



INTRODUCTION

Twenty eight claims were acquired by the Dominion Gulf Company, in Midlothian township, Montreal River Mining Division, Province of Ontario, during the month of May 1952. These claims entirely surround properties held by Mr. Alex Miller, the Van Olieaf interests, and the Copeland group. Work done by Johns-Marville on these properties had defined a large ultrabasic intrusive containing appreciable amounts of asbestos fibre. The Dominion Gulf Company decided to stake the perimeter claims on the speculation that other ultrabasic intrusives lying under the many lakes in the area might also contain asbestos fibre in larger amounts.

Since ultrabasic intrusives generally contain a substantial amount of magnetite, it was believed that this property of the intrusive might provide a means of outlining prospective fibre areas. Accordingly a ground magnetometer survey was proposed. Its purpose was to outline the ultrabasic intrusives on the property, particularly in those areas where rock outcrop was scarce, with the view of selecting and testing the most promising sections. Due to the large area covered by water, the survey was conducted in two parts, summer and winter program.

An Askania Schmidt-type magnetic balance, having a sensitivity of about 25 gauss per scale division was used in the survey. Basic coverage consisted of stations 100 feet apart on picket lines 400 feet apart. In anomalous areas, the station spacing was reduced to 50 feet or less, while the picket line interval in some cases was reduced to 100 feet. In all, a total of 1524 stations were observed on 30.6 miles of picket line.

The magnetic data were observed and reduced by a Dominion Gulf Company magnetometer crew. On completion of the survey, the data were transmitted to the Toronto office of the Dominion Gulf Company for further processing and interpretation. The basic data, together with isomagnetic contours and interpretation are presented on a map at a scale of 1 inch = 400 feet, accompanying this report.

SUMMARY

Two anomaly zones have been outlined by this survey. The northern zone is generally representative of small peridotite bodies intruding acidic lavas. A few of these anomalies, however, appear to be representative of sulphide concentrations in the lavas. Surface work has been recommended on three such anomalies.

The central anomaly zone outlines a complex ultrabasic intrusive having a dunite core surrounded by a border phase of peridotite and/or pyroxenite. Asbestos fibre has been found associated with the peridotite phase of the intrusive. There is some substantiated evidence that the extreme local magnetic highs are indicative of secondary magnetite formed in conjunction with asbestos fibre. Further investigation on such anomalies has been recommended.

INTERPRETATION

The geology of most of the property was mapped by Mr. G. E. Parsons and others, during the summer of 1952. Consequently a great deal of definitive information is available to the interpreter. Basically, the area is underlain by trachodacites of Keewatin age, which have been intruded by multiple sills of gabbro, pyroxenite, peridotite, and dunite. Diabase dikes trending northerly cut across the regional strike at right angles. On the extreme easternmost claims, Cobalt sediments overlie and mask the trachodacite, intrusive series. A few outcrops of Timiskaming sediments were found in the northeastern corner of the property.

While the claim group consists of 28 claims, only 21 of these were covered by the ground magnetometer survey. Four claims on the western end, and the three easternmost were omitted from the survey. The important ultrabasic intrusive does not appear to extend into the westernmost claims, and while evidence of the intrusive may be found on the eastern claims, it is apparently covered by a fair thickness of Cobalt sediments.

An examination of the magnetic data indicates that the area may be considered to be composed of four sections, each of which trends generally east-west. The most northerly section contains a number of small relatively minor magnetic anomalies, having a base level of about 1500 gammas. A broad (2000 feet), magnetically uniform horizon, having a base level of about 800 gammas, is located immediately south of the northern anomaly zone. South of the zone of uniform magnetics is a highly anomalous area some 1500 feet across. This anomaly apparently cuts off near the western end of the property, and although still present in the eastern portion, its peak intensity is greatly decreased. Anomalies in excess of 20,000 gammas are common in the anomaly zone. South of this zone, along the southern boundary of the claim group, another zone of uniform magnetic intensity is found. The base level for the southern horizon appears to be about 1500 gammas.

The magnetically uniform areas appear to represent lava horizons, which have been, in places, intruded by diabase dikes and gabbro sills. None of these rock types - trachodacite lavas, gabbro, or diabase, - or the Timiskaming and Cobalt sediments, appear to contain appreciable amounts of magnetite and consequently the magnetic fields over them are relatively uniform and featureless. For this reason, it is impossible to trace any structural relationships which may occur within these horizons.

