63.769

010

INTRODUCTION

The Côté II group consists of 40 claims (P-39758 to P-39797) located in the lower half of the northwest quarter of Côté Township, Ontario. It is in the Porcupine Mining Division.

The claim group was worked from a fly camp located on the baseline at 35/00E, near Enid Creek. The main base camp is at Fortune Lake which is accessible by plane and by trail from Kamiskotia Lake.

Earliest work in the area was done by E. W. Todd in 1923. In 1930, A. R. Graham mapped Côté Township as part of his geological survey of the Groundhog-Kamiskotia area. The group includes a portion of the former Lusikauf claims, which were originally staked for gold. In 1927, Hollinger Gold Mines Ltd. optioned these claims and drilled two shallow holes on the property.

In the spring of 1955, Dominion Gulf Company staked the Côté II group on the basis of aeromagnetic data. The purpose of the present investigation is to evaluate the claims.

Geological mapping was initiated to the scale 1 inch equals 200 feet, and north-south lines were cut at 400-foot intervals. A portion of this group was mapped by D. Sprague in the fall of 1955. W. J. Gannon, assisted by F. Faulkner, completed a ground magnetometer survey of the group. About 19 claims remain to be mapped.

SUMMARY & CONCLUSIONS

The claim group lies on the same belt of altered volcanic rocks that is found on the Enid I group. The favourable host rock for Ni-Cu deposition, i.e., gabbro, is found on the claim group, and also the claim group has on it, over 2 miles of the favourable gabbro-lava contact.

RECOMMENDATIONS

Complete the geological mapping. No further magnetometer work is recommended. A dip needle survey along strike of the iron formation would prove useful in outlining it for structural information, and is therefore recommended. This could be done in conjunction with the geological mapping.

An E.M. survey should be carried out over favourable areas on the group, if

(1) the drilling of the E.M. anomalies in the Kamiskotia this winter is successful; and

(2) E.M. anomalies are found on our Enid I claim group.

TOPOGRAPHY

A spruce-cedar-tamarac swamp covers a large portion of the claim group. At the east end of the property, this grades into an open spruce swamp. Outcrop areas provide the only relief in the area, sometimes rising as high as 80 feet above the swamp level. The only drainage in the area is provided by Enid Creek, which passes through the west portion of the group. Outcrops are few, aggregating less than 5% of the total area mapped. Outcrops were moss covered, and good bare exposures were rare.

GEOLOGY

General

The claim group is situated on the same volcanic belt that the Enid I group lies on. The rock types exposed on the Côte II group are mainly chlorite-sericite schists which strike a little south of west and dip steeply to the south. Gabbro, granite and diabase intrude this belt.

Table of Formations

The following formations have been found on the Cote II claim group. All are PreCambrian in age.

Greenstone complex

Keewatin iron formation

Schist

Gabbro 2a

2b Altered and more feldspathic

Granite 3a

3b Aplites and related dike rocks

Diabase.

Description of Formations

Greenstone Complex

This formation was found on both portions of the claim group that were mapped. In the west section, there are two prominent outcrop areas of this type, and to the east, much of the outcrop surrounding the former Lusikauf gold showing consists of this formation.

Formerly consisting of volcanic rocks intermediate to basic in composition, this formation is now represented predominately by a fine grained chlorite-sericite schist (see Spec. 214-DS-65 and -49). Some fine grained, massive, acidic to basic phases of this rock type were found along the baseline at 28E and 44E. This schisted area is at least ½ mile wide and passes through the center of the group. The average strike of these schists is a little south of west, dipping vertically or steeply to the south. On the weathered surface, this formation is often pitted, caused by the weathering out of carbonates.

This formation is intruded by diabase, granite, aplites, porphyries, quartz veins and gabbro. Relationship between this rock type and the "porphyroblastic" schists to the east was not determined. It is possible that this formation may have once been a porphyry, as intense shearing has destroyed all clues to the original rock type.

Drag folds were found in the schists on Line 44E, 20/00S, 1/20W indicating a north side west movement which correlates with the movement indicated by similar structures on our Enid I property.

Keewatin Iron Formation

This formation was discovered near the east boundary of the group in three places. It occurs in the greenstones (chlorite-sericite-schist) as narrow bands striking E15N, and dipping vertically. These bands are from one to six feet in width, and are contained in a zone possibly 200 feet in width. These bands contain narrow seams of magnetite, from 1/16 to 1/3 inches in width. These seams may locally be highly contorted (Spec. 214-DS-66). Drag folds found in this formation indicate north side west movement, and plunge vertically.

The bands of iron formation are now silicified and are composed mainly of pyrite, magnetite, quartz and minor chlorite.

The contact between these bands and the schist is distinct and can easily be seen in the field.

Schist

Four outcrop areas of this rock type were found in the west portion of the claim group. This schist was formerly a feldspar porphyry, but it now consists of a sericite-carbonate-chlorite schist, characterized by sheared phenocrysts of feldspar. Only one outcrop of massive unsheared feldspar porphyry was found, and this was off the claim group. Here, the phenocrysts of feldspar were seen to be in the order of ¼ inch by ¼ inch in cross section. Zoning was evident in these phenocrysts as the centres, being more calcic, tended to weather out, leaving a "hollow tooth" effect on the weathered surface. These phenocrysts made up from 20% to 40% of the rock. The groundmass consisted of a light grey green aggregate of feldspar, chlorite and sericite.

The distinguishing feature of this formation is the reminents of the former phenocrysts of feldspar, which remain in the schist. The transformation from a feldspar porphyry to a chlorite-sericite-carbonate-schist was seen in the outcrop area just off the southwest corner of the property. Pyritized quartz veins and lenses, and acidic aplite dikes were noted cutting this rock type.

