958: Metamorphic Reactions and Metamorphic Facies; Geol. Soc. America, Memoir 73, 259p.

GSC
1964: Kamiskotia Lake, Cochrane District, Ontario; Geol. Surv. Canada, Aeromag. Ser., Map 2300G (Rev.), scale 1 inch to 1 mile. Survey flown 1963 and 1964.

GSC
1970a: Peterlong Lake, Sudbury and Timiskaming Districts; Geol. Surv. Canada, Aeromag. Ser., Map 291G (Rev.), scale 1 inch to 1 mile. Survey flown 1947, 1948, and 1949.
1970b: Timmins, District of Cochrane, Ontario; Geol. Surv. Canada, Aeromag. Ser., Map 293G (Rev.), scale 1 inch to 1 mile. Survey flown 1947, 1948, and 1949.
1970c: Radisson Lake, Timiskaming District, Ontario; Geol. Surv. Canada, Aeromag. Ser., Map 290G (Rev.), scale 1 inch to 1 mile. Survey flown 1947, 1948, and 1949.

Gledhill, T.L.
1926: Grassy River Area, District of Sudbury; Ontario Dept. Mines, Vol.35, pt.6, p.57-76. Accompanied by Map 35j, scale 1 inch to 1½ miles.

Glikson, A.Y.
1971: Primitive Archean Element Distribution Patterns: Chemical Evidence and Geotectonic Significance; Earth Planet. Sci. Letters, Vol.12, p.309-320.

Harding, W.D. and Berry, L.G.
1938: Geology of the Keefer-Eldorado Area; Ontario Dept. Mines, Vol.47, pt.4, p.1-26. Accompanied by Map 47, scale 1 inch to 1 mile.

Hogg, N.
1947: Unpublished Report on Alcide Porcupine Mines Ltd., McArthur Township, Temagami Forest Reserve; Regional Geologist's Files, Ontario Ministry Natural Resources, Timmins.

Hopkins, P.E.
1924: Notes on Gold in McNeil and Other Townships; Ontario Dept. Mines, Vol.33, pt.3, p.37-40 (published 1925). Accompanied by sketch map.

Irvine, T.N. and Baragar, W.R.A.
1971: A Guide to the Chemical Classification of the Common Volcanic Rocks; Canadian J. Earth Sci., Vol.8, No.5, p.523-548.

Leech, A.V.
1965: A Reconnaissance: Basic Intrusive Rocks of the Precambrian Shield, Canada; unpublished M. Sc. thesis, University of Alberta, Edmonton, Alberta.

Leigh, O.E.
1971: Texmont Mines Limited, Bartlett and Geikie Townships; unpublished report for Derry, Michener and Booth, Mining Geological Consultants, 11p.

Lovell, H.L.
1967: Geology of the Matachewan Area, District of Timiskaming; Ontario Dept. Mines, GR51, 61p. Accompanied by Maps 2109 and 2110, scale 1 inch to ½ mile.

Middleton, R.S.
1969: Remnant Magnetism and Magnetic Susceptibility in the Interpretation of Ground Magnetics, Jamieson Township, District of Cochrane, Ontario; unpublished M.Sc. thesis, Michigan Technological University, Houghton, Michigan.

Milne, V.G.
1972: Geology of the Kukatush-Sewell Lake Area, District of Sudbury; Ontario Div. Mines, GR97, 116p. Accompanied by Maps 2230 and 2231, scale 1 inch to ½ mile.

Naldrett, A.J.
1972: Archean Ultramafic Rocks; Earth Physics Branch Publ., Canada Dept. Energy, Mines and Resources, Vol.42, p.141-151.

Naldrett, A.J. and Mason, G.D.
1968: Contrasting Archean Ultramafic Igneous Bodies in Dundonald and Clergue Townships, Ontario; Canadian J. Earth Sci., Vol.5, No.1, p.111-143.

Nesbitt, R.W.
1971: Skeletal Crystal Forms in the Ultramafic Rocks of the Yilgarn Block, Western Australia: Evidence for an Archean Ultramafic Liquid; Geol. Soc. Australia, Spec. Publ.3, p.331-347.

Pyke, D.R.
1970: Geology of Langmuir and Blackstock Townships, District of Timiskaming, Ontario Dept. Mines, GR86, 65p. Accompanied by Map 2206, scale 1 inch to ½ mile.
1973a: Geology of Fallon and Fasken Townships, District of Timiskaming; Ontario Div. Mines, GR104, 31p. Accompanied by Map 2253, scale 1 inch to ½ mile.
1973b: Peterlong Lake Area, Districts of Timiskaming and Sudbury; Ontario Div. Mines, Prelim. Map P.810, Geol. Ser., scale 1 inch to 1 mile. Geology 1972.
1974: Timmins Area, Districts of Timiskaming and Cochrane; Ontario Div. Mines, Prelim. Map P.941, Geol. Ser., scale 1 inch to 1 mile. Geology and compilation 1973.
1975a: Geology of Adams and Eldorado Townships, District of Cochrane; Ontario Div. Mines, GR121, 51p. Accompanied by Map 2274, scale 1 inch to ½ mile.
1975b: On the Relationship of Gold Mineralization and Ultramafic Volcanic Rocks in the Timmins Area; Ontario Div. Mines, MP62, 23p.
in press: Geology of the Peterlong Lake Area, Districts of Timiskaming and Sudbury; Ontario Div. Mines, GR171, 53p. Accompanied by Map 2345, scale 1:50,000.

Pyke, D.R., Ayres, L.D. and Innes, D.G.
1973: Timmins-Kirkland Lake, Districts of Cochrane, Sudbury and Timiskaming; Ontario Div. Mines, Map 2205, Geol. Comp. Ser., scale 1 inch to 4 miles. Geological compilation 1970-1971.