The northern anomaly zone is composed of a number of narrow, elongated anomalies trending easterly or southeasterly. Geological mapping has shown that lavas intruded by peridotite are the predominant rock types in this section. In several cases, the magnetic anomalies can be directly correlated with peridotite outcrops. On occasion, however, similar anomalies were found over lava outcrops, and conversely, no anomalies were found associated with a few peridotite outcrops. Diabase was found cutting both the lavas and the peridotite with little or no associated magnetic expression. In two cases at least, local magnetic anomalies were found in association with small sulphide occurrences. Some asbestos fibre has been

noted in the peridotite outcrops.

It is extremely doubtful if the peridotite intrusives in this band are large enough to warrant examination for asbestos fibre. It is therefore believed that the economic possibilities of this horizon hinge on base metals associated with the sulphide mineralisation. Some interesting copper and zinc values were obtained near the southeastern corner of Bray Lake, off the end of a small magnetic anomaly. This anomaly, however, is probably representative of a peridotite intrusive, rather than the sulphides or associated alteration. On Line 28E at 600 feet south, a sharp, magnetic anomaly is found in direct association with pyrite and pyrrhotite mineralisation. The anomaly extends both east and west of this point and may represent further segregations of sulphide mineralisation. A similar, but smaller anomaly on Line 12E at 100 feet south is also found in direct association with pyrite, pyrrhotite and chalcocopyrite mineralisation. Using these indications as "guide posts," a limited amount of trenching is recommended in the vicinity of similar anomalies such as the anomaly extending west from 700 feet north on Line 20E, the anomaly at 600 feet north on Line 24E, and the anomaly at 100 feet north on Line 18E.

The major anomaly zone, about which the claim group is centred, extends from Line 8+00 East to the eastern end of the claim group. Only the southern flank of this anomaly zone is located on Dominion Gulf Company property. Information which has been made available to the Company suggests that the anomaly zone is about 1500 feet wide on the average, although it is somewhat elliptical in shape. The anomaly has a very distinctive character being composed of a broad central plateau some 5000 gamma above regional base level, almost surrounded (except at the southeastern corner) by a more magnetic, locally erratic rim. The southern rim anomaly which falls along the north edge of the south tier of the Dominion Gulf Company claims is perhaps more discontinuous and erratic than any other portion.

The eastern end of the anomaly while persisting east of the Company claims, becomes much more uniform and less intense, suggesting that the causative body may be located at a somewhat greater depth. This is substantiated by the presence of Cobalt sediments in the anomaly area, but in addition, a small outcrop of lavas has been located a short distance north of the anomalous horizon, indicating that the Cobalt horizon is quite thin over the anomaly zone. A profile along Line 97+59 East was used to determine the depth to the anomalous body. The depth as determined by the half-slope method was found to be 340 feet. Two possibilities therefore exist. The causative body may not extend to the top of the Keewatin surface, or a pre-Cobalt topographic valley was formed and later filled by Cobalt sediments. Since the present topography indicates that the causative body is easily eroded (the anomaly lies under an arm of Lloyd Lake for the most part) the second solution appears to be the more plausible.

Examination of the anomaly zone of the Miller property, substantiated by drilling under Lloyd Lake near the sharp anomaly at 40+00 East and the 0+00 Base Line, has shown that the erratic magnetic fields on the rim of the anomaly are caused by pyroxenite-peridotite rocks containing a fair amount of asbestos fibre. It is reported that the broad central plateau of the anomaly reflects a dunite phase of the intrusion. Very little asbestos fibre has been found in this dunite phase. Several discontinuities between the local magnetic anomalies have been found to coincide with diabase dikes.

It is suggested that the ultrabasic intrusive was injected as a large fluid mass. The iron-rich minerals were concentrated on the outer edge of the body as cooling from the outside began. Later shattering and serpentinisation liberated more iron, in the form of magnetite, and asbestos in the peridotite phase but since very little iron was left in the dunite phase, a similar action could not take place. It is interesting to note that the dunite appears to be much softer, and less resistant to erosion than the peridotite, since the peridotite forms the shores of the lake while the dunite forms the lake basin. This fact also tends to increase the sharp difference in the character of the magnetic anomalies caused by the two rock types. In effect, the magnetic field from the peridotite is relatively undamped at the instrument level, as compared to that from the dunite, due to the distance factor.