The age of this formation is in doubt, but because it is cut by acidic dikes, presumably Algoman in age, it is considered to be Keewatin in age.

Gabbro 2a

Most of the gabbro outcrops seen in the portion of the claim group that was mapped were of this type. This gabbro was massive in appearance, fine to coarse grained, and had a gabbroic texture. The major minerals are pyroxene and feldspar with accessory magnetite, and occasionally minor pyrite or pyrrhotite. Locally, the gabbro may contain up to 20% magnetite. No appreciable amounts of sulphide minerals were noted in the gabbro on the Côté II claim group.

Gabbro 2b

Only two outcrops of this rock type were noted on the property, one on Line 124E at 39S, and the other 1/50W of 16S on the same line. The rock is the same as the 2a type gabbro, but with more alteration and less ferromagnesian minerals.

Granite 3a

An excellent exposure of granite was found on LO/00 at 16/00S. It is a medium grained massive rock, composed essentially of feldspar, quartz and accessory biotite (Spec. 214-DS-13 and -15).

Intruding the granite are numerous narrow quartz veins with considerable associated pyrite. The granite intrudes the older greenstone complex.

Granite 3b Aplite Dikes, Quartz Porphyry, Feldspar Porphyry and Quartz Veins

All acidic, fine grained, dike rocks and quartz veins were grouped into this formation. They were characteristically fine grained, massive, white to pink in colour, and occasionally exhibited quartz and/or feldspar phenocrysts. These dikes except for quartz veins were rare in the greenstone complex and the schist. Two of these dikes were found intruding a small gabbro mass on the former Lusikauf ground. These two dikes were sheared and converted to a sericite-carbonate schist. (Spec. 214-DS-62).

These dike rocks tended to parallel the schistosity of the greenstone complex when occurring in this rock type.

Diabase

Thirteen diabase dikes were found on the portion of the claim block mapped, and ground magnetometer results indicate the existence of many more.

These dikes were fine to medium grained, massive, fresh, unaltered and have an ophitic texture. Chilled contacts were often seen. They varied from a few feet to as much as 125 feet in width.

Structure

Faulting and Shearing

The abundance of schists in the greenstone belt indicate that it has suffered the effects of an intense faulting and shearing action. Other rock types in the area have been less affected, although shear zones were found in the diabase, gabbro and porphyry dikes.

Most of the faulting was in an east-west direction, although the magnetics indicate the presence of a fault striking roughly north-south at the east end of the property.

A post-diabase fault zone, striking east-west, was found about 100 feet north of our northwest corner. It affected the gabbro and the diabase. Two strong shear zones were found in the porphyroblastic schists at Line 16W, 26S, and on an outcrop a few hundred feet west of the southwest corner of the group. Both these shear zones contain quartz lenses and pyrite (Spec. 214-DS-21).

The Lusikauf gold showing is situated at the contact between a gabbro and a fine grained acidic rock, which has been sheared. The shearing, striking W30S and dipping vertically, occurred in the acidic rock and in about three feet of the gabbro. A narrow acidic dike immediately north of this showing was intensely sheared, but the gabbro remained unaffected, although it was quartz-rich at the contact.

On Line 44W, 2S, 0/70W, a narrow east-west striking fault zone, dipping 70° to the south, was found in the massive andesite. This fault zone was silicified and contained several narrow seams of magnetite, with some associated pyrite. The overall width of the fault zone was about 5 inches.

Folding

Drag folds were found in both the greenstone schist and the Keewatin iron formation. They plunged vertically and indicated a north side west movement.

Metamorphism

Regional metamorphism, together with east-west shearing stresses, has affected the Keewatin complex, resulting in a fine grained chlorite-sericite schist. A former feldspar porphyry, Keewatin in age; has been altered to a sericite-chlorite-carbonate schist with porphyroblasts of feldspar. All the gabbro mapped, except the outcrops at 38/50S, and 16S on Line 124E, were relatively fresh and unaltered. Algoman feldspar porphyry dikes near the east boundary have been sheared and intruded by quartz veins carrying gold values.

Economic Geology & Mineralization

No Ni-Cu sulphides were noted in the area mapped.

Two gold showings were found in the area. One of these, located just west of our southwest corner, consisted of a 12-inch quartz vein cutting a highly sheared and schisted Keewatin feldspar porphyry. Pyrite was the only sulphide noted, occurring both in the quartz vein and in the wallrock. Gold values as high as $20.00/ton are said to have been obtained here. A gold occurrence near our east boundary consists of gold bearing quartz veins in a sericite-carbonate schist. This schist occurs at a gabbro-feldspar porphyry contact. Pyrite occurring mostly in the wallrock was the only sulphide noted. Hollinger drilled this showing in 1928 with discouraging results.

Apparently there are old workings on Line 60E; however, these have not been seen by the writer.

GEOPHYSICS

A ground magnetometer survey was carried out on lines 400 feet apart over the entire group. No detail work has been done to date.

Diabase, gabbro and iron formation give rise to magnetic highs in the area. Of these, the gabbro and iron formation anomalies are most important. The iron formation anomaly can be used to interpret the existence of north-south faults, and also may be used to outline folding, etc. in the greenstone belt. Gabbro anomalies are important in that they may indicate the presence of sulphide bodies (i.e., massive pyrrhotite).

The sharp cut-off of the iron formation anomaly near our east boundary suggests a north-south trending fault, probably with a west side south movement. Most of the remaining anomalies, especially in the central portion of the group, can be explained by either gabbro or diabase.

The presence of all three of these anomalous rock types tends to confuse the magnetic picture of the group.

D. Sprague

DS:bh
Duplicate - Mr. Wyckoff

ATTACHMENTS

DGC Detail Geology of Portion of Cote II - Base Map 42A/12S - Cote Township, Ontario - D. Sprague - November 1955.