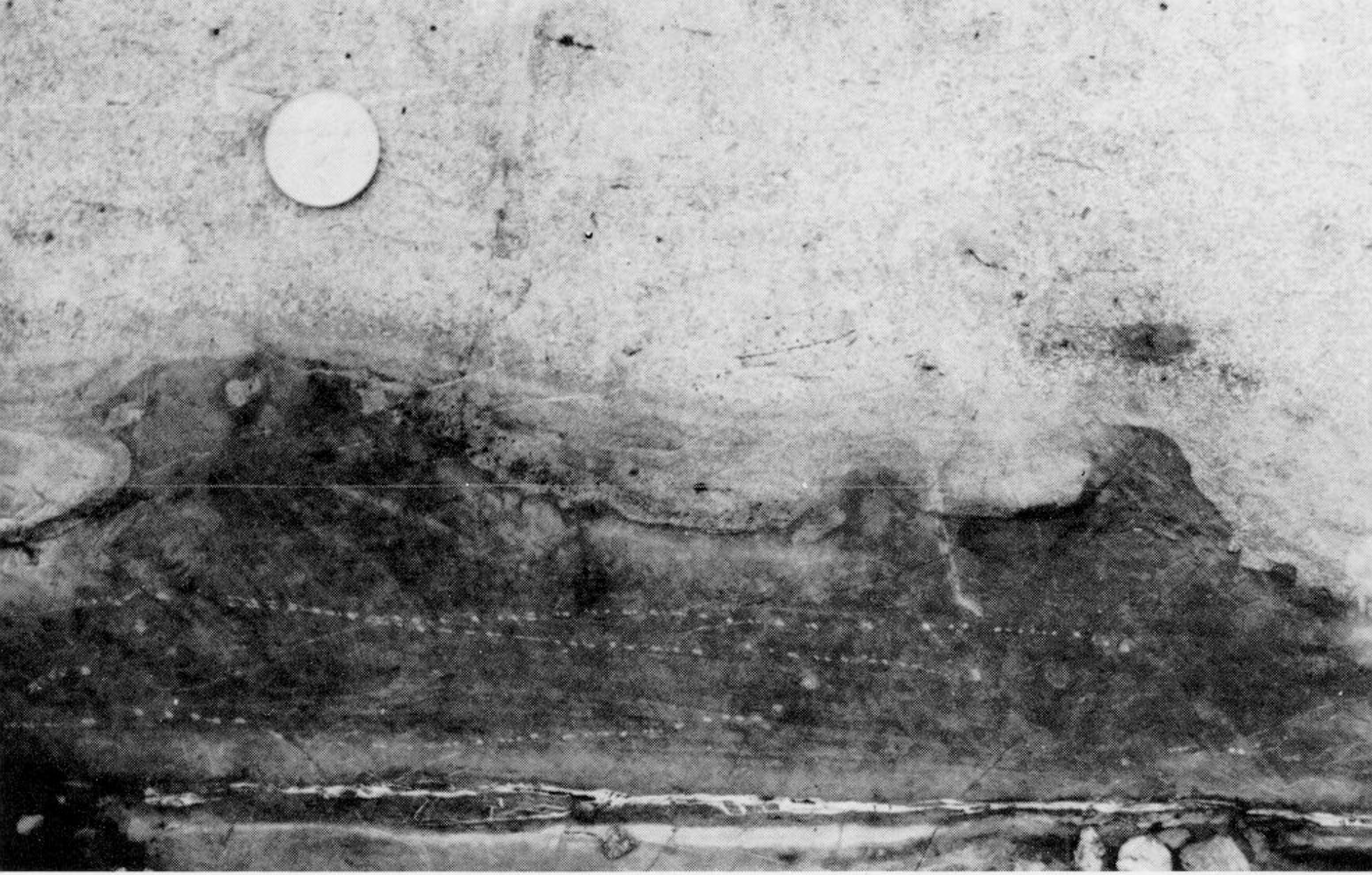
Pyke, D.R., Naldrett, A.J. and Eckstrand, O.R.
1973: Archean Ultramafic Flows in Munro Township, Ontario; Geol. Soc. America Bull., Vol.84, p.955-978.