There is some evidence that the intrusive has a dip to the south. The broad flaring contours south of the anomaly, which never reach a base level although located 1500 feet south of the south rim, coupled with the relatively sharp drop-off on the northern edge of the anomaly as indicated by the profile along Line 97+59 East are characteristic of a south dip. It is not expected however that this dip is less than 60°.

Based on the assumption outlined above, that asbestos fibre and secondary magnetite form concurrently during the process of serpentinisation, it would appear that those areas of high, complex magnetics will provide the best chances for asbestos ore. This assumption was tested by a diamond drill hole through the anomaly at 40+00 East on Base Line 0+00, and fair results were obtained. Good fibre over a fair length was intersected. It is therefore recommended that similar anomalies be examined either by surface exploration or, if inaccessible, by diamond drilling. As an example, the anomaly on the south shore of Lloyd Lake at 64+00 East may be worthy of investigation, although the dimensions of the anomaly preclude any large orebody.

"J. H. Batcliffe"

JHR:jm

Attach: Ground Magnetometer Survey
 Midlothian township claims Group II
 Midlothian township Province of Ontario.
 Scale 1" = 400' March 23, 1953

c.c. w/attach: Dr. E. A. Eckhardt.



41P14NE0038 63.366 MIDLOTHIAN

230

1.

1. INTRODUCTION

This report covers four claims,- MR 20034, MR 20077, MR 20256, MR 20258, in central portion of Midlothian Township, Montreal River Mining Division. These claims were staked in 1952.

They are only accessible by plane or canoe. Matachewan is the closest town, and is some 15 miles to the east.

The claims were mapped by D. Sprague and the writer during the summer of 1952. The township was previously mapped by H.L.Marshall for the Ontario Department of Mines, (Vol. LVI, pt.V, 1947).

2. TOPOGRAPHY

There is considerable relief, with rock hills rising up to 100 ft. above the lakes and swamps. Rock is quite plentiful in the west part of this four-claim group, but swamp constitutes a good half of the east two claims. High topography is related to areas of massive lavas, and low topography, in part at least, to ultrabasic intrusives.

3. GEOLOGY

General: The geology was mapped by pace and compass from lines spaced at intervals varying 100 to 400 ft. apart.

The rocks are all Precambrian in age, and consist of east-west trending Timiskaming conglomerate, and Keewatin acid lavas that are intruded by ultrabasic intrusives and diabase dikes.

Table of Formations

Matachewan:	Diabase dikes
Haileyburian:	Peridotite
Timiskaming:	Conglomerate
Keewatin:	Rhyolite, rhyolite breccias and agglomerates

Description of Rock Types:

Rhyolites, rhyolite breccias and agglomerates appear to underlie most of the claim block except in the northeast corner of claim MR 20256, and except where intruded out by the ultrabasics. The rhyolites are light green or grey, dense, hard, and rather structureless rocks. Locally lineations resembling flow structure are present. Rhyolite breccia zones are fairly common, but apparently very discontinuous; they consist of angular fragments of lava in a lava base.

The agglomerates are a heterogeneous group of rock types. They are characterized by rounded pebble or boulders in a base varying from lava to ultrabasic rock. They appear to have originated in several ways, e.g.:

(i) by peridotite intruding a rhyolite breccia to consolidate as globular masses resembling boulders in a lava-breccia matrix;

(ii) movement and alteration along zones of weakness so that the brecciated rock fragments became rounded to resemble true agglomerates.

These breccias are usually highly altered, - carbonated, serpentized plus a characteristic secondary mineral development

called "chicken track". The latter is apparently a fibrous inter-growth of tremolite and serpentine.

Conglomerate: outcrops of typical Timiskaming type are exposed on the north part of claim MR 20256. They consist of pebbles of variable composition in a greywacke base. Rusty, sheared, carbonate zones are rather common in these rocks. No bedding was noted; however, an east-west strike is indicated from the distribution of the outcrops.