REFERENCES

1. DGC Report - Detailed Geology of Enid I - Base Map 42A/12S - D. Sprague - November 25, 1955.

2. ODM Vol. XL, Part III, 1931 - Groundhog-Kamiskotia Area - by A. R. Graham.

INTRODUCTION

The Cote II claim group, consisting of 40 claims, located in the Porcupine Mining Division, Province of Ontario, was staked for the Dominion Gulf Company during the spring of 1955. Interest in the area was derived from an aeromagnetic anomaly which was believed to represent altered andesites, which, further to the east, have proven to be favourable host rocks for copper mineralisation.

A ground magnetometer survey of the property was completed during the fall of 1955. Geological mapping during the fall of 1955 and spring of 1956 indicated that the major magnetic anomalies were due to diabase dikes, local segregations of magnetite in a gabbro intrusive, narrow bands of iron formation, and secondary magnetite along shear zones. The greenstone complex itself did not appear to contain any magnetite. These rocks, however, were highly sheared, the greenstones being altered in many places to a chlorite-sericite schist. Some minor mineralisation, consisting of pyrite (with some gold values reported) in quartz veins was reported in two sections. No indication of copper, nickel, lead, or zinc sulphides were observed on the property however.

About 95% of the area of the property lies under a mantle of overburden, thus necessitating the use of geophysical methods as the major exploration tool. The ground magnetometer survey suggested that the geological structure was rather simple and straightforward but could provide no assistance in determining if a sulphide deposit was present on the property. To do this an electromagnetic survey of the property was recommended.

A vertical transmitting coil system utilising two frequencies, 1,000 and 5,000 cycles per second was used in the survey. Dip angles of the resultant field for both frequencies were observed at each receiver location or station. Basic coverage consisted of stations 100 feet apart, on picket lines 400 feet apart. A total of 1,771 stations were observed on 32.0 miles of picket line. Seventeen separate transmitter locations were required to provide this coverage.

The electromagnetic data were observed during the month of July, 1956 by a McPhar Geophysics crew under the supervision of W. Latta. Dr. N. R. Paterson checked the field operations for the Dominion Gulf Company. On completion of the survey, the field notes and maps were transmitted to the Toronto office of the Dominion Gulf Company for processing and interpretation. A plot of the basic data with interpretation is presented on the accompanying map, the scale of which is 1 inch equals 200 feet.

SUMMARY AND RECOMMENDATIONS

A number of conductors were outlined by this dual frequency survey. In all cases the high frequency anomalies were much stronger than the low frequency anomalies, indicating that the conductors were composed of disseminated conductive elements. All of the anomalies were broad suggesting that the conductors extended to depth.

Comparison of the electromagnetic anomalies with geological and ground magnetic data indicated that the conductors could be attributed to shear zones, contact zones or iron formation. None of the electromagnetic anomalies could be attributed to massive sulphides.

It is therefore recommended that no further work be done on this property and that the claims be allowed to lapse on their anniversary date.

INTERPRETATION

The dip angle method of electromagnetic surveying is based upon the premise that the primary field at the receiver is horizontal and coplanar with a line joining the centres of the transmitter and receiving coils. If a conductor is present in the earth, the primary field will induce electrical currents in the conductor. The induced electrical currents will then generate their own electromagnetic field. This field is called the secondary field. At the receiver, the primary and secondary fields combine to form a resultant field the direction of which is dependant upon the magnitude, direction and sense of both the primary and secondary fields. In practice, the resultant field dips to the north, north of the conductor, has zero dip directly over the conductor, and dips to the south, south of the conductor. The position of the conductor is then pinpointed at the transitional zero dip between the north dips to the north and the south dips to the south.

The dual frequency technique is used in an effort to distinguish between massive and disseminated conductors. A massive conductor will respond equally well to both low and high frequency, while a disseminated conductor will respond poorly to low frequency excitation but may respond quite well to higher frequencies.

An examination of the observed profiles shows that on every anomaly indicated by the survey, the high frequency dip angles are much larger than the low frequency dip angles. This suggests that all the conductors outlined by the survey are disseminated in character.

It will also be noticed that the dip angle profiles appear to be long and drawn out, therebeing a great distance between the maximum north and south dips. There may be three explanations for this effect; the conductor may be deeply buried, it may extend for considerable distance in a vertical direction, or it may be very wide. If the conductor is buried very deeply, attenuation of the secondary field will be high, and consequently the resultant dip angles will be small. This effect will be particularly prominent on the high frequency. Large angles are found on both frequencies, however, so this explanation does not appear valid on this property.

Most sulphide occurrences are extremely limited in their depth extent. Thus if the second explanation is correct, the electromagnetic anomalies cannot represent sulphide bodies. It would appear more likely that they were indicative of shear zones extending to depth.

A wide body, or a series of closely-spaced narrow conductors may produce, through interference, a single anomaly in which the maximum north and south dip angles are far apart. It is quite possible that some of the anomalies on the Cote II claim group are caused by this mechanism.

For ease in reference, the more important electromagnetic anomalies have been assigned code letters. Since high frequency anomalies are more prominent and continuous, they have been assigned simple letter designations as A, B, C, etc. The low frequency anomalies which sometimes are associated with the high frequency anomalies have been assigned a letter and subscript designation as A_1, A_2, C_1, etc.

Anomaly A, which is located about 3,000 feet south of the main base line, between lines 16E and 68E, follows a very sinuous course. Depending upon the distance from the transmitter, and the local conductivity, the maximum high frequency dip angles vary from 6° to 45°. A large number of weak flanking conductors suggest that the anomaly zone consists of a series of more or less parallel conductors, none of which can be considered as massive.