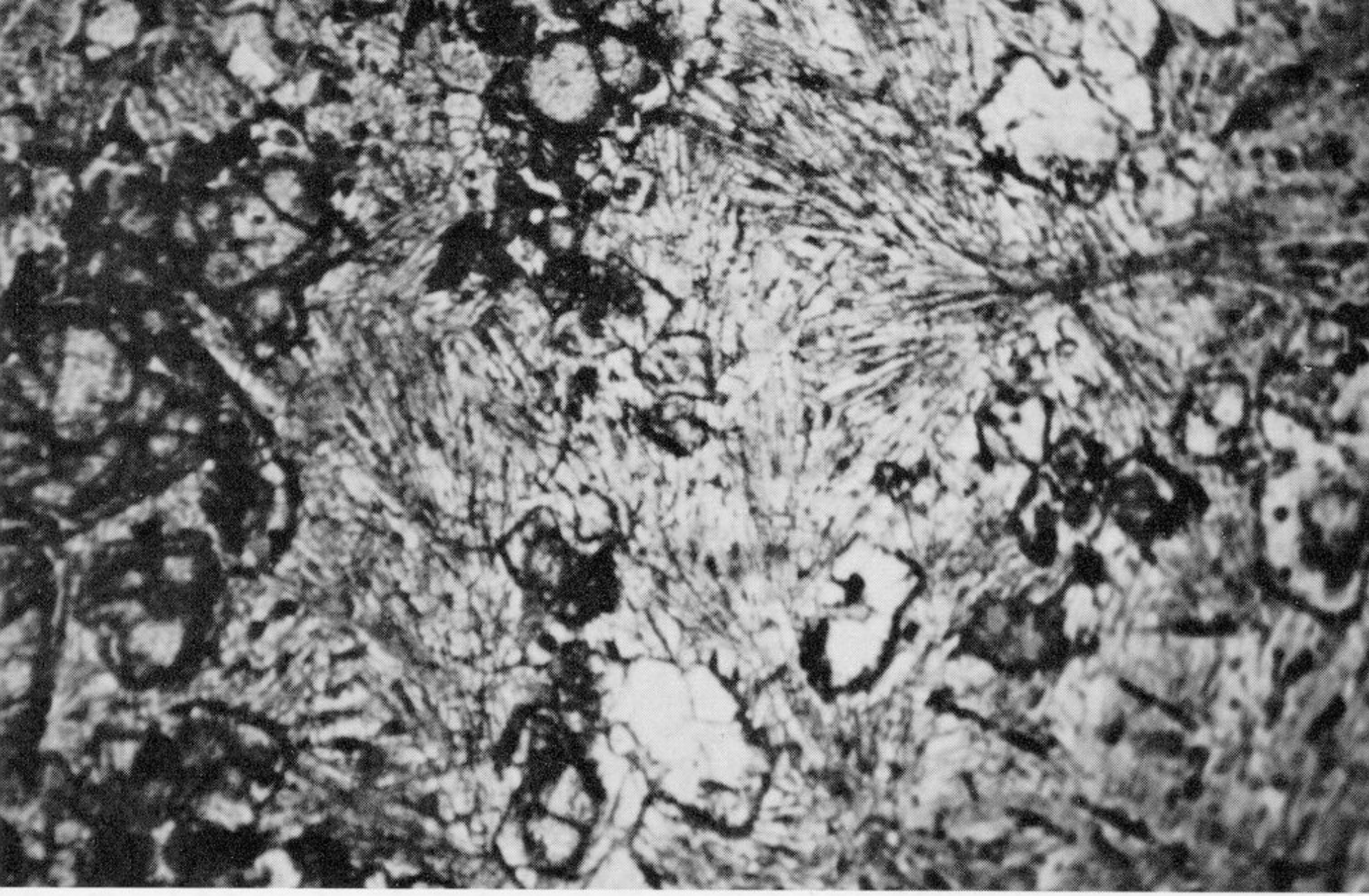
Stockwell, C.H. (editor)
1957: Geology and Economic Minerals of Canada; Geol. Surv. Canada, Econ. Geol. Series, No.1 (Fourth Edition), 517p. Accompanied by Maps and Charts.

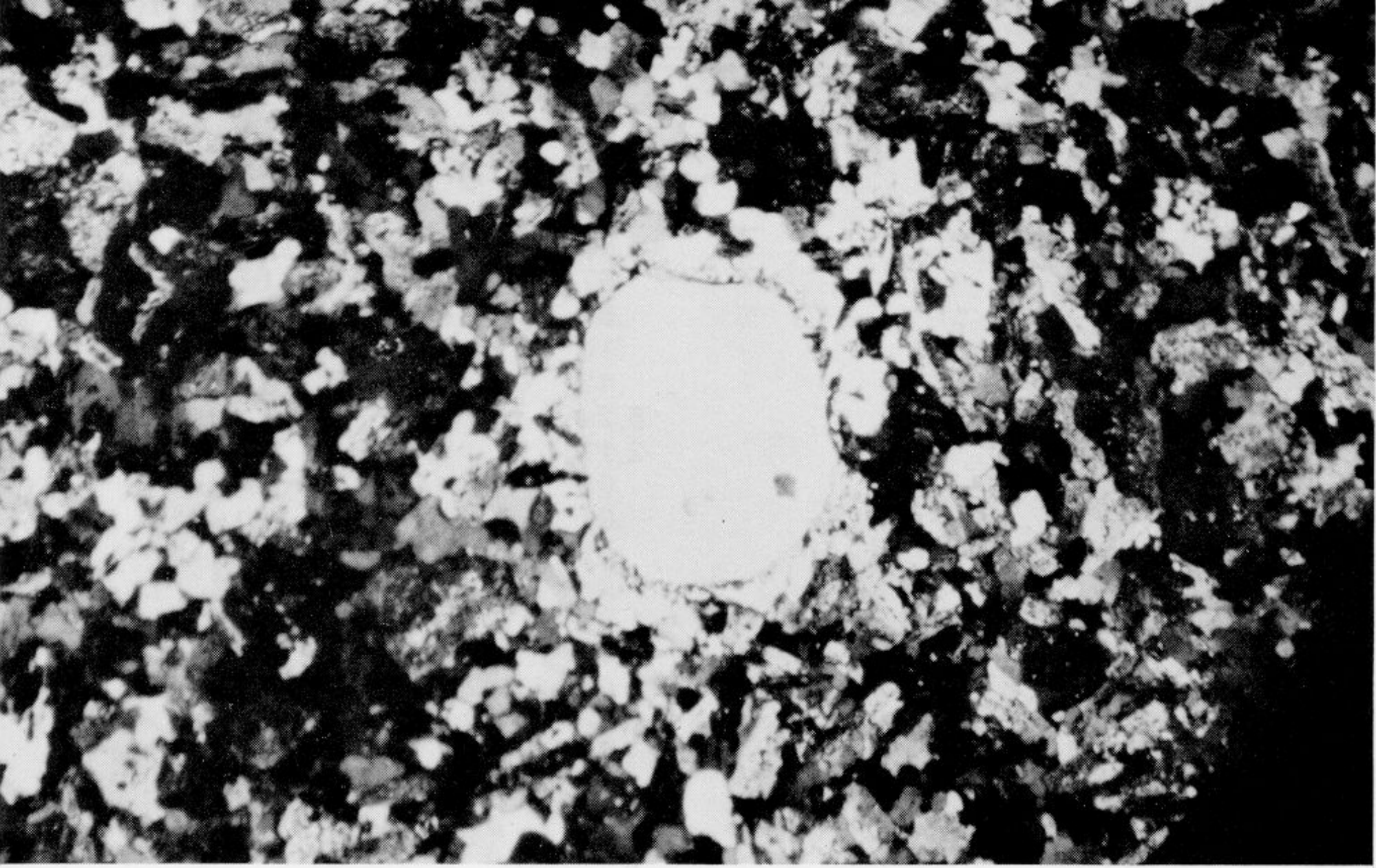
Viljoen, M.J., and Viljoen, R.P.
1969a: Evidence for the Existence of a Mobile Extrusive Peridotite Magma from the Komati Formation of the Onverwacht Group; Geol. Soc. South Africa, Spec. Pub.2, Upper Mantle Project, p.87-112.
1969b: The Geochemical Evolution of the Granitic Rocks of the Barberton Region; Geol. Soc. South Africa, Spec. Pub.2, Upper Mantle Project, p.189-219.