Peridotite: outcrops of this type are scattered throughout the claims, and normally found along the edge of valleys and depressed areas. One of these depressed areas, extending from Bray Lake east across the claim, is believed to be underlain in part by peridotite. Another depressed area across the south part of claim MR 20258 is believed to be largely due to weathered out peridotites.

The peridotites that are exposed are mostly only the border phase of the main mass. These are black-green, dense, soft weathering rocks with a sharp intrusive contact with the massive lavas. The contact with brecciated or agglomeratic rocks may be indefinite due to the serpentinization of these types or irregular penetration of them by the peridotite magma.

Diabase: outcrops indicate the presence of four north-south trending dikes of this type of rock. They weather below the lavas giving masked topographical trends where the outcrops are rather plentiful.

Structure

The formations trend on a general east-west direction, and dip steeply. Top determinations off the claim block indicate the lavas face north.

The large number of rusty carbonate boulders south of the sediments in the north part of Claim MR 20256 tend to indicate the presence of a highly altered fault zone between the lavas and the conglomerates.

Most of the east-west depressions are believed due to weathering out of serpentinized peridotites and not to sheared fault zones.

There is evidence of rather strong faulting in the vicinity of the main showing on claim MR 20077. This will be referred to in describing the showing under mineralization.

Mineralization

South of Bray Lake in claim MR 20077 chalcopyrite and sphalerite mineralization is scattered along a 50 ft. length and 20 ft. width. The chalcopyrite is in a sheared agglomeratic rock trending slightly north of east. The sphalerite is in patches or with dark slaty bands in rhyolite breccia immediately south of the copper mineralization. This mineralization is intersected by faults both on its east and west ends. On the east end the intersecting fault trends east southeast and dips vertically. The movement on this fault may not be excessive, and deeply weathered and schisted rocks on the north side may be the faulted section of mineralized zone. These deeply weathered rocks abruptly terminate against another fault trending southeast. 150 feet south-east along this fault is rusty sheared agglomerates that could be the faulted

extension of the zone. The detail plan shows the geology of zone.

A number of other mineralized outcrops exist, and these are noted on the map. The sulphides are pyrrhotite and pyrite and without significant nickel, copper or zinc assays being obtained.

G. E. Parsons.

March 29, 1956.

Attachment

Dominion Gulf Company

Geology

Part of Midlothian II, Ontario

Scale 1"=100 ft. March 29/56

G.E.Parsons and D.Sprague.



INTRODUCTION

This report deals with geological mapping on eleven claims of the Dominion Gulf Company Midlothian II claims in Midlothian township, Ontario. They are as follows: MR-20047, MR-20050, -51, -52, -53, MR-20036, -37, -38, -39, MR-20042 and MR-20043

They are contiguous claims along the south and east shores of the narrow east-west arm at the northern part of Lloyd Lake. At the west end they adjoin the south boundary of the surveyed claims TR-1929 and TR-1930. The group is approximately forty miles in a direction slightly east of south from South Porcupine, and approximately eighteen miles southwest of Matachewan, Ontario. It is readily accessible by air using planes equipped to land on the lake.

Geological mapping was preceded by a program of prospecting and stripping of outcrops which began on May 13, 1953. This was later carried on simultaneously with the mapping. All outcrops were covered thoroughly and large areas were stripped of moss. Some trenching was also done. Mapping was started on June 3, 1953 by the writer assisted by O. Eliason, G. Breti, D. M. Nowlan and H. Judges. It was completed on July 6, 1953.

Outcrops were tied into north-south picket lines by pacing from chainage points. The lines were usually 400 feet apart but locally were at closer intervals.

TOPOGRAPHY

The relief in the area is a little greater than the average of the Precambrian Shield. Along the south shore of Lloyd Lake, there are rock hills rising well over one hundred feet above the lake level. They have steep north and west sides with some near vertical cliffs up to fifty feet high. The ridge of hills is cut by several deep north-south trending valleys. The eastern claims are much less hilly.