Anomalies A_1, A_2, and A_3 are low frequency expressions of Anomaly A. The maximum low frequency dip angles vary from 1° to 20°, the stronger low frequency dip angles being associated with the stronger high frequency dip angles.

Anomaly B appears to be one of the stronger high frequency flanking anomalies which are associated with Anomaly A.

Anomalies C and C_1 are very similar to and on strike with Anomalies A, A_1, A_2, and A_3. Since Anomalies A, B, C, and satellites occupy a zone having little magnetic relief except for diabase dike anomalies, it is suggested that the electromagnetic conductors represent a broad shear zone, the central portion of which is represented by Anomalies A and C. Due to the broad nature of the dip angle profiles, there is no indication of a replacement type sulphide deposit along the shear zone. The conductors may be mud-filled faults or possibly graphitic shears.

Anomalies D and D_1 are located about 900 feet south of the main base line between lines 96E and 104E. They lie in a magnetically flat zone between two magnetic anomaly zones which are believed to represent iron formation horizons or magnetite-bearing shear zones. Anomalies D and D_1, however, may be associated with a 300 gamma magnetic anomaly, the strike of which is obscured by lack of magnetic data. The electromagnetic anomalies are quite similar to those previously discussed, the high frequency anomalies being quite strong (maximum dip angles up to 32°), and broad. The maximum low frequency dip angles range from 6° to 10° and the low frequency profiles are also broad. The conductor therefore must be considered disseminated and of rather large vertical extent. Lack of flanking anomalies and a more continous appearance of the profiles suggest a single narrow conductor, rather than a number of parallel conductors. The anomaly could represent a narrow, graphitic shear.

Anomalies E and E_1 trend northeasterly from a point 550 feet north of the main base line on line 108E. The low frequency anomaly can be traced about 400 feet to line 112E. A weak indication of it may be seen on line 120E, 1,450 feet north of the main base line and again on lines 128E and 132E about 1,950 feet and 2,050 feet respectively north of the main base line. The high frequency anomaly is also quite weak, but may be traced from 550 feet north of the main base line on line 108E to 1,250 feet north of the main base line on line 120E. It is also picked up weakly on lines 128E and 132E at 1,850 feet and 2,150 feet north of the main base line.

The alignment of these anomalies is rather interesting since they parallel a magnetic anomaly which has been interpreted as the contact between gabbro and greenstone. The shape of the anomalies, as before, suggest a conductor which extends to great depth. It is therefore believed that Anomalies E and E_1 are associated with the contact between gabbro and greenstone. The nature of this contact cannot be determined from the data, but it does not appear to be mineralised by sulphides.

Anomaly F is a weak high frequency anomaly which strikes westerly towards the southwestern extremity of Anomalies E and E_1. It may be traced for about 2,000 feet between lines 108E and 128E. Since it apparently follows the regional strike of the greenstone up to the greenstone-gabbro contact, it probably represents a structure in the greenstone horizon. It is suggested that the structure is most likely a weak strike fault or shear.

Anomalies G and G_1 which trend in a northeasterly direction through the junction of tie-line 2640N and line 124E, parallel Anomalies E and E_1 but apparently lie wholly within the gabbro. Unlike Anomalies E and E_1, Anomalies G and G_1 are associated with a zone of uniform magnetics. They may be caused by jointing or weak shearing parallel to the gabbro-greenstone contact.

Anomalies H and H_1 are located about 600 feet south of the base line on lines 124E, 128E, and 132E. The low frequency anomalies cannot be considered strong but they are easily identifiable. The high frequency anomalies are very prominent. The electrical conductor represented by Anomalies H and H_1 is coincident with a magnetic anomaly.

From the geophysical data the anomalous feature must satisfy the following conditions; (1) it must be a fair conductor, (2) it must contain magnetic minerals, and (3) it must extend to a reasonable depth. Minerals which can meet these conditions are magnetite and pyrrhotite. Considering the known mineral assemblage in the area and the relative magnitudes of the anomalies, it is believed that the anomalous feature is probably caused by magnetite. The anomalous horizon is therefore most likely a band of iron formation.

Several strong, isolated crossovers were found during the course of the survey. Some of these are located at 150 feet south and 2,600 feet south on line 120E, and 2,100 feet south on line 12E. These local anomalies are difficult to interpret but the form of the anomalies suggest that the conductors extend to depth and that they are of a disseminated nature. This suggests that they represent shear zones rather than sulphide occurrences.

In summary therefore, it would appear that the conductors outlined by this survey are caused by shear zones, contact zones or iron formations. None of the anomalies obtained were of the type usually associated with sulphide deposits.

REFERENCES

1. Dominion Gulf Company Preliminary Report, Geology of a Portion of Cote II, Base Map 42A/12B, Cote Township, Ontario, by D. Sprague, December 14, 1955.

2. Dominion Gulf Company Report, Interpretation of Ground Magnetometer Survey Data, Cote II, Province of Ontario, by J. H. Ratcliffe, dated October 19, 1956.

ATTACHMENTS

1. Dominion Gulf Company Map, Electromagnetic Survey, Cote II, Cote Township, Province of Ontario, Scales 1" = 200', 1" = 20 degrees, dated July, 1956.

INTRODUCTION

Forty claims, located in the west-central portion of Cote township, Porcupine Mining Division, Province of Ontario, were staked during the spring of 1955, to permit exploration of an aeromagnetic anomaly.

It has been estimated that 95% of the area of the property is overburden covered. Consequently geophysical methods were indicated as a means toward delineating geological structure and possibly outlining a mineral deposit. Since the area had been selected for exploration on the basis on an aeromagnetic anomaly, the first geophysical investigation of the property consisted of a ground magnetometer survey.