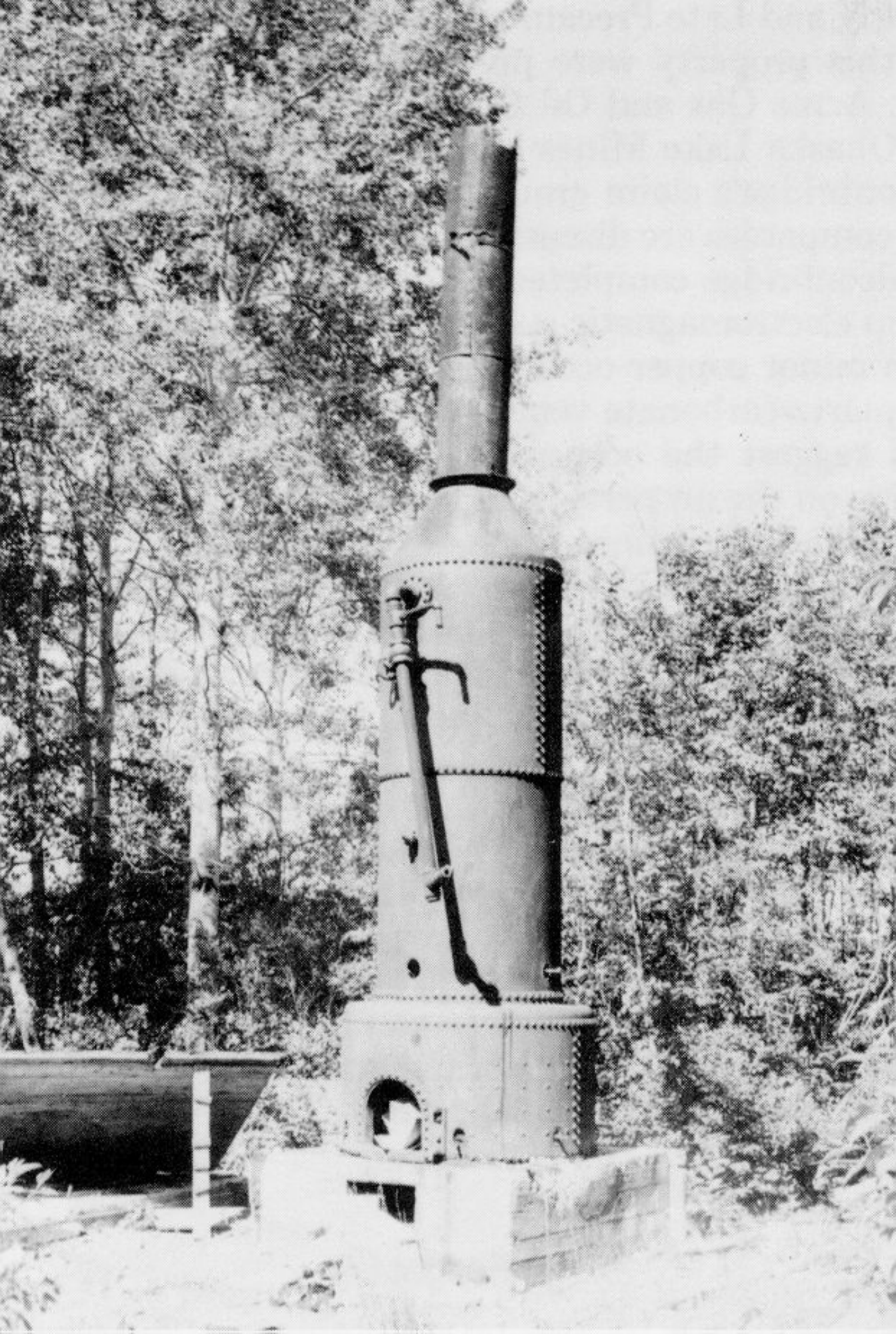
Wilson, J.T.
1949: Some Major Structures of the Canadian Shield; CIM, Trans. Vol.52, p.231-242.