Rolling sand and gravel deposits are fairly extensive in the eastern part of claim MR-20053 and in the adjoining section of MR-20036. They are bounded on the east by a fairly extensive spruce and cedar swamp. The forest growth is fairly thin except for the dense underbrush and slash which make foot travel rather arduous. The main tree types are birch, poplar, jackpine, spruce and pine. None of these appear to be sufficiently plentiful for profitable logging operations.

SUMMARY OF GEOLOGY

The area is underlain by rocks of Precambrian age. South of the lake, there is a series of steeply dipping-east-west striking rhyolitic flows and breccias. Intruding these and lying mainly under the lake is a sill-like basic-ultrabasic complex with a dunite and peridotite centre and a pyroxenite

and gabbro marginal phase. In addition, there are several small tongues or shoots of the same material in the lavas to the south. The older rocks are cut by northerly trending diabase dikes.

In the eastern claims, flat dipping beds of Cobalt conglomerate, greywacke, and argillite overlie the older formations.

TABLE OF FORMATIONS

Recent - sand, gravel and clay
Cobalt - arkose, conglomerate, greywacke, argillite
Matachewan - diabase dikes
Haileyburian (?) - gabbro, pyroxenite, dunite, peridotite, peridotite-dunite
Keewatin - rhyolite, rhyolite breccia

DESCRIPTION OF FORMATIONS

Cobalt

Cobalt sediments were found in the three easternmost claims viz; MR-20039, -42 and -43. The strike of the beds is close to north and they dip from 10° to 15° to the east. There is no doubt that they rest unconformably on the Keewatin although the contact is nowhere exposed. The formations occur in distinct beds from a few inches to several feet thick.

The conglomerate weathers grey or light grey. It contains pebbles usually less than an inch in diameter of several rock types.

The greywacke is grey, fine-grained and weathers a light grey color. Occasional pebbles are seen in it. The arkose weathers grey or light grey but on a fresh surface is usually pink.

Matachewan

Approximately north-south striking diabase dikes - probably vertical - were found cutting the rhyolite in claims MR-20047 (west end) and the Haileyburian series in the northwest corner of MR-20036.

The former is a coarse gabbroic rock in two irregular segments. The southern one is exposed only at the south boundary of the claim. The other forms a large lens - shaped mass in the centre of the claim. It does not have a distinct diabasic texture. The dike in claim MR-20036 is poorly exposed and its attitude could not be determined. It is fine grained and very dark colored with a good diabasic texture.

Haileyburian

The rocks classed as Haileyburian form a complex of basic and ultra-basic rocks generally lying under the lake in the northern part of the claims. It is exposed along most of the south shore. In addition, small offshoots or tongues are found in the lavas further inland to the south of claims MR-20051 and MR-20037. As a rule the rocks near the contact consist of gabbro or pyroxenite and in the central section are peridotite or dunite or gradations.

However, peridotite was noted in contact with the lavas along the shore in claims MR-20050 and MR-20051.

Keewatin

The greater part of the claims along the south shore of the lake is underlain by flows of rhyolite and rhyolite breccia. These are very well exposed in numerous large outcrop areas. Little structural information is available. However, pillows in the western part showed a strike close to east and a steep north dip. No top determinations could be made.

The rock is very fine grained. Most of it is light grey but a few local sections are cream colored. Quartz phenocrysts are quite rare. It is possible that its composition may be closer to that of a dacite or trachyte in part. Fragments make up a large part of the rock in the eastern claims and in the northern part of the two westernmost claims. They are angular blocks of rhyolite generally about 2 inches across but occasionally as much as 8 inches.

Irregular quartz veins, usually about an inch wide, are very numerous in the rhyolite in the central part of MR-20051. Pillow structures are common in the southern part of the two westernmost claims. Usually, they are insufficiently developed to provide any structural information.