An Askania Schmidt-type vertical force magnetic balance having a sensitivity of about 20 gamma per scale division was used for the survey. Basic coverage consisted of stations 100 feet apart on picket lines 400 feet apart. Picket line control was established by means of a main base line and three tie lines, each of which were included in the ground magnetometer survey. In all, a total of 2,454 stations were observed on 43.29 miles of picket line.

The survey was carried out during the period September 22 through October 17, 1955 by a Dominion Gulf Company crew under the supervision of Dr. N. R. Paterson. On completion of the survey, the basic data together with field maps were transmitted to the Toronto office of the Dominion Gulf Company for further processing and interpretation. A map having a scale of 1 inch equals 200 feet, showing the basic data, isomagnetic contours and interpretation accompanies this report.

SUMMARY AND RECOMMENDATIONS

Magnetic anomalies from diabase dikes, gabbro intrusives, iron formation and magnetite-bearing shear zones combine to form a rather complicated pattern. An attempt has been made to segregate the various magnetic anomalies into groups, in order to obtain a geological picture which will account for the magnetic anomalies.

Essentially the claim group consists of a greenstone complex which has been highly sheared along strike. Gabbro has intruded the northern part of the claim group, and a granite-gabbro complex occupies the extreme southeastern corner. Diabase dikes cut through all of these rocks.

An electromagnetic survey of the claim group indicated the presence of several conductors, which, however, lay in magnetically uniform areas. These conductors are believed to be expressions of open-fissure type shear zones.

The magnetic survey has aided in determining the geological structure of the area. There does not appear to be anything in the structural pattern thus developed which would justify further expenditures on the property.

INTERPRETATION

The ground magnetometer data observed on this property indicate the presence of highly complex magnetic fields. The contouring of the basic data shown on the accompanying map may be considered as an elementary version which violates a minimum number of the individual magnetic values but bears little relationship to the geology of the property. Any contour pattern which will fit the minor amount of known geology must be largely interpretive. Forcing the magnetic data, (which is at least evenly distributed throughout the claim group) to fit sketchy geological information would be highly dangerous. It is believed preferable to accept the elementary version of the contoured magnetic data, knowing that it is simplified, rather than attempting to interpret the magnetics before contouring.

Normally stations observed 100 feet apart on picket lines 400 feet apart would provide sufficient coverage to permit relatively accurate contouring of the data. On this property, however, a number of north-south trending diabase dikes, running sub-parallel to the picket lines and crossing them at acute angles disturb the magnetic pattern. In addition, narrow bands of iron formation which tend to be discontinuous produce sharp, intense, elongated magnetic anomalies. Finally to compound the difficulties of interpretation, the gabbro masses which over most of the property contain less than one percent magnetite are locally enriched to 5 percent or more in magnetite. All of these rock types therefore can produce magnetic anomalies which are similar in form and intensity. No doubt closer grid spacing would tend to alleviate some of this difficulty but even with station saturation on the property, interference between anomalies would exist, and a clear cut interpretation is therefore impossible.

The rocks known to be present on the claim group are listed according to age in the following table.

TABLE OF FORMATIONS

Diabase

Granite

Gabbro

Chlorite-Sericite Schist

Keewatin Iron Formation

Greenstone Complex.

Thirty-three hand specimens were examined and checked for magnetite content by means of crushing and sorting by a horse-shoe magnet. None of the samples of the greenstone complex, the chlorite-sericite schist or the granite contained appreciable magnetite. The single sample of diabase contained between 3 and 5% magnetite. The single sample of iron formation contained up to 40% magnetite. Two specimens from a shear zone cutting through the greenstone complex contained 2 to 3% magnetite at least. Great fluctuations were found in the gabbro. Two specimens were found to contain no magnetite; two contained less than 1% magnetite; two contained 1% magnetite; and one contained from 3 to 5% magnetite. At another location, from which no specimens were obtained, the geologist remarks on gabbro "very rich in magnetite locally."

The first problem is to eliminate the magnetic anomalies due to the diabase dikes. Fortunately, in most cases the diabase is more resistant to erosion than the enclosing rocks. Consequently outcrops of diabase are relatively plentiful, and the problem of tracing the dikes is simplified. Seventeen diabase dikes have been shown on the map. Outcrops appear somewhere along the course of the dikes in all but two of these. The magnetic anomalies associated with the dikes vary from 200 or 300 gamma up to 5,000 gamma, depending upon width, depth of burial and magnetite content. They trend slightly west of north and occur more or less evenly spaced across the property. There is reason to believe that they have been intruded along northerly trending faults some of which show minor horizontal displacement.

Once the diabase dike anomalies are removed, two distinct types of magnetic anomaly remain. These consist of a series of long, narrow anomalies trending generally a few degrees north of east, and a set of local anomalies which do not appear to have any distinct trend. The long, linear anomalies are confined to the greenstone complex, while the local anomalies are found within the gabbro or granite-gabbro complex.

The long, linear anomalies are confined to two distinct zones each of which is about 400 feet wide. The first of these zones is centred about 600 feet south of the main base line. One of the anomalies is associated with a magnetite-bearing shear zone, which in one instance appears very similar to an iron formation horizon. The magnetic anomaly over this horizon which is only about 5 inches wide, reaches an intensity of about 2,500 gamma above base level.

The second zone is located about 2,200 feet south of the main base line. One anomaly in this zone reaches an intensity of 9,000 gamma above base level, and appears to be associated with iron formation. Several bands of iron formation from 1 to 6 feet wide are contained in an iron formation horizon about 200 feet wide. The rock separating the bands of iron formation is part of the greenstone complex.

Correlation between magnetic data and geological information, then, suggests two possible causes for the elongated magnetic anomalies found in the greenstone complex. One of these, the iron formation, is a primary feature, while the banded iron in the shear zone must be considered as a secondary structure.