INDEX

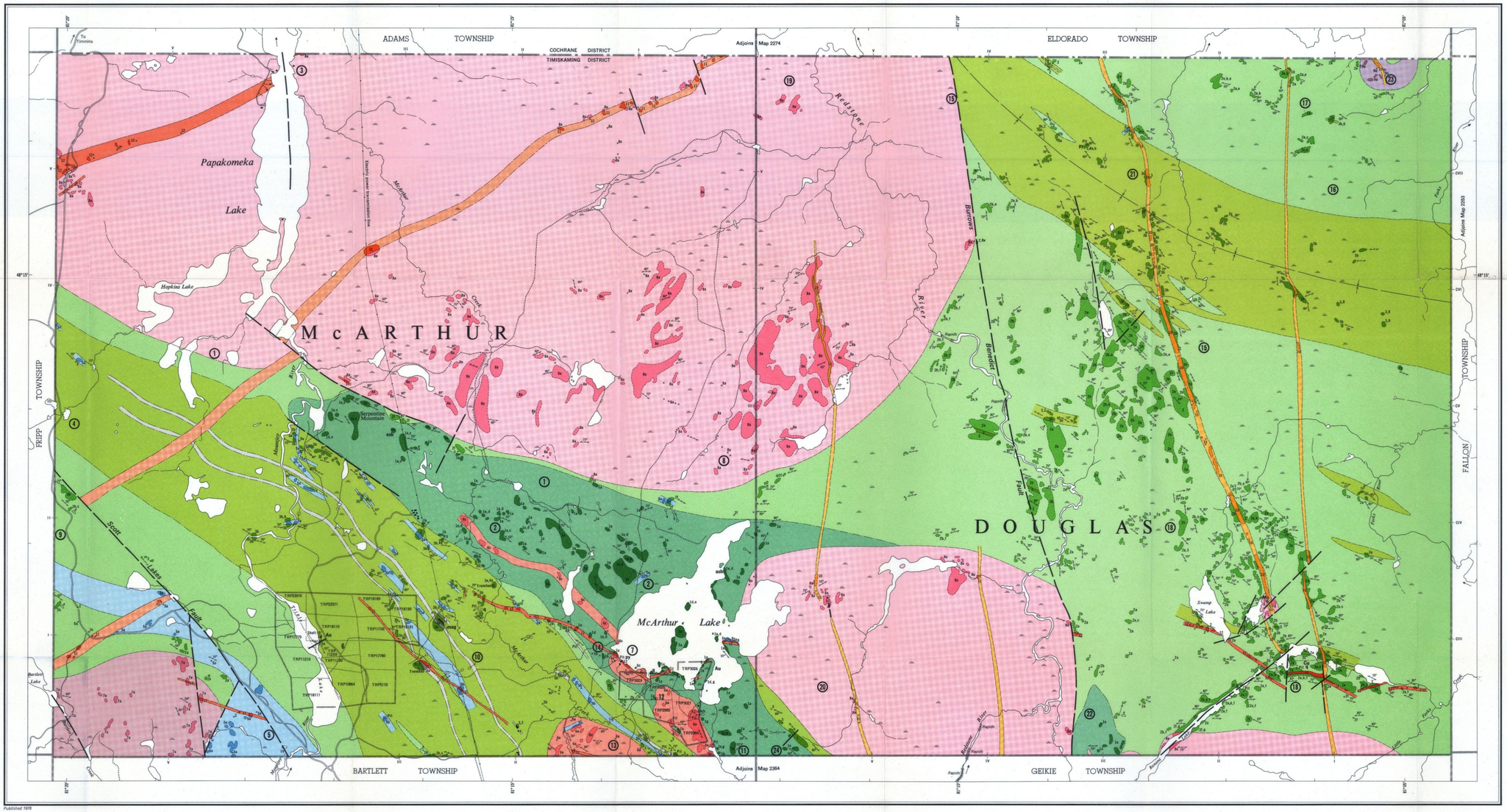








ONTARIO
DIVISION OF MINES
HONOURABLE LEO BERNIER, *Minister of Natural Resources*
DR J. K. REYNOLDS, *Deputy Minister of Natural Resources*
G. A. Jewett, *Executive Director, Division of Mines* E. G. Pye, *Director, Geological Branch*



Scale, 1 inch to 50 miles
N.T.S. reference
42A/3, 42A/6

LEGEND

PHANEROZOIC
CENOZOIC[a]
QUATERNARY
PLEISTOCENE AND RECENT
Clay, sand, gravel, and swamp and stream deposits.

UNCONFORMITY

PRECAMBRIAN[b]
LATE PRECAMBRIAN
MAFIC INTRUSIVE ROCKS[c]
12 — *12 Olivine diabase.*

INTRUSIVE CONTACT

MIDDLE PRECAMBRIAN
MAFIC INTRUSIVE ROCKS[c]
11 — *11 Quartz diabase.*

INTRUSIVE CONTACT

EARLY PRECAMBRIAN (ARCHEAN)
MAFIC INTRUSIVE ROCKS[c]
10 — *10 Diabase.*

INTRUSIVE CONTACT

FELSIC INTRUSIVE ROCKS
PYROXENE AMPHIBOLITE
9 — *9a Pyroxene amphibolite, a contaminated marginal phase of monzonitic stock.*
ADAMS AND GEIKIE PLUTONS
8 — *8 Unsubdivided.*
8a Porphyritic granodiorite.
8b Contaminated, quartz dioritic-dioritic marginal zone.†
PETERLONG LAKE COMPLEX
7 — *7 Unsubdivided.†*
7a Quartz diorite.
7b Diorite.†
7c Granodiorite.†
EPIZONAL INTRUSIVE ROCKS[d]
6 — *6 Unsubdivided.*
6a Trondhjemitic quartz-felspar porphyry.
6b Fine-to medium-grained equigranular trondhjemite.†
6c Mafic trondhjemite to quartz diorite.