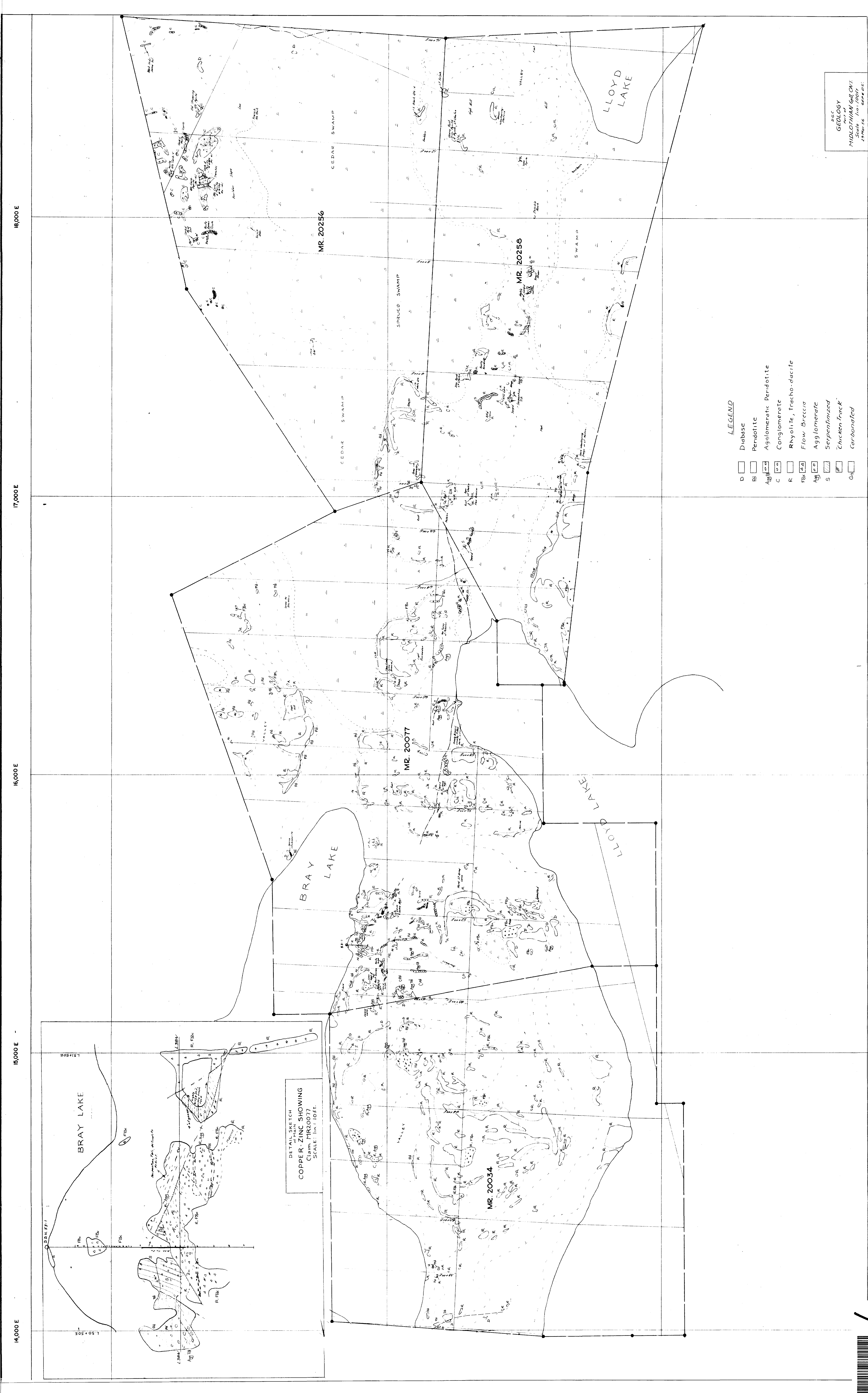
STRUCTURAL FEATURES

Steeply dipping east-west running rhyolitic flows have been intruded by a sill-like ultrabasic mass. These are both cut by later vertical north-south diabase dikes. In MR-20051, a fault, reflected by a pronounced valley on surface, is indicated by an offset in the gabbro-rhyolite contact. It strikes close to north and its dip is unknown. The east side has moved relatively 500 feet to the south. A similar fault is indicated by the offsetting of the peridotite-rhyolite contact near the lake on line 200+00E. The east side has moved relatively approximately fifty feet to the north.

At the east end of the property, later flat-lying sediments rest unconformably on the rhyolite and ultrabasic complex. These sediments dip gently to the east.