Another primary feature which often causes elongated anomalies in greenstone areas is a more basic interflow horizon. This type of structure does not appear to be present on the property, however, since, in the fifteen magnetite content tests made on the volcanic rocks, no magnetite was found.

The gabbro is found along the northern part of the claim group, and a granite-gabbro complex is found in the southeastern section. Due to the wide variations in magnetite content found in the gabbro it is rather difficult to define the gabbro-greenstone contact precisely. The typical gabbro area consists of a zone of uniform magnetics suddenly cut by a sharp, intense anomaly having no particular trend direction. In many instances, strong negative magnetic anomalies are closely associated with the magnetic highs, suggesting that the magnetite concentration in the gabbro does not continue to any great depth.

Other negative magnetic anomalies have been found associated with the diabase dikes. The cause of these negatives cannot be readily determined. They may be explained by unknown factors in body geometry such as dip, depth extent or erosional characteristics, or by remanent magnetization.

The geological structure of the area as interpreted from the magnetic data appears to be singularly uninteresting. The strike of the greenstone complex is consistently a few degrees north of east. The gabbro-greenstone contact is quite irregular but typical of intrusive contacts. There is a suggestion of faulting, with minor horizontal displacements, along some of the diabase dikes.

Geological evidence indicates that the entire greenstone belt has been subjected to intense faulting and shearing along the strike of the formations.

There is no evidence of such activity to be gained from the magnetic data except perhaps in a negative way. It is suggested that the broad, magnetically flat areas lying on either side of the southern anomaly zone in the greenstone complex may represent areas in which heavy shearing has destroyed all of the original magnetite in the greenstone complex.

Mineralization found on the property consisted of quartz, pyrite and some secondary magnetite. Some gold values were obtained many years ago from a quartz vein heavily mineralized with pyrite. No nickel or copper sulphides were observed on the property.

An electromagnetic survey of the property indicated the presence of several conductive horizons. For the most part these conductors lie in the magnetically uniform zones and are therefore considered to represent open-fissure shears or faults.

The claim group does not appear to present attractive possibilities for further exploration. It is therefore recommended that no further work be scheduled on the property at this time.

REFERENCES

1. Dominion Gulf Company Preliminary Report, Geology of a Portion of Cote II, Base Map 42A/12S, Cote Township, Ontario, by D. Sprague, Dated December 14, 1955.

ATTACHMENTS

1. Dominion Gulf Company Map, Ground Magnetometer Survey, Cote II, Cote Township, Province of Ontario, Scale 1" = 200', dated October, 1955, Contour interval = 100 gammas.

The east and west parts of the property were mapped by D. Sprague in the fall of 1955. On December 14, 1955, Sprague submitted a report entitled "Preliminary Report on Geology of a Portion of Cote II". A geological map, at a scale of 1"=200', accompanied the report. Detailed descriptions of the rock formations and structurel features, occurring on the parts of the property mapped by Sprague, are included in the report.

The central part of the property, from line 56 + 00E to line 100 + 00E, was mapped by R.W.Hutchinson and J.S.Vincent in 1956. Hutchinson and Vincent left South Porcupine for the property on May 28th and returned on June 13th; the geology mapped by Hutchinson and Vincent has been added to Sprague's map, - scale 1"=200'.

Hutchinson reported that the rock formations and structural features mapped by him are similar to those obseved and reported by D. Sprague.

Volcanic rocks in the central part of the property comprise highly altered andesite and minor interbedded acidic flows. Narrow, interbedded bands of iron formation indicate that the volcanic formations strike easterly. The volcanic rocks are extensively altered to chlorite-sericite schists. The direction of the schistosity is easterly, parallel to the strike of the flows.

Several wide, northerly trending diabase dikes intrude the volcanics. The diabase exposure on line 76 + OOE, with an easterly striking contact, may be a 'spill-out' in the direction of the schistosity.

A small outcrop of coarse grained, massive gabbro occurs in the northeast part of claim number P-39775.

Pyrite is the only sulphide mineral noted in the central part of the property. Disseminated, medium to coarse grained occurrences were observed as noted on the map. These occurrences are considered to be unimportant economically.

C. G. MacIntosh.

CGMacl/BL

Reference

DGC Map - Detailed Geology of Portion of Cote II, Base Map 42A/12S, Cote Township, Ontario. Scale 1" = 200', November 1955, (to accompany report by D.Sprague dated December 14, 1955). Geology completed by R.W.Hutchinson and J.S.Vincent, June 1956.

Attachments

Rock Specimen Record Sheet - Cote II, Base Map 42A/12S, Ontario, (to accompany map with geology completed by R.W.Hutchinson and J.S.Vincent, June 1956.)

D106B

DOMINION GULF COMPANY
Rock Specimen Record Sheet

Property or Twp. Cote II .... Base Map No. 42 A/12S ...... Prov. Ontario ....
To accompany [struck out], geology report or map, [struck out], ENTITLED
..........Preliminary Report "Detail Geology - Cote II" ....
.... By D. Sprague ....Dated Dec. 1955
(stroke out reports not applicable; state reasons for any lab. work at bottom of sheet)

Received in Central File by ....Date..........Stored at..............
Lab. Reports by (1) ....Dated ....
(2) ....Dated ....