INTRUSIVE CONTACT

METAMORPHOSED MAFIC INTRUSIVE ROCKS
5 — *5 Unsubdivided.†*
5a Gabbro.
5b Quartz gabbro.
5c Anorthositic gabbro.†
5d Pyroxenite.†

INTRUSIVE CONTACT

METAVOLCANICS AND METASEDIMENTS[e]
METASEDIMENTS
4 — *4 Unsubdivided.†*
4a Iron formation.
4b Chert.
4c Siltstone.†
INTERMEDIATE TO FELSIC METAVOLCANICS
3 — *3 Unsubdivided.*
3a Massive, largely-unstratified tuffs.†
3b Tuff and lapilli tuff.
3c Breccia.
3d Intercalated massive fine-grained tuffs and flows.†
MAFIC METAVOLCANICS
2 — *2 Unsubdivided.*
2a Massive to well foliated flows.
2b Pillowed.
2c Massive to well foliated coarse-grained flows.
2d Variolitic flows.
2e Tuff and breccia.
2f Amphibolitized.
2g Layered or gneissic.
ULTRAMAFIC METAVOLCANICS
1 — *1 Unsubdivided.†*
1a Massive, polysutured serpentinized flows.
1b Massive, serpentinized peridotite of possible intrusive origin.
1c Irregular patches and lenses of spinifex-textured peridotite.
1d Serpentinized flows with spinifex-textured tops.
1e Ultramafic pyroclastics.†
1g Carbonitized ultramafics.

asb — *Asbestos.*
Au — *Gold.*
Cu — *Copper.*
mag — *Magnetite.*
Mo — *Molybdenum.*
Ni — *Nickel.†*
po — *Pyrrhotite.†*
py — *Pyrite.*
q — *Quartz.*

[a] *Unconsolidated deposits. Cenozoic deposits are represented by the lighter coloured parts of the map.*

[b] *Bedrock geology. Outcrops and inferred extensions of each rock map unit are shown respectively in deep and light tones of the same colour. Where in places a formation is too narrow to show in colour and must appear in black, a short black bar appears in the appropriate block.*

[c] *Where definite age relationships have not been established for a diabase dike, an Early, Middle or Late Precambrian age has been assigned on the basis of the trend of the dike.*

[d] *May be an intrusive phase (subvolcanic) of the felsic volcanism.*

[e] *No age relationships are inferred by the order of the rock units within this group.*

† *Could in part contain some massive flows.*

† *Occurs only on companion sheet.*

SOURCES OF INFORMATION

Geology by D. R. Pyke and assistants, Geological Branch, 1970.
Geology is not tied to surveyed lines.

Geological and geophysical maps and reports of mining companies.

Aeromagnetic maps 291G and 293G; ODM-GSC.

Preliminary maps (ODM) P. 631 McArthur Township and P. 632 Douglas Township, scale 1 inch to ¼ mile, issued 1971.

Cartography by P. A. Wisbey and assistants, Surveys and Mapping Branch, 1976.

Base maps derived from maps of the Forest Resources Inventory, Surveys and Mapping Branch, with additional information by D. R. Pyke.

Magnetic declination in the area was approximately 8° West in 1970.

SYMBOLS

- *Glacial striae.*
- *Small bedrock outcrop.*
- *Area of bedrock outcrop.*
- *Bedding, top unknown; (inclined, vertical).*
- *Bedding, top (arrow) from grain gradation; (inclined, vertical, overturned).*
- *Lava flow; top (arrow) from pillows shape and packing.*
- *Lava flow; top in direction of arrow.*
- *Schistosity; (horizontal, inclined, vertical).*
- *Foliation; (horizontal, inclined, vertical).*
- *Lineation with plunge.*
- *Geological boundary, observed.*
- *Geological boundary, position interpreted.*
- *Geological boundary, deduced from geophysics.*
- *Lineament or fault.*
- *Drag folds with plunge.*
- *Anticline, syncline, with plunge.*
- *Drill hole; (vertical, inclined).*
- *Swamp.*
- *Motor road.*
- *Other road.*
- *Trail, portage, winter road.*
- *District boundary, with milepost, approximate position only.*
- *Township boundary, with milepost, approximate position only.*
- 12 — *Mining property, surveyed, approximate position only.*
- (22) — *Mineral deposit; mining property, unsurveyed.*
- *Surveyed line, approximate position only.*

PROPERTIES

McARTHUR TOWNSHIP

1. *Abitibi Asbestos Mining Company Limited.*
2. *Bazinet, E.*
3. *Carr, L. [1962].*
4. *Cera, T.*
5. *Conigo Mines Limited [1965].*
6. *Donaldson, E. T.*
7. *Forget, M.*
8. *Lakehead Mines Limited [1966].*
9. *Perrault, G. [1965].*
10. *Texas Gulf Incorporated.*
11. *Texmont Mines Limited [1970].*
12. *Theriault, A.*
13. *Westport Porcupine Gold Mines Limited [1938].*
14. *Whitmarsh, B.*

DOUGLAS TOWNSHIP

15. *Acme Gas and Oil Company Limited [1966].*
16. *Bradex Mines Limited [1966].*
17. *Canadian Lencourt Mines Limited [1966].*
18. *Falconbridge Nickel Mines Limited [1970].*
19. *Guilho, C.*
20. *Lakehead Mines Limited [1966].*
21. *Rowan Consolidated Mines Limited [1970].*
22. *Silver Town Mines Limited [1965].*
23. *Tagliamonte, F.*
24. *Texmont Mines Limited [1970].*

Information current to September 30th, 1972.

Only former properties on ground now open for staking are shown where exploration information is available—a date in square brackets indicates last year of exploration activity. For further information see report.