"C. McAulay"
October 29, 1953

Attach: Map -"Geology of Part of Midlothian II" by C. McAulay, Oct. 4/53
Scale: 1"=400'



- LEGEND**
- D Diabase
 - R Peridotite
 - Aggl Agglomerate
 - C Conglomerate
 - R Rhyolite, Trachodacrite
 - FB Flow Breccia
 - Ag Agglomerate
 - S Serpentinized
 - CT Chicken track
 - Ca Carbonated

DETAIL SKETCH
 OF MAIN
 COPPER-ZINC SHOWING
 Claim MR20077
 SCALE: 1" = 100'



41P14NE0038 63.366 MIDLOTHIAN

020

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In the eastern claims, flat dipping beds of Cobalt conglomerate, greywacke, and argillite overlie the older formations.

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Cobalt - arkose, conglomerate, greywacke, argillite
Matachewan - diabase dikes
Haileyburian (?) - gabbro, pyroxenite, dunite, peridotite, peridotite-dunite
Keewatin - rhyolite, rhyolite breccia

DESCRIPTION OF FORMATIONS

Cobalt

Cobalt sediments were found in the three easternmost claims viz; MR-20039, -42 and -43. The strike of the beds is close to north and they dip from 10° to 15° to the east. There is no doubt that they rest unconformably on the Keewatin although the contact is nowhere exposed. The formations occur in distinct beds from a few inches to several feet thick.

The conglomerate weathers grey or light grey. It contains pebbles usually less than an inch in diameter of several rock types.

The greywacke is grey, fine-grained and weathers a light grey color. Occasional pebbles are seen in it. The arkose weathers grey or light grey but on a fresh surface is usually pink.

Matachewan

Approximately north-south striking diabase dikes - probably vertical - were found cutting the rhyolite in claims MR-20047 (west end) and the Haileyburian series in the northwest corner of MR-20036.

The former is a coarse gabbroic rock in two irregular segments. The southern one is exposed only at the south boundary of the claim. The other forms a large lens-shaped mass in the centre of the claim. It does not have a distinct diabasic texture. The dike in claim MR-20036 is poorly exposed and its attitude could not be determined. It is fine grained and very dark colored with a good diabasic texture.

Haileyburian

The rocks classed as Haileyburian form a complex of basic and ultra-basic rocks generally lying under the lake in the northern part of the claims. It is exposed along most of the south shore. In addition, small offshoots or tongues are found in the lavas further inland to the south of claims MR-20051 and MR-20037. As a rule the rocks near the contact consist of gabbro or pyroxenite and in the central section are peridotite or dunite or gradations.

However, peridotite was noted in contact with the lavas along the shore in claims MR-20050 and MR-20051.

KeeWatIn

The greater part of the claims along the south shore of the lake is underlain by flows of rhyolite and rhyolite breccia. These are very well exposed in numerous large outcrop areas. Little structural information is available. However, pillows in the western part showed a strike close to east and a steep north dip. No top determinations could be made.

The rock is very fine grained. Most of it is light grey but a few local sections are cream colored. Quartz phenocrysts are quite rare. It is possible that its composition may be closer to that of a dacite or trachyte in part. Fragments make up a large part of the rock in the eastern claims and in the northern part of the two westernmost claims. They are angular blocks of rhyolite generally about 2 inches across but occasionally as much as 8 inches.

Irregular quartz veins, usually about an inch wide, are very numerous in the rhyolite in the central part of MR-20051. Pillow structures are common in the southern part of the two westernmost claims. Usually, they are insufficiently developed to provide any structural information.

STRUCTURAL FEATURES

Steeply dipping east-west running rhyolitic flows have been intruded by a sill-like ultrabasic mass. These are both cut by later vertical north-south diabase dikes. In MR-20051, a fault, reflected by a pronounced valley on surface, is indicated by an offset in the gabbro-rhyolite contact. It strikes close to north and its dip is unknown. The east side has moved relatively 500 feet to the south. A similar fault is indicated by the offsetting of the peridotite-rhyolite contact near the lake on line 200+00E. The east side has moved relatively approximately fifty feet to the north.

At the east end of the property, later flat-lying sediments rest unconformably on the rhyolite and ultrabasic complex. These sediments dip gently to the east.

"C. McAulay"
October 29, 1953

Attach: Map -"Geology of Part of Midlothian II" by C. McAulay, Oct. 4/53
Scale: 1"=400'