C.F. No.	Field No.	Location	Field Name	Misc. Notes, Assay No., Results, Purpose, q/s, etc.
13682	DS-214-12	L-4+00E, 16+80S 1+10E	Chlorite-Sercite Schist (More massive specimen)	
13683	DS-214-13	L-0+00, 16+00S 0+40W	Granite	
13684	DS-214-14	L-0+00, 1+50N 0+10E	Gabbro	
13685	DS-214 15	L-0+00, 17+00S 1+00E	Granite	
13686	DS-214-16	L-4+00E, 16+80S 1+10E	Feldspar porphry sill 10" wide	
13687	DS-214-17	L-0+00, 0+50N 0+40W	Gabbro, fine grained	
13688	DS-214-18	L-4+00E, 3+80S	Acidic lava, fine grained, lineated	
13689	DS-214-19	L-0+00, 17+00S 3+00E	Altered volcanic	
13690	DS-214-20	L-12W, 38+00S 0+50E	Diabase	
13691	DS-214-21	L-12+00W, 26+50S 0+80W	Mineralized schist,(with granulated qtz. lenses)	

D106B

DOMINION GULF COMPANY
Rock Specimen Record Sheet

Property or Twp. ..Cote II.................... Base Map No. 42 A/12S Prov. Ontario
To accompany [illegible] geology report or map, [illegible], ENTITLED
.... Preliminary Report "Detailed Geology - Cote II"
....By. D. Sprague ....Dated. Dec. 1955
(stroke out reports not applicable; state reasons for any lab. work at bottom of sheet)

Received in Central File by ....Date..........Stored at..............
Lab. Reports by (1) ....Dated ....
(2) ....Dated ....

C.F. No.	Field No.	Location	Field Name	Misc. Notes, Assay No., Results, Purpose, o/s, etc.
13692	DS-214-22	~~XX~~ 39+60S TL 7+40E, 0+20S	Chlorite sericite carbonate schist	
13693	DS-214-23	L-0+00, 37+00S 5+00W	sheared feldspar porphry(chlorite sericite carbonate schist)	
13694	DS-214-24	L-0+00, 37+75S 6+50W	slighty sheared feldspar porphyy	
13695	DS-214-25	L-16+00E, 19+30S	chlorite-sericite-carbonare schist with sheared phenocrysts of feldspar	
13696	DS-214-34	L-24+00E, 22+75S 1+75W	Acidic type volcanic?	
13697	DS-214-35	L-28+00E, 3+20S 0+30E	Chlorite - sericite schist	
13698	DS-214-36	L-28+00E, 2+85S 0+50W	gneissic coarser grained variety of 35	
13699	DS-214-45	L-44+00E, 2+75S (1) 0+70W	Andesite	
13700	DS-214-45	(2) " "	Magnetite seams in sheared andesite	
13701	DS-214-45	(3) " "	Silicified rock in shear zone	

D106B

DOMINION GULF COMPANY
Rock Specimen Record Sheet

Property or Twp. ..Cote II.................... Base Map No. 42 A/12S Prov. Ontario.........
To accompany xxxxxxxxxxxxxxxxxxxxxx geology report or map, xxxxxxxxxxxx, ENTITLED
..........Preliminary Report "Detailed Geology - Cote II"..............................
....By D. Sprague..........Dated Dec. 1955.
(stroke out reports not applicable; state reasons for any lab. work at bottom of sheet)

Received in Central File by ....Date..........Stored at..............
Lab. Reports by (1) ....Dated ....
(2) ....Dated ....

C.F. No.	Field No.	Location	Field Name	Misc. Notes, Assay No., Results, Purpose, c/s, etc.
13702	DS-214-49	L-44+00E, 18+60S 1+20W	Schist (carbonate, sericite, chlorite)	
13703	DS-214-50	L-48+00E 22+00S	Schist " " "	
13704	DS-214-55	L-52+00E, 3+30N 1+70E	Granodiorite	Near contact between gabbro and the greenstone either recryst. grnst. or acidified gabbro
13705	DS-214-58	L-52+00E, 7+50N 1+50E	Gabbro	medium grained
13706	DS-214-62	L124+00E, 17+10S 1+00E	Schist	(from acidic dike in gabbro)
13707	DS-214-62 (b)	L124+00E, 16+75S 1+10E	Gabbro	
13708	DS-214-63	L128+00E, 17+35S 1+10W	Mineralized rock at gold showing	
13709	DS-214-65	L128+00E, 12+25S 0+25E	Schist	
13710	DS-214-66	L124+00E, 9+35S 0+36W	Iron formation	
13711	DS/214-69	L128+00E, 18+10S 0+30E	Fine grained acidic rock	

D106B

DOMINION GULF COMPANY
Rock Specimen Record Sheet

Property or Twp. Cote II Base Map No. 42 A/12s Prov. Ontario
To accompany xxxxxxxxxxxxxxxxxxxxx geology report or map, xxxxxxxxxxxxxx ENTITLED
Preliminary Report "Detailed Geology - Cote II"
By D. Sprague Dated Dec. 1955
(stroke out reports not applicable; state reasons for any lab. work at bottom of sheet)

Received in Central File by .... Date .... Stored at ....
Lab. Reports by (1) .... Dated ....
(2) .... Dated ....

D.G.F. No.	Field No.	Location	Field Name	Misc. Notes, Assay No., Results, Purpose, c/s, etc.
13712	DS-214-77	L108+00E, 15+80S 1+40E	Mineralized rock at pit	
13713	DS/214/79	L108+00E, 12+75N 2+25W	Gabbro	
13714	DS-214-80	L108+00E, 24+10N 0+15W	Gabbro	

D106B

DOMINION GULF COMPANY
Rock Specimen Record Sheet

Property or Twp. COTE II Base Map No. 42A/12S Prov. Ontario
To accompany memo, progress report, geology report or map, drill hole log, ENTITLED Detailed Geology, COTE II (Geology completed by B.W.Hutchison & J.S.Vincent) Map June 1956 By C.G.MacIntosh Dated October 1956
(stroke out reports not applicable; state reasons for any lab. work at bottom of sheet)

Received in Central File by .... Date .... Stored at ....
Lab. Reports by (1) .... Dated ....
(2) .... Dated ....