Map 2363

McARTHUR and DOUGLAS TOWNSHIPS

TIMISKAMING DISTRICT

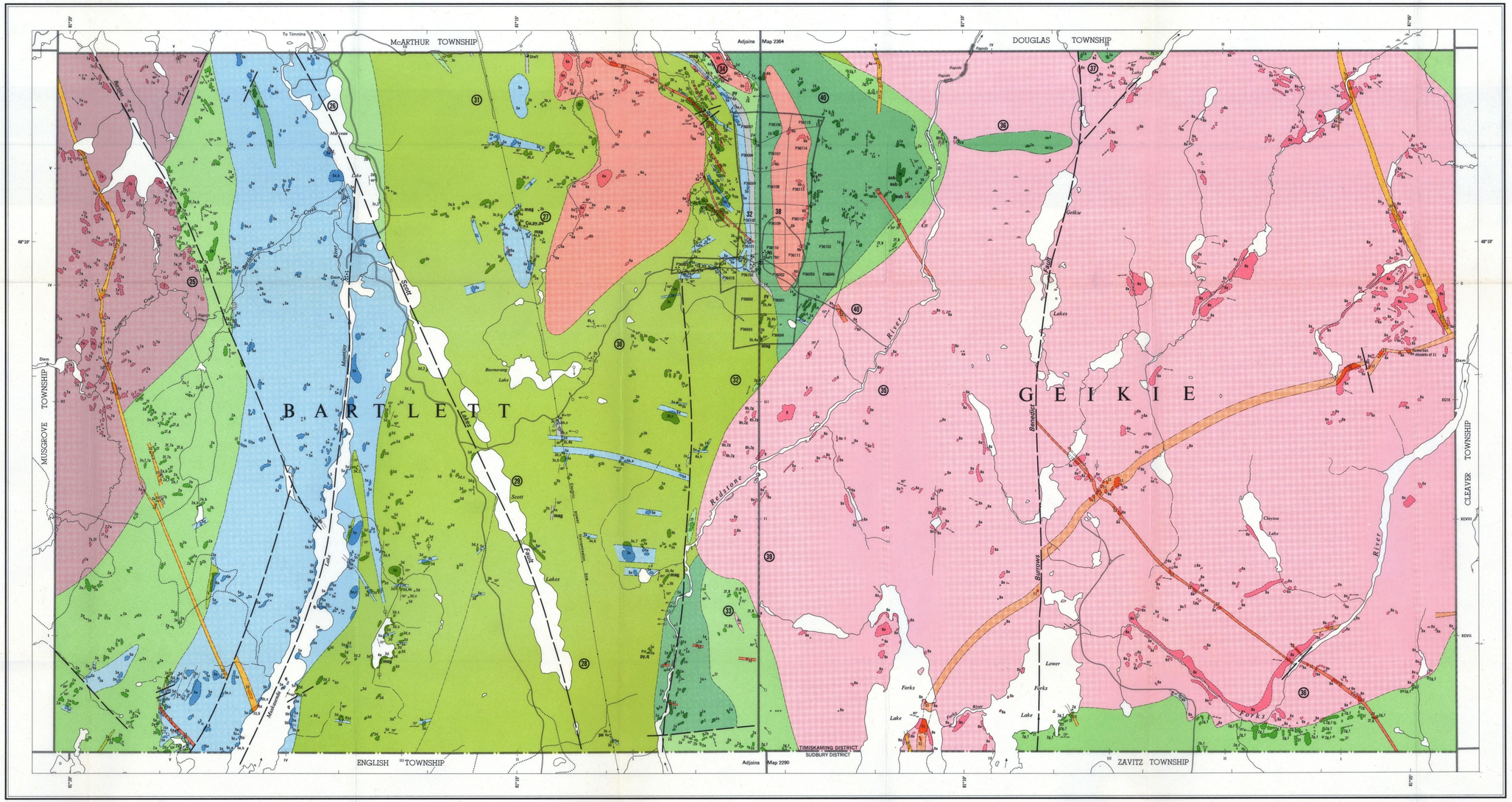
Scale 1:31,680 or 1 Inch to ½ Mile

Chains 80 60 40 20 0 1 2 Miles
Metres 1000 0 1 2 3 Kilometres
Feet 1000 0 5,000 10,000 Feet

ONTARIO
DIVISION OF MINES
HONOURABLE LEO BERNIER, *Minister of Natural Resources*
DR. J. K. REYNOLDS, *Deputy Minister of Natural Resources*
G. A. Jewett, *Executive Director, Division of Mines* E. G. Pye, *Director, Geological Branch*

Map 2364
Bartlett and Geikie Townships

Scale, 1 inch to 50 miles
N.T.S. reference 42A/3



Published 1976

LEGEND

PHANEROZOIC
CENOZOIC[a]
QUATERNARY
PLEISTOCENE AND RECENT
Clay, sand, gravel, and swamp and stream deposits.