C.F. No.	Field No.	Location	Field Name	Misc. Notes, Assay No., Results, Purpose, c/s, etc.
15065	214 RWH 1	L64+00E 19+30S	Sericite Schist	
15066	214 RWH 2	L64+00E 19+00S 0+50W	Sericite-Chlorite Schist	
15067	214 RWH 3	L56+00E 8+00S 0+60W	Felsic Schist	
15068	214 RWH 4	L78+00E 4+50S 0+30W	Chlorite Schist	
15069	214 RWH 5	L84+00E 10+50S 0+60W	Acidic Volcanic	
15070	241 RWH 6	L88+00E 2+50S 0+35W	Iron Formation	
15071	214 RWH 7	L68+00E 11+80N 1+80W	Gabbro	


LEGEND
Shear Zone
Contact
Magnetic High Axis
(Indicative of Iron Formation or Magnetic-rich Shear Zone)
TL-26+40N
BL-0+00
TL-26+40N
TL-13+20N
BL-0+00
FORTUNE TWP
COTE TWP
Granite-Gabbro Complex
Diabase
Gabbro
Greenstone Complex
Iron Formation
Greenstone
Granite


LEGEND
Low Frequency Conductor Axis
High Frequency Conductor Axis
W Weak Indication of Conductor
A Anomaly Number (High Frequency)
(Subscript denotes Low Frequency).
10% 0 10%
1000 C.P.S.
5000 C.P.S.
T.L-26+40N
T.L-26+40N
T.L-13+20N
B.L-0+00
B.L-0+00
FORTUNE TWP
COTE TWP


TIE LINE 26+40N
TIE LINE 13+00N
BASELINE 0+00
FORTUNE TWP
COTE TWP
P-39781
P-39782
P-39794
P-39795
P-39780
P-39783
P-39797
P-39796
P-39775
P-39774
P-39772
P-39773
P-39784
P-39785
P-39789
P-39791
P-39771
P-39776
P-39779
P-39786
P-39790
P-39793
P-39759
P-39761
P-39764
P-39767
P-39760
P-39762
P-39765
P-39769
ENID CREEK
LEGEND
4 diabase
3a/3b 3a granite
3b aplite dikes, quartz porphyry, feldspar porphyry & quartz veins
2a/2b 2a gabbro, basic gabbro, fine to coarse grained, fresh appearing
2b gabbro altered & more feldspathic
Sch. schist, definitely derived wholly or in part from a feldspar porphyry, now consisting of a chlorite-sericite-carbonate schist, characterized by scattered sheared porphyroblasts of feldspar
KFe Keewatin iron formation
1. greenstone complex, usually represented by a chlorite-sericite schist, but locally may be massive, acidic to basic.
SYMBOLS
strike & dip of lineation
strike & dip of shearing, schistocity
fault, with indicated movement
drag fold with indicated movement
pit or trench
outcrop boundary
formation boundry, known
formation boundary, assumed
cg, mg, fg. coarse, medium & fine grained
topographic boundary
trail
claim line
claim posts
spruce, cedar, tamarac or alder swamp
open alder or grass swamp
INDEX MAP

DOMINION GULF COMPANY

GROUND MAGNETOMETER SURVEY

COTE II

COTE TWP. PROV. OF ONTARIO

Scale: 1" = 200' OCT. 1955

Contour Interval = 100 Gammas

To accompany Interp. Report by J.H.R. Dated: Oct. 19, 1956.

(3X6)


LEGEND
Low Frequency Conductor Axis
High Frequency Conductor Axis
w Weak Indication of Conductor
A Anomaly Number (High Frequency) (Subscript denotes Low Frequency)
FORTUNE TWP
COTE TWP
B.L-0+00
T.L-39+60S
L-0+00
DOMINION GULF COMPANY
ELECTROMAGNETIC SURVEY
COTE II
COTE TWP PROV OF ONTARIO
Scale: 1"=200' July, 1956.
1"=20°
To acc. Interp. Report by J.H.R.
Dated: Oct. 23, 1956.
10% 0 10%
1000 C.P.S.
5000 C.P.S.


LEGEND
4 diabase
3a/3b 3a granite
3b aplite dikes, quartz porphyry, feldspar porphyry & quartz veins
2a/2b 2a gabbro, basic gabbro, fine to coarse grained, fresh appearing
2b gabbro altered & more feldspathic
Sch. schist, definitely derived wholly or in part from a feldspar porphyry, now consisting of a chlorite-sericite-carbonate schist, characterized by scattered sheared porphyroblasts of feldspar
Fe Keewatin iron formation
1. greenstone complex, usually represented by a chlorite-sericite schist, but locally may be massive, acidic to basic.
SYMBOLS
70° strike & dip of lineation
70° strike & dip of shearing, schistocity
fault, with indicated movement
drag fold with indicated movement
pit or trench
outcrop boundary
...... formation boundry, known
...?... formation boundary, assumed
cg, mg, fg coarse, medium & fine grained
topographic boundary
trail
claim line
O claim posts
spruce, cedar, tamarac or alder swamp
open alder or grass swamp
INDEX MAP
FORTUNE
DYERS
LOVELAND
COTE
ROBB
I.R. #3
ENID
MASSEY
TURNBULL
1 in = 8 mi
DOMINION GULF CO.
DETAILED GEOLOGY
of PORTION of CÔTÉ II
BASE MAP 42A/12S
CÔTÉ TWP. ONT.
SCALE 1 in. = 200 ft.
NOVEMBER 1955
To accompany report by D. Sprague dated Dec. 14/55
D. SPRAGUE
REVISED AS OF OCTOBER 25, 1956.
BASELINE 0+00
TIE LINE 39+60S
TIE LINE 13+00N
FORTUNE TWP
CÔTÉ TWP
ENID CREEK
P-39774