UNCONFORMITY

PRECAMBRIAN[b]
LATE PRECAMBRIAN
MAFIC INTRUSIVE ROCKS[c]
12 *Olivine diabase.*
INTRUSIVE CONTACT
MIDDLE PRECAMBRIAN
MAFIC INTRUSIVE ROCKS[c]
11 *Quartz diabase.*
INTRUSIVE CONTACT
EARLY PRECAMBRIAN (ARCHEAN)
MAFIC INTRUSIVE ROCKS[c]
10 *Diabase.*
INTRUSIVE CONTACT
FELSIC INTRUSIVE ROCKS
PYROXENE AMPHIBOLITE
9a *Pyroxene amphibolite, a contaminated marginal phase of monzonitic stock.f*
ADAMS AND GEIKIE PLUTONS
8 *Unsubdivided.*
8a *Porphyritic granodiorite.*
8b *Contaminated, quartz dioritic-dioritic marginal zone.*
PETERLONG LAKE COMPLEX
7 *Unsubdivided.*
7a *Quartz diorite.*
7b *Diorite.f*
7c *Granodiorite.*
EPIZONAL INTRUSIVE ROCKS[d]
6 *Unsubdivided.*
6a *Trondhjemitic quartz-felspar porphyry.*
6b *Fine-to medium-grained equigranular trondhjemite.*
6c *Mafic trondhjemite to quartz diorite.f*
INTRUSIVE CONTACT
METAMORPHOSED MAFIC INTRUSIVE ROCKS
5 *Unsubdivided.*
5a *Gabbro.*
5b *Quartz gabbro.*
5c *Anorthositic gabbro.*
5d *Pyroxenite.*
INTRUSIVE CONTACT
METAVOLCANICS AND METASEDIMENTS[e]
METASEDIMENTS
4 *Unsubdivided.*
4a *Iron formation.*
4b *Chert.*
4c *Siltstone.*
INTERMEDIATE TO FELSIC METAVOLCANICS
3 *Unsubdivided.*
3a *Massive, largely-unstratified tuffs.f*
3b *Tuff and lapilli tuff.*
3c *Breccia.*
3d *Intercalated massive fine-grained tuffs and flows.*
MAFIC METAVOLCANICS
2 *Unsubdivided.*
2a *Massive to well foliated flows.*
2b *Pillowed.*
2c *Massive to well foliated coarse-grained flows.f*
2d *Variolitic flows.f*
2e *Tuff and breccia.f*
2f *Amphibolitized.*
2g *Layered or gneissic.*
ULTRAMAFIC METAVOLCANICS
1 *Unsubdivided.*
1a *Massive, polysutured serpentinized flows.*
1b *Massive, serpentinized peridotite of possible intrusive origin.*
1c *Irregular patches and lenses of spinifex-textured peridotite.f*
1d *Serpentinized flows with spinifex-textured tops.*
1e *Ultramafic pyroclastics.*
1g *Carbonitized ultramafics.f*

asb	*Asbestos.*
Au	*Gold.f*
Cu	*Copper.*
mag	*Magnetite.*
Mo	*Molybdenum.f*
Ni	*Nickel.*
po	*Pyrrhotite.*
py	*Pyrite.*
q	*Quartz.*

[a] *Unconsolidated deposits. Cenozoic deposits are represented by the lighter coloured parts of the map.*

[b] *Bedrock geology. Outcrops and inferred extensions of each rock map unit are shown respectively in deep and light tones of the same colour. Where in places a formation is too narrow to show in colour and must appear in black, a short black bar appears in the appropriate block.*

[c] *Where definite age relationships have not been established for a diabase dike, an Early, Middle or Late Precambrian age has been assigned on the basis of the trend of the dike.*

[d] *May be an intrusive phase (subvolcanic) of the felsic volcanism.*

[e] *No age relationships are inferred by the order of the rock units within this group.*

[f] *Could in part contain some massive flows.*

[f] *Occurs only on companion sheet.*

SYMBOLS

- *Glacial striae.*
- *Small bedrock outcrop.*
- *Area of bedrock outcrop.*
- *Bedding, top unknown; (inclined, vertical).*
- *Bedding, top (arrow) from grain gradation; (inclined, vertical, overturned).*
- *Lava flow; top (arrow) from pillows shape and packing.*
- *Lava flow; top in direction of arrow.*
- *Schistosity; (horizontal, inclined, vertical).*
- *Foliation; (horizontal, inclined, vertical).*
- *Lineation with plunge.*
- *Geological boundary, observed.*
- *Geological boundary, position interpreted.*
- *Geological boundary, deduced from geophysics.*
- *Lineament or fault.*
- *Drag folds with plunge.*
- *Anticline, syncline, with plunge.*
- *Drill hole; (vertical, inclined).*
- *Swamp.*
- *Motor road.*
- *Other road.*
- *Trail, portage, winter road.*
- *District boundary, with milepost, approximate position only.*
- *Township boundary, with milepost, approximate position only.*
- *Mining property, surveyed, approximate position only.*
- *Mineral deposit; mining property, unsurveyed.*
- *Surveyed line, approximate position only.*

SOURCES OF INFORMATION

Geology by D. R. Pyke and assistants, Geological Branch, 1971.
Geology is not tied to surveyed lines.

Geological and geophysical maps and reports of mining companies.

Aeromagnetic map 591G; ODM-GSC.

Preliminary maps (ODM) P. 745 Bartlett Township and P. 746 Geikie Township, scale 1 inch to ¼ mile, issued 1972.

Cartography by P. A. Wisbey and assistants, Surveys and Mapping Branch, 1976.

Base maps derived from maps of the Forest Resources Inventory, Surveys and Mapping Branch with additional information by D. R. Pyke.

Magnetic declination in the area was approximately 6° West in 1970.

Map 2364

BARTLETT and GEIKIE TOWNSHIPS

TIMISKAMING DISTRICT

Scale 1:31,680 or 1 Inch to ½ Mile

Chains 80 60 40 20 0 1 2 Miles
Metres 1000 0 1 2 3 Kilometres
Feet 1000 0 5,000 10,000 Feet

PROPERTIES

BARTLETT TOWNSHIP
25. Canadian North Inca Mines Limited [1960].
26. Conigo Mines Limited [1965].
27. McKeen, S.
28. Murphy, J. A.
29. Roby, P.
30. Silver Summit Mining Company Limited
31. Texas Gulf Incorporated.
32. Texmont Mines Limited.
33. Texmont Mines Limited [1966].
34. Texmont Mines Limited [1970].

GEIKIE TOWNSHIP
35. Conigo Mines Limited [1965].
36. Falconbridge Nickel Mines Limited.
37. Silver Town Mines Limited [1965].
38. Texmont Mines Limited.
39. Texmont Mines Limited [1966].
40. Texmont Mines Limited [1970].

Information current to September 30th, 1972.

Only former properties on ground now open for staking are shown where exploration information is available—a date in square brackets indicates last year of exploration activity. For further information see